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JULY, 1865.

PART FIRST.

Analytical and Critical Reviews.

Review I.

A Manual of Practical Hygiene; prepared especially for use in the Medical Service of the Army. By Edmund M. Parkes, M.D., F.R.S., Professor of Military Hygiene in the Army Medical School, &c. &c.—*London*, 1864. 8vo, p. 602.

When, in one of the master-pieces of our great dramatist, Iago, the world-worn ancient, vents his spleen on the fact of Cassio's promotion, he describes that fortunate officer as an "arithmetician," feathering his shaft of sarcasm from the wing of such prejudice as is begotten of envy and professional discontent. It will be remembered that in the sequel of the play poetical justice is fully satisfied, since the princes of the Venetian state entrust to Cassio the supreme command. The exactness, indeed, that is required in attack and defence, in constructing angle or parallel, or in calculating the range of a trajectory, is modelled after Nature's laws, who, in her quality of man's tutoress, on every breach of them inflicts unerring blows, which he, so long as his conceptions as yet were immature, persistently ascribed to fate. Scarce otherwise than thus, and little improved by the enforcement of such discipline, the world went on for centuries, until a Civilization had grown up which is stronger than governments, as also it is more pervading and enduring. Gifted with a life that holds its way amid the waste and destruction of human lives, her mild genius beckons towards change, yet not without bestowing the means, as she offers to her armed force the pattern of methods and contrivances drawn from her fertile bosom. For the improvement of the soldier's lot and for his increased efficiency, there is doubtless, in the coming time, much to ensue; if on the fields of glory enough is done to show our nature far above the beasts that perish, much on the side of humanity yet remains unachieved to prove us kindred to the angels. In the history of past wars we see reflected the deadliness of the serpent, with but little of that wisdom which marks him as a subject for our admiring imitation.

And what is this Hygiene that we should exalt it, or that we should fear it? It is indeed Civilization's better part. Much there is in it of that mystery that attaches to our race; the counters that it plays with are not merely human lives; crowns and sceptres are under the influence of its sway; the balance of European power, the British constitution itself, may bend to its strong appeal: for with a step like that of the ghostly statue in the play, amid the clang of international and jars of political discord, Civilization irresistibly advances—strong by its alliances, attractive in its sympathies, pulsating under the pressure of ancient and domestic thrall, yet sworn in fealty to no soil, it spreads and pierces by a law of life; and come what will, it must go on. There is no longer any let to this must; and as it establishes itself it will call for barriers against disease. The interpretation of individual independence—incompatibility of state institutions—will all ultimately prove plastic, or rend under the application of its force. A perception of the laws of life will end in a cry for the preservation of human lives as loud mayhap as ever was the cry for liberty. Hygiene must finally be accepted as the imperative duty and privilege of the State, as its use comes to be cherished more and more by each individual man.

The march of these facts might have been retarded for some years had not society possessed in its soldiers a special field for observation whence to draw inferences that are incontrovertible. The results of army statistics pass now deservedly among the discoveries of science. What mind, indeed, was fully prepared for such results? There are few, we would fain trust, that are not touched with compunction for the devastations of the past. Under support of a general consent to the firm basis on which the science rests, Hygiene now enters unchallenged into the field of legislation, to remain no intruder there. The flutter at the novelty of State medicine, while it serves to give assurance of security against individual oppression, is no prelude of resistance to our national progress and to the well-being of the multitude.

The book we have before us is a wonderful monument of literary industry; so little has been omitted or overlooked in its construction that we succeed ill in finding anything either to add or to correct. In point of science it carries the department of "Military Hygiene" thoroughly up to the improvements of the present day, and will doubtless continue for some time to be the standard of reference and court of appeal on this subject. It seems, indeed, intended as a *résumé* of the whole science of Hygiene as at present understood; for a handbook too unwieldy, and in its details somewhat cumbrous, far from forcible in particular recommendations to reform, not unlikely, we fear, to be misemployed as an annoyance to the medical officer, while welcome to him as a means of information, it gathers together in one sheaf all the scattered ears of knowledge our modern age affords, to sift and use them for its purpose; if displayed with too much abundance and teased out with too excessive a minuteness, subsequent literary arrangements may correct that inconvenience, just as also improved methods, as time goes on, will necessitate changes of formulæ, and military reform will throw behind us many suggestions which greatly occupy us now.

Our author gives the first consideration to water, that necessary of life, which the old Theban poet roughly compared with gold. In the praise of water the hyperbole is not extreme; a division in the book of sixty-three pages length scarcely exhausts this subject of general importance. In our advancing, but still retarded society, the influence of water on health remains even yet underrated; and when we consider that in dysentery, typhoïd, yellow fever, and cholera, the mucous membranes are the parts chiefly affected, the assertion which refers them partly or casually at least to this vehicle of impurity demands a full consideration. Lately, London has been pondering about turning to account a lake fed by the mountains of Wales, while Glasgow is bringing down the waters of a highland loch, and Manchester and Liverpool collect their supply from the vast regions of the millstone grit; let us then compare our increased metropolitan allowance of fifty gallons of water per head per diem with the quantity afforded in New York of three hundred gallons, the latter being a pretty exact equivalent of the quantity furnished to ancient Rome, as Rome flourished in its palmy and imperial days. If we may assume four gallons per head per diem as a minimum for personal use and cleanliness while within doors, any plan of habitation which includes sewage requires twenty-five gallons per head per diem to pass through the conduits, in addition to rainfall. This was the lowest amount estimated by Brunel, and communicated by him to our author. Jennings's waterclosets at Netley require ten gallons per head per diem to flush them.

The storage of water is well considered in these pages, and as regards some of our fortified posts, is of the very last degree of importance. A descriptive note is added of the plan in which the tanks in Venice were constructed; under their arrangements, three hundred and twelve gallons per head per diem were collected. The observations made on permanence of water supply, in making choice of a post, are such as we would fain subjoin:

"It is obvious that the permanence of the supply of a spring or small stream may often be of the greatest moment in the case of an encampment, or in the establishment of a permanent station.

"In the first place, evidence should, when available, be obtained. If no evidence can be got, and if the amount and period of rain be not known, it is almost impossible to arrive at any safe conclusion. The country which forms the gathering-ground for the springs or rivers should be considered. If there be an extensive background of hills, the springs towards the foot of the hills will probably be permanent. In a flat country the permanency is doubtful, unless there be some evidence from the temperature of the spring that the water comes from some depth. In limestone regions, springs are often fed from subterranean reservoirs, caused by the gradual solution of the rocks by the water charged with carbonic acid; and such springs are very permanent. In the chalk districts there are few springs or streams, on account of the porosity of the soil, unless at the point the level be considerably below that of the country generally. The same may be said of the sandstone formations, both old and new; but deep wells in the sandstone often yield largely, as the permeable rocks form a vast reservoir. In the granitic and trap districts, small streams are liable to great variations, unless fed from lakes; springs are more permanent when they exist, being perhaps fed from large collections or lochs."

Waters derive their character from the soil they percolate. The selenite or sulphurated are hard and costly, and are not such as conduce to the preservation of health; the granite waters are deficient in carbonic acid, &c. Water sources from artesian wells are not worthy of every praise. All surface waters should be looked on with suspicion; for correctives, permanganate of potass and alum salt are in some cases recommended to be used; though, in practice, it is difficult to enforce them on the soldier. Colour is a deceptive test. Water with organic matter dissolved (but not suspended) in quantities relatively large, has, it would appear, in certain circumstances, been indulged in with impunity, if free from those fermentations which render it pernicious as a result of such transformation; but oftener its prolonged use will betray in illness those who employ it. Certain fatty acids are noticed by our author as occurring in streams and springs from marshy soils. The sulphates, chlorides, and nitrates, in large relative quantities, are each and all indicated as prejudicial to health. The happy consequences of a better water supply are strikingly evident by a lessened death-rate in the West Indies; amongst other instances quoted the water of the vast Landes in southern France is referred to as a prominent example; this water derives impurity from the vegetable organic matter unsuspectingly intermingled with the sands of these sea-bordered plains—a matter which, at a greater depth, operates in giving cohesion to the subsoil. The water, derived from those Landes, has a marshy smell, and it produces intermittents and visceral engorgements; and pellagra is also, we believe, frequent in the country.

The outbreak at Prague, 1860, of mucous diarrhœa and bronchial affection was due to the fact of sudden violent rainfall washing impurities into the wells; for, as our author remarks, a well of sixty feet or so will drain, in ordinary seasons, a circumference of two hundred feet around. Dr. Parkes feels that, as regards cholera and typhoïd, resulting from bad water, the evidence is not logically complete; we have ceased to be sceptics on that point, as well as in regard to ague, boils, and other sequelæ. Under a scarcity of water, typhus—the soldier's bane—festers around clothes long unwashed, the care and disposal of which should be an especial subject of attention for the medical officer. The British soldier has as yet an education to receive as regards his provision of water; he is in general wholly dependent for it on others. Dr. Parkes gives a recommendation that a water-carrier should be in attendance on each ammunition-waggon on active service, so that as each man takes in his ammunition he may fill his bottle with water.

If, in proportion to the amplitude and complexity of the subject, we have touched but slightly upon that necessary of life, from the consideration of which we are departing, we shall deal with the subject of air from amidst a great fulness of detail with yet greater brevity, since indeed the facts, which are of prime urgency and importance in relation to it, are now becoming generally understood, although, if we look at the returns of phthisis in the troops lately as given from some of our colonies, the application of these facts would seem to be extremely neglected; such endurance attaches to long-established abuse. Air is more subject to stagnation than water, and stagnation is ruinous to it; it is a sewer for gaseous exhalation, as rivers are for watery liquids. The full quantity required for one man, according to Grassi, is 2118 cubic feet; in barracks, General Morin fixes it at 1059 cubic feet per day, 2118 per night.[1] A horse has been roughly estimated to consume four times as much air as a man, and by Reynand, if we recollect aright, to require at least a metre and a half standing room. In calculating for the work in mines, Mr. Robert Stephenson estimated that the rate of 100 feet of air per man per minute would not be enough (6000 feet per hour), we may learn from hence the exacting nature of human conditions.

It clings to our memory to have heard of a certain small island in the Atlantic, the inhabitants of which are said to be sensorially affected by the presence of any newly-arrived stranger, owing to the freshness of his organic emanations. The common soldier somehow is not the most undiscoverable creature in the world by the unaided sense of smell: the organic matter given off in barracks has been collected from the air by condensing watery vapour on the sides of a globe containing ice (as by Taddei in the wards of Santa Maria Novella); it is precipitated by nitrate of silver, it blackens platina, and yields ammonia; it is therefore nitrogenous. It has a fetid smell, which will last in a room for four hours, oxygenizing very slowly; probably it is combined with water, although molecular; it is absorbed most by wool, feathers, damp walls and moist paper, and least by straw and horsehair; variety in colour influences its absorption; it is not very diffusable. Whenever carbonic acid reaches to 0·7 per 1000 volumes in a room, the smell of organic matter is always perceptible, and is very strong when it amounts to 1 in 1000. Gualtier de Claubry[2] asserts that in barracks some minutes only after the soldiers had entered there was a perceptible smell of organic matter, though at that time no augmentation of carbonic acid was discoverable. This matter, when absorbed into the circulation, undergoes organic elaboration, in the hurried conflict of vital actions, but when much perverted and intensified in its material conditions it starts a series of changes which are abnormal to the constitution, the misled materies pursues

[1] The Barrack Commissioners recommend that at least 1200 cubic feet per man per hour be given at home. The regulation orders 1200 cubic feet for temperate, and 1500 for tropical climates, and 600 feet for huts. Malta, not being a tropical climate, the number of cubic feet allowed is too small. From the great variations in humidity, fevers of a bad type abound, and should be stayed by good ventilation. It is also worthy of note, that during the present spring (1865) typhus has been extraordinarily frequent and fatal in country districts in Malta.

[2] Ann. d'Hygiène, April, 1861, p. 348.

forbidden tracts, and soon it bursts out into disease. It is thus that fever and phthisis come into view, and swell the returns.

3. Among disinfectants of rooms and barracks during the march of epidemics, or in prevention of them, nitrous acid is most relied on as destructive of organic matter, though the nitrous and sulphurous acids and chlorine should be used alternately, or all united, for thorough disinfection; Condy's fluid is in this work spoken of with somewhat more favour than Burnett's, the decomposing action of which on sulphuretted hydrogen is denied by Hofmann. Dr. Parkes throws doubt on the opinion he quotes from Dr. Little as regards the poisonous influence of sulphuretted hydrogen on man. Dr. Little asserts that this gas is not pernicious, and even that it assists in subduing miasms. We may add to his Dr. Livingstone's experience in the river Shire as in part corroborative of the same view. The evidence which Dr. Parkes adduces in proof of its perniciousness is drawn from the marshes of Italy; this argument will not, we think, bear a close examination. We know not the exact source whence they are drawn. Casorati, one of the most recent and best authorities, is against him. In various parts of Italy, as in the valley of Amsante, in the province of Arpini, mephitic vapours burst forth which are so striking as once to have formed a theme for Virgil's pen. They are composed of carbonic acid and sulphuretted hydrogen; yet although these vapours are superabundant and enormous in quantity, they are not productive of disease. In one part of that Tuscan maremma so notorious among the fields of Italy—viz., over the steaming lagoons of Castelnuovo, Travale, and Monte Cerboli—carbonic acid and sulphuretted hydrogen are developed in such abundance as renders their neighbourhood insupportable. With the aqueous vapour which accompanies them, they form so dense a cloud as greatly to obscure the orb of day; such atmosphere might be expected to be lethal; on the contrary, one of these lagoons is situated in proximity to the country of Castelnuovo, where the climatic conditions, if they are not to be considered excellent as forming part of the maremma, are at least far less deleterious to health than in the interior of that tract of ground where these sulphuretted hydrogen emanations have really no existence. Moreover, the unhealthiness of these marshes diminishes after the heats of summer, whereas the escape from both gases lasts pretty equally throughout the year. We add this example to Dr. Little's opinion as to the innocuous character of sulphuretted hydrogen, its pernicious nature being by no means an accepted doctrine in Italy. Dr. Parkes does not either incline to accept Parent-Duchâtelet's dictum that work in sewers, as established by the state of health of those engaged in the service, is unprejudicial. He considers Duchâtelet as refusing weight to fair evidence against hurtful influences on life. Our own observation in the metropolis, as to the results of defective drainage, would lead us to the opinion that anæmia is the most wide-spread and undeniable symptom that ensues therefrom; but is this anæmia nothing? Duchâtelet himself affirms that the sewer air greatly aggra-

vates enthetic disease, and that those who persist in working while suffering from its complications inevitably perish.

In treating of ventilation, our author concludes that great engineering exactness is requisite in artificial arrangements of tubes and supply of hot air; he is eclectic, and wedded to no plan. He agrees, however, that the system of propulsion is more needed in the tropics, while that of exhaustion is to be preferred in our climate. Warming by hot-water pipes, and Van Hecke's arrangements, are cheaper than giving motion to a large fan; as suited to large hospitals, natural ventilation, as he says, is best. We are of opinion, however, from observation in civil hospitals, that a fan, or other mechanical contrivance, might be advantageously used in some instances to clear the passages of foul air in early morning before the doors of the wards are opened.

This is all we shall say with regard to air.

The consideration of the relative value of foods and arrangements of dietaries constitute the reigning topic of the day; we shall avoid repetition, therefore, by saying that every article of diet passes under the test of our author's scrutiny and adjudication, and not without scientific generalizations which are applicable to the subject. This question, however, of the private's food is complicated with the issue of his pay. It is allowable here to remark, that both the food and pay of the soldier, especially the former, are somewhat short of what is judicious and expedient. Dr. Parkes has not entered boldly upon this subject; it is evident, however, that if a soldier is insufficiently and barely fed, he will certainly spend his spare money in strong drink. Nothing can be simpler than the view that the soldier should be fed by the State, and his health be maintained by its care. The soldier's ration is only part of his diet: it consists of bread and beef alone.[1] The expenditure of other necessaries of life come under the head of "messing," and the accounts are only not entangled because they have settled into use by time, and worn themselves a pathway in the military and official mind; to outsiders they are inexplicable, and even mysterious. This complex kind of arrangement seems a relic of those feudal times when each chief brought his retainers into the field, but is not without some claim to the plea of convenience and economy; it even derives a degree of countenance from the unthrifty practice of private families in allowing beer money, extra money, &c., in place of food, to their domestics. It is fair, however, to state that the expenditure of his pay is in the least degree under the soldier's control, and that he has little to do with it, and is often behindhand with his officer.[2] These

[1] Of the soldier's pound of beef, a quarter of a pound may be bone (any default of this kind does not admit of a prompt remedy); the loss by cooking would then bring it down to six ounces of cooked meat. The ration should be one pound and a half of meat, if only in the interests of economy in health. It is not by what soldiers eat and drink that nations are ruined—it is extraordinary estimates and munitions of war that overcharge the army estimate returns.

[2] The soldier has a penny for beer money in addition to his shilling a day. Deduct eightpence halfpenny for rations and messing (tea, coffee, vegetables) and washing, threepence halfpenny remains out of the shilling to pay for barrack damages, wash-

circumstances require revision before the soldier can enjoy good health and morals, the latter often waiting upon the first. An era of peace is the best time for consideration and change, to perfect old arrangements or to endeavour at new. If we deprive the soldier of such *solamina vitæ* as his extra beer and his dram, we must feed him liberally in proportion to work and training, otherwise climatic and other deteriorating influences will tell prejudicially upon his ill-sustained frame.

The soldier's present dietary is deficient in nitrogenous elements,[1] and so far from happy in other respects, that we even find a recommendation to copy arrangements of diet from the Russians in view of better preservation of health in the field. (p. 148). We have nothing to say against Dr. Parkes's proposition of adding two ounces of cheese to the daily fare, and leguminous food might without disadvantage enter into it in some proportion; still bearing in view that a large amount of dyspepsia prevails in the British ranks, even beyond the ken of the medical officer, and that the experience of foreign armies is not much in favour of this superaddition of peas and beans.[2] The suggestion may pass in a parenthesis, but we would give a more generous consideration to a question which is material to the service of the country.

In the passage of European society from subjection to despotic will towards present conditions, it is impossible not to note the impress of individual character and the transmission of certain unmodified ideas in the growth of our military and regimental systems. The despicable parsimony of Frederick of Prussia, who sacrificed the lives of his soldiers to economize every penny in his purse, is prolonged into our times, and is felt in our army ranks. The commander who could never undertake a siege because frightened at the expense,[3] who could not put his hand in his pocket to reward information, and who used the coarsest expedients of cruelty against desertion, rather than pay and feed his soldiers fairly well; the sovereign who wrote down scrupulously every bottle of wine he gave his friends, though to his latest hour one of the coarsest gluttons of his time;—this man's discipline and tactics came into use among surrounding nations so far as the minute and harassing nature of them permitted. He put the generosity of others to the severest test as he moved his army from victory to victory, "like a weaver's shuttle," but he never overcame his vice. What a lesson was not subsequently given to mankind when in 1792, on the heights of Valmy, the *élite* of the Prussian army, perfected in

ing his sheets, hair cutting!! and keeping up his kit. Another most serious item is known by the name of hospital stoppages. After the free kit is worn out by the soldier, he has to provide himself with forage-cap, shell-jackets, three shirts (in the present year each cotton shirt costs him 4*s.* 3¼*d.*), razors, shoe and cloth brushes, mits, soap, sponge, and haversack.

[1] This has been previously dwelt upon in our January number, 1865, p. 71.

[2] See Marques on Portuguese army statistics, our April number, 1863.

[3] The siege of Schweidnitz might be quoted as an exception to this. The ordinary exigences of the service there produced the most vehement protestations on the part of Balbi, the engineer, to obtain some extra beef and beer for his worn-out men. "For God's sake, sire, do not look at the expense!" are the words quoted by the historian Aschenholz. After only sixteen days' siege the place was taken by storm.

discipline, but enfeebled by want of food, recoiled before the raw levies of France! For four days previously, according to the historian (Mignet), the Prussians had boiled corn for their only food. From the encounter at Valmy alone the French Revolution became an accomplished fact. At the more recent battle of Solferino, one of the longest known to history, the French had taken their morning meal, or at least their coffee; the Austrians were all day without any food, nor have they coffee at any time. At Austerlitz, too, the French were well provided, while famine was in the ranks of their opponents. Still, in spite of all evidence in history and in science, the faith in low diet, as establishing a useful condition of the human body, seems rooted in the deepest prejudice, both among civilians and military. According to the former, capabilities of the highest contemplation and enhanced emotion, and with the latter of the greatest endurance, are warranted to ensue on a miserable and non-nitrogenous dietary. The cardinal that made his dinner with his finger, and the chesnut-fed, half-starved Auvergnat, are with them types to be imitated and admired. The charter of our nature is reversed. It is convenient to so many interests to read it upside down.

For ourselves, we are willing to protest that the question of increase or re-arrangement of the soldier's pay is quite subordinate with us to that of his health.[1] We would wish the soldier to have occasionally so much money in hand as to add to his cheerfulness and healthfulness; our view leads no further. It is fair to state that under the strain of war the dietary of the British army is re-arranged, but then the best and most extraordinary resources prove short of what is desired; and the soldier's diet in time of peace gives a false datum whereon to reason, and leaves him less solidly constituted for the exhausting trials of the field.[2]

Such minutiæ as are spread over our author's pages would in times not remote seem to belong rather to the gauger and purveyor than to the province of the physician. Exactness and precision result from the appliances of science, and their advantage will assuredly be felt as a check and as a guarantee. It is allowable, it may be presumed, to take the kind of work before us as a specimen of the discipline and occupation of the Army Medical School. The microscope comes largely into operation, and is much depended on. It is for the best,

[1] If the soldier had twopence a day for his tobacco and little fancies, besides good plain food and clothing, his position would be immensely improved. His beer should be drank with his midday meal, and not at the canteen.

[2] The following may be quoted from Dr. Edward Smith's work on Practical Dietary for Schools and Families and Labouring Classes. He observes: "To one who takes much bodily and mental exertion during the day, as in hunting, campaigning, the following quantities of food will not be excessive—viz., cooked meat, 8 oz.; bacon, 4 oz.; milk, 2 pints; bread, 1 lb. to 1½ lb.; vegetables, 1 lb.; butter, 2 oz.; sugar, 2 oz.; cheese, 2 oz.; besides one or more eggs and the less important food that enters into daily dietary." It must be remembered, moreover, that the soldier is above the average build and height of frame. The English soldier has by regulation no war ration; it is framed to circumstances and climate. The Prussian soldier of our day has not only a war ration for the campaign, but an extraordinary ration is provided for the day of battle.

perhaps; and we would not see a backwardness in greeting nascent truth or in approving the fruit of modern endeavour. We will venture the remark, however, that subjects and methods which are novel receive very much at the hands of the cultivators of science that treatment which women are accused of giving to their sweethearts—viz., the last arrived are best attended to. There is much before us, indeed, calculated to make a man of some capacity knowing rather than practical, and a weak man perchance overbearing from conceit; but the sum of information is immense—the excuse for a minuteness which sometimes is extreme, is accounted for by the impossibility of the medical officer to hold many books at command. We might add too that the form and style of the book forbid entertainment, and in that degree only is it less instructive than it might otherwise have been.

We have listened with fastened attention to the relation of British officers of the greediness with which they devoured the *petit pain* of the French soldier during their association with him in the Crimea, and the high price in silver they were willing to pay for it. All this tells in favour of fresh bread. The French have also a biscuited loaf, which is baked more firmly than ordinary bread; it is wholly, or, it may be, a half or a quarter biscuited; it keeps from ten to fifteen days. We find oatmeal favourably mentioned by our author, from its small bulk, large amount of fat, and keeping unchanged for a long time; it is a useful food in war, but much subject to adulteration by dealers. The millet bread issued to the troops in the China expedition seemed very good. Dr. Parkes follows most modern authorities, giving a high degree of importance to the dietetic use of fat, and thinks that its employment in preparing food is the best and most obvious application of its valuable properties.

The notice which has fallen from the pen of Dr. Parkes, that red wine should always be supplied when possible to troops in campaign, would seem to show that he is aware that, as a cure for scurvy and other complaints, and as a prophylactic generally, wine, especially the red, has qualities which cannot be replaced. The soldier deprived of it has exactly one weapon less, the troop and regiment only a portion of its force. Its introduction into the navy by Lind was one of the brightest reforms of the service; it is an attraction of which the recruiting department for the navy do not fail to avail themselves, however it may be evaded in the strict letter of performance.[1] Here we are met by the objection of land transport; under all other considerations the supply of a ration of wine to troops abroad and in campaign would be an economy to the nation, while as constituting a

[1] An appearance of unfair dealing should be scrupulously avoided as bad policy in every branch of business. The myth of a shilling a day to the soldier should be banished from the vocabulary of the service.

> Lunga promessa con l'attender corto
> Ti fara triumfar,

would ill become the lips of a British statesman; when regulations change, it should be plainly stated and openly.

privilege of class, it would appeal to the self-love and self-respect of the soldier. In wine-growing countries, the fermented juice of the grape supplies the want of animal food and varied diet; with bread and wine, and crude vegetables, the peasant thrives moderately well—or, at least contentedly—but his government dare not tax his wine. The quantity of wine consumed in France—a little more than seventy millions of gallons, it has been stated—about balances the consumption of beer in England, which is very nearly of that amount; but wine is far superior as an addition to diet. The frightful scrofulous and skin-diseases of the Middle Ages have been said to be accounted for by the quality of the beer used, which in those times could have been little else than a most wretched sweet wort.

None have more insisted than Dr. Parkes on the superior usefulness of warm drinks for the soldier as a support against inclement weather and for food, and as a substitute for spirits. We go entirely with a modern authority, who has demonstrated by ingenious methods how absolute and essential is the intrusion of caloric into physiological processes; and as far as great principles are concerned, it is best for all of us to keep fully in view the transformations whereby chemical force, in connexion with production of heat, comes to be finally expended in those objective and subjective manifestations which make up the sum of man's activity. This argument serves to enforce the physiological truth, that it is impossible to get more out of man in the way of work than you allow him in the form of food. Caloric is undoubtedly a prime agent in all the recondite phenomena within the frame. As regards the use of hot drinks otherwise than exceptionally, unless it be in the morning, when the function of the stomach is naturally feeble, we incline, however, to think that popular experience is in favour of those slower processes of conversion of force, whereby alcoholic and other food furnish fuel to the frame. In rickets and scrofula, produced by our ever-changing clime, wine keeps its place well in the esteem of physicians, and even gains upon the past. Cold beer is preferred to hot by most, it will be found, of those that use it during exposure to weather. But in all these questions we refer to the test of experience; and it is fair to state that Dr. Parkes argues this one on no theoretical grounds. The refusal of the Duke of Wellington to allow of any teetotal combination in the army showed, we think, a caution and a wisdom beyond our time. We fear not to insist that warm drink taken at or soon after meals wastes food, hurries digestion, and enfeebles it. The Spanish proverb seems sensible enough:

> "Comida fria, bebida caliente
> Nunca hizieron buen vientre."

Dr. Parkes speaks highly in praise of coffee, but declines assigning to it anti-miasmatic properties. He thinks it must always be delivered burnt to the soldier (and who is to pound and grind it). We should plead for the superior convenience of tea, though not accounted so good a stand-by as coffee. In one of the chief battles of the Peninsular war the troops took their afternoon tea leisurely, and then set on orderly at the word of command. In default of animal food, we esteem cocoa the most reparatory of the muscular system; but it disagrees with so many that only toil and famine would render it generally adaptive.[1]

The author is firm against the use of spirits in the army. In a general view we certainly agree with him. In ordinary times and campaigns the principle is good to banish spirits entirely from camp, and even to discourage the use of them by a sufficient diet. Opinion has greatly swerved on this point; we are no longer in the days when Frederick II. penned the words, "and let not the soldier miss his dram." The great workers of the country, in pit and workshop, feel no necessity for such stimulants in sustained labour. Still the conditions are not identical, and nothing is more deceiving than false analogy—arguments drawn from the general population, and applied to military life, are indeed highly calculated to deceive. We cannot indeed forget that the British army heretofore has been made a school of drunkenness to many; the recruit has been actually tutored into drinking. In this and some other particulars we could name, he is the creature of enforced circumstance: his moral atmosphere has not reached him untainted. We refrain, however, from adopting Dr. Parkes' views abstractedly and in their full extent. It may be desirable to get the greatest possible amount of work out of a man, and often at a pinch; we shall not pledge ourselves, therefore, to a wholesale condemnation of spirits. We may also remark that its protective power against miasm, if not proved, is at least ineradicably grounded in the minds of inhabitants in miasmatic districts, both in this and neighbouring countries.[2]

Had we to follow the bent of our inclination, we should, perhaps, dwell somewhat at length on the relations of soil to hygiene. Dr. Parkes seems to have a full perception of the importance of this subject, which is not yet generally diffused. It is no assertion of ours that the mere mineral constituents of the earth, except in exceptional circumstances as yet not defined, are effectual in modifying health; still, when we consider the intense and ceaseless metamorphism which is ever going on beneath our feet, we may readily infer some influences from thence which have as yet escaped definition. The single circumstance that water is as the earth through which it percolates, is a sufficient reason for minute attention to the subject of soil. The ex-

[1] We see the onion noticed in a list of antiscorbutics, in this work; we would recommend it on the score of its extraordinary califacient properties. It should be largely furnished in a campaign.

[2] Could the soldier have got through the first winter of the Crimean campaign without the help of spirits?—That is a question we would like to see satisfactorily answered. Dr. Parkes would, as we judge, unhesitatingly answer in the affirmative. Other practical men are of a different way of thinking. Some of the surgeons in the Crimea recommended that the soldiers should take their spirits with hot water in the morning, before starting for the trenches. They report favourably of the result.

traordinary manner in which soils influence heat;[1] their qualities of radiation and absorption of heat and reflection of light; their relations to air and water, and their chemical composition, are all subjects of interest. "There are few good analyses of malarious soil, though no problem is, perhaps, more important to human nature." In cold climates sandy soils are generally recommendable as less liable to produce cold and rheumatism; and it has been observed that Asiatic cholera is infrequent in houses seated on granitic, metamorphic, and trap rocks, as well as volcanic formations. Of the limestone, the hard oolite is the best, magnesia the worst; gravel hillocks are the healthiest of all sites; plains, with water, at the foot of low hills of one hundred feet or so in elevation, are especially to be avoided. The hard mill-stone-grit formations are very healthy, and their conditions resemble those of granite. The weathered and disintegrated granite of Hong-Kong is accused of giving rise to fever; and like many strata of a deeper character, possesses a fœtid and recognisable odour, though the amount of organic matter is ascertained to be small.

We confess that we have no affection for the close contact with our mother earth. We do not find the immense advantage to health of tressels for camp furniture insisted on; on the contrary, Dr. Parkes seems to have no strong fear of the ground with a good waterproof upon it. We deem this point of elevation above the surface of the ground important in hygiene, the spread of deteriorating air being chiefly horizontal. We must do Dr. Parkes the justice to state, that he insists on the advantage in laying planks for the inside of a tent, of a free space underneath, and we find the slung hammocks in Turner's tents commended on the same principle.

The utility of straw is hardly, we think, done justice to in these pages. It is the gipsy's mattress; the directions for its change and removal are not superfluous.

It seems to have been the custom of the Romans to encamp their men under trees in all hot countries. Huts woven from their boughs were used in the Peninsular war; agreeably cool by day, they proved too cold at night. Dr. Parkes suggests that in hot climates the trees should be removed with great judgment; "a decided and pernicious interference with the movement of the air seems the only reason for removing them." Whoever would attempt to charge an electric machine while a piece of furze is held in the neighbourhood, will be aware of the immense influence of vegetation on electricity. The presence of brushwood is almost always threatening for health; still it is well to be aware that its removal, on account of disturbance of the ground, will sometimes increase malarious disease for a time, and therefore in case of a temporary camp in a hot malarious country it is often best to avoid disturbing it. When removed the work should be carried on, when practicable, in the heat of the day, not in the early morning or evening, and the ground

[1] The heat of sand at the Cape of Good Hope and India, exposed to the sun, marks 159 or 160 degrees.

should be sown with grass if possible; the presence of fresh herbage is always good. In the streets of Sierra Leone the cultivation of a herbage called Bahama grass is supposed to have diminished fevers; the occupiers of each house were obliged to keep it short cut and in good order. In digging foundations of dwellings, the same results of disease are to be looked for as in the case of disturbed vegetation; even in Paris lately this has been experienced in fever and ague.

With regard to clothing of the soldier, we meet with things that are inexplicable to men in civil life, especially to physicians whose experience carries them out of themselves. It has been, perhaps, the misfortune of the soldier, that the officers who have decided on his condition are themselves a hardy class, led, perhaps, to the choice of their profession by the impulse of a strong organic composition, and, moreover, strengthened to the utmost by elastic training and hardy uses (see p. 489). The influence of gentle and fostering influences on the human constitution is a secret to the military mind; strong routine men have but one panacea—viz., to harden by toil and exposure; but this constitutes but a partof military training. It is on this account that the civilian element is so indispensable a complement to the perfection of military matters, and that rank exalted above prejudice and fashion should temper the relations of the commander and the command. The Duke of Wellington was undoubtedly right when he stated that the chief of the state should be the commander-in-chief of the army, that is, under circumstances which rendered such an arrangement possible; in neighbouring countries we have the spectacle of troops well cared for, or alternately neglected, flattered, and pampered as suits the genius of the ruling power; we have in history the lesson of kingdoms and commonwealths arrived at the acme of military renown collapsing all of a sudden no longer to be formidable; state craft and war policy do not touch this question, which is one of the most refined humanity, but too apt among us to be considered as a special branch. It stands removed from the comprehension of those sectaries who have shown so much activity in other fields of well-doing as to claim them more particularly as their own; this one exacts a constant supervision under dominion of those instincts that are fostered by the highest and most elevated rank in which pity and high sense of duty blend in harmonious concert.

What is the underclothing of the soldier in these isles, in which sudden variations of temperature is the main characteristic, amounting to a yearly range of 100° or more, with immense variations in humidity, which have concurrently a bearing upon health? Too often the underclothing consists wholly of a cotton shirt and a pair of cotton socks; over these, in summer, a shell jacket and thin trousers; in winter, a short and scanty tunic, made of cloth, which, as he best may, and as far as its dimensions allow, the soldier lines with flannel and wadding, is worn with cloth trousers: add to these a greatcoat. According to our observation and the agreement of medical officers, he is not sufficiently well-clad. Even in warm climates, if hilly, and exposed to cold winds, such as Greece, Turkey, and Affghanistan, the clothing selected by the inhabitants is of the very warmest character. The use of flannel and a tolerable amount of clothing is insisted on by all best hygeists, even in tropical countries. The wearing of flannel shirts should be, not partial in our army, but enforced as universal. Its demerits of woollen shirts are wholly outweighed by its advantages. The use of flannel drawers is also insisted on by Dr. Parkes, even in India; the flannel belly-band, or kummerbund, may then be done away with. Let a waistcoat with sleeves be added, such as our author brings prominently into notice, and which was recommended by Pringle as late as a hundred and twenty years ago. A great step will then have been made in favour of the soldier. Chest and renal affections will not then be inevitable, which beset him now.[1]

The greatcoat, it seems to be agreed, is the most important article of the soldier's dress. Its scanty cape, its want of the convenience of pockets and of loops for the march, are said to detract much from its acknowledged merits. It seems probable that changes of tent service, borrowed from the French *tente d'abri,* will supplant this garment by a short convenient cloak, with a hood, which may do double service as tent and cloak.[2] In fact, we believe the costume of the British soldier will have to be entirely remodelled with a view to his greater efficiency. The words of Dr. Parkes in this respect are golden, but beat out into somewhat too thin a leaf. If the changes he suggests are carried out, the familiar aspect of the soldier may undergo a metamorphosis which may disturb the mental associations of a life, but public assent will ultimately follow any considerable improvement. For ourselves, we agree to the quotation that our author has thought necessary to append to his text, in considering that costume the most gallant in which the soldier is best prepared for the enemy. However we detest all that is meretricious and delusive, and all that fosters conceit, we are not sorry that by concluding as he does for the pretty Glengarry bonnet, as the most comfortable head-dress for the soldier, to see that portion of our troops which clings most fondly to national ways and fashions will be conciliated by this choice. It permits of being swathed into a turban by bands of linen or covered by oilsilk in winter, or shrouded

[1] We are not ignorant how much the authority of Jackson and Luscombe served to keep back this question in the sense of improvement, but the weight of unprejudiced opinion is all on the side of flannel or mixed woollen. Far more certain is it than our author would make it appear, that good clothing is a protection not only from heat by day, but, what is more important, from miasm even at night. Indeed, in his praise of the blanket in keeping off the dew at night, he nearly touches on this latter ground, for dew and miasm are nearly connected (see Jourdanet). India reeks with miasm. One-third of it is alluvial soil. The fevers are of that type. And have we, then, so many remedies against miasm?

[2] Our author dwells much on the advantage of a waterproof material, with suggestions which seem generally made rather in view of protection from rain than from cold. It may not be amiss to refer back to the time of the Peninsular war, 1810, at which period Marshal Beresford, in training the Portuguese, inculcated the opinion that no personal covering could preserve troops against the rain during a wet march as a fact fully proved by experience; he directed that cloak and blanket should be kept dry for comfort at the journey's end as the most advantageous practice to the soldier.—Southey's History of the Peninsular War, vol. iv. p. 359.

by a hood; it also admits of flaps and earpieces. We are in doubt, however, if it will be improved by a peak, as soldiers are wont to complain greatly of the heat and of the weight pressing on the forehead from this addition to the head-dress. We agree fully and most decidedly with our author, that uniformity as regards production is a point of the highest importance; not to be mistaken for the enemy is the main point; there is futility in multiplying tokens of national and provincial folly. A soldier should be able to say where he has fought, not what clothes he has worn. The entire question, however, of his improved kit and clothing touches closely on the consideration of transport; in this argument of clothing, transport remains the key of the position. That is the point wherein the jealousy of parliaments and individual subserviency have ever compromised the dignity of the nation; it is herein that organization and economy should gain and establish public confidence. Till that shall take place our country will have regiments rather than an army; an extemporized transport is prodigality itself.

It is a fact not to be controverted that both as regards healthful occupation of ground and the choice of head-dress, in hot countries and seasons, the Turks and other Orientals have shown themselves in advance of European custom; whether this be attributable or not to the early associations of pastoral life, or the borrowed traditions of a preceding civilization. Now that the superiority of tent-life over the occupation of old inhabited buildings, and especially in view of infectious disease, has been clearly shown to be great, it is a natural expectation that the attention of the military world will be largely directed towards perfecting tent constructions. In the view of the reception of the wounded in campaign, both regimental and division hospitals move with the force, and should be formed of tents. The Austrian experience is, moreover, altogether in favour of the field general hospital being under canvas. The classification of patients in the general hospital, Dr. Parkes thinks, can be managed better in an arrangement either of tents or wooden huts. The removal of the sick from front in hospitals one or two journeys in the rear is of benefit, as he believes, to the spirits of the efficient, and also to the bodies of the sick. As to this latter point we may be permitted to record a doubt; in the experience of the American war, it has recently proved otherwise. The transport to the rear has there told most hardly on complicated cases and operations, and to the disadvantage of conservative surgery. But we are ever apt to fancy we can do what others have failed in; though transport, indeed, has not generally proved our forte. Such gradations of hospitals will necessarily serve to double, we fear, the list of primary amputations which, it may be, have been reduced in modern field practice below their just proportions. The rude, imperfect, ill-ventilated bell-tent of our army has but little to recommend it beyond its portability. It weighs, when dry, about 65 to 70 lbs.; when wet, about 40 per cent. more; it holds from twelve to sixteen men. The much-admired *tente d'abri* of the French, which was certainly an ingenious improvement, holds four or five soldiers; it weighs from $6\frac{1}{2}$ lbs. to $8\frac{3}{4}$ lbs. only; its carriage is distributed among four men; it is certainly very small. The hospital marquee of the English service is far from equal in perfection to the Prussian and Austrian upright four-poled tent. The small, conical, ill-ventilated tent, called Sibley's, has failed in America to satisfy requirements. Of home suggestions, Edgington's square military construction, and Turner's and Rhodes', seem excellent for choice, or at least for trial. The first of these large tents is pyramidal; it is single poled, with another pole for entrance-flap. It weighs 90 lbs., and will shelter sixteen men. Turner's has a hollow iron tube for its pole, which also serves for chimney or ventilation; its ropes are of galvanized iron, and serve to sling hammocks; but this tent is necessarily somewhat heavy. Col. Rhodes' excellent tents, among their other excellences, are well calculated to resist storms. They take the shape of an umbrella; they have a framework, but no principal pole. For the present, however, favour seems to rest on a certain kind of shelter-tent which seems more immediately to have originated in the extemporized resources of the 12th Regiment, when called into use during a long march, performed by them at the Cape Colony in 1852. The men obtained shelter for themselves by suspending their blankets over their firelocks. A shelter-tent on this principle was exhibited by a private of the 12th Regiment, named Paul, at Chatham, 1862, and has since been improved by Colonel Stewart, of the 2nd Depôt Battalion. This contrivance seems better than Rhodes's covered tent, and is an improvement on the French *tente d'abri.* It is also in advance of the American poncho tent, as instead of a slit through which the head passes on the march, a portion of the sheeting goes over the head, so as to form a hood, and the man is protected by the remainder as far as his knees in marching. The Americans are now using French and shelter-tents. The plan of these last seems too promptly suggestive to be entirely novel. The Macedonians had small tents, which held two men; and in the year 1750, the English had tents of a similar form to the *tente d'abri,* which held five men.

These are surface observations, which we owe to the author's extensive means of experience. We shall observe, however, that if the soldier deprives himself of his main garment to encamp himself, his under clothing, possession of blanket, &c., must all receive separate consideration.

Two subjects of surpassing interest we may not omit to mention—one that of boots and foot-covering, the most perplexing to the hygienist of all that concern the soldier. Dr. Parkes fully discusses it, and at last gives it up in despair. We cannot look in the face the suggestion that the soldier can do without any covering for his feet; but, even with present facilities afforded, we learn that he suffers immensely from this source. The knapsack or valise invented by Sir Thomas Troubridge is much recommended in these pages as by far the most comfortable pack yet invented; it covers the loins, and is supported by means of two curved rods, on the principle of a milk-maid's yoke, resting on the top of the shoulders. The weight is thrown on the upper parts of the scapula, and falls slightly on the loins. The chest is left perfectly free, and no muscles, nerves, or vessels are pressed upon. The whole question of the pack is receiving attention from the hands of Government. The men are said to have marched long distances with Sir Thomas Troubridge's pack, and came in fresh as when they started. It would appear, on a *primâ facie* view, that any unequal pressure on the loins must be of a most distressing character, as any one who has worn a cavalry sword can testify. There would also seem danger occasionally of a chill when the valise is removed; but each of these objections might be dispelled by experience. The Prussian knapsack presents a favourable appearance to our eye; and a pack invented by Mr. Tress deserves further trial. It has been familiarly observed that deeply-vaulted loins characterized the veteran of Napoleon's campaigns; and it is well known that emphysema affected the soldier in the French ranks to a surprising extent. The pages of Dr. Parkes contain a rebuke, which it is imperative to us to notice as material to the service:

> "Commanding officers should be informed how seriously guard and sentry duties, conducted as they are in full dress, tell on the men if they are too frequent. . . . . The weights and accoutrements are injurious, and of late a practice has prevailed of making the soldier carry his pack much more frequently than formerly. Twenty years ago he merely paraded twice a week in heavy marching order for inspection. Now he carries his pack on field, sentry, and regimental drill. Instead of accustoming the men to the pack, and making it easier, it breaks them down."

Meteorology is a subject which should largely interest the medical officer; and he has such large opportunities for the cultivation of the science that we cannot but approve of the greatest facilities being given him in the way of good instruments, for the sake of the practical as well as scientific observations which opportunity may enable him to furnish. It is a pursuit which is so exclusive and absorbing as to require the greatest sacrifices of time and convenience; and it can only cease to be painful as experience increases, and as a conscience of having deserved well of the public is followed by distinction and support. Whether the treatise on meteorology which forms part of the work before us may, in default of other data, prove sufficient to novices in the art, we cannot decide; the study is tedious and difficult, but its practical application is likely to become far less remote through the perseverance of a body of well-educated men, distributed, like our medical service, in different parts of the globe. Nothing is more striking than the amplitude of yearly fluctuations in so-called temperate, compared with tropical climates. At Yakoutsk, North Asia, the fluctuation is noticed as 112° 5′ during the year, while at Singapore it was but 3° 4′.

The immediate connexion between heat and liver disease seems lately to have been regarded with more doubt than formerly. As regards the disease called sun-stroke, both the hour of attack and the seasons at which it prevails refuse so facile an explanation; yet at sea and on high grounds it is not known. Exhaustion of nervous power from long continuance of heat seems to lie at the foundation of most tropical complaints. Too lengthened and continuous an exposure to either heat or cold is what we chiefly should refrain from and fear. At home no less than abroad the British soldier is exposed to immense contrasts in climatic change: the cutting blasts of Edinburgh or Quebec, and the furnace heats of Benares and Kurrachee, prepare him for the deeds of war.[1]

In the service of our country the soldier is a volunteer, and brings with him a carelessness of existence which is rather an advantage than a defect, and which gives him a stronger claim to the protection of the ruling power; in moral strength he is an overgrown child, often perverse, and little influenced by reason. The ranks of the service consists mainly of young troops; the system of frequent removes and reliefs necessitated by colonial exigencies, and especially by the character of the Indian climate, renders the indulgence of marriage to them a quasi-impossibility. The case of foreign troops is more deplorable. With no vocation for that mode of life, sold like Egyptian fellahs under a prince, who is at once proprietor and sovereign, these masses serve to hold in check military governments which hang like threatening clouds over the fortunes of mankind; c'est à qui mieux, it is a system which pertains to our era, and which ancient societies would have contemplated with perplexity. Let us accept the facts, who then shall lend their hearts and thoughts to lighten the entire weight which presses on the military class? To say the truth, the schoolmaster will never feel quite at home in the barracks, and the chaplain is only wanted occasionally. The lead which this nation has taken in material progress leads us to expect that in its centre will be found suggestions in contrivance of accoutrements and novel appliances which will put an end to many aggravations of the soldier's condition. The disciples of Bacon would be at fault, and we should ill deserve the praise bestowed on us by Milton as a sagacious, ingenious, and contriving people, if we hesitated at advance in ever so devious a path of progress, while the ends of the earth send their contributions for our contemplation and selection, and lend their treasures to our manufacturing skill.

We will particularize a few points in which necessity finds argument for change; first, as regards boots. Something, we think, may eventually be discovered and applied which may enable troops to march to the full extent of their muscular endurance without falling lame under a pressure which is next to metallic. The skin of a man is no match for the artificially indurated hide of the brute. The next hint concerns underclothing, in which the defects of woollen garments are

[1] The suffering from cold at the camp at Aldershott during the past winter has been very great, and at Shornecliffe greater still. We may notice that on May 18, 1864, we observed the thermometer in London as high as 127° Fahr. in the sun; while on January 29, 1865, at eight in the morning in the country, at four feet from the ground, the thermometer stood at 8° 2′ Fahr. Both of these extremes lie in the soldier's ordinary path of home duty.

so many that it calls loudly for invention to improve their texture; and under the suggestion of Dr. Parkes and the admirable arrangements of Government in its modern plan of manufacture, this improvement, we doubt not, may be remedied. The next particular regards head-dress for cavalry, and here aluminium would come into use advantageously did not the present dearness of production deprive us of it; the door to this secret will probably soon give way to the importunate interrogations of our chemists. If an inventive faculty of less concentration is enlisted by goodwill in this ample field of interest, there remains enough in suggestions of land transport, tent encampment and kit, to employ ingenious thoughts; but, as regards the military authorities, it is to the subject of tent encampment that we beat the *réveillée;* old buildings, whether churches or hospitals, are found beyond the reach of exorcism through science; and just as in civil life a knowledge of the lethal wave-currents is now leading to particular ideas of hospital construction, so recent military experience has amply shown the superior advantages of tent constructions, and the subject of their portability, ventilation, convenience, and stability, has well need to undergo scrutiny and trial.

The great length to which our observations have extended forbid us dwelling on the two remaining divisions of the work, which, indeed, occupy nearly a third of its bulk. The first concerns those important diseases of the army, which build up the mass of army surgeons' experience in treatment. In the disposal of the dead, we confess a strong prejudice in favour of incremation; but this is rarely possible, and, says our author, if the burning is not complete, fœtid organic matters are given off, which hang cloud-like in the air, and may be perceptible and even hurtful. The destruction of forests led to the disuse of this means, so superior in a sanitary point of view to interment. After the late battles in Italy, the neighbourhood of the battle-fields gave rise to a vast amount of disease in the subsequent autumn.

In beleaguered fortresses the disposal of the dead is often a matter of difficulty; cremation may then be resorted to as an extraordinary means, and sewage also under pressure of circumstances should be mixed with gunpowder and burnt. Modern science will eventually help to find a solution to these difficulties. Chapters on statistics, and particular considerations on the service of the soldier, next engage attention. We shall only say in this place, that we give our full approval to the institutes lately founded, where a man can claim a little quiet away from the obstreperous barrack-room. Referring back to gymnastic training, we may remark that in this means of efficiency a corrective may be found to that liability which occurs in men who act in masses to lean too much to the ranks with prejudice to their personal intrepidity; the less pedantic, however, this kind of instruction is made the better; to sing and dance do well become the soldier; no lumpish German *Turnerei* ever lent a spirit to the camp, and we cannot help expressing the wish that the use of the sword should be brought home to the hand of the private; it is not that the French soldier fences even tolerably well, but there is something in the clash of the steel that reverberates to the heart of the soldier, and persuades him of his strength, something that mere drill and display of muscle cannot impart. We will say thus much, thoroughly persuaded that the soldier's *morale*, even more than his physical strength, should be the object of cultivation, and in this brief maxim we include the results of multiplied and varied reflection; qualifying it further by the remark that no approbation can be yielded to the military training which approaches the level of the "slow."

Dr. Parkes would have the training of the recruit carried on in a separate school at a depôt, continued to six months instead of three, and if excused guard in the first year there would, he says, be ample time for service; not always is the veteran the best soldier, but too often is he insubordinate, cunning, morose, malicious, and a burden to the ranks; from the day the light division joined in the Peninsula they showed themselves the best men; they took their position at once. Protection from ever-present solicitations to vice, which, from the peculiarities of his position, the soldier has had a right to demand from society, and which also, but with less urgency, is the rightful claim of every citizen, he has not yet found, though the words of the Vagrant Act, as it seems to us, clearly point to such protection for all. This is a continuing proof of the incapacity of the vulgar to comprehend the idea of liberty even when they profit more than they deserve from its advantages.

In the chapters on Foreign Service, there are many things deserving the attention of statesmen and the public. This part of the work, indeed, should least of all need recommendation. "Out of sight out of mind" is of every-day application. We should indeed be careful about criticising what lies beyond our ken, and grateful for detail about the remote, even if not punctually accurate. The sources of information as concerns the condition of the soldier and outworks of our national possessions are, it is sad to confess, far in advance of any general or popular interest on the subject; it seems, therefore, somewhat idle to regret that the most recent information is not made available to the country. In the form of government in which we are fallen, the predominance of local and sectional over imperial views is every way evident. Well might Earl Russell reproach the representatives of the great popular constituencies that they were "so very narrow-minded." Were it otherwise, reports of vital interest both to the soldier and the country would neither be allowed to stagnate at the War Office; nor would Parliament be content to furnish by driblets, in a scattering and insufficient manner, those means which are necessary to immediate preservation of life and to the security of our possessions.[1]

[1] Military boards for sanitary purposes in the Mediterranean were sitting in 1859. A Blue Book saw the light in 1863, but little or nothing has been done as regards improved barrack accommodation and water supply. Some future historian may perhaps comment on the madness of the British Government in confiding rich provinces (India, for example) to the loyalty of men neither attached to the service by gratitude nor selected under any moral consideration. On this head a few hints borrowed from the history of Spain and its possessions might prove instructive.

The conversation of the upper ranks of the soldiery is so distinct from the general movement of society—this profession is so essentially active, so much one of youth and power, its discipline so formed on habit in contrast to deliberation and pale thought—that it is doubtful whether ever by himself the officer will find those secrets which touch most nearly to the condition of his command, exception being allowed for that instinct we call genius, by which a few arrive at truths denied to their fellows. The author of the work before us seems to think some heaven-born general would influence society so as to work wonders in the way of reformation in the army. This, however, we may be permitted to doubt; it might be the one thing denied him. We know from the past that the laurels of a conqueror on a head unsurpassed for military conceptions and experience did not bestow the right to qualify undue retrenchment by remonstrance, or scarce to utter a warning when our coasts and dependencies most invited attack. The motto which declares that "everything happens in France," holds good of our country too; but the why and wherefore, and the how, it is not very easy to discern. Let us then be grateful for what occurs for good, and give the palm of thanks where it is most evidently due: may the fortunes of the State be less capricious than our social deviations, and on each turn may the country right itself! Meanwhile, our army medical service holds its own, not without appreciation, at least among our class. The names of Longmore, Barclay, Mouatt, Gordon, Muir, Matthew, Gulliver, Marston, crowd upon our pen as bright ornaments of our profession; from whom when furthest divided we are prepared to expect the most: bound by a double tie of science and fraternity, long may such bonds unite us.

For you men of the past—Munro, Robert Jackson, Lind, Henry Marshall, John Davy, and may we also add Cook and Vancouver—kindred souls! what were the aspirations which led to your glorious reminiscence? Obscure, thwarted, needy, under-valued men, what kind of comfort solaced your rest?—nought, as it would appear to us, but a quiet confidence in the great work before you, which is even now scarce begun. Had your intelligent conception travelled to our days, you would have seen your imperishable work guarded by a few acolytes, to whom your names are a beacon and a trust. But in the bulk of any service, men of this cast necessarily form but a part; to the remainder we offer this advice: If a sense of worthiness in a deprivation of all the sweetest freedoms and glories of existence—if a trustfulness in the reality of things possess you, and sets your vision free from those deceitful illusions which throng the stage of life so as to engross it, betraying when permitted to persuade; if the approbation of the powerful and even the fond attraction of existence exercise no dominion over you, continue then in this path, but else cease from a calling which you may exercise, but assuredly will not adorn. To hold your position by a thread, to speak the truth before the face of kings, to be humble with the upright and distressed, to be patient and hopeful, and to be brave beyond a warrior's bravery, to be satisfied with duty done and with the most niggardly recognition of it:—these are the qualities which will make the calling of an army surgeon a recommendable and respected service; to others it will be a degradation at the same time that it is a livelihood, and too often it will be a disappointment. So far for the moral aspect of the question; as regards the technical, with which we have been occupied, we will hazard one word more. In a world-known work of fiction, the prince Rasselas retorts on the exaggerations of his tutor, after an enumeration of countless needful accomplishments, that he had perfectly succeeded in proving how no man living could be a poet; in the same vein of feeling we will add, that if, in addition to being an able operating and consulting surgeon, and a clinical physician, it is expected of a medical officer that he should be thoroughly acquainted with the contents of such books as the one that lies before us, then we can heartily say there are no rewards in the country too considerable for such men; but we do not expect to find, or that others should find, such monsters of perfection.

Review II.

1. *Ueber Kraetze.* Von Dr. Ferdinand Hebra, in Wien. ('Med. Jahrbücher des k. k. Oester. Staates,' xlvi., pp. 280—292; xlvii., pp. 44—54, 163—173.)

On Itch. By Dr. Ferdinand Hebra, of Vienna.

2. *Hautkrankheiten.* Von Professor Hebra. (Virchow's 'Handbuch der speciellen Pathologie und Therapie.' Dritter Band, pp. 410—476. Scabies-Kraetze. 1864.)

Diseases of the Skin. By Professor Hebra. (Virchow's 'Handbook,' &c.) Vol. III. Scabies.

3. *Beiträge zur Lehre von den durch Parasiten bedingten Hautkrankheiten.* Von Dr. B. Gudden.—*Stuttgart,* 1855. pp. 96.

Contributions to the Study of the Diseases of the Skin, caused by Parasites. By Dr. B. Gudden.

4. *Beitrag zur Lehre von der Scabies.* Von Dr. Gudden. Zweite vermehrte Auflage.—*Würzburg,* 1863. pp. 28.

Contribution to the Study of Scabies. By Dr. Gudden.

5. *Notice sur la Gale, et sur l'Animalcule qui la produit.* Par Eug. Lanquetin. Seconde Edition.—*Paris,* 1859. pp. 96.

An Account of Itch, and of the Animalcule which gives rise to it. By Eug. Lanquetin.

The final demonstration of the Acarus scabiei, by Renucci, in 1834, after two centuries at least of doubt about its existence, by no means decided the question as to the nature of scabies. There are, indeed, those who even now look on the animal as not the cause, but the effect, of the disease. Dr. Frazer, of Dublin,[1] still maintains this view. The reasons he gives for this opinion are, however, for the most part,

[1] Treatment of Diseases of the Skin, p. 66.

The conversation of the upper ranks of the soldiery is so distinct from the general movement of society—this profession is so essentially active, so much one of youth and power, its discipline so formed on habit in contrast to deliberation and pale thought—that it is doubtful whether ever by himself the officer will find those secrets which touch most nearly to the condition of his command, exception being allowed for that instinct we call genius, by which a few arrive at truths denied to their fellows. The author of the work before us seems to think some heaven-born general would influence society so as to work wonders in the way of reformation in the army. This, however, we may be permitted to doubt; it might be the one thing denied him. We know from the past that the laurels of a conqueror on a head unsurpassed for military conceptions and experience did not bestow the right to qualify undue retrenchment by remonstrance, or scarce to utter a warning when our coasts and dependencies most invited attack. The motto which declares that "everything happens in France," holds good of our country too; but the why and wherefore, and the how, it is not very easy to discern. Let us then be grateful for what occurs for good, and give the palm of thanks where it is most evidently due: may the fortunes of the State be less capricious than our social deviations, and on each turn may the country right itself! Meanwhile, our army medical service holds its own, not without appreciation, at least among our class. The names of Longmore, Barclay, Mouatt, Gordon, Muir, Matthew, Gulliver, Marston, crowd upon our pen as bright ornaments of our profession; from whom when furthest divided we are prepared to expect the most: bound by a double tie of science and fraternity, long may such bonds unite us.

For you men of the past—Munro, Robert Jackson, Lind, Henr[illegible]
Marshall, John Davy, and may we also add Cook and Vancouver—
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founded on error. He asserts that, in the Norwegian itch, the parasite is not the same as in the ordinary form of the disease; but, though this was at one time the opinion of Hebra, the more recent researches of Boeck have shown that it is not the case. Another of his arguments, that all persons are not equally susceptible of the contagion of scabies, is opposed to the latest views of Hebra, who thinks that the skin of every man offers sufficient accommodation to the acarus, if only full opportunity for contagion be afforded. A third statement of Dr. Frazer's, that "those who have passed through the unpleasant stages of an attack, and have been thoroughly cured, show a comparative, it might almost be said an absolute, immunity from future infection," would no doubt, if true, support the view that something more than the acarus is concerned in the causation of the disease; but we are at present ignorant on what evidence this assertion rests. Dr. Frazer himself insists on the "strange tendency which the disease shows to relapses, *when insufficiently treated*, and its indefinite duration when neglected."

There are others also whose views are similar. Devergie, one of the staff of the Hôpital St. Louis, the finest field in Europe for the observation of cutaneous affections, asserts that scabies may be a spontaneous disease, and that the presence of the acarus is only one of its subordinate characters; and Mr. Hunt, in a book which affords to Hebra most valuable opportunities of amusing his class, declares that "the real cause of scabies is *dirt*." But Devergie has probably but few followers among the younger French dermatologists; and Mr. Hunt is not very likely to have many converts to his views in this country. We do not doubt that in a few years it will be universally admitted that scabies is propagated and produced solely by the parasite.

One of the questions which earliest suggested itself, when the existence of the acarus was proved, was whether the disease was transmissible from animals to man. A good deal of information upon this subject is given by Küchenmeister.[1] He admits that the acari of the cat and of the lion may be identical with that of man, which differs from them only in size. He states that Bourguignon observed the transference of the mite of the lion to the human subject, and *vice versâ*. Hardy says that, the lion of a menagerie having scabies, the keepers became affected with various eruptions, but no treatment was necessary; and he thinks that the acari of other animals produce in man only a temporary prurigo. Hebra, on the other hand, says that he has frequently observed the transmission of scabies from animals to man in the menagerie at Schönbrunn; and he thinks that the Sarcoptes equi, S. canis, S. suis, S. cati, and S. cuniculi of Gerlach, as well as the S. scabiei crustosæ, S. vulpis, S. capræ, S. squamiferus, and S. minor of Fürstenberg, are all varieties of the same animal. The acarus of the horse is, however, very different from that of man. Eichstedt[2] says that on examining some of the crusts taken from a mangy horse,

[1] Manual of Parasites (Translation of the Sydenham Society), vol. ii. p. 50.
[2] Froriep's Notizen, 39, 1846, p. 269.

in which the mite peculiar to that animal could not be detected, he found in it several specimens of the acarus scabiei of man. This appears to show that the differences in the form of the parasite are not, as is supposed by Hebra, merely due to differences in its seat. Hebra himself states that he has found the ordinary acarus scabiei in the camel, the Egyptian sheep, and the ferret; and he says that Fürstenberg has discovered it also in the horse, the lion, the llama, an ape, and a Neapolitan sheep.

There is no better way of tracing the development of scabies, and no more conclusive proof of the real nature of the affection, than to place an impregnated female acarus upon the skin, and then to leave it to its own devices. The fact of impregnation, which is of course all-important, is readily determined in the way pointed out by Gudden. We have only to extract an acarus, without injuring it, from a recent cuniculus, and then to cut off the portion of skin containing the cuniculus, and to examine it under the microscope. If it should present ova, we may be quite sure that the animal will afterwards deposit others. Hebra says, however, that a female acarus, even though it may lay eggs, does not always with certainty generate scabies; and he recommends for the artificial production of the disease, the application to the skin of a whole cuniculus removed from another person suffering from that affection.

For the experimental investigation of the habits of the acarus, however, it is best to take a single female, and place it upon the skin. It moves briskly over the surface, and soon begins to attack the epidermis. It may either proceed at once to bury itself, or it may leave off after a time, and commence again at another spot. In penetrating the superficial part of the epidermis, the acarus seems to experience some difficulty. It places itself in a position almost vertical with respect to the skin, supporting itself by means of the long bristles which project from the hinder part of its body. Having once pierced the surface of the cuticle, it makes more rapid progress, and in from ten to thirty minutes it is completely buried. It naturally attacks in preference those parts of the skin which have the thinnest epidermis, and for this reason it appears often to select the entrances of the hair-sacs.

Having thus ensconced itself within the epidermis, it continues to traverse the rete mucosum in a horizontal direction, and proceeds to lay its eggs. The number of ova which are deposited by one acarus is variously estimated. Hebra has never seen more than twenty-four to twenty-six ova in one cuniculus. Gudden, on the other hand, counted fifty-one in one passage, at the bottom of which was the parent, which still contained ova; and he assumes fifty to be the ordinary number. The rapidity with which they are laid varies with the age of the acarus. An experiment of Gudden's, made in the winter of 1859–1860, gives very precise information upon this point. He placed an acarus, which was ascertained to have laid previously only three ova, and which contained another nearly ready to be deposited, upon the skin of a healthy person, who was kept all day in a moderately warm room. At the end of five days, the cuniculus was cut out, and was found to contain eleven eggs. In other observations in which the acari were more nearly exhausted, the eggs were deposited much more slowly, one in two or three days. According to Bourguignon and Gudden, apertures are always found, at more or less regular distances, in the roof of the passages formed by the acari, and it is supposed that they may serve for air-holes. Their existence is positively denied by Hebra; but however this may be, it appears certain that they are not used by the female acarus as means of egress from the cuniculus. The animal, in fact, never emerges from the passage which it has formed for the reception of its ova. It continues to eat its way through the skin, and when its power of laying eggs is exhausted it dies. The whole duration of the life of an acarus is estimated by Gudden at three or four months. Impregnated females, placed on a healthy person's skin, were found by him alive, but exhausted, in the seventh or eighth week afterwards.

The "cuniculi," or passages formed by the female acarus ("sillons" of the French, "milbengänge" of Hebra and other German authors), are so important in the diagnosis of scabies, that a full description of them can hardly be otherwise than valuable to an English reader, for we believe that in this country they are by no means so generally recognised as on the Continent. In the following account of them we follow chiefly that given by Hebra in the recent number of 'Virchow's Handbuch.' Their simplest form is that of a more or less curved, dotted line. Their colour varies with their position, and with the station in life of the subject on whom they are found. On the hands and feet of the lower classes they are generally black; on the penis, buttock, elbow, and knee, even of such persons, they are usually white; and in people who wash very frequently, they are often white even upon the hands. The dotted appearance is caused, according to Gudden, by the air-holes which he asserts to exist in these passages. Hardy and Bazin state that it is produced by the small black fæces of the acarus which are always found in the cuniculi. Hebra ascribes the dotted appearance to dirt, which, he remarks, penetrates the cuniculi so completely, that it cannot be removed by washing or even by friction: so that, in people who are very dirty, the effect of ablution is to make the cuniculi more distinct, by placing them in marked contrast with the rest of the skin. The length of a passage varies from one millimetre to several centimetres. The longest which Hebra has seen measured ten centimetres (nearly four inches); its usual length is about one and a half centimetre. Bazin compares it to a slight scratch caused by a pin; but the comparison does not appear to us a good one. The two extremities of the cuniculus are called by Hebra the "head" and the "tail," the former being the point at which the acarus entered. It is usually slightly raised above the surface of the skin, and whiter than the other extremity, at which the acarus may be observed as a sharply defined roundish point, which is rather deeply situated.

This description of the cuniculus is generally applicable to those which are seated on the two surfaces of the hands and feet, or on the sides of the fingers and toes, or on the extensor surfaces of the limbs, especially the elbows and knees. On other parts of the body these appearances are generally modified by the development of a vesicle or a pustule beneath the cuniculus. These vesicles usually begin at the head of the passage, but frequently extend beneath it, so that it lies in their roof. Gudden supposes (and Bourguignon had previously suggested the same idea) that they are produced by a secretion from the acarus, which acts as tincture of cantharides might do; and he quotes in favour of this view the fact stated by Bourguignon and confirmed by himself, that the inoculation of a mass of bruised acari beneath the skin causes the development of a pustule resembling that of variola. However this may be, the acarus always maintains its position beyond the area of the vesicle; and therefore, when a crust is formed, the parent animal is never found in it, though it often contains ova or young acari. There is every reason to suppose that these crusts are often capable of propagating the disease, but experiments made with that object appear to have generally failed.

Sometimes the cuniculus presents a modification which it is important to recognise. It is then seated on a red elongated eminence, forming a white dotted line upon its summit. Cazenave seems to have noticed this appearance of the cuniculi which are found on the back and neck, and describes them as occupying the summit of tubercular elevations. Hebra states that such cuniculi occur also on the penis, the fold of the axilla, the umbilicus, the nipple, and especially on those parts of the back which are subject to pressure during sitting or lying. In infants the passages may present this form on any part of the body. Another modification is afforded by old cuniculi, when the vesicle at their head has disappeared, leaving a red spot with a white edge which is continuous with the sides of the passage, so that Hebra compares its shape to that of a retort.

Cuniculi are undoubtedly found most abundantly on the hands and feet. Hebra indeed asserted at one time, that in 98 per cent. of cases of scabies they are confined to these parts. In 1844 he stated that the only other points at which he had found them were the penis and scrotum, the forearm (and that but seldom), the anterior surface of the thorax, and the knees. He now, however, admits that they may be detected elsewhere. Other observers do not agree with Hebra in the statement that they are very frequent on the feet. According to Lanquetin, in France they are rarely seen there; and Gudden says that in the lower limbs, the further from the trunk, the more rarely are they found. Hebra insists on the fact that in women the line of junction of the inner side of the foot with the dorsum is a favourite seat for them. It is well known that they are rarely to be detected upon the face. Lanquetin has, however, extracted the acarus from the forehead of a patient in the "service" of M. Cazenave. It is stated that Augias Turenne took one from within the lower eyelid from a "sillon," which occupied its free edge, *in an infant.* Dr. Hillier and others have also found cuniculi in rare instances on the face or forehead of infants; and of this, as we shall see, Gudden gives an explanation. The only other case, so far as we know, in which an acarus has been found lodged in a true mucous membrane, is that described by Hebra, who once found "a beautiful cuniculus, containing an acarus and eight ova, within the urethra, about a line from the meatus."

Eichstedt stated that the ova are not deposited in the egg-passage in a continuous series, but that there are always intervals after two or three, or at most six, ova. Gudden admits that this is the case in the cuniculi which are seated on the hands, where the acarus is exposed to frequent disturbance; but he says that on the trunk as many as twenty-one eggs are often found in an unbroken row.

Embryos are rapidly formed in these ova. In examining under the microscope any cuniculus in which several eggs have been deposited, these are usually found to present different stages of development. There are, however, rarely more than from eight to fourteen which contain embryos; the others are merely egg-shells, from which the young acari have already escaped. Assuming that the parent animal lays one or two eggs daily, this gives some idea as to the rate at which they are hatched. There is, however, more direct evidence on this point, though it is not very satisfactory. If the ova are placed in watch-glasses and kept at a proper temperature, which is effected by fixing them in the axilla, they may be hatched artificially. Gudden says that four days was the shortest time within which the young acari have left the shell in his experiments. The statements of earlier observers are rendered valueless by the doubt whether the ova had been recently deposited when the process of incubation was commenced. It is, however, tolerably certain that the time is not always the same; for Gudden says that, after placing upon the skin acari which no doubt at once proceeded to deposit eggs, no empty shell was found within the cuniculus, in one case on the fifth, in another on the sixth day. It would be of great importance to ascertain how long the ova retain their vitality, when they are placed under unfavourable circumstances; but as to this point there is at present no evidence.

Having left the shell, the young acari almost immediately make their exit from the cuniculus also; and, according to Gudden, they avail themselves of the air-holes which he describes as existing in its roof. They then move over the surface of the skin with considerable rapidity, and, after a time, imbed themselves again within the cuticle. The passages which they form are usually very short; Gudden says that he has seen some a line in length, but that these are rare exceptions. He states, however, that the young penetrate into the skin more deeply than the older acari, and that they therefore produce more irritation. Their bite is often followed by the appearance of a small papule or vesicle, in which exudation shows itself on the second day. Before this time the animal has usually moved off to another part of the skin. Hence the young acari are very difficult to find; but, according to Gudden, a diagnosis may sometimes be made, in slight cases of scabies, in which none of the larger cuniculi are to be detected, by cutting off the heads of some of the vesicles or papules, and examining them, without any varnish to render them transparent. The entrance of the passage formed by the young acarus may then be made out. When the light comes from below, the dried edge of the opening looks dark. Should there be any doubt as to its nature, the question may often be settled by the discovery of the fæces, which are smaller and paler than those of the adult acarus. In order to obtain specimens of the young animal, the best plan is to rub oil of turpentine over a portion of the skin; this kills them, and they may then be found imbedded in the papules or vesicles which first appear on the part to which the oil of turpentine was applied.

The young acari have at first only six legs, but they soon shed their skin, and then acquire eight legs. The exact number of "moults" passed through by each acarus is perhaps not certainly known; Gudden supposes that the animal changes its skin three times. Before the first moult the acarus is characterised, according to him, not only by its six legs, but also by its having only two bristles at the posterior extremity of its body, and ten of the longer spines on its back. With its eight legs it acquires also four "bristles" and twelve "spines." After the second moult it presents fourteen "spines." After the third moult the sexual characters become apparent; and the male and female also differ in the number of spines, the female retaining fourteen, while the male has now only twelve. The size of the acarus also varies, according to the degree of its development. Gudden admits that it is possible that his account of the number of "spines" in the different stages may not be absolutely correct. While it is changing its skin the animal remains imbedded in small cavities in the skin, similar to those formed by the young acari. It would appear that about six or seven weeks are required for the development of the acarus, from the ovum to its becoming impregnated. Gudden says that in about three months after receiving a fertile female acarus upon the skin, a person would generally be covered with the eruption of scabies.

The discovery of the male acarus is claimed by several observers. The French ascribe it to Lanquetin, who found it in the year 1851, but who states himself that he had seen one before in the collection of M. Bourgogne, who had obtained it from an *employé* at St. Louis, but who did not know how to discover it. According to the Germans, the credit belongs either to Krämer or to Eichstedt. The former found it in 1845, but appears not to have published his drawings till 1846. Hebra quotes his description of the suckers on the inner pair of the hind legs, which are peculiar to the male; and therefore there can be no doubt that he really did see it. Lanquetin does not notice his claim, but disputes that of Eichstedt, who perhaps discovered it about the same time (1845), on the ground that the latter does not mention the presence of these suckers. It is therefore possible that the acari which he found may have been young females. The male acarus is very difficult to find. It occupies a small hole in the cuticle, similar to that tenanted by the young animals. According to Worms, it is very often to be found in the neighbourhood of the larger egg-passages. It may be seen with a magnifying glass as a little brown point in the cuticle. Its presence appears never to excite any inflammatory action in the subjacent skin. Gerlach supposed that there was only one male acarus to about ten females, but the idea of the rarity of the male probably arose from the difficulty of finding it; for in the Norwegian scabies and among the cheese-mites, males and females are stated by Gudden to occur in about equal numbers.

As might be expected, there is no very certain information as to the way in which impregnation of the female acarus is effected. In a case of the Norwegian disease, Hebra found a male and female, both dead, lying the one over the other. There is, however, nothing to show that this was not accidental. Gudden states that there is not much difficulty in observing the act of copulation in the cheese-mites. The male and female then have their backs turned towards each other, and the abdomen of the male slightly overlaps the female. He says that the male becomes visibly smaller, and the female larger, during the process. In his later pamphlet he states that in the case of the acarus scabies, copulation occurs within the cuniculus occupied by the female after the last moult. He has several preparations in which he has been able to make out the points at which the male entered and left the passage. This he seems to have determined by the smaller size of the fæces deposited by the male. Gudden has also specimens of cuniculi in which the female underwent the process of moulting for the last time, and which have afterwards been continued onwards as egg-passages.

It is well known that the acarus is exceedingly sensitive to changes of temperature. Itch-insects, when first extracted from the cuniculus, often remain motionless; but if the glass slide on which they are laid is warmed, or if the warm breath is allowed to pass over them, they at once begin to move. Gudden states that, when they are placed upon the skin, the rapidity of their movements is always observed to depend upon the temperature of the surface at the time. Admitting the influence of warmth on the activity of the acari, it seems natural to ascribe to the movements of these animals the irritation which those who have scabies experience when the body first becomes warm in bed. Everybody knows that the itching is then worse than at other times; and Gudden says that a similar increase of irritation is felt whenever the skin is warmed, whether by the sun's heat, by exposure to a fire, or even by exercise; and, according to the same observer, cooling the surface quickly relieves the itching.

Some of the other peculiarities of scabies appear to receive their explanation on the same principle. If the acarus moves only on those parts of the skin which are warm, and therefore chiefly at night, it would seem to follow that parts which are uncovered during sleep will remain free from their presence. In this way Gudden accounts for the well-known fact that the face rarely presents any traces of the eruption in cases of scabies, and he states that this immunity is enjoyed by the face only when it is exposed at night; and, as we have already seen, several observers have found acari on the face or forehead of infants, who lie with those parts deeply imbedded in pillows. An experiment made by Gudden points to the same conclusion. He placed a female acarus upon the left hand of a man who always slept on the left side, and with the clothes carefully pulled up round his chin. The young brood were traced up the arm on to the trunk; and one was caught on the left cheek, which lay in the warm. The other side of the face remained free from their presence. The same writer says that cuniculi are rarely found on the feet of people whose feet are constantly cold. He also relates a very interesting case in which acari occurred in great numbers on the trunk, while none could be detected on the hands. This patient was confined in a strait-jacket, and her hands and feet were always cold, and did not become thoroughly warm even when she was in bed, as she was so unquiet that the bed-clothes could not be kept over her. The inner side of the arm, which was fixed to the side, presented a few cuniculi. This case is the more conclusive, as Gudden states that it was left undisturbed for a considerable time.

We are inclined to explain in a similar way a fact which seems to have been observed first by Hebra, and to which we have more than once heard him draw the attention of his class—that the disease is always present in large quantity on parts of the skin which are exposed to pressure. Thus in cobblers, tailors, weavers, and other artisans who sit on hard benches or stools, the buttocks, and especially those parts of them which come into contact with the seat, are always covered with the eruption. This consists in part of papules, in part of pustules and crusts; and some of these elevations of the skin present cuniculi on their long axis; others contain no parasite. On the other hand, in joiners, carpenters, and bricklayers, this part of the body is unaffected by the disease. Again, in women the eruption always shows itself on those parts of the skin which are pressed on by straps or girdles; and the pressure of garters, trusses, or of any tight article of apparel, or even of a crutch, is said by Hebra to be sufficient to produce the same effect. He accounts for these facts by ascribing the papules and pustules to direct irritation of the cutaneous surface; but it seems to us more reasonable to suppose that the pressure keeps up the warmth of the skin at that part, and that this favours the development of the acari, and at the same time prevents their wandering to other parts of the epidermis.

Hebra, however, does not admit that the distribution of the itch-insect over the skin is influenced to any great extent by temperature; but his reasons for this opinion do not appear to us to have any great weight. He says that if it were so, the eruption of scabies ought to increase rather than diminish during the progress of acute diseases when the patient is kept constantly in bed; but there is every reason to believe that the morbid condition of the system has in this case a direct influence in checking the development of the parasite. Another of his arguments is, that if the acarus loved warmth, it ought to select the axilla, the bend of the elbow, and the softer parts of the skin, rather than the hands and feet, the penis, the buttock, and the extensor surfaces of the joints, on which parts cuniculi are found most abundantly. But we have already seen that at the moment when the acari are moving over the surface of the skin, these parts are for the most part warm, and that the distribution of the acari is rather favourable to the view to which Hebra is opposed. Again, he gives as a reason for thinking that the acari are not much affected by external warmth, the fact that they reside in the deeper layers of the cuticle, which must be kept of a nearly constant temperature by the blood circulating through the derma; but this appears to us to remove a difficulty in the way of Gudden's view, by accounting for the fact that the ova can be developed in the cuniculi which are seated on the hand, and which must otherwise be exposed to considerable variations of temperature.

The truth is that, in Hebra's opinion, the acarus forms a very unimportant element in the causation of scabies, except so far as contagion is concerned. He criticises the views of Gerlach and Aubé and others, who looked on the acarus as a kind of nocturnal beast of prey, which hunts for spoil at night on the surface of the skin, and retires during the day into the dark gallery which serves as its retreat. He says that it is not likely that the acari leave their stations of their own accord and without necessity, and take long journeys, in order to seek at another spot and with considerable trouble what they can get abundantly by staying where they are. Even in the propagation of the disease, Hebra regards them as altogether passive. He thinks that the cuniculi are torn open by the patient's finger-nails, and that in this way the ova and young acari are carried not only to the skin of other persons, but even to different parts of the same patient's body. Now, it is universally admitted that the female acarus never emerges from the cuniculus in which she lays her eggs; but it appears to us to be quite established, by the experiments of Gudden and others, that the young acari have the power of distributing themselves widely over the skin by their own movements; in fact, according to Gudden, they probably seldom remain more than three days in the same place.

Hebra makes the remark (and other dermatologists have said the same thing) that, viewed as a disease of the skin, scabies can scarcely claim an independent place in the scheme of classification, but that it should be regarded rather as an artificial eczema, caused by the presence of the acari and by the *scratching of the patient.* Now it is obvious that, if the acarus be the sluggish animal which Hebra supposes it to be, its presence in the skin is not likely to give rise to very much inflammation; and accordingly we find that of the two factors to which he ascribes the development of the eruption, the scratching on the part of the patient is the one to which he attaches most importance. It has long been known that the severity of the eruption is by no means proportionate to the number of acari which can be discovered, and that in the pustular scabies of children scarcely any cuniculi are sometimes to be found. Hebra also states that in no case does the seat of the acari and that of the eruption correspond; for while the former are found chiefly on the hands and feet, the penis, &c., the eruption is always most abundant on the anterior surface of the body, between the mammæ above, and the knees below. This he accounts for by supposing that the acari only produce a vague itching, not referred to any particular point, and that therefore the patient scratches himself at that part of the body which is most accessible to himself; that is to say, on the chest, abdomen, and thighs. To us this explanation does not appear very satisfactory. With the exception of those papules or pustules on which cuniculi are seated, Hebra does not admit any part of the eruption of scabies to be caused directly by the irritation of the acari, but regards it all as the effect of scratching, with the exception of those appearances which, as we have seen, he ascribes to pressure.

There is, however, good evidence to show that papules and pustules may be produced in scabies, independently of scratching. Gudden says that his patient, who was confined in a strait-jacket, presented tolerably large pustules not only on other parts, but also on the shoulders, which were but little exposed to external irritation. Again, he placed a female acarus on the skin of a healthy man: she formed a cuniculus and deposited ova. Even during the first few days a kind of itching was felt over the whole body, which he rightly ascribes to excited attention; but on the ninth and tenth days a new sensation was felt, which was referred to the hand, and resembled a pricking or gnawing; and before long papules and vesicles made their appearance, and gradually increased in numbers. *Scratching was altogether refrained from*, and the eruption was caused solely by the bites of young acari. The point is not, perhaps, of much importance, for every one must admit that scratching does to a great extent aggravate the eruption in most cases of scabies; but it is, as we think, quite clear that the great German authority on cutaneous diseases is not altogether justified by the facts in his views upon this subject.

There can be no question that, since the appearance of the cuniculi has been thoroughly understood, the diagnosis of scabies has been immensely facilitated; it has, in fact, in a large number of cases, become a matter of demonstration. But we doubt whether these passages are generally recognised by medical men in this country. Only three or four years since an eminent physician recommended searching for ova, rather than for the parent acarus, in doubtful cases. We have several times tried to find them, as he advised, by scraping the skin or examining the crusts; and, as might be expected, we have always been unsuccessful. But when one has once learned thoroughly the appearance of the cuniculi, the finding of the ova is often an affair of a few seconds only. We would strongly recommend to those who are learning medicine, the practice of slicing off with a sharp knife or pair of scissors any doubtful cuniculi, and examining them, *en masse*, under a low power of the microscope. In order to remove the parent acarus, it is necessary to cut rather deeply; but the detection of the ova or of the fæces may usually be effected without causing the slightest pain. The recognition of these cuniculi is of the more importance, because it appears that in some cases they are the only manifestations of scabies. Baum and Eichstedt have especially drawn attention to this form of the disease, in which there is no trace of papules or of pustules; and Lanquetin describes a similar case, that of a young hysterical girl, who did not suffer from itching, and whose skin was quite healthy. This case might no doubt be cited in favour of Hebra's opinion, that the eruption is caused by scratching; but it is more probable that some morbid state of the cutaneous sensibility caused the absence of both the itching and the eruption.

We have already quoted the directions of Gudden for discovering the young acari or the short cuniculi in which they dwell. Gudden thinks that in almost every case of scabies, even though none of the longer passages can be found, it will be possible to detect those of the young animals; but it does not appear that he has under observation more than a small number of patients. In his earlier papers Hebra asserted that without the discovery of the cuniculi we are not justified in concluding that scabies is present. But the experience of 40,000 cases has caused him to change his opinion, and he now says that it is possible to make a diagnosis of the disease with great probability, if not certainty, in cases in which no cuniculi, nor even any of the papules caused by young acari, can be recognised. There can be no doubt that such cases do sometimes occur. Moreover, it must not be forgotten that the presence of cuniculi on the hands may be interfered with by many circumstances. In those who wash their hands very frequently, or who use pumice-stone to cleanse them, these passages are quickly destroyed; and, according to Hebra, they are also absent on the hands of washerwomen, hatmakers, and bricklayers, because these people employ in their business substances which are prejudicial to the acarus. In Paris an exaggerated importance is attached to the presence of a cuniculus on the skin of the penis, or on the glans, in the diagnosis of this disease; and according to Piogey, scabies is sometimes limited to that part only. We have heard Hardy insist on the fact, which we think he has also published, that eczema, confined to the female breast, is almost always caused by the presence of acari.

In No. LXVI. of this Review (April, 1864, p. 392), an account was given of the "rapid cure" introduced by Hardy at St. Louis. This method appears to be attended with very considerable success, and it undoubtedly presents the great advantage that it is carried out under the eye of the physician. Lanquetin states that it is doubtful whether all the cases are cured, as they are not kept under observation within the hospital. Great irritation of the skin is sometimes caused by this treatment, and therefore it is not adapted for private practice. Moreover, as Hebra remarks, the saving of time is more apparent than real, for the disappearance of the eruption must always take some days; and till that has occurred, the lay observer would not believe that a cure had really been effected. Altogether, Hardy's plan of treatment seems best adapted for soldiers and the poorer class of labourers. We have often wondered why one of the large metropolitan hospitals does not establish a "skin department" on a large scale, in which these affections could be treated locally with baths, &c. on the premises, as is done in St. Louis and at Vienna.

In cases in which the eruption is generally diffused and severe, while cuniculi can be found only on certain parts of the skin, it might perhaps be advantageous to recommend inunction only at those points. Hebra states that he did this at one time with very fair success, but he then believed that the acari were rarely to be found except on the hands and feet; and when he gave up this opinion, he seems to have modified also his practice, so that his statements upon this point ought perhaps to be received with some caution, and as indicative of the sanguine nature of the man.

It seems to be generally thought in this country, that in order to prevent relapses it is necessary to disinfect the patient's clothing, in addition to inunction of the skin. Dr. Frazer, of Dublin, states that he has seen pustular scabies return more than once in a young child, till a pair of boots were destroyed to which the virus (according to his view) was persistently adhering. But though it cannot be denied that portions of loose epidermis, or crusts containing ova, may remain in the clothes, and so that a second contagion may arise, it does not appear that this is frequently the case. Gudden says that persons often sleep in their dirty beds, after treatment, without any relapse occurring. In the General Hospital at Vienna, where 1500 patients come under treatment every year, no attempt is made to disinfect the clothes, although there is every appliance requisite for doing so. The relapses are said never to exceed one per cent. It appears to be certain that living acari never wander of their own accord into articles of clothing, as pediculi often do.

REVIEW III.

Traité d'Anatomie Pathologique Générale et Spéciale. Par le Docteur H. LEBERT.

A Treatise on General and Special Pathological Anatomy. By Dr. H. LEBERT.—*Paris,* 1855—61. Two Vols., fol., pp. 760, 733. With Atlas containing 200 Coloured Plates.

IN an age and at a time when, if not the constitutions of men, at all events the medical opinions concerning them are so constantly changing; when each new decennium ushers in some fresh doctrine to supplant the one before in vogue; when a father dare not teach his son the lessons that he himself has learnt,—a book like this must meet on all sides with a hearty welcome.

The great size and costliness of the work place it, necessarily, beyond the reach of many; but we are convinced that no large medical library will be without it, and that, consequently, to most it will be at all times accessible as a book of reference.

Since the publication of Cruveilhier's remarkable 'Anat. Path. du Corps Humain,' in the year 1835, there is no treatise on pathology which can be compared with the above. Lebert may, indeed, be said to have continued, and, in his generation, carried on towards perfection, the great design of his great forerunner; to have bequeathed to posterity a rich legacy of clinical facts illustrated by accurate drawings of morbid specimens. He has even surpassed Cruveilhier in that he has added to his two beautiful volumes of plates a full compilation of what was known in pathology and morbid anatomy up to the year 1861; supplementing the knowledge of others by the results of his own numerous and fruitful researches in Paris, Zurich, and Breslau. "Penetrated," he says, "with the conviction that we live in an age of transition, in which the very principles of medical science are undergoing transformation, it is my ardent wish that my successors may profit by my investigations, even though the doctrines themselves that I teach may be replaced by others which shall be truer than mine." Herein it is that he is to be regarded as a great benefactor, in that he has given us a faithful record written by Nature herself; one which bears the stamp of a hand that does not change, and which will be useful when the doctrine of crases is a thing of the dark ages, and the cellular pathology is discarded to make way for some newer and more fashionable discovery.

The book is divided into two parts—Part 1, which treats of general pathology, and is subdivided into chapters; and Part 2, which deals with special pathology, and is subdivided into books. At the end of each chapter and each book, the disease in question is illustrated by a list of cases whose clinical history and autopsy are given at length. There is also a reference, at the heading of each case, to a plate, in which a drawing of the morbid specimen is made. In this way a series of two hundred beautiful coloured engravings has been collected to accompany the text, and constitutes, as has already been remarked, the most valuable, because the most unchangeable, part of the work. The greater part of the drawings are from nature by Lackerbauer, who deserves all praise for the way in which he has combined a thoroughly accurate representation of disease with really beautiful drawing. He has done for pathology what Bourgery and Jacob's plates have done for anatomy. Lastly, Messrs. Baillière and Son have by this work alone established their claim to be the first of Continental medical publishers. A comparison of this with Cruveilhier's work, by the same firm, shows, in a remarkable manner, what progress they have made during the last twenty years.

It is proposed to take the several chapters and books in order, noticing in each whatever is striking and of special interest, and comparing the doctrines of Lebert with those of other observers of the present day, more particularly Virchow and the German school.

The book opens with a sketch of the history of pathology from the sixteenth century, "le berceau de la renaissance des sciences," which marks the first commencement of the real study of pathological anatomy, down to the present day. The names are mentioned in order: of Ruysch, the founder of iconographic pathology; of Morgagni, for whom post-mortem examination was the only true means of acquiring thorough pathological knowledge, and whose immortal book is the accumulated work of a long and busy lifetime; of Dupuytren, who made physiology what Morgagni had made anatomy, a stepping-stone to pathology; of Laennec, Bayle, Broussais, Cruveilhier, Andral; of Rokitansky, whose book, as a whole, is the most remarkable of its time, but whose theory of "crases" is attacked; of Louis, with his Baconian system; of J. Müller, Bennett, Paget, Todd, and Bowman; lastly, of Virchow, the leader of the new German pathology.

In Chapter I. the question of *inflammation* is very fully discussed; the microscopical changes in the calibre of the bloodvessels, especially the miniature aneurysmal dilatations and contractions, being dwelt on at length. These changes are all to be regarded as secondary phenomena; the tissues affected being the positive seat of all primary changes in disease. He has become, in part at least, a cellular pathologist, in that he endorses the Virchowian maxim, "Omnis cellula e cellulâ," and subscribes to the doctrine that various pathological products, as pus, cancer, and tubercle, take origin in the connective-tissue. "The connective-tissue is not only, as a whole, the *point de départ* of the formation of pathological products, but its cells in particular are the source whence, by division and hyperplasia, many morbid tissues are derived." He confesses that, formerly a believer in the theory of Schwann—the exudation or blastema theory, which maintains that cells originate by grouping of atoms or molecules in blastema—he was inclined to rebel against the cellular view, and strove hard, by his own observations, to overthrow it; but that, the more he sought, the more he became convinced of its truth: a concession which, coming from so original and independent a worker as Lebert, cannot fail to be a great satisfaction to the founder of the cellular pathology.

The study of *false membranes*, and of the important part that they play in inflammations of serous membranes, is most instructive. When the discovery was made—thanks more especially to the injections of Schroeder van der Kolk—that arteries and veins, as well as perfect lymphatics, are formed in these membranes, and are the important agents by which the re-absorption of the effused serum and the resolution of the inflammation are effected, a great truth was made known to pathologists, and more particularly to physicians, which, acted upon by unbiassed and reflecting men, has conduced, as much as any modern discovery, to the establishment of a rational, in place of a grossly empirical, system of treatment. If it is clear that the formation of these new vessels is as essential to the restoration of health as the first formation of bloodvessels in the ovum is to the development of the fœtus, surely our object must be to aid in every way the efforts that Nature is making, and to abstain most religiously from weakening the power on which their completion depends. The peculiar delicacy of the walls of these bloodvessels, and the facility with which they are ruptured, are worthy of remark. Virchow, especially, lays stress on this: he attributes to their agency various hæmorrhages which occur in the body; as, for instance, the effusions of blood into the layers of new connective-tissue, in his so-called pachymeningitis, or chronic inflammation of the dura mater, so common in lunatics; also many cases of the retro-uterine hæmatocele.

Chapter V. commences the study of *hypertrophy*, from whence, by an easy step, we get to the history of *tumours*, a subject in connexion with which Lebert's name is particularly famous, and which occupies the next nine chapters. The first division of tumours is, indeed, classified under the head of *Hypertrophied Products*, best illustrated by the glandular tumours caused by hypertrophy of gland-tissue. The second division includes the great mass of tumours under the title of *Homœomorphous Heterotopic Products*, or tumours consisting of elements that have a physiological prototype in the body, but which are developed in parts or organs from whose structure they differ entirely. The third division takes account of cancer and tubercle under the title of *Heteromorphous Products*, or tumours consisting of elements that have no physiological prototype in the body. The fourth division includes all *parasitical products*. This doctrine of specific tumour-elements, which has found especial favour in France, thanks more particularly to the instrumentality of Lebert, and has also met with many supporters in England, has been, from the first, much less welcomed in Germany, and, within the last few years, completely refuted by the strong and, to us, convincing arguments of Virchow. It seems apparently a contradiction, this doctrine of Lebert's, that certain tumours should be made up of cells differing *in toto* from anything that is seen in the normal state of the body, and yet directly developed out of the cells of one of the natural tissues of the body. For he admits that cancer grows directly out of connective-tissue, but yet maintains that it differs, in the appearances which it presents to the naked eye, and in its microscopical characters, from all other tissues, normal or pathological. So long as he was a disciple of Schwann, and believed that cancer-cells, like all other cells, were formed *de novo* in blastema, he might well be pardoned for regarding a cancerous tumour as a heterologous mass, formed out of a peculiar juice exuded from the blood in consequence of a peculiar cancerous diathesis; but having admitted so much of the cellular doctrine as he admits at the end of the book, he ought to re-consider his views on the nature of tumours propounded at the beginning of the book, and written while he was still convinced of the truth of the blastema theory. More than twenty years ago Johannes Müller[1] taught that there was no such thing as a heterologous or heteromorphous growth, but that the finer elements of all, even the cancerous, tumours were only copies or reproductions of normal elements met with either in the adult or embryo body. Virchow has developed this dogma, showing that all pathological growths are made up of structures which are really reproduced physiological tissues; that the two forms of special elements which Lebert particularly instances, the tubercular corpuscles and the cancer-cells, are neither of them special; the former being nothing more than the remains of what have been cells or nuclei, the mere shrivelled residue

[1] On the Nature of Cancer, translation by West, pp. 24 and 32.

of previously existing forms, met with in all the so-called cheesy or retrograde products of inflammation; the latter being exact copies of certain irregularly-developed epithelial cells, such as are found in the urinary passages, and which have the same irregular shape, the same large nuclei and nucleoli as the cells of cancer. He has thus established a law that the same type which serves as a model for the development of the body, serves also as a model for the development of tumours. Lebert's classification is unsatisfactory for another reason, that he includes, in his second division, tumours which grow undoubtedly from and in the very tissues of which they are themselves composed. For surely nothing can be more strictly homœotopic than a fatty subcutaneous tumour; but fatty tumours are classified as heterotopic tumours. The same may be said of epithelial tumours growing in the skin, and of fibrous tumours growing in the subcutaneous tissue.

In connexion with hypertrophy of glands, and of the pancreas in particular, the question of the dependence of fatty evacuations on disease of this gland, as observed by Lloyd and others, is discussed. Though he does not deny the fact that there was disease in these cases, he does question the conclusion that the fat in the stools was dependent on the disease of the pancreas. He has observed a similar case in which large quantities of fat were passed by the bowels, but the pancreas was found to be perfectly healthy, whereas the liver was large and hypertrophied.

One of the best chapters in the book is that on *pigment deposits*, or *melanosis*. It is met with in four different forms: 1. As the remains of effused blood, e.g., in the corpora lutea; 2. In the form of black diffused pigment, rich in carbon, the type of which is seen in the lungs; 3. Where the pigment is present as an accessory element in other morbid products; 4. As essential melanosis, or melanotic tumours proper. These latter, though made up of nothing but pigment-granules, have a remarkable tendency to spread and become general; they may be found scattered in almost every organ of the body, causing death by wasting like cancer, but yet they contain no trace of cancer-cells, and are to be distinguished from melanotic cancer. Hence, although the common belief among English pathologists—a belief warranted by the approval of Paget[1]—is to the effect that all examples of melanosis or melanotic tumours in the human subject are cancer with deposit of pigment, we have now sufficient authority to convince us that no so general and sweeping law as this can be laid down. The cases of Lebert here instanced, as also a carefully observed and well related case by Collis,[2] show that in man, as well as in the lower animals, melanotic tumours are met with—true instances of melanosis—in which no trace of cancer-cells can be found. Virchow is now striving in Germany to correct the error into which most writers, from the time of Laennec till now, have fallen. He divides melanotic tumours into three groups: 1. Simple melanoma; 2.

[1] See Lectures, ed. by Turner, p. 731.
[2] See his book on Tumours, 1864, p. 301.

Melano-sarcoma; 3. Melano-carcinoma. Group 2 has always been described by writers, with the exception of Stromeyer, G. Simon, and a few others, as cancer, but is to be carefully distinguished from Group 3, which is really cancer, by the difference in its anatomy. These tumours, instead of containing the cells of medullary cancer, are made up of spindle-shaped cells; those cells, namely, which characterise the great mass of tumours called by Lebert "fibro-plastic," and which are figured by Paget as the essential elements of the "recurring fibroïd," and as forming a part, though not the most prominent part, of the "myeloïd." For this group Virchow retains the old name of "sarcoma,"[1] which, when mixed with pigment, constitutes a most malignant variety of melanoma.

The analogies that associate the *epithelial tumour* or cancroïd with cancer, a question so ably discussed by Paget, are fully entered into. He differs from Paget in not classifying it with cancer, because, though prone to ulcerate and extend to neighbouring glands, it does not show a tendency to become multiple and infect the whole economy.

In the chapter on Fibrous Tumours, the *loose bodies in serous membranes* are described at some length, and the affinities between them and phlebolithes are insisted on. They vary in size from that of a millet-seed to that of a pea, or even a nut; have a lamellated onion-like arrangement, and, for the most part, a kind of hilus, probably where the pedicle of attachment was inserted; are composed of fibrous tissue, and have often a chalky centre. The resemblance of phlebolithes to these bodies is very striking: not only are the two structurally similar, but there is good evidence to show that both originate in the same manner; the loose bodies budding out from the serous membrane or sub-serous tissue, and being afterwards detached from their pedicle; the phlebolithes sprouting in like manner from the lining membrane of the vein, to which they are often found still adhering by their pedicle. An interesting case observed by Barth is quoted, in which both loose bodies and phlebolithes were found in the same person. Rokitansky is therefore wrong in regarding phlebolithes as old clots with a concentric plan of arrangement. Virchow considers the loose bodies, at all events when found in the peritonæum, to be fatty tumours that have grown from some part of the intestine into the sac of the peritonæum, and, becoming gradually calcified by atrophy of their bloodvessels, have been set free by rupture of their thin pedicle.[2]

The *Neuromata* show well how difficult it is to define the term tumour. In the first place, a considerable portion of a nerve may be generally thickened by interstitial development of the neurilemma—the cylindrical hypertrophy. Secondly, the hypertrophy is more localized, and the nerve has a varicose or beaded appearance. Thirdly, the swelling may be lateral, a part only of the thickness of the nerve

[1] See Virchow über Geschwülste, vol. ii. pt. 1. The first half alone of this volume is at present published; the second half will shortly appear, when the whole volume will be noticed in continuation of vol. i., already reviewed in October, 1864.

[2] See op. cit., vol. i. p. 384.

being involved; the remainder of the fibres passing alongside of the swelling without penetrating it. Fourthly, the tumour grows in the midst of the nerve-fibres, which are spread out and irregularly distributed on its surface. Lastly, the neuroma may be quite peripheral, seated in the very sheath of the nerve, whose fibres are quite independent of the tumour. In all these the morbid process is essentially the same, a hyperplasia of the neurilemma. Lebert has collected seventeen cases of *multiple neuroma*. This disease shows a predilection for the middle age and the male sex. Oddly enough, pain is seldom present; but pallor, with general prostration and wasting, sometimes vomiting and diarrhœa, precede death—a train of symptoms which recall to mind, not a little, those in Addison's disease. A very interesting case, in a young man, is related, where nearly all the nerves in the body were the seat of neuromata. Beautiful drawings of some of the nerves and plexuses illustrate the case (see Plates xxii–iii.)

Among the *erectile tumours*, or tumours composed of cavernous tissue, those in the liver seem to be here worthy of mention. They occupy, generally, the anterior and upper part of the liver; are often multiple; vary in size, being sometimes as large as a nut or small apple; are composed of true cavernous tissue, the trabeculæ consisting of connective-tissue with muscular fibres. These tumours have been well described by Virchow: they are not, he thinks, to be regarded as extraneous growths, formed entirely *de novo* in the liver, but as caused by a change in the size and arrangement of pre-existing hepatic vessels. They seem to be more common, or are, at all events, more often observed, in Germany than in England. We cannot recall a single case that we have seen in England, whereas in Germany they were not uncommon. Lebert himself remarks on their greater frequency in certain towns of Germany, Vienna and Wurzburg, than others.

In the chapter on *osseous tumours* allusion is made to the puerperal osteophyte of Rokitansky; that formation of new bone which is said to take place in the crania of pregnant women, occupying by preference, and symmetrically, either side of the frontal bone. This osseous development never seems to go beyond a certain point or to reach any considerable thickness. Its occurrence is inexplicable, nor does it seem to cause any peculiar symptoms. Whether the pregnant state has really anything to do with its production is a matter of some doubt. Virchow (in his 'Gesamm. Abhandl.,' p. 762) states that this condition is commonly enough seen in the dead-house, but certainly not more often in pregnant women or women who have borne children than in others. He is inclined to associate it with the tubercular rather than any other state.

With regard to *cysts* in the kidney, the author is disposed to recognise but one common cause for all—dilatation of the Malpighian capsules or tubules. Their supposed autogenous formation out of cells or nuclei is untenable.

Chapter XVI. opens with the history of the heteromorphous products, or *cancers*. Cancer he defines as "a special disease, differing in the appearances it presents to the naked eye, and in its microscopical elements, from all other tissues normal as well as pathological." He is honest enough to confess that, a cell being given, it is not always possible to say positively whether it be that of cancer or no; but he maintains that, if a piece of a tumour be examined, it is possible to give a positive opinion in all cases, except those where the cancer is very soft and in a state of such rapid growth that the nuclei are still small and unsurrounded by a cell-wall, and those where, from degeneration taking place, the cells are broken down, granular, or fatty. Hence we may conclude that, in the vast majority of cases, a good pathologist and practised microscopist can say with certainty, if a tumour be placed before him, whether it is or is not cancer.

His beautiful and original account of *colloïd cancer* is known to all English readers through Paget's 'Pathology,' in which book the microscopical characters of the disease are given verbatim from Lebert's paper in Virchow's 'Archiv.' The cells and curious large laminar bodies there figured give the colloïd cancer its malignant properties, and make it more than the simple amorphous colloïd substance met with in the ovary and elsewhere.

Schroeder v. der Kolk has made the strange assertion that there are no veins in cancers. He has injected with the greatest care, from the adjacent vein and artery, cancers in various parts of the body, and although he has never failed to inject, most minutely, arteries in the tumour, as his preparations show, yet he has never succeeded in demonstrating a trace of veins. The coloured injection may be seen filling the finest venous ramifications right up to the margin of the cancer, but there it ceases abruptly; and though in many specimens the cut surface is red with finely injected arteries, no sign of veins is ever present. There seemed to be something so unnatural in this arrangement that we are glad to find Lebert altogether at issue with Van der Kolk. Lebert and Ch. Robin, one of the greatest authorities on the subject of microscopical morbid anatomy, and one of the most dexterous manipulators of the day, have injected repeatedly veins as well as arteries in cancer. It appears, therefore, that for want of some proper precaution—a rare fault with the great Dutch pathologist—Van der Kolk is here in error.

Lastly, cancer and tubercle do not mutually exclude one another, but may, and often do, exist simultaneously in the same person. Lebert goes so far as to say that those who are affected with cancer appear to be just as liable to be the subjects of tubercle as individuals of the same age who have not cancer; but, on the other hand, cancer is rarely developed in cases of progressing tubercle. Thus, in 13 out of 45 cases of uterine cancer, in 2 out of 34 cases of mammary cancer, in 2 out of 9 cases of œsophageal cancer, in 2 out of 13 cases of bony cancer, tubercular disease coexisted. Perhaps the real truth of the matter is this, that the two diseases coexist in the same individual; but there is very great doubt whether they ever progress coincidently. The suspension of the one is connected with the development of the other; so that the one may be said so far to exclude the other, in that, by its own formation, it puts a stop to the advance of the other.

Chap. XXI., on *parasites*, is, in great part, a *résumé* of Robin's beautiful work (' Hist. Natur. des Végét. Paras.'). The really simple, but to many mysterious, disease *Plica polonica*, the author, in conjunction with Robin and Guensburg, regards wrongly as a parasitical disease. Guensburg even believes that he has discovered a parasite closely akin to the Trichophyton tonsurans and peculiar to the Plica. Hebra keeps a basketful of these matted, tangled, dirty wigs—for they are nothing more—to exhibit in his clinical lectures. An individual need not be a Pole to get a Plica polonica. The hair must be allowed to grow as it will; no soap or comb must come near it; lice must be permitted to nest unmolested in the filthy mass; and, in this way, a tolerably good Plica may be formed after a certain time. If the whole be removed *en masse*, by shaving (the practice in Hebra's wards), the scalp is always found more or less inflamed and eczematous from the irritation kept up by the lice and dirt, but soon recovers itself under the influence of soap and water and oil. The sticky secretion from the inflamed scalp glues the hairs together, and adds to the stink and disgusting appearance of the Plica.

Lebert doubts the occurrence of the disease termed *phthiriasis*. That lice can so abound as to destroy life, literally to eat up the body, is certainly doubtful; but that they can produce the most terrible eruptions on the whole surface, so as to render life a burden, we can assert positively. In that same clinique of Hebra's, cases were frequently stripped and exposed on the table which would have been called cases of general impetigo or ecthyma by dermatologists, but in which the eruption was merely the effect of chronic itching or scratching, kept up by the presence of innumerable body-lice. The Polish Jews were, if we remember right, most often the subjects of this affection. Van der Kolk has beautifully injected and preserved in spirit the arm of a prostitute who was notorious in Utrecht for her filthiness—*summæ immunditi ei traditæ*—and who died of cholera in 1832. This arm is the seat of numerous ugly-looking ulcers, reminding one of the ulcers that remain in rupia when the conical crusts have fallen off, each of which was, during life, covered with large scabs. Beneath and in these scabs such myriads of lice did " riot and propagate their kind," that the surface of the warm water in which he put the arm before injecting it became so thickly covered with them, *ut præ pediculis nihil per illud stratum conspici posset.* The whole of the body was in the same condition.

Part II., on Special Pathology, opens with the diseases of the *circulatory system.* His views on *endocarditis and pericarditis* are so singular that they seem worthy of notice. That the former is of frequent occurrence, even in acute rheumatism, he denies, and regards all that has been said or written on this subject as matter wanting revision and sharp criticism. Bouillaud is more especially attacked. A saying of Andral is quoted, as according very nearly with Lebert's own belief—that, in all his experience, he had only once seen what could be called inflammation of the endocardium, or of the valves, in consequence of acute rheumatism. The greater part of the fibrinous concretions on the valves are nothing more than small coagula of blood. Indeed, with regard to the question of valvular changes generally, he comments on the exclusiveness of the doctrines which reign in this branch of pathology. He considers the fibrous thickening or fibrous hypertrophy of the valves, and the osteoïd or calcareous deposits, to be "altérations nutritives," quite independent of inflammation. Pericarditis, on the other hand, is, for him, a true inflammation, to the effects of which must be ascribed not only the mischief that it is commonly supposed to leave behind it—adhesion of the contiguous surfaces, and often a permanent change in the muscular layer of the heart directly beneath the pericardium—but also the alterations in the valves themselves: "I believe that it is by the agency of pericarditis that acute articular rheumatism exerts so deleterious an influence as it does in bringing about organic disease of the heart;" in other words, that rheumatism causes pericarditis, and that the valvular affection is only an after occurrence induced by the effects of the pericarditis. A twofold explanation of this is hazarded: firstly, that the embarrassment of the heart's action caused by the adherent pericardium produces an exaggerated nutrition in the tissue of the heart and of its valves, which become thickened in consequence; secondly, that, at least in the mitral valve, the pericarditis is the *point de départ* of valvular disease by direct contiguity, because the visceral layer of the pericardium is close to the fibrous zone of the base of the valve. A hypothesis so singular as this, and so at variance with what is known and taught on the subject, would not have been worthy of mention had it come from a pathologist of less weight than M. Lebert. That the poison in acute rheumatism, whatever it be, acts frequently as a direct irritant on the endocardium and sets up changes there, is a fact so established by post-mortem investigation and clinical observation, that not one of our readers, we are convinced, will reject it. There may well be two opinions concerning the nature of the changes —that is, whether they are what the old doctrine concerning inflammation and exudation would have them to be, or whether they are to be looked at from the standing point of cellular pathology; but that valvular disease is repeatedly the direct result of rheumatic fever is allowed by all.

Atheroma is not a product of inflammation or exudation, but is the effect of altered nutrition in the very tissue of the arterial coats. It occurs in two forms: 1st, as "gelatinous deposits;" 2nd, as yellow patches, larger than the former, and distinguished by their colour. Lebert has evidently in view the same idea that Virchow has developed so clearly and beautifully in the cellular pathology.[1] The gelatinous deposits of the former are probably spots, where, from a great increase in the quantity of the connective-tissue corpuscles of the inner coat, the surface presents the well-known swollen and gelatinous appearance. The yellow colour of the patches is due to a further advance of the disease, when fatty degeneration has set in.

The history of *thrombosis* and of the changes that clots undergo in

[1] See Translation by Chance, p. 353.

veins, particularly their *puriform* transformation by softening, as distinguished from the true *purulent* fluid met with in the coats of the vein, is borrowed from Virchow. The possibility of spontaneous pyæmia is admitted, although the cases are very rare in which clots cannot be found in some vein or another, if carefully sought after.

A good and interesting account of *varicose lymphatics*—a disease of which the author professes to have given the first detailed anatomical and clinical description—concludes Book I. Cases are occasionally, though rarely, seen, in which the lymphatics of certain parts of the body become dilated, so as to form small ampullæ or groups of varices, sometimes as large as a hen's egg. Their seats of preference are the inguinal region and thigh, and the thoracic walls. They sometimes open externally, and discharge even large quantities of unmistakeable lymph. This occurred in a case which he saw with Demarquay, and of which an excellent illustration is given in Plate LXVII. The varix was here seated in the thigh, and discharged lymph spontaneously through a very small opening, sometimes shooting it out with force. Another case he saw, under Schönlein in Zurich, of a man aged twenty-one, in whom were groups of varicose lymphatics in the upper part of the thigh and in the scrotum, which discharged periodically a milky fluid to the amount of several ounces. It is probable that cases which have been described as "milky discharge" from the scrotum, by Löwig and others, were really cases of this disease.

In Book II. the various diseases of the *respiratory system* are enumerated and discussed. *Pseudo-membranous bronchitis* is the name given to that affection in which casts of the bronchial tubes are expectorated. An analysis is given of 22 cases, from which it is shown that the disease is most common between the age of twenty and forty.

The sacs which are formed out of excessively *dilated bronchi* are, in most instances, superficial. A case of the kind, with the autopsy, is related where such a sac ruptured into the pleura, and death followed from empyema and pneumothorax. A similar case occurred last year in Vienna, in the clinique of Oppolzer, who made an accurate diagnosis as to its nature. Some good lectures have lately been delivered by Skoda, in the same hospital,[1] on dilatation of the bronchi, more especial attention being paid to the symptoms by which the disease may be recognised. He lays great stress on the character of the sputa and the nature of the cough. The sputa consist of abundant watery secretion, in which float small masses of pus much less coherent and compact than the nummular sputa of phthisis. It is only in advanced cases that they have the peculiar penetrating stink. The cough is particularly characteristic, being constant day and night, but only occasionally relieved by expectoration, which, when it does come, is more or less abundant, according to the size of the sac.

In more than one-half of all cases of *emphysema* examined after death tubercle was found coexisting; in some cases the tubercle, in others the emphysema, being the primary disease. The prediction is

[1] See Allgem. Wiener Mediz. Zeitung, 1864, No. 26.

made that emphysema will be found to depend on more than one cause; that it will be proved to be sometimes catarrhal, at other times dependent on disease of the air-vesicles themselves. To believe that it is always catarrhal is to deny what is an indisputable fact, that it is often hereditary. In the best treatise on emphysema now extant, Waters holds very much the same views concerning its nature as are here promulgated. This writer recognises two distinct forms of the disease—one lobar or general, due to a primary idiopathic affection of the very walls of the air-vesicles, which, when their elastic force is destroyed, are gradually distended by the simple force of inspiration; the other lobular or partial, found in connexion with tubercle, hooping-cough, or any other lung affection where long and violent coughing is present, in which case the expiration theory of Jenner explains the occurrence of the emphysema.

Some stress is laid on a peculiar character of the sputa in *pneumonia*, first noticed by Remak; the presence, namely, of small ramifying concretions or false membranes. These are to be looked for from the third to the seventh day of the attack by diluting the sputa with water and spreading them out on a glass slide. The concretions are then seen in the form of little branching cylinders which divide dichotomously, and are slightly swollen at the points of division.

The *bilious pneumonia* of writers is not, as many suppose, caused by propagation of disease from the lung to the liver; for pneumonia may be complicated with jaundice where the inflammation is limited to the left lung. The coexistence of the two diseases is merely a coincidence.

In Book III. diseases of the *nervous system* come under consideration. The term *arachnitis* must be discarded from our nomenclature, and diseases of the membranes are to be henceforth described in connexion with the dura or pia mater. "The arachnoïd is not a closed sac or serous membrane in the same sense as the pleura or peritonæum, but forms a simple single serous layer or covering for the dura mater on the one side and the pia on the other." Virchow[1] is very positive about this.

A series of interesting cases are next related of *phlebitis of the sinuses*, especially the lateral and petrosal, with formation of pus in them, as a consequence of otitis interna. This affection is to be carefully distinguished from thrombosis of the sinuses, which, like that in other veins, occurs in connexion with wasting diseases, more especially tubercle.

Although the author does not go so far as to deny the existence of *hydrocephalus externus*—that is, effusion between the dura and pia mater—he nevertheless considers it to be very rare. Virchow[2] confesses that he is very sceptical about this disease. According to him, it only occurs in one form, as congenital, and always in connexion with faulty development of the brain or cranial bones (cyclopia, &c.) How extremely rare it must be, even then, may be imagined from the fact

[1] Geschwülste, p. 173.   [2] Op. cit., p. 172.

that only one case was met with by Bednar[1] out of about 30,000 foundlings, during four years, in the Vienna Foundling Hospital.

The remarks on the subject of *cerebral abscess* are instructive. A singular fact noticed is the latency of the symptoms for a certain time, sometimes as much as two months, then followed by a rapid outburst and a fatal termination. The explanation offered to account for this phenomenon is the slow formation of the pyogenic membrane. This membrane, far from being an agent in absorption, is a most fertile source of formation of pus. No sooner, then, is it completed, which seldom happens before the end of the third week, than the pus begins to increase to such an extent that the brain can no longer bear the pressure to which it is subjected, and violent cerebral symptoms declare themselves. It is indeed unaccountable that the brain may be sometimes riddled with abscesses without the health suffering in a remarkable degree.

There is nothing particularly worthy of notice in the chapter on the *spinal cord* till the subject of atrophy is introduced. That disease of the cord, called *gray degeneration,* is mentioned in connexion with atrophy. Lebert does not seem to be familiar with this disease, for he states that he has not as yet been able to make any microscopical investigations as to its nature; though he thinks that the change is principally due to an increased formation of connective-tissue.

The publication of Trousseau's admirable Clinical Lectures[2] has familiarized to most of us a train of symptoms included by him under the denomination of "la maladie de Duchenne, ou ataxie locomotrice progressive," a supposed disease, on which a volume had been already written by Duchenne de Boulogne, detailing with French accuracy and power of description the clinical history, but leaving the real nature of the morbid changes, which could give rise to so bizarre a series of symptoms, enveloped in mystery. The most prominent of the symptoms, it will be remembered, is *the loss of the power to co-ordinate the voluntary movements,* so that there is apparent paralysis; but, if the muscular force be tested, it is found to be perfect, nay, sometimes even exaggerated. It is, therefore, supposed that the guiding muscular sense is here lost, while the motor power remains intact; that there is no loss of power in the muscles individually, but that the person affected is incapable of combining their action from not knowing where they are and in what position the part that he wishes to move is already placed. The individual so staggers and totters that he can make no progress without support; he flings his legs about at random; he generally endeavours to supply by the sight the sense that seems to be absent, so that, if his eyes be shut when he is in the erect posture, he falls to the ground. The same person, in the recumbent posture, can flex or extend his legs with as much force as the strongest man, and, if allowed to prop himself against any object, when standing, can support on his back almost any weight (of which we have seen instances in the clinique of Trousseau and Duchenne, where a common

[1] Die Krankh. der Neugebornen und Säuglinge.
[2] Paris, 1862, vol. ii. p. 181.

test of the strength of these "ataxiques" was to make them support some of the heavier students on their backs).

The few post-mortem examinations made in France were unsatisfactory; and Trousseau concludes a brilliant lecture on the symptoms of the "ataxie," with the assertion that it belongs to the great class of diseases which, for want of better information, are called nervous disorders (*névroses*). On referring to this lecture there will be found, at page 203, an elaborate account of a post-mortem examination made on a well-marked case of ataxie by Bourdon and Luys, in which the spinal cord, *more especially its posterior columns and the posterior roots of its nerves*, were in an advanced state of disease; but, he adds, because the cerebellum was intact, and because it is over sensation, not motion, that the posterior columns are supposed by physiologists to preside, "we may conclude by saying that this autopsy proves nothing" ("disons que cette autopsie ne démontre rien"). The fact being that, by regarding the matter from an *à priori* point of view, Trousseau missed the clue to the whole secret, though it lay before his eyes.[1] The Germans have sifted this mystery, and seemingly solved it. Leyden[2] more particularly, and Friedreich,[3] have worked out the morbid anatomy of the ataxie, and have come to the conclusion that ataxie is not to be regarded as a disease *per se*—a "névrose," as Trousseau would have it—but merely as a group of symptoms dependent on a disease of the spinal cord, *a gray or gelatinous degeneration of the posterior columns and posterior roots of the spinal nerves.* Leyden has collected twenty-three cases and made nine post-mortem examinations in which this disease was present, and all of which were characterised by a train of symptoms corresponding with those described by Duchenne and Trousseau. Further, the experiments and pathological observations of Brown-Séquard[4] associate the most marked of the above symptoms—namely, a defect in, or loss of, co-ordination of movement in standing and walking, the *power* to execute voluntary movements being preserved intact, with alterations in the posterior columns and posterior roots of the spinal nerves. This peculiar symptom is considered by Brown-Séquard to be due in part to the loss of "guiding sensations." For although the posterior columns are not in the slightest degree conductors of sensation, yet, inasmuch as the sen-

[1] In the second edition of his Lectures, just published, and to which our attention has been called since the above was written, Trousseau has become so far convinced of the frequent association of disease of the cord with ataxie, that he devotes two or three pages to the consideration of the relation which the one bears to the other. He cannot, he says, contest or dispute the anatomical facts observed and related by so many trustworthy pathologists, but he does question the conclusions they would draw from these facts. Seeing how physiologists are still at variance as to the functions of the posterior columns, and how divided pathologists are about the symptoms present when those columns are diseased, he still persists in regarding ataxie as a névrose; looking at the lesions in the cord as the *effect*, not the *cause* of the nervous disease. "C'est à tort qu'on voudrait leur (ces lésions) subordonner la maladie, car elles n'en sont que la conséquence."

[2] Die Graue Degeneration der hintern Rückenmarks-stränge. Berlin, 1863.

[3] Virch. Archiv, xxvi. 391–419; xxvii. 1–26.

[4] Phys. of the Central Nervous System, p. 136.

sitive nerves coming from the posterior roots pass through these columns before they reach the grey substance of the cord, it is clear that the columns cannot be altered to any great extent without involving those nerve-fibres which pass through them, and, in this way, interfering with the conduction of sensitive impressions. Lastly, Gull[1] relates a very interesting case in which the most marked symptom was a loss of power to *regulate* the muscular contractions, even though the patient could, when in bed, flex and extend the leg with some freedom. To explain this phenomenon, Gull calls to his aid Todd's theory concerning the functions of the posterior columns—"that they propagate the influence of that part of the encephalon which combines with the nerves of volition to regulate the locomotive power, and serve as commissures in harmonizing the action of the several segments of the cord."

The following conclusions may, then, be drawn—first, that disease of the posterior columns of the cord and posterior roots of the spinal nerves causes the voluntary movements to become irregular and unharmonious, and, by its extension, gradually and inevitably destroys life; secondly, that the ataxie of the French is a group of symptoms dependent on this disease. No matter whether physiologists can or cannot explain the phenomenon, the pathological facts are there, and the conclusions drawn are, we humbly think, quite warrantable.

This grey degeneration, which gives the cord a greyish-yellow, translucent, or gelatinous appearance, is either localized in islands or patches, or diffused, occupying by preference the posterior columns and posterior roots of the spinal nerves, but sometimes extending to the lateral columns, and, according to Friedreich, to the grey substance throughout the whole length of the cord. The cauda equina will also be found, in most cases, to contain some grey strands. The following is a summary of the microscopical characters (from observations by Virchow, Rokitansky, Leyden, and Friedreich): 1st. The nerve-fibres in the part are atrophied. 2nd. There is abundant formation of connective-tissue, which gives the naturally amorphous neuroglia a fibrous appearance. 3rd. There is thickening of the coats, especially the outer coat, of the bloodvessels. 4th. At a later stage, a retrogressive change is found to have commenced, and fatty granules are seen in the cells and nuclei of the connective-tissue and bloodvessels. 5th. Friedreich has remarked on the number of corpora amylacea present.

Book IV. contains an account of *diseases of the alimentary canal.* The probability seems ever greater that the *round ulcer of the stomach* is quite peculiar in its cause and in the manner of its formation. The author does well to separate it from the follicular ulcers, which are comparatively small and numerous, and appear in the form of erosions rather than ulcers. The ulcus rotundum is denominated by him "ulcère par arrêt circulatoire." He therefore adopts the view first propounded by Virchow—that, owing to some obstruction in a branch

[1] Guy's Hosp. Rep., 1858, vol. iv. p. 179.

of one of the gastric arteries, a certain portion of the stomach is deprived of its blood, and that the gastric juice acts upon the part thus deprived of its alkaline blood, just as it would act on a piece of food. He has been led to this belief by the fact of having seen in stomachs, where the round ulcer was unmistakeably present, one or two other patches of mucous membrane evidently in a state of gangrene, from which a slough was just about to separate; and also by the circumstance that the common aspect of the ulcer is very much that which a part presents after the separation of a slough from caustic. The experiments of Dr. Pavy, as is well known to all, show clearly how readily the stomach digests itself, when, by ligature of its arteries, the circulation in it is arrested.

The rate of mortality in *typhoïd fever*, as observed by Lebert, is lower than that in London as observed by Murchison. The former estimates the number of deaths at 14 per cent. The latter, from an analysis of cases in the London Fever Hospital, finds the mortality as high as 18·56 per cent., or, deducting patients moribund on admission, 17·2 per cent., a mortality not higher than that observed elsewhere in England. Both are of the same opinion that the mortality is greater in women than in men.

Passing over diseases of the liver, from which nothing particularly new is to be gleaned, and of the kidney, where Bright's disease is described after Frerichs, and therefore not quite on a par with the knowledge of the present day, we come to *diseases of the testis* in Book VI.

The *hernia testis* is described in most books, more especially in English, as a protrusion of the tubuli through the tunica albuginea, covered with granulations. This, as Deville has shown, and as Lebert's observations have confirmed, is not a correct interpretation of the real nature of the disease; the fact being that the whole testis protrudes *en masse.*

The so-called "Inclusion fœtale" is discussed at some length. Velpeau and others have published cases where parts of a fœtus were found enclosed in the testicle; and have, in their description of them, followed Geoffroy St. Hilaire, who first promulgated the view that they were really cases of fœtal inclusion. These are, as Lebert rightly argues, nothing more than dermoïd cysts, in which hair, bones, or teeth, are developed, and which are exact analogies of the corresponding cysts in the ovary—aberrant proliferous cysts, with, what Virchow calls, a teratoïd character.

In Book VII., on diseases of the organs of locomotion, we recommend especially Plates clxviii.—ix., which illustrate the different stages and degrees of *rickets.* These plates, together with Virchow's description of the morbid anatomy of the disease in his cellular pathology, and Jenner's papers on the clinical history (in the 'Medical Times,' 1860, vol. i.), make up as complete an account of the disease as can be read.

The special pathology closes with a short sketch of diseases of the skin. This chapter has no particular merit, and the accompanying illustrations seem poor in comparison with the beautiful drawings by

Elfinger of Vienna, which were made to illustrate Hebra's lectures, from cases in his clinique, and tolerable copies of which have been published by the Sydenham Society.

Review IV.

1. *Principles of Human Physiology.* By William B. Carpenter, M.D., F.R.S., F.G.S., F.L.S., Registrar to the University of London, &c. &c. Sixth Edition. Edited by Henry Power, M.B. Lond., F.R.C.S., Assistant-surgeon to, and Lecturer on, Physiology at the Westminster Hospital.—*London*, 1864. 8vo, pp. 946.
2. *Handbook of Physiology.* By William Senhouse Kirkes, M.D., &c. &c. Fifth Edition.—*London*, 1863. pp. 774.
3. *A Treatise on Human Physiology. Designed for the Use of Students and Practitioners of Medicine.* By John C. Dalton, Junr., M.D., Professor of Physiology and Microscopic Anatomy in the College of Physicians and Surgeons, New York, &c. &c. Third Edition. —*Philadelphia*, 1864. pp. 706.

We have no intention of reviewing at length the works which stand at the head of this article. To do so would be to write a fourth Manual of Physiology, and would, moreover, be a piece of unnecessary labour. These books have been so long before the world, that the public has had ample time to form its own opinion on their merits without aid from us. What the general verdict has been there can be no doubt. A mere glance at the title-pages assures us that it has been favourable. The works, it will be seen there, have reached respectively their sixth, fifth, and third edition. Still, we do not like new batches of such important treatises to pass without any notice from us. We say important, and we do not think that any one who is acquainted with our medical schools will dispute the justice and propriety of the term. Their importance consists, not in their containing much new matter, and so adding materially to the capital of acquired knowledge, but in the fact that these are *the* works, *par excellence,* on which the mass of our medical students rely for their physiological instruction. It is hardly an exaggeration to say, that the majority of medical practitioners, scattered at the present time over the surface of England and her colonies, owe all that they know of physiological science to some one or other of Dr. Carpenter's treatises on the subject. Add to Carpenter Kirkes and Todd and Bowman, and we have exhausted the whole library of the ordinary medical student in our London schools, so far as relates to this branch of education. Of the condition in this respect of the schools on the other side of the Atlantic, we cannot speak with much certainty; but we are told that a scarcely less important position is held there by the treatise of Dr. Dalton.

We could wish with all our hearts that this were not so. Manuals, of course, our students must have. But we could wish that they had something more; that besides these dry *résumés* of ascertained facts, they had books of original research and investigations made by their own countrymen and written in their own language. In calling these manuals "dry," we do not mean to speak slightingly or disparagingly of them. *All* compilations are dry and uninteresting, when compared with writings the author of which is at the same time the discoverer of the facts and truths which he describes. To such works these manuals bear the same relation as our ordinary hospital school lectures to the experimental courses, which are open to the French student at the College de France, or to the German in the various physiological laboratories of his universities. We do not wish to be understood to say that these manuals contain no original matter. Far from it. Both Dr. Carpenter and Dr. Dalton have added new facts and new observations to our stock of knowledge, and we trust will still add more. That Dr. Carpenter, at least, will do so we have every reason to believe; for we learn from his preface that the chief reason which has induced him to leave this new edition to the competent hands of Mr. Power is, "that he may devote such power as remains to him rather to the extension of the boundaries of knowledge by researches of his own, than to the co-ordination of the results elaborated by others." That he may live long to carry out his investigations, and that his present labours may be crowned with as great success as has attended his past ones, is, we are sure, the hearty wish of all those who know with what indefatigable energy he has hitherto worked to popularize numerous branches of science and render their ascertained results accessible to the ordinary student. We would that it had been in our power to express the same good wishes to the author of the work which stands second at the head of this article. Our readers, equally with ourselves, will regret that the recent premature death of Dr. Kirkes has robbed us of one of the very few medical practitioners who had not abandoned the special study of physiology so soon as they had obtained their diploma. How is it that the number of these is so small that they may be almost reckoned on one's fingers? How is it that in England the science of physiology is, as all must allow, at so low an ebb? We have heard the greatest astonishment expressed by foreign professors that England, not undistinguished in other sciences, is content apparently to do without physiologists of her own, and to import its knowledge from abroad as she does her corn or her cotton. Doubtless the answer is in part to be found in the fact that physiology does not pay as a profession. The same qualities of mind which make a good physiologist will also, as a rule, make a good and successful practitioner of medicine. The same power of observation, the same attention to minutiæ, the same unwearying energy is necessary for both. Now, to a man endowed with these advantages, medicine offers an honourable and a lucrative field of labour, in strong contrast with the unrecognised and unprofitable pursuit of physiology. We can hardly, then, be astonished that, with the choice of these two studies before him, the medical man—for none other than medical men, with scarce an exception, have even an elementary knowledge of the science —should decide in favour of the former rather than of the latter. Even should he be induced to take up the latter pursuit, it will almost certainly only be for a short time, merely as a temporary occupation to fill up the interval before practice, and to be abandoned so soon as the waiting-room comes into frequent use. There is little hope then, in our opinion, for physiology, until some way or other be found of making its study more lucrative. A tolerably well-endowed chair has recently been established at Oxford, and its occupant, being strictly forbidden to practise medicine, is able to devote his undivided energies to his subject. There exists at Oxford all that is necessary for the maintenance and establishment of a first-rate physiological school: abundant leisure, ample means, a magnificent and well-stocked museum, a large concourse of students, and last, not least, a learned and energetic professor. Should there be no prejudiced authorities to offer opposition, we see no reason why in time a school may not be formed there which may vie with those of foreign countries, and do something, so far as its limited influence extends, to raise the standard of English physiology above its present low level. But the happy conditions under which Oxford exists, with means more ample than her necessities, are unfortunately exceptional. We cannot hope to see similar chairs set up elsewhere, for there are no funds for the purpose. Even could such be found, we are by no means sure that endowed professorships are a certain mode of insuring scientific activity and progress. Where there is a fixed stipend, the amount of work done will depend on the zeal and honesty of the recipient for the time being. Were it not invidious so to do, we might point out instances in our universities where liberal endowments produce but scanty results; and counter-instances also, we are happy to say, where a nominal salary, as that of the Greek professor, has obtained the most conscientious and productive toil. The only sure method of stimulating the vast majority of men is to make their emoluments depend on the amount of work done. This is the case when the teacher's gains depend on the number of his pupils. The number of students who at present require physiological instruction is quite inadequate to the number of lecturers in our various schools of medicine. Each school has its own teacher, who necessarily receives but a scanty remuneration, and who as necessarily only works at physiology *ἐκ παρέργου*, and abandons it for the first chance of more lucrative employment. A remedy to this might of course be found in the fusion of our too numerous schools into one or two larger institutions. The proportion of teachers to pupils would thus be diminished, and their receipts in an equal degree augmented. Of such a change, however, there is little prospect. We nourish another hope, perhaps equally distant, in our minds. We look forward to a time when the number of physiological students shall be very greatly increased, and furnished from other and larger classes than that of medical practitioners. We trust that the day will come when at least an elementary knowledge of the functions of his body shall be considered an indispensable part of a gentleman's education, and when an ignorance of the use of the heart or lungs shall be at any rate as great a slur as the perpetration of a false quantity. Do not let our readers suppose that we are joining in the vulgar cry against classical education. Far from it. We have the greatest respect for Latin and Greek, and would not ourselves for much give up our Tacitus and our Homer. What we wish is, not to pull down these time-honoured idols and set up the statues of Harvey and Hunter in their stead, but to place them side by side, and give to neither our individual worship. This certainly might be done without injury to classical lore. Surely out of the ten or twelve years which are at present spent in acquiring, for the most part, a very superficial acquaintance with easy classical authors, sufficient time might be spared for this additional study; and though the knowledge of nature thus obtained might be no more than elementary, it would not, we are certain, be without its use in after-life. The wider the basis of education, the more stable will be its results; and we feel assured that, were our youths trained in the manner we propose, the advertising quack, the table-turner, or the spirit-medium, would find in them less numerous and less facile dupes than they do under our present system.

We are aware that already in our universities physical science holds a recognised place as an element in education. But a mere glance at the Oxford Calendar will show what little root the study has yet taken, the number of candidates who present themselves in this school being as nothing when compared with that of those examined in the three others. Nor can we wonder at this, seeing that all the prestige and all the prizes, with some few trivial exceptions, are still monopolized by the older branches of knowledge.

It may be asked, Do not the same obstacles to physiology which we have mentioned as existing in England operate also in France and Germany? They do not, we believe, in the same degree. In these latter countries there exists a greater demand for physiological instruction; its successful pursuit is attended by more honourable distinction; there are more numerous and better endowed professorships; and, at the same time, the counter-attractions of medical practice are by no means so great. Moreover, independently of the question of emolument, we fear that we must allow that there is a greater love of science for science' sake in France, and still more in Germany, than in England. The German will take up a question, and spend years, if necessary, in laboriously working out its minutest details, simply and purely for the sake of solving the problem, and is careless to inquire whether there be any practical good to be hoped for from the solution. He has acquired fresh knowledge, brought new facts to light, and this satisfies his intellectual cravings, while he looks on their capability of material application as a matter of but secondary importance. An Englishman is constituted in a different way. As a rule, he cares little for mere knowledge. That knowledge alone is to his taste which can be turned to use. "Knowledge is power" is with him a favourite maxim; and all knowledge which cannot at once be shown to be power meets from him with but slight regard. Prove to him that the solution of any question will lead directly to an improvement in our material wellbeing, and he will work at it with as much or more zeal and energy than a German. But in the absence of such a stimulus of expectation he will not be induced to stir a finger. Now the tangible results of such sciences as chemistry and physics are patent to him. Have they not found out new dyes for our stuffs, cheaper and more perfect methods of working our iron and fabrics? Have they not, in a thousand ways, increased the results of labour, saved expenditure of time, and facilitated all the intricate processes of manufacture and of business? These sciences therefore please his fancy. But physiology can promise no such manifest nor such immediate results. Its practical applications are in the far distance. The time may indeed come when a more perfect knowledge of its laws may form a real substantial basis for medical practice; but at present the bridge between it and medicine remains to be built. The claims often advanced on behalf of physiology, of having discovered laws of large and general benefit to mankind, prove on examination to be unfounded. We had already found out the necessity of a free supply of pure air, and the ill effects of want of ventilation, before the physiologists had interpreted the laws of respiration. How much food we must take, and what must be its nature, in order to support life, was known practically long before an accurate balance had been struck between the ingesta and the egesta of the animal economy, and when we were in utter ignorance of the various purposes served by the various proximate principles we consume. All that physiology in these cases has done has been to place on a scientific basis conclusions to which we had already been led by vague experience.

From this digression we return to the books which stand at the head of our article. Of these, two—namely, Dr. Kirkes' and Dr. Dalton's—scarcely require notice. Their several editions have appeared after each other at such short intervals, that they have constantly been kept on a level with the advance of physiological knowledge, and each successive publication has differed but slightly from its predecessor. With Dr. Carpenter's book the case is different. It is now ten years since the last edition was published, and in that period a vast amount of new material has accumulated, and more or less change has taken place in the aspect of every one of the numerous branches of the science. The labour required to fuse the fresh discoveries into the old work was great, and required abundant leisure as well as minute acquaintance with the detail of recent observations. Dr. Carpenter having his hands fully occupied with his official duties and the original researches which he has undertaken, has wisely consigned the task to the care of a younger and less occupied man. That he has been successful in the selection of Mr. Power as his substitute, all those who read the present edition will, we are sure, allow.

We proceed to notice the chief alterations which Mr. Power has made in this sixth edition. How industrious the physiologists have been, and what changes they have wrought in the last ten years, is seen so soon as we reach the third chapter, which deals with the various processes of digestion. Of all the digestive fluids, there is not a single one on which some new light has not been poured during this period. The influence of the nervous system upon the secretion of saliva has been made the subject of numerous experiments by Bernard, Eckhard, and others; and their results are given clearly and concisely in our treatise. It has been shown by Bernard that the glands which form this fluid are under the influence of two sets of nerves, furnished, one from the cerebro-spinal, the other from the sympathetic system. These produce exactly contrary actions in the glands, the stimulation of the former either directly or in a reflex manner determining secretion, that of the latter diminishing or entirely suspending this function. Eckhard, moreover, has shown that, in the case of the submaxillary gland, irritation of the sympathetic nerves affects not only the quantity but the quality of the saliva. At the same time as it becomes less abundant, it becomes more viscous, and is found to contain a number of sarcode-like bodies possessing the power of spontaneous movement. The interest of this latter observation consists in the evidence it affords that the nerves exercise some other influence on glandular structures than contraction or dilatation of their bloodvessels. We can understand how an increased or a diminished supply of blood may lead to an increased or diminished amount of secretion; but how the same cause should lead to an alteration in its components is less intelligible. A similar result has been observed in the case of the kidneys. When all the nerves going to these organs have been divided, the urine not only becomes scanty, but changes its quality, and is found to contain an abnormal constituent, uro-benzoic acid.[1] This change, like that of the saliva observed by Eckhard, seems to imply something else than mere alteration of blood-supply. Our readers will also find in Dr. Dalton's book some interesting observations on saliva. He has succeeded in obtaining the pure secretion of the parotids from the human subject by introducing a fine canule into the orifice of Steno's duct. The saliva being thus obtained under perfectly healthy conditions, and unmixed with other animal fluids, gives much more satisfactory results than that which other observers have procured for examination in cases of salivary fistula, when there was no certainty of its retaining its normal character. He finds that the secretion of these glands is in man, as in dogs, watery, and not viscid like that of the submaxillary or sublingual. It contains sulpho-cyanogen, as does the

[1] In Dr. Kirkes' Manual, p. 354, it is said that "it is not possible to say with certainty whether the secretion of a gland would be arrested by the division or destruction of all the nerves distributed to it, for the branches of these nerves are largely spread over the bloodvessels, so that their destruction cannot be effected without serious injury to the vessels." No objection, however, can, we think, be fairly made to the method employed by M. Brachet. This physiologist cut the renal artery right through, thus dividing all the nerves, at the same time maintaining the circulation by uniting the cut ends of the vessel with a hollow tube. (Physiologie, J. Béclard, 3me édition, p. 386.)

secretion of the latter glands; but, unlike them, it contains some unknown organic substance, which masks the reaction of the sulpho-cyanogen when treated with perchloride of iron. It is only when this organic substance has been precipitated by alcohol that the characteristic red colour is obtainable. Dr. Dalton has also shown that the fact previously observed by Colin in horses[1]—namely, that the parotids only secrete during mastication, and only on that side on which the animal is at the time chewing—is true also in the case of man. When canulæ are introduced into both of Steno's ducts, and mastication is confined to one side, the clear watery fluid is seen to trickle from the tube on that side, while none issues from that on the other. This fact, together with the absence of ptyalin from the secretion, seems to indicate that the parotids furnish a fluid destined merely to moisten and saturate the dry food, in accordance with the view long since advocated by Bernard. But we cannot agree with Dr. Dalton that the functions of the other salivary glands are equally mechanical. It is true that the starch we consume sojourns but a brief time in the mouth, and it is also probably true that the acid gastric juice suspends the action of the saliva upon it when it has been swallowed; but the conversion into sugar is a very rapid one under ordinary circumstances, and it is probably some time before the gastric juice penetrates to the interior of each bolus which passes the cardiac orifice. This part therefore may escape neutralization until the conversion into sugar has taken place.

As regards the gastric juice, Mr. Power gives us the experimental results of Brücke, showing how its solvent powers vary with its degree of acidity, a feebly acid juice being the best solvent of fibrin, a doubly acid one acting more rapidly on coagulated albumen. He gives us also fresh evidence on the vexed question of the cause of the acidity of this secretion. It has been maintained by Bernard[2] and others that this reaction is due to the presence of free lactic acid, and that the hydrochloric acid which others have thought to find is not a constituent of the juice in its natural condition, but resulted from their method of analysis, a decomposition of the chloride of sodium taking place in the presence of lactic acid under the influence of the high temperature used in the process of distillation. Professor Graham, however, has succeeded in separating hydrochloric acid from gastric juice by his method of liquid diffusion—a method not open to the same objection; and though he also found some free lactic acid, its quantity was comparatively small. Mr. Power might also have quoted the decisive experiments on this point of Lehmann. This chemist used a method as little liable as that of Prof. Graham to the cause of error mentioned above. Having procured some healthy gastric juice, he dried it *in vacuo* without using heat, and obtained an amount of hydrochloric acid which varied in six experiments from 0·098 to 0·132 for 100 parts of juice. In the residue he found a still larger propor-

[1] Traité de Phys. Comp., 1854, p. 468.
[2] Leçons de Phys. Experim., 1856, p. 396.

tion of lactic acid.[1] The results, then, of both these chemists show that the acidity of the gastric secretion is to be ascribed neither to lactic nor to hydrochloric acid exclusively, but to the two combined.

In treating of the pancreatic secretion, Mr. Power gives an account of the controversy carried on by Bernard on one side, and Lehmann, Frerichs, and Lenz on the other, as to the extent of its action on fat; he also states clearly the several views entertained by physiologists as to the existence in this fluid of a capability of effecting a solution and metamorphosis of albuminous bodies. His decision on this point is in favour of Bernard's view, "that the solvent power of the pancreatic juice for albuminous substances is only exercised when it is mixed with bile, and then only after the preparatory action of the gastric juice." (p. 97.)

We pass over Mr. Power's account of the bile and its functions to notice the original researches on this fluid made by Dr. Dalton. In order to make these intelligible we must recal to our readers' memories in a few words the ordinary view entertained by our chemists as to the composition of the biliary secretion—a view due originally to the investigations of Strecker. The bile is stated to contain two essential constituents, which exist nowhere else, and are therefore characteristic of it—a pigment and a substance of resinous nature. This latter substance—the biline of Berzelius and Mulder—consists, according to Strecker, in all animals, the pig only excepted, of a mixture of taurocholate and glycocholate of soda. The bile of one animal differs from that of another only in the relative proportion in which these two salts exist, the glycocholate being much more abundant in some animals than in others, and being, for instance, entirely, or at any rate almost entirely, absent from the bile of dogs.

Dr. Dalton has shown that this view of the composition of the bile is not entirely correct. The taurocholate and the glycocholate exist, properly speaking, only in the bile of the ox, where they were discovered by Strecker. The bile of other animals contains substances analogous to one or both of those salts, and resembling them in their reaction with Pettenkofer's test, but at the same time presenting some minor differences which show them not to be identical. Thus the bile of a cat contains a crystallizable salt and a non-crystallizable one, analogous respectively to the glycocholate and taurocholate of soda. But the crystallizable salt cannot be glycocholate, for it is not precipitable from its watery solution by the acetate of lead, which is the case with that substance. So also in the human bile; there is here no crystallizable substance at all, nothing that is answering to the glycocholate of soda. The resinous substance obtained from it might, however, be supposed to be the non-crystallizable taurocholate. But neither can this be so, for it is precipitable from its watery solution by the acetate of lead; and this is not the case with the taurocholate. It is thus shown that "the crystalline and resinous substances in different kinds of bile, though resembling each other in very many respects, are yet in reality far from being identical." (Dalton, p. 184.)

[1] Lehrbuch der Phys. Chemie, 1853, vol. i. p. 101, and vol. ii. p. 38.

There is another constituent of the bile—cholesterin—which deserves a passing notice. It has long been known that this substance is not formed in the liver, as are the organic salts which we have been discussing, but exists in the blood and in the tissues. It is especially abundant in the brain, and Lehmann[1] once found the choroïd plexus completely encrusted with its crystals. It has therefore been surmised that one source of cholesterin is the waste of nerve-tissue, and that the liver simply eliminates it. This view is confirmed by the researches of Professor Flint, who has found that there is nearly one quarter more cholesterin in the blood of the jugular vein returning from the brain, than in that of the carotid artery, before its passage through that organ; and that, on the other hand, the blood of the hepatic artery as well as that of the portal vein loses cholesterin in passing through the liver, so that but a small quantity can be found in the blood of the hepatic vein. (Dalton, p. 177.)

Dr. Dalton has also made some interesting experiments on the discharge of bile into the duodenum. He points out that a distinction must be made between the entrance of the secretion into the gall-bladder, and its exit from that receptacle into the intestine. The two processes are entirely distinct, and attain their maxima at different periods. The rate of the former is measured by means of a fistulous opening into the bladder, and is found to be most active some hours after food has been taken, when a greater supply of materials is circulating through the vessels. The rate of the latter is taken by establishing a duodenal fistula, and drawing off the intestinal contents at various periods after feeding. This Dr. Dalton did at intervals of fifteen minutes, and he found that the bile passes into the intestine in by far the largest quantity immediately after feeding, and within the first hour, the difference being especially marked when the essential constituents are alone taken into consideration, and the fluid portion neglected. (p. 192.)

Mr. Power's fourth chapter treats of absorption and sanguification. New materials are used here to throw light both on the absorption of fat by the lacteals, and of albuminous and other substances by the bloodvessels. If the anatomical investigations of Brücke and Heidenhain, which are clearly stated, turn out to be correct, all difficulties as to the entrance of fat into the lacteals are at an end. It was long since pointed out by Kölliker that the cylindrical cells which cover the intestinal villi present on their free surface a double contour, and that fine longitudinal stripings could be seen in the interval between the double transverse lines. Various interpretations have been given of this appearance. Some[2] hold the longitudinal line in question to be nothing more than wrinkles in the cell-wall. Others, as Virchow,[3] think they are cilia covering the whole free surface or broad end of the cell. Kölliker himself[4] and Funke regard them as fine canals or

1 Day's Chemistry, p. 83.
2 Wiegandt, Canstatt's Jahresbericht, 1862, p. 32.
3 Cellular Pathology, 1858, p. 294.
4 Hum. Microscop. Anat., 1860, p. 329.

pores piercing the thick membrane which closes the free end of the cells. Lastly, Brücke and Heidenhain support the view that the free end is entirely patent, and that the transverse striæ are cilia which exist as a fringe round the margin of the opening. Heidenhain also believes that the smaller or attached end of each cell is prolonged into the matrix of the villus, becoming continuous with the caudate cells of the connective-tissue, and that these latter again open directly into the lacteals, so that particles of fat, and indeed of any solid substance in a sufficient state of division, have free access into the absorbent system. The simplicity of this view is captivating. It gives an easy explanation of the occasional presence of particles of charcoal, or sulphur, or starch in the circulation.[1] But we must not be seduced by tempting simplicity into too facile acceptation of a theory. We say a theory, for how feeble is the basis of anatomical observation is plain from the discordant results at which the various competent observers we have cited have arrived. We would ask also, how comes it, if this free passage exists, that all substances do not pass with equal facility from the intestine into the lacteals? How is it that these vessels exercise a kind of selection, taking up some bodies and rejecting others, though in an equally fine state of subdivision? How is it, we would also ask, that cells in other parts not concerned in absorption, such as the cells which line the gall-bladder, present the same appearance of a double contour and longitudinal striation?[2]

It is well known that in old times similar openings were supposed to connect the cavity of the intestine with the bloodvessels. No one nowadays adheres to this opinion. The substances absorbed by them pass through their walls by osmosis. Much light has been thrown on this purely physical process by the researches of Professor Graham; and of these Mr. Power has introduced a brief notice into his edition. But, as Dr. Kirkes (p. 313) justly remarks, a satisfactory short abstract of Professor Graham's paper is scarcely possible; and to gain an intelligible idea of his theory, it is necessary for the student to consult the original essay. Our readers will find an interesting observation in Mr. Power's book on the absorption of albumen. This belongs to what Graham calls the "colloïd" group of substances. These pass through a membrane with great difficulty, and thus the entrance of albumen into the bloodvessels seems at first sight hard to explain. But Funke has shown that the change which albumen undergoes in the stomach and intestine converts it into a "crystalloïd;" that is, into a member of that group of substances which traverse an animal membrane with comparative facility. (p. 119.)

In his fifth and sixth chapters Mr. Power treats of the blood and its circulation. He has curtailed the account of the chemical charac-

[1] Oesterlen found that particles of charcoal could be detected in the mesenteric veins when that substance, finely divided, had been introduced into the alimentary canal. (Haller's Archiv, 1847.) And similar results have been obtained with starch and sulphur. (Carpenter, p. 120.)

[2] Cellular Pathology, 1858, Fig. 14.

ters in deference to Von Gorup-Besanez. This chemist has shown that very little reliance can in fact be placed in the various quantitative analyses which have been made of this fluid. The very same blood will give very different results, according as it is subjected to one or other of the various methods of analysis. A specimen of blood, for instance, taken from a vigorous man of fifty years of age, was subjected to four separate methods of analysis. Each gave the same result so far as concerned the water and the fibrin, but by no means the same uniformity was obtained for the albumen and the corpuscles. Becquerel and Rodier's analysis, for instance, gave 63·87 and 117·82 as the respective proportions of these in 1000 of blood; while that of Höfle gave only 50·84 and 103·23. The analysis of a second specimen from another subject gave equally divergent results.

The space thus economized Mr. Power has filled up by a fuller account of the corpuscles and crystals of the blood, and by a separate section on its pneumatology. The account of the circulation has been considerably altered and improved. We have the well-known experiments of Dr. Halford on the heart's sounds, the observations of Dr. E. Smith on the variations in the frequency of its action; and lastly, we have—what was much wanted—a short account of the various instruments in use to measure and register the movement of the blood in the arteries. Of these the most important is the sphygmograph of M. Marey,[1] which is an improvement on the original one of Vierordt, in which the *vis inertiæ* was found to be too great for accuracy. Marey's instrument is pictured in Mr. Power's book, and consists essentially of a long light wooden lever, which is so arranged as to press on the artery of the fore-arm by a very delicate steel spring. The distant extremity of the lever terminates in a fine point, touching a plate of smoked glass, and this plate is moved along at an equable rate by clockwork. Each movement of the arterial wall, of course, determines an increased movement in the terminal point of the lever, and this acting on the smoked surface of the plate produces a series of markings, which register with unerring accuracy the number, the force, and the duration of the arterial pulsations. This instrument Mr. Power thinks is destined to come into more general use, and to be employed in the diagnosis of disease. At any rate, there can be no doubt that it would be of great service in rendering the description of cases more accurate. We all know how vaguely the terms soft, hard, full, thready, are often used, and how different are the powers of different men in estimating delicately these distinctions by their touch. Any instrument of precision, then, such as this, which eliminates errors which depend on coarseness of tactile sensibility, must be hailed with satisfaction. Doubtless improvements will still be made in it, so as to render it more easy of use, and more delicate in its mechanism; and one such step has, we learn from Mr. Power, been already made, Mach having devised a more perfect lever and spring. (p. 236.)

The chapter on respiration is divided into three parts. The first

[1] See our numbers for April, 1861, p. 339, and for July, 1861, p. 238.

deals with the structure of the lungs and the mechanism of the respiratory movements; the second with the changes effected by this process in the air; the third with the results of suspended or of deficient respiration. In the first part Mr. Power has introduced the experiments of Rosenthal. These corroborate the earlier results obtained by Dr. Reid as to the effects of section of the pneumogastrics, and as to the character of the superior and inferior laryngeal branches, the former being centripetal or afferent, and carrying to the medulla oblongata the impressions by which muscular movements are excited, and the latter being centrifugal or motor, and supplying nearly all the laryngeal muscles. The opposite characters of these two branches being thus established, a further distinction is arrived at between the functions of the superior laryngeal and of the pulmonary branches of the par vagum. The former are shown to be nerves of expiration, their irritation determining a contraction in the expiratory muscles, and at the same time a relaxation of the diaphragm, while the latter or pulmonary nerves cause contraction of the diaphragm, and thus minister to inspiration. This observation of Rosenthal, as to the action of the superior laryngeal in causing when stimulated a complete relaxation of the diaphragm, is an important one. It will add, if confirmed, another instance to those already accumulated, of a nerve exercising an inhibitory influence on a muscle. That such an influence is exercised by the pneumogastrics on the heart has been long known, the pulsations of that organ increasing in rapidity on their section, and diminishing or being entirely suspended by their stimulation. So also Pflueger has shown that a similar power of arresting muscular action belongs to the splanchnic nerves. When the abdomen of a living rabbit is opened, vigorous peristaltic contractions are seen in the intestines, and these continue when the splanchnic nerve is cut across. But no sooner is a powerful electric stimulus applied to the peripheric end of the section than the contractions are brought to an instantaneous standstill. It is true that some physiologists, as Biffi, have failed to obtain the same result; but the experiment has been repeated several times by Funke, and this writer bears the strongest testimony to the accuracy of Pflueger's statement, having himself met with the most unequivocal success.[1] Rosenthal's case of an inhibitory nerve differs in one respect from these. His nerve, the superior laryngeal, is a centripetal or afferent nerve, and its controlling power must therefore be exercised indirectly through the medulla oblongata, whereas in the two other instances cited the nerves are motor.

The second section of this chapter treats of the effect of respiration upon the air. Since the days of Lavoisier this has been a favourite subject of investigation, and to enumerate those who have experimented upon it would be to mention all the most distinguished names in physiology. In spite of all this expenditure of labour, the results have been far from satisfactory, for each observer has arrived at a

[1] Funke, Lehrb. der Phys., 1860, ii. 599.

different conclusion on almost every point, and especially have they differed in their estimates of the amount of carbon expired in the course of the day. In this table are given the results arrived at on this point by sundry well-known physiologists :

Observers.		Subjects of experiment.	Carbon expired in 24 hours. Oz.	Grs.	
Lavoisier and Seguin		One person	10	4	French.
			5	7	
Coathupe		One person	5·45		Avoirdupois.
Valentin and Brunner		Several	9·202		Avoirdupois.
Scharling	Skin also	Several	4·4		Avoirdupois.[1]
			8·462		
Barral	Skin also	One person	8·5		
			12·		
Liebig	Skin also	Many persons	13·9		
Vierordt		One person	6·78		

The great want of harmony in these results depends, doubtless, in part on the fact that there is the greatest difference in this point between different individuals, some habitually giving off a much larger amount than others in a given time; and it will be noticed in the above table that most of the observers limited their investigations to a single subject. Taking, however, an average from all these various observations, we arrive at eight ounces and a half as the daily excretion of carbon by expiration. But, though we have thus eliminated one cause of error, there remains another of great importance. The estimates above (Liebig's excepted) were made by collecting the carbon given off by the subjects of experiment in a very limited period, sometimes only in a few seconds, and at most in an hour and a half, and by using the datum thus obtained as a basis for calculation for the whole period of twenty-four hours; but this simple method of multiplication involves a fallacy. It takes for granted that the products of expiration are uniform for equal periods throughout the day, whereas this is far from being the case, the variations from hour to hour being, as Dr. E. Smith has shown, of very considerable extent. In order, therefore, to avoid this cause of error, it is necessary to devise some method by which it shall be possible to collect all the gas given off during the whole day. Such a method has been hit upon by Dr. E. Smith, and the chief results of his observations have been embodied by Mr. Power in this section. Too much praise cannot be accorded to these laborious and prolonged experiments of Dr. Smith. He has used his new spirometer for the whole twenty-four hours without intermission, except for meals, and he has ascertained the amount of air inspired, and of carbonic acid exhaled, during sleep, in rest, in exercise, upon the treadwheel, with and without food (fasting on several occasions for more than twenty-four hours), with every kind of diet, and, in fact, under almost every possible condition of existence. Dr.

[1] Philos. Trans., 1859, p. 686.

Smith finds that the excretion of carbon by the lungs during twenty-four hours amounts to 7·144 ounces for an adult man in a state of rest, this being the average in eight sets of inquiries on four subjects. More is given off in the day than in the night in equal times, the proportion being 1·84 to 1. Of the conditions which augment the excretion, the most important are exercise and food. A man on the treadwheel gives off as much carbonic acid in a single hour as he would in four hours and a half were he at rest and taking food, or as he would in six hours at rest and without food. When no food at all is taken, the daily excretion is diminished 25 per cent., and there is scarcely any variation in the hourly amount, exactly the same quantity being expired at the end of twenty-seven hours' fast as after only four hours and a half. There is thus a normal or basal line below which the carbonic acid does not pass in health, and this line is tolerably uniform. It represents the constant excretion when the body is at rest and without food. Exercise or a meal produce a temporary elevation above the basal line, but in the interval the system returns to the normal standard-point. It is also worth noticing, as an example of the effect of habit in producing periodical conditions of the body, that even when no food is taken there is an increase in the amount of carbon excreted at or near the usual meal-time. Dr. Smith's experiments on the effect of various forms of diet are excessively interesting, and have led him to conclusions at variance with the statements hitherto generally accepted. It is, for instance, stated in most physiological manuals, on the authority of Regnault and Reiset, that amylaceous substances have a much greater effect in augmenting the excretion of carbonic acid than has a nitrogenous article of diet. Dr. Smith, on the contrary, finds that starch and fat have no influence whatever in producing an increase, while casein and gluten, and in a somewhat less degree gelatin and albumen, determine a rise in the excretion, which is only less than that resulting from sugar, tea, milk, and a few other substances. Dr. Smith has also arrived at some unexpected results as to the effects of alcoholic drinks. Notwithstanding the evidence afforded by disease, that different alcoholic drinks exercise very different influences upon the body, some, as is well known, being much more gouty than others, physiologists have been in the habit of considering them all as one, and of attributing to them all identical actions. It is generally believed, on the authority of Vierordt's and Prout's experiments, that any spirituous drink, especially when taken on an empty stomach, produces an immediate and marked effect in diminishing the amount of carbonic acid excreted. Dr. Smith has shown that this is by no means the case, and that a distinction must be drawn between the various kinds of spirituous beverages. Pure alcohol, so far from diminishing, actually increases the carbonic acid excretion, and so also do rum, ale, porter, and, in a less degree, sherry. On the other hand, brandy, whisky, and, above all, gin, have the contrary influence, and almost always lessen the respiratory changes, and consequently the amount of carbon exhaled.

There is an end, then, to one of the arguments often used by supporters of total abstinence—that, namely, which was founded on the supposed interference with pulmonary excretion. It may also be mentioned that another argument against the use of alcohol, which was brought prominently forward in a back number of the 'Westminster Review,' and which then seemed of some force, has lately received a satisfactory answer. That argument was founded on the experimental researches of Perrin, Lallemand, and Duroy. These chemists stated that when alcohol was taken, nearly the whole of it passed out unconsumed in the excretions, the deficiency not being more than might fairly be set down to the difficulties of collection and errors of experimentation. It was urged that a substance which thus passed out of the body unchanged could have been of no material benefit in the system. Passing over the manifest answer, that the experiments, if correct, would equally prove that it could have been of no material disadvantage, we may mention that M. Baudot has since that date subjected the experiments to criticism, and has shown that, comparatively, a very small proportion of the alcohol ingested can be recovered in the excretions.[1] It would, we think, have been better had Mr. Power quoted this opposite statement of M. Baudot, when he cited the experiments of Lallemand and Duroy as an argument against the alimentary value of alcohol. (pp. 49, 50.) In another portion of his book (p. 435), Mr. Power does briefly allude to Baudot's articles, and admits it to be a certain fact that alcohol "serves as a fuel to keep up the calorifying process." It is to this heat-producing power that Mr. Power ascribes the beneficial results of the administration of alcohol in cases of fever. But we would remark that, even when no alcohol is given, the temperature of the body in fever is usually considerably above the normal standard of health.

The third section of the chapter on respiration deals with the effects of suspended or deficient respiration. We have here admirable instances, which appeared however in the former editions, showing conclusively the intimate connexion between zymotic disease and want of ventilation; and, in addition, we have the results of the experiments of the committee of the Medico-Chirurgical Society on drowning. These show that, though the mere suspension of respiration is, of course, sufficient to cause death, yet that this result takes place much more rapidly when water is admitted into the lungs. Brown-Séquard's experiments are also quoted, on the strange power of new-born animals of sustaining prolonged immersion, and on the inverse proportions of that faculty and their temperature.

The inexorable exigencies of limited space compel us to pass over the remainder of Mr. Power's work with much less consideration than it deserves. There is, for instance, in the chapter on nutrition, an entirely new section on "The Balance of the Vital Economy," or "The Relations which subsist between the Ingesta, the Metamor-

[1] L'Union Médicale, Nov. 1863. The question of elimination of alcohol has been taken up by Dr. Anstie. His experiments corroborate the conclusions arrived at by M. Baudot.—Cf. Anstie on 'Stimulants and Narcotics,' p. 416–431.

phosis of Tissue, and the Egesta," which merits ample notice. This is an attempt to bring in a condensed form before the student the results of the numerous laborious investigations made in the last few years by Bidder, Schmidt, Vierordt, Bischoff, Voit, and other distinguished Germans, on the manner in which different kinds of food are disposed of within the system, either in the formation of tissue or in the maintenance of heat; also on the mode in which the results of their metamorphosis within the body are ultimately discharged by the various excretory organs. (p. 324.) The difficulties in conducting these protracted investigations are enormous. It is no easy task to collect and analyse the whole products of a single channel of excretion; to perform this for all is a labour to which the zeal and energy of a German are alone adequate. But this is only a small portion of the work to be done. A rigid account has also to be kept of the amount of food given, and of its exact chemical constitution; the variations in weight of the body have to be accurately noted; and when all this has been done, there remains the still greater difficulty of tracing back the organic constituents of the excreta to their true origin in the food, or in the tissues which have undergone metamorphosis. In spite, however, of all these difficulties, and of the numerous almost unavoidable sources of error,—in spite, moreover, of the short period during which these questions have been seriously taken in hand, much more precise results have been obtained than could fairly be expected. So many, too, are the able minds engaged at present in the inquiry, that we look forward with Mr. Power to a future time, not we trust too far distant, when it will "be possible to follow closely every step of the successive changes which the different kinds of food undergo from the moment of their introduction into the body to the period of their ultimate discharge." (p. 325.)

It will never, however, it seems to us, be possible to express numerically the proportions in which the egesta are distributed amongst the several excretory organs with any great precision. And for this simple reason. There exists in different individuals, even in perfect health, a very great difference in the functional activity of their several organs, depending, perhaps, on original minute variations of structure, or perhaps on modifications induced by habits of life. The excretory organs can, to a considerable extent, perform each other's duties. The substances, for instance, which in one man pass out habitually by his skin, may in a second pass out by some other channel, the kidneys or the lungs, and this with perfect health. It is only necessary to look at any set of experiments made on any one excretion in a number of individuals to be convinced of the great differences which thus exist. Funke, for instance, made a number of experiments on the amount of the sweat. In three individuals, himself and two of his students, exposed to identically the same external conditions, the relative quantities of this excretion given off in an hour were 1 : 2·3 : 4·4, and in a second set 1 : 1·7 : 2·06. Dr. E. Smith's tables show that there is a difference, not quite so great however, in the excretion of carbon by the lungs in different individuals. And though it is true that, when we take the weights of the several subjects of his experiments into consideration, the differences are much reduced, yet they by no means disappear. One of the four on whom he experimented, for instance, gave off 18·24 grains of carbon in twenty-four hours for each pound of his weight, while a second excreted 23·04.

We come now to the chapter on secretion. This has been considerably modified. A section has been added, giving an account of the glycogenic function of the liver, and in it will be found the opposite views and statements of Bernard and Dr. Pavy. Bernard states that the glycogen is formed exclusively from the nitrogenous principles of food; and Schmidt, who at first held a different view, now agrees with this statement. Pavy, on the contrary, finds much more of this substance in the liver when an animal has been fed on meat *and sugar*, than when it has been strictly limited to an animal diet.[1] We have ourselves had the opportunity of seeing Bernard perform his experiments, and have no doubt whatsoever of the accuracy of his statement. Several dogs, all in health and without notable difference in weight or size, were kept without food for a week. The object of this week's abstinence was to get rid of any store of glycogen preexisting in the liver, and Bernard had already determined experimentally that this was a sufficient period to ensure that result. The week's abstinence over, the dogs were dieted. Each received the same amount of water. But to one was given each day an ounce of fat, to a second an ounce of gelatin, to a third an ounce of pure fibrin, and to a fourth an ounce of vegetable starch. After a few days the dogs were killed. The livers of the two who had been fed on fibrin or gelatin contained abundant glycogen; the livers of the others who had only had starch or fat contained scarcely a trace. Mr. Power mentions that a third view of the origin of glycogen has been recently put forward by V. Deen, Poggiale, and others, that it is the result of the metamorphosis of the fatty substances consumed as food, or generated in the liver itself. We have not ourselves seen the articles containing the experiments on which they base their opinion; but, according to Mr. Power, their theory is not a very satisfactory nor probable one, either on chemical or physiological grounds.

Dr. Pavy and Bernard are not only at issue as to the origin of the glycogen, but also as to its destination. Bernard states that, not only after death but during life, it is constantly being converted into sugar by the action of a peculiar ferment, which in its properties resembles vegetable diastase. The sugar thus formed passes by the hepatic veins into the circulation. Pavy, on the contrary, believes that no such conversion into sugar occurs in life, there being then "some force or condition which overcomes the chemical tendency to saccharine metamorphosis, and the hepatin (i.e., the glycogen) undergoes some other change than conversion into sugar."[2] He inclines to the view that it is destined to enter the intestinal canal through the biliary ducts, and then possibly subserve some purpose in relation to the formation of fat. Dr. Pavy's experiments have, however, been repeated by Dr. G. Harley, in conjunction with Professor Sharpey, and

[1] Phil. Trans., 1860. [2] Guy's Reports, vol. v. p. 205.

the result has been to confirm the statement of Bernard, that the glycogen is transformed into sugar during life, and passes out of that organ by the hepatic veins. As regards the ferment which effects the change, Mr. Power does not seem to have noticed that Bernard professes to have isolated it. The method employed is given in 'Liquides de l'Organisme,' t. ii. p. 124:

"Le ferment du foie peut se préparer facilement avec les macérations du foie; on laisse abandonnée à ellemême la decoction opaline du foie jusqu'à ce qu'elle soit complètement transparente, c'est à dire jusqu'à ce que toute la matière glycogène soit transformée en sucre; on verse alors de l'alcohol dans le liquide transparent, et il se précipite une matière albuminoïde qui se redissout ensuite dans l'eau, et qui est le ferment hépatique, analogue à la diastase, et qui transforme très rapidement la matière glycogène en sucre."

There are some other researches of Bernard on sugar formation, which seem to us more worthy of notice than their entire omission by Dr. Dalton, and their mere mention by Mr. Power and Dr. Kirkes would seem to imply. Their value consists in their demonstrating the importance of the sugar formation, by showing that when the liver is inadequate to this function, as it is in early fœtal life, the same office is performed by another organ. The age at which the liver begins to form glycogen differs in different animals. In the calf it begins to do so about the fifth month. But sugar and glycogen also may be found in the blood and tissues of a calf at a much earlier date than this. Where is this produced? Bernard searched for it in the calf's placenta, and after many trials still failed to find the starchy substance. He then tried rabbits, and at once found in the placenta an abundance of glycogen, in every respect resembling that which at a later date occurs in the liver. He succeeded equally well with dogs, guinea-pigs, &c. The reason he had failed with calves was that the glycogen does not occupy the same organ in all fœtal animals. In the calf and all ruminants it is formed in certain processes scattered in great abundance over the surface of the amnios, "plaques amniotiques;" whereas in rabbits, dogs, guinea-pigs, &c., the seats of its production are certain cells interposed between the maternal and the fœtal placenta. There is also a provision in the bird's egg for its formation, the duty here devolving on a layer of cells lining the interior of the vitelline membrane. The cells of the placenta or of the "plaques amniotiques," as the case may be, begin to degenerate as soon as the liver-cells acquire that degree of development which enables them to take up the office. It will be noticed that Bernard finds not only sugar but glycogen itself in the tissue of the fœtus, notably in the muscles and lungs. It seems that some of this substance escapes from the organ where it is formed without undergoing transformation into sugar, and that in some way or other it is used up in the muscles and the lungs during the period of their functional activity. In the fœtus these organs are in a state of repose, and the glycogen not being consumed remains stored up in them. In the adult it is consumed as fast as it is supplied. But when an adult animal is kept in a state of forced repose, either by confinement in a close-fitting box, or by section of the motor nerves of its limbs, starch is found in its muscles just as it is in those of the fœtus.

In the course of the ten years which have elapsed since the appearance of the fifth edition of Dr. Carpenter's work, there has been perhaps as much labour spent on the nervous system as on all the other branches of physiology together. The literature of the subject has become enormous. The result, however, of all this research has been rather destructive than constructive. More current theories have been overturned than new ones set up; and at the present time there is scarcely an important point, either in the anatomy or in the physiology of the system, on which the most discordant opinions are not entertained by different writers. It is no easy task which falls on the editor of a general treatise, to make his way through the tangled labyrinth of recent experiments, and impossible for him to co-ordinate their utterly contradictory results into one harmonious whole. Mr. Power has taken what was probably the best course under the circumstances. Instead of bewildering the student with too many of the conflicting views at present in currency, he has taken one or two of the leading authorities as his guides, and has incorporated their results into the well-known chapter containing Dr. Carpenter's views of the functions of the cerebro-spinal axis.

As regards the minute structure, he has chiefly followed Mr. Lockhart Clarke, and has illustrated that accurate histologist's account by introducing original drawings of some of his microscopical sections of the medulla oblongata, and others copied from his writings. As to functions, the chief authorities relied on are Brown-Séquard and Schiff, two experimenters, however, who, if they agree in some of their results, disagree in still more. Brown-Séquard, for instance, refuses to admit that the posterior columns take any part in the transmission of sensory impressions. Schiff attributes to them the conduction of those of touch in opposition to those of pain. Brown-Séquard states that there is a perfect decussation in the cord of the sensory conductors, so that section of one lateral half of the cord involves complete anæsthesia on the opposite side below the section. Schiff contradicts this. The conductors of painful impressions from one half of the body occupy, according to him, the whole extent of the grey matter on the other side, and also the central portion of the grey matter on their own; and consequently, in order to produce complete analgesia on either side, it is necessary to cut more than the opposite half of the cord. Brown-Séquard, again, believes that there are fixed channels for the conduction of sensory impressions, the presence of some of which cannot compensate for the absence of others. He believes, indeed, that the sensations of touch, pain, temperature, muscular contraction, have each their special channels, which are incapable of replacing each other. Schiff, on the other hand, disbelieves in the existence of any fixed channels at all in the grey matter. It is capable, he thinks, of conducting equally well in all directions, laterally as well as longitudinally, and any particle of it may serve as a channel for an impression coming from any part of the surface below. The two physiologists agree that section of a lateral half of the cord causes hyperæsthesia on the same side below the section, but they differ in their explanation of the fact. Séquard traces the hyperæsthesia to a peripheric origin, connecting it with the increased flow of blood and increased temperature of the limb. Schiff attributes it to a central cause—namely, inflammation at the seat of injury. We might go on enumerating differences between these two physiologists, but we will content ourselves with mentioning one not mentioned in our handbooks. Brown-Séquard holds to the time-honoured view that the channels of motor impulses in the medulla oblongata are in the anterior pyramids, and that in their visible decussation lies the explanation of the phenomenon of "crossed paralysis." Schiff states that on cutting through either one or both of the anterior pyramids the motions of the trunk and of the limbs remain perfectly unaffected.[1] As sensation is equally undisturbed, Schiff concludes with Stilling that the anterior pyramids are essentially new formations, just as are the posterior pyramids and the restiform bodies.

One change for the better made in this chapter is the omission of some 140 pages which, under the name of Functions of the Cerebrum, contained an outline of psychology. This had always seemed to us out of place in a purely physiological treatise, just as the descriptive anatomy of the nervous system, which Mr. Bain introduces into his 'Senses and Intellect,' is in our opinion misplaced in that excellent psychological work. "The connexion," says Mr. Bain, "of the mental processes with certain of the bodily organs is now understood to be of the most intimate kind. A knowledge of the structure of these organs may therefore be expected to aid us in the study of mind. The contributions at present obtained from this source are something considerable, which makes it not improper to introduce a small portion of the anatomy and physiology of the human body into the present work." (p. 10.) And on these grounds Mr. Bain gives a description from Quain of the external configuration of the nervous system. From the first part of the above statement of his no one will be disposed to dissent; but we cannot admit that physiology has at present contributed anything considerable to psychology. The whole of Mr. Bain's book might, for all we see, have been equally well written had he been entirely ignorant of the anatomy of the brain and spinal cord. There might have been some slight difference in the terms employed, but the substance would have remained the same. Whatever may at some future time be the case, at present our knowledge of the structure and functions of these organs is too vague to form a basis for psychologists. There are doubts whether certain structures are nerve-fibres or not; there are doubts as to which cells are nervous, which connective-corpuscles; there are doubts as to the extent and mode of connexion of the nerve-fibre and nerve-cell; there are, as we have seen, doubts and serious discrepancies as to the channel through which impressions, sensory or motor, are conveyed; and when we get to the brain itself, it is hardly an exaggeration to say that each sepa-

[1] Funke, ii. 543.

rate function has been in turn assigned to each different portion of it. So far from physiology proper forming a basis for psychology, the contrary has, as a rule, been the case. Physiologists, instead of making the structure of the brain and cord their starting-point, instead of asking what is the function of this or that portion of it, and trying to gain an answer from comparative anatomy and experimental research, have been too much inclined to approach the subject from the other side. They have adopted the psychological divisions of mental philosophers as sure and unquestionable facts, and have hunted through the nervous centres to find some unappropriated organ in which they might locate each separate division. It is by following this faulty method that the phrenologists have arrived at their erroneous results. They first split up the mind into a number of parts, and then parcel out the brain into a corresponding number of distinct organs, assigning to each its faculty. It is clear that, as a first step in this process (to say nothing of the after difficulties of location), the psychological classifications must be strictly accurate, that there must be no overlapping of the several divisions, and that each must represent a simple elementary part of the mind. But that psychology has arrived at this perfection, no one can uphold; and that the divisions adopted by the phrenologists are especially faulty, Mr. Bain has himself shown. We think, then, that Dr. Carpenter has done well in omitting from the present edition the psychological section, which rendered a book already of inconvenient size still more bulky. We trust, however, that he may find time to carry out his intention of expanding the omitted outline into a manual of psychology.

Our space will not allow us to notice the other numerous alterations made by Mr. Power. There is one, however, which we must not omit altogether, and that is the increase in the number of illustrations. Woodcuts are of essential importance in a book intended for students; and while some of the old ones have been replaced by new, the total number has been raised from 156 to 206.

Review V.

Medico-Chirurgical Transactions. Published by the Royal Medical and Chirurgical Society of London. Vol. XLVII. —*London,* 1865. 8vo, pp. 447.

The present volume of 'Transactions,' after giving the usual lists of Officers and Fellows of the Society, contains twenty-four papers, of which the following are abstracts :—

I. *Case of Cancerous Infiltration of the Penis, with Cancerous Ulcer of the Bladder, and Secondary Deposits in the Lungs, Bones, and other parts of the Body.* By Holmes Coote, F.R.C.S., Surgeon to St. Bartholomew's Hospital.—Mr. Coote observes that cancer of the penis usually attacks the anterior part of the organ, assuming the characters of epithelioma, but that general cancerous infiltration of the penis is very rare. The case recorded was of the latter kind. The patient was affected with enlargement, induration, and distortion of the whole of the penis, attended with severe pain, and there was also a small nodular swelling on the right tibia. There was complete phymosis, and from under the prepuce there flowed on pressure a sero-purulent, fetid, and offensive discharge; the penis was rigid, bent on itself, and of incompressible hardness. The patient's sufferings became so great that it was at last proposed to put him under the influence of chloroform, and to remove the entire penis; but the attempt to administer the chloroform excited such an alarming degree of spasm of the throat, dyspnœa, and sinking of the pulse, that it was thought imprudent to persist; and the prepuce was slit up with much relief, showing the glans penis nodulated, hardened, and superficially ulcerated. The general symptoms, however, became more severe, and the patient died comatose. The examination of the body showed that the skin of the penis was quite normal, but the corpora cavernosa, corpus spongiosum, and glans penis were infiltrated and hardened by a semifluid creamy deposit, which exuded a thick juice, containing nucleated cells, seen under the microscope to be mostly elongated and caudate, and similar to those deposited in scirrhous cancer of the breast. There was a large ragged ulcer on the mucous membrane of the bladder; there was a chain of glands between the bladder and rectum filled with white cancerous matter; and the bronchial glands, the lungs, and many other parts of the body (including the shin-bone, where a tumour was observed during life), were more or less infiltrated with cancerous deposits. The heart was found in a state of extreme fatty degeneration; and Mr. Coote remarks that if the inhalation of the chloroform had been continued, sudden death would in all probability have ensued.

II. *Case of a Mucous Cyst on the Laryngeal Aspect of the Epiglottis successfully treated by Incision.* By Arthur E. Durham, F.R.C.S., Assistant-Surgeon to Guy's Hospital.—The patient was a delicate boy who had suffered from severe sore throat, and had afterwards experienced some difficulty in swallowing. This latter symptom at last became very distressing; his voice was altered, and he suffered from repeated attacks of severe dyspnœa, which generally came on during sleep. Three or four days after he was admitted into Guy's Hospital he had so severe an attack of dyspnœa that tracheotomy was on the point of being performed, but the operation was delayed in order that a thorough laryngoscopical examination might be made. When this was done there was found, instead of the ordinary form of the epiglottis, a large round swelling, projecting downwards and backwards, and completely covering in and concealing the glottis. This tumour, which was pale, translucent, and very tense, could be just reached by the finger. As Mr. Durham felt certain that it contained fluid, he proposed to make a free incision into it, and when this was done there was a sudden gush of thick, glairy, muco-purulent matter, mixed with a little blood. The operation was soon followed by relief of all the symptoms, and eventually the boy completely recovered. Mr. Durham considers this case to be unique.

III. *Case of Unusual Difficulty in Lithotomy, arising from great Distortion of the Pelvis by Rickets.* By HENRY THOMPSON, F.R.C.S., Surgeon to University College Hospital; with a Note by JOHN ERICHSEN, Esq., Professor of Surgery in University College, &c.—The patient was a boy, aged four and a half years, presenting the usual symptoms of stone in the bladder, and there was a cicatrix in the perinæum indicating the site of a median operation of lithotomy, which had been performed by Mr. Erichsen some nine or ten weeks before the case was seen by Mr. Thompson. As another operation was considered indispensable, the child was placed on the operating table under chloroform, and the median incision was again performed; but on Mr. Thompson's finger entering the neck of the bladder, it was found that there was an unusual prominence of the sacrum, deformed apparently by rickets, and barring the entrance of the finger into the cavity of the bladder, which viscus appeared to be wholly in the abdomen. The stone could be distinctly felt by the hand placed on the abdomen. The assistant was desired to grasp the stone there, and to press it as much as possible within the brim of the pelvis; and Mr. Thompson then insinuated a pair of polypus forceps, one blade on each side, and after one or two fruitless attempts, from external layers of the calculus becoming detached and causing the blades to slip, he succeeded in extracting it entire. The next day the child showed symptoms of peritonitis, and died on the third day. On a post-mortem examination the usual appearances of peritonitis were found in the abdomen. The bladder was situated entirely in the abdominal cavity; the index finger could only just be passed flatwise between the sacral promontory and the symphysis pubis. The pelvis was carefully removed entire, and its upper outlet was found to present an irregular heart-shaped figure, the sacral promontory approaching within three-eighths of an inch of the left pubic ramus, and within barely five-eighths of the right. In the dried bone there were barely seven-eighths of an inch of space from the promontory of the sacrum to the symphysis pubis, and the space must have been less when the soft parts were present. The calculus was composed of uric acid, was hard, and of an oval form; its breadth was almost seven-eighths of an inch, and by comparing its dimensions with the pelvic aperture it was seen that sufficient room to withdraw it through the pelvis existed only at the central portion of the outlet, and a little to the right of it. Mr. Thompson observes that he has not met with any record of a case presenting the difficulties above described; and that, if he had been aware of the anatomical conformation in the case before operating, he would have seriously considered the question of performing supra-pubic lithotomy.

Mr. Erichsen, in a note appended to the paper, states that he previously performed the median operation for stone in the same patient, but finding that the calculus could not be extracted by ordinary instruments, and was too hard to be broken up, he deferred the proceeding, and the case came under Mr. Thompson's care at a subsequent period.

IV. *Account of some Unusual Occurrences during the Cure of a Popliteal Aneurysm.* By CHARLES H. MOORE, Esq., F.R.C.S., Surgeon to the Middlesex Hospital.—The aneurysm was in the calf of the leg, under cover of the highest part of the gastrocnemius: its beat was forcible and expanding, so as to be visible through the trousers, and the bruit was distinct and characteristic. The treatment employed was by genuflexion, and was continued for eight days. The pulse which had been 100, came down to about 80, and the force of the beat of the aneurysm diminished; but the bending of the knee brought on such a degree of pain along the posterior tibial nerve that this method of treatment was abandoned. Two tourniquets were then employed to make pressure alternately on the femoral artery in the groin and the thigh, and effective pressure, such as materially to lessen the pulsation of the aneurysm, was made with the instruments through ten or fourteen hours of each day, but they were taken off at night, and twice during the day. This treatment was continued from the 1st September, 1863, to the 25th; and between the 4th and the 21st the patient took internally an ounce and a half of the iodide of potassium. The aneurysm, although enlarged, seemed to be now approaching its cure, but this hope was disappointed, and on the 27th the patient felt a sharp pain in the tumour, which on examination was found to be diminished in size, and the pulsation also was lessened. Mr. Moore concluded that a large piece of lymph had been detached from the uppermost part of the aneurysm, and he hoped that it might probably be carried into the arterial opening, might finally plug it, and thus effect a cure. Such, however, was not the case; and the day after this occurrence the venous congestion and the œdema had diminished, and subsequently it was made clear that a change had taken place in the disposition of the clots, and had released the popliteal artery and vein, as well as the nerve, from compression. For the three following weeks the pressure by means of tourniquets was steadily kept up every day, but as it appeared that this treatment was likely to be much prolonged, it was determined to substitute digital compression. This latter plan was commenced on the 22nd of October, being alternated with pressure with a tourniquet, and the digital compression was renewed at intervals for five days, with decided improvement; and on the 6th of November the aneurysm had diminished a little in size, the leg and foot had lost much of their œdematous swelling, and the anterior tibial artery was perceived distinctly pulsating on the instep. About six months afterwards the patient was examined and found to be in good health, and the aneurysm appeared to be in process of cure.

V. *Case of Popliteal Aneurysm successfully treated by Flexion of the Knee.* By ARTHUR E. DURHAM, F.R.C.S., Assistant-Surgeon to, and Lecturer on Anatomy at Guy's Hospital.—The patient was a man, aged thirty-one, of unhealthy appearance, and the existence of the aneurysm was not accounted for by any strain of the limb or other accidental circumstance. As the case seemed favourable for the treatment by flexion, that method was adopted, and the knee was bent as far as was deemed expedient, and the foot was placed in a kind of slipper, attached by a heel-strap to broad bands passed round the thigh and pelvis. This plan caused so much pain and inconvenience, however, that it was discontinued, and the limb was bandaged from the toes to within a short distance of the knee, and carefully flexed. On each succeeding day for the next three days after this plan was adopted, flexion was slightly increased, a large pad of cotton wool being placed over the aneurysm. The result was a complete cure of the disease.

VI. *Some Particulars of a Case of Popliteal Aneurysm cured by Flexion of the Knee.* By the late H. C. JOHNSON, Esq.; narrated by ERNEST HART.—The patient was an adult male, admitted into St. George's Hospital, the aneurysm being of moderate size and of a few months' duration. Mr. Johnson employed tourniquets for nearly three months, but the pressure was ineffectual, and he was afterwards on the point of tying the femoral artery, when flexion of the knee was proposed in consequence of the perusal of a case published by Mr. Hart. Mr. Johnson accordingly bandaged the leg to the thigh, including the whole foot in the bandage, and the result was consolidation in six days. The cure was permanent. The cases of cure of popliteal aneurysm by flexion of the knee above recorded raise the number of such cures by British surgeons to 12 since September, 1858, when Mr. Hart brought his first case before the society; and in a postscript Mr. Hart states that another successful application of this method has been since made by Mr. Hutchinson at the London Hospital.

VII. *Note on the Application of Indices to Aneurysmal Clamps, and other Pressure Instruments.* By ERNEST HART.—Mr. Hart remarks that, in the unsuccessful cases of popliteal aneurysm treated by pressure, the greater part have failed through the pain caused by the pressure, through the ulceration or sloughing of the skin beneath the pad, or through the extreme tediousness of the process, and that these unfavourable conditions depend in many instances on the defective application of the pressure. The maintenance of continued and graduated pressure on the femoral artery, without exerting too much pressure on the one hand, and yet sufficiently controlling the flow of blood on the other, requires skilled and constant attention, such as cannot always be secured on the part of those who are entrusted by hospital surgeons to watch over the cases; and Mr. Hart thinks that the application of indices to the compressing instrument is likely to obviate much of the difficulty at present experienced. The surgeon putting the pad in position, can then in each case ascertain for himself with what amount of pressure the femoral circulation can be stopped or slackened, and having determined the minimum force by which this object can be effected, he can then inform his assistants, and point out to them the limits within which they must keep the pressure. Mr. Hart adduces, for the purpose of example, the notes of three cases in which the amount of pressure exerted upon the femoral artery was ascertained, and he gives a woodcut showing the instrument which he proposes to employ. The pressure is registered by a needle on a scale, and is effected by a strong spring, affording an elastic pressure capable of nice graduation from four to twenty pounds.

VIII. *Clinical Observations illustrating the Effects produced by the Implication of Branches of the Pneumogastric Nerve in Aneurysmal Tumours.* By S. O. Habershon, M.D., Assistant-Physician to Guy's Hospital.—In this paper, Dr. Habershon alludes, in the first place, to the complicated functions of the pneumogastric nerve, which, besides having motor and sensitive filaments, gives off large branches to the cardiac and pulmonary ganglia, and sends off filaments to the semilunar ganglia, to the liver, to the pancreas, and to the supra-renal capsules, besides supplying the stomach. He then records the particulars of four cases in illustration of the important influence exerted by this nerve in modifying the symptoms of aneurysmal disease in the chest. In the first case there was double aneurysm of the arteria innominata and pressure on the recurrent laryngeal nerve, and as a consequence there was commencing degeneration of the muscular fibres of the laryngeal muscles. In the second case there was aneurysm of the aorta, and pressure upon the left recurrent laryngeal nerve and on the left pneumo-gastric, and there was atrophy of the muscles of the larynx, with pneumonia of the left lung. In the third case there was dilatation of the aorta and pressure on the trunk of the right pneumogastric nerve, and there was pneumonia of the right lung. In the fourth case there was aneurysm of the aorta and pressure on the recurrent nerve, and there was feeble voice, with dysphagia and intense pain. This paper does not admit of an abstract, as each case presented peculiar symptoms, in accordance with the part of the pneumogastric nerve which was subjected to pressure, and the conclusions arrived at by Dr. Habershon have special reference to the particulars of the symptoms and the post-mortem examinations which are detailed.

IX. *On the Endemic Hæmaturia of the Cape of Good Hope.* By John Harley, M.D., Assistant-Physician to King's College Hospital, &c.—Endemic hæmaturia is a disease indigenous to hot climates, and is altogether absent in temperate regions. Dr. Harley was attending a gentleman who was a resident of the Cape of Good Hope for a trifling ailment, when he was informed incidentally that his patient had for several years past frequently passed blood with his urine, and that the disease was very common at the Cape, especially at Uitenhage. It was commonly supposed to be a gravel complaint, caused by drinking the water derived from a clear spring arising in the Winterhoek mountains. The statement thus made to Dr. Harley was corroborated by some inquiries made of other persons who had resided at the Cape, and who said that hæmaturia was a common complaint at Uitenhage, and was supposed to be caused by drinking the sandy water which flows through the streets. Hæmaturia is also known to be endemic in the Mauritius. In the case of the patient referred to, the hæmaturia was intermittent, and unusual exercise or railway travelling always caused a slight increase in the quantity of the blood; but the complaint caused little annoyance, and the health was otherwise very good.

The examination of the urine being made from time to time, showed that the fluid was of about the specific gravity 1017·6, depositing a flocculent matter, and containing a trace of albumen. Sometimes the specimen contained abundance of fine crystals of uric acid and urates; oxalate of lime was never altogether absent, and sometimes there was a little blood-stained, slimy mucus. There were also pus-corpuscles and a few blood-corpuscles, and a number of filamentous bodies, which, on being carefully examined, were found to be composed of round or flattened, often branched, masses of mucous cells, and soft molecular mucous fibres, forming together a firm coherent matrix, imbedding a variable number of bright, oval bodies, which Dr. Harley recognised to be the ova of an entozoon, belonging apparently to the genus and species *Bilharzia hæmatobia*, the genus being so named from its discoverer, *Bilharz*, and bearing a resemblance to the genus *Distomum*.

Since writing an account of the case, Dr. Harley obtained an introduction to a surgeon practising at the Cape, who stated that hæmaturia was a very common disease in Uitenhage among the male population, but that it occasioned little inconvenience, and was not amenable to any known form of treatment. This gentleman's two sons had both suffered from hæmaturia, and, as they were on a visit to England, their urine was examined by Dr. Harley, who never failed to detect the ova, which were usually encrusted with crystalline deposits of oxalate of lime. Thus it appears to be proved that the hæmaturia of the Cape has a parasitic origin, and that the cure of the disease is to be sought in those remedies which would act through the blood and destroy the parasite. Dr. Harley suggests the use of essential oils—as turpentine, copaiba, cubebs, bucco, &c.; and as a preventive measure he recommends great care in the employment of the drinking water.

X. *Some Account of the Amputations performed at St. Bartholomew's Hospital, from the* 1*st of January*, 1853, *to the* 1*st of October*, 1863. By George William Callender, F.R.C.S., Assistant-Surgeon to St. Bartholomew's Hospital.—This paper contains some particulars of a number of amputations performed at St. Bartholomew's Hospital during a series of consecutive years, showing the totals of deaths and recoveries in male and female patients. The operations comprise all the principal amputations, excluding, namely, those involving the removal of parts only of the hands or feet, but including, however, amputations of whatever kind performed at the ankle-joint. The paper is illustrated by a number of tables, and is almost entirely statistical, thus rendering an abstract impossible. Among the results obtained, it is shown that old people are little able to bear the shock of the more serious amputations; and in reference to the influence of sex, it appears that although females recover as readily, if not more so, than males, from the shock of certain amputations, they do not rally so easily after the severe shocks preceding and accompanying primary amputations, nor after the depression consequent upon amputation at the thigh.

XI. *A Case of Strangulated Femoral Rupture, where, on a former occasion, the Neck had been torn from the Body of the Sac, in the Taxis, and the Escaping Bowel had formed a Sub-peritoneal Pouch, which finally attained an extraordinary size.* By J. W. HULKE, F.R.C.S., Assistant-Surgeon to the Middlesex Hospital, &c.—The subject of this very interesting and rare case was a woman, aged seventy, who had had a femoral rupture for thirty years, but had been always relieved by the taxis, although strangulation had several times occurred. When admitted into the Middlesex Hospital for strangulated hernia, the taxis was again resorted to, but without effect, and the operation was accordingly performed. An attempt was at first made to return the hernia without opening the sac, but as this attempt was unsuccessful, the sac was opened and its neck was divided, and as this proceeding was also unsuccessful, Poupart's ligament was cut. The distension and congestion of the bowel subsided, proving that the strangulation was removed, but the patient sank, and died seventeen hours after the operation. At the post-mortem examination it was found that there existed a large pouch between the peritoneum and the abdominal walls, containing a large quantity of intestine, the posterior wall of the pouch being formed by the anterior surface of the bladder and a part of the peritoneum, and the anterior wall by the pubes and the abdominal parietes. Mr. Hulke's explanation is, that on a remote occasion the neck had been torn by the taxis from the body of the hernial sac; and the intestine, pushed back through the femoral ring, but still girt by the neck of the sac, had insinuated itself under the peritoneum and fascia transversalis, where it formed a subperitoneal pouch. On the last occasion of operation, the femoral ring was the seat of stricture, which was divided, and the strangulation thus removed, but death was caused by the inflammation of the large extent of bowel in the subperitoneal pouch, and the distension of this pouch by the intestine appears to have been the cause which prevented the return of the strangulated bowel. The old neck of the sac seems to have admitted the passage of the bowel outwards into the subperitoneal pouch to a great extent; but as the pouch was now distended to its utmost limits, it would admit no more, and pressure through the external ring was ineffectual.

XII. *On the Absorption of Dead Bone.* By WILLIAM SCOVELL SAVORY, F.R.S., Assistant-Surgeon to St. Bartholomew's Hospital.—The question whether dead bone can be absorbed, has not yet received a satisfactory answer; but Mr. Savory thinks that one very important consideration has been neglected in the inquiry—namely, the influence of pressure in determining the result. In the experiments hitherto performed on the subject, and in which the dead bone kept among living tissues lost hardly any of its weight, the dead bone was kept simply in contact with the living parts. No considerable pressure was maintained, whereas when ivory pegs are driven into bone, extreme pressure is of course produced. In order to test this view, Mr. Savory performed a series of experiments, the details of which he describes, and the conclusion he draws is, that the absorption of dead bone, when in contact with living bone, is determined by the pressure to which it is subjected. The experiments were performed upon young animals, and portions of dead bone were driven into the living bone, or loosely connected with it; and it was found that in the latter case no absorption took place, while in the former, the dead bone underwent that process. It is thus explained why sequestra are hardly ever absorbed, although the possibility of such an occurrence cannot be denied.

XIII. *On a New Operation for Obtaining Union of Ununited Fracture; with Remarks on its Application to Certain Cases of Recent Fracture.* By E. R. Bickersteth, Esq., F.R.C.S., Surgeon to the Liverpool Royal Infirmary.—The operation performed by Mr. Bickersteth consists in fastening together the broken ends of the bone by means of copper nails, which are first introduced into holes drilled in the bones, and then driven in by a hammer. Mr. Bickersteth asks why, as surgeons have recognised the use of sutures in keeping together divided surfaces of skin, the same plan may not be adopted in the case of bones? He relates the particulars of two cases of fracture of the lower jaw-bone, in which very great deformity was produced from the inability to keep the fractured portions in apposition, the fracture being a double one in each case. In one of the cases it was impossible to keep the jaw at rest, owing to the patient being attacked with violent rigors of the whole body, but especially of the muscles connected with the lower jaw. In both these cases the broken portions of bone were brought together by nails or drills, and thus kept in apposition until the union was complete. The presence of the metallic body does not seem to cause much inconvenience. In three other cases, two of the fractures were situated in the humerus and one in the tibia, and in all the same plan was successfully adopted. It is chiefly called for in those cases where great deformity is threatened by the bones overlapping one another, but Mr. Bickersteth thinks it may also be applicable even in transverse fractures where union has not taken place; but he has not yet had an opportunity of putting the operation in practice in such a case.

XIV. *On a New Method of Procuring the Consolidation of Fibrin in Certain Incurable Aneurysms.* By Charles H. Moore, F.R.C.S., Surgeon to the Middlesex Hospital. *With the Report of a Case in which an Aneurysm of the Ascending Aorta was treated by the Insertion* *of Wire.* By CHARLES MURCHISON, M.D., F.R.C.P., Physician to the London Fever Hospital.—The records of surgery prove that the introduction of certain metallic substances into the interior of living vessels causes a deposition of lymph or coagulum on the foreign body, and these facts suggested to the authors of the present paper the possibility of procuring the consolidation of fibrine in aneurysmal tumours, if a suitable material for introduction could be found. The foreign body which at present is seen to be least irritating to the natural tissues is wire. The introduction of the wire into the cavity of the aneurysm of course requires very great care, and the method recommended is to choose wire which is stiff enough to pass a canula without bending, but so fine as to bend easily when pressed against the wall within the aneurysm. The canula should be rather larger than is sufficient to give ready passage to the wire, but there should be a thicker piece of wire which fills the canula, and may act as a probe. The wire should be introduced in the form of coils by moving the canula within the aneurysm. This bold operation was performed on a patient at the Middlesex Hospital, suffering from saccular aneurysm of the ascending aorta, the tumour projecting through the anterior walls of the left side of the chest. It became evident in the progress of the case, that the bursting of the aneurysm through the integuments could not long be delayed, and the operation in question was recommended to the patient as a last resource. It was accordingly performed, and a quantity of fine iron wire was introduced into the aneurysm. The operation lasted one hour, was not attended with much difficulty, and its immediate effect seemed to be beneficial, for the pulse was reduced from 116 to 92, the pulsation in the aneurysm ceased, and its size was diminished. But the patient died five days after the operation. On a post-mortem examination, it was found that the interior of the tumour was filled with a fibrinous coagulum, enveloping and imbedded in the coils of wire, and firmly adherent to the surrounding walls. There were marks of recent inflammation in the pericardial sac, and both kidneys contained a number of circumscribed abscesses. In his remarks on the operation, Mr. Moore observes, that the immediate result afforded a confirmation of the theory he had formed, and that the proceeding was to a certain extent successful; but he admits that it gave rise to inflammation, and that the state of the kidneys may be ascribed to the introduction of fibrin into those organs from the aneurysm with the arterial current. The pericarditis appears to have been an indirect result of the operation, a pathological consequence of a febrile excitement of the circulation. Mr. Moore still believes that the operation may prove eventually useful, and he suggests several modifications by which he thinks that dangerous results may hereafter be avoided.

XV. *Two Cases of Stone in the Bladder of the Female, treated by Rapid Urethral Dilatation; with Remarks on the Operation.* By THOMAS BRYANT, F.R.C.S., Assistant-Surgeon to Guy's Hospital.—After relating the particulars of the two cases, in which the calculus was removed by dilatation, Mr. Bryant offers some general remarks on the propriety of that operation in certain cases of stone in the female. He shows that the female urethra is naturally very dilatable, as is proved by the spontaneous discharge of the stone in several recorded instances; and he attributes to the late Mr. Thomas the suggestion of dilating the canal for the removal of a calculus or a foreign body. Since that suggestion, and a successful operation performed by Mr. Thomas, many cases of calculus in women have been treated, and Mr. Bryant has collected all the published results; and in one of the tables he has tabulated twenty-eight cases, in all of which the stone was successfully removed by urethral dilatation, and in only four of which was there any subsequent incontinence of urine. By a careful analysis of the four unsuccessful cases it is seen that in them the urethra had been *slowly* dilated, while in most of the twenty-four successful ones the dilatation had been *rapid*. Mr. Bryant therefore concludes that the female urethra may be dilated to a considerable extent with perfect safety, that rapid dilatation is preferable to slow, and that all small calculi and foreign bodies may be readily removed by this method. The instrument he employs for the operation is Weiss's dilater, only he covers the arms of the instrument with a thin india-rubber coating, to prevent injury to the mucous membrane. Mr. Bryant lastly passes under review the various methods of removing stone in the female bladder by urethral lithotomy, by lithotrity, and by vaginal lithotomy, and he points out the cases in which these operations are called for; but he considers that rapid dilatation is generally the safest and most expeditious plan for all average sized calculi and foreign bodies.

XVI. *Statistics of Queen Charlotte's Lying-in Hospital.* By George B. Brodie, M.D., one of the Medical Officers.—Dr. Brodie presents in this paper the result of his examination of the registers of the hospital with reference to the mortality in this and other lying-in establishments in London. The data extend from the year 1828 to 1863, and they therefore form an epitome of the practice of the hospital during the last thirty-six years. Among other facts elicited by these statistics is one that has been always noticed—namely, that the greatest mortality occurs among unmarried women in the puerperal state, as compared with the mortality among married women. But Dr. Brodie observes that, among the latter class admitted into the hospital, many are married only a few weeks, some only a few days before their confinement, and thus they are exposed to many of the unfavourable mental discomforts of single women in a similar position. In reference to puerperal fever, which is known to be the great scourge of lying-in hospitals, one of the tables shows that during eight years—namely, 1832, 1837, 1840, 1851, 1852, 1853, 1854, and 1858, the hospital was free from its visitations; and during the whole period from 1828 to 1863, the whole number of deaths from this cause was 123. It should be mentioned that between those years 7736 patients were delivered in the hospital.

The cause of death standing next to puerperal fever is puerperal mania, of which 16 instances occurred, 1 only being a multiparous patient, and 11 being single women. Next comes phthisis, and afterwards diarrhœa; and lastly, what may be termed the accidental cases, as post-partum hæmorrhage, rupture of the uterus, convulsions, &c. Dr. Brodie concludes his paper by describing the present construction of Queen Charlotte's Lying-in Hospital, with the measures taken to insure ventilation and cleanliness, and to avoid contagion. When a case of fever occurs the ward and the bedding are thoroughly purified, and the ward is not again occupied for at least a month.

XVII. *An Account of a Case of Aneurysm of the Abdominal Aorta, which was cured by Compression of that Artery immediately above the Tumour.* By WILLIAM MURRAY, M.D., M.R.C.P, Physician to the Dispensary, Newcastle-on-Tyne.—The patient was a man aged twenty-six, who was a paviour, and therefore obliged to make great muscular efforts. Early in 1863 he was somewhat suddenly seized, after a hard day's work, with severe pain in the back, for which he was treated, without avail, by ordinary remedies. When he became a patient of Dr. Murray, that gentleman was convinced that he had an aneurysm of the abdominal aorta. The aneurysmal tumour was felt to the left, and slightly above the umbilicus; it was hard, of a distinct globular form, and about the size of a very large orange. By auscultation, a feeble bruit was heard over the tumour. The existence of aneurysm was confirmed by the opinions of several medical gentlemen, the patient having been introduced for examination to the Northumberland and Durham Medical Society. Dr. Murray determined to try compression; and the patient was accordingly put under the influence of chloroform for two hours, during which time the pulsation in the aneurysm was completely arrested by a tourniquet, except during momentary displacements of the instrument. Three days afterwards the same proceeding was repeated, the insensibility being kept up for about five hours. During the last hour the existence of pulsation in the tumour could not be ascertained; and on removing the pressure, very slight pulsations were felt. In the evening of the same day the tumour was perfectly pulseless, and every indication of pulsation in the aorta below it had disappeared, and there was no pulsation in the iliac or femoral arteries. Dr. Murray traces the subsequent history of the patient, showing that he eventually recovered, and that the tumour was diminished in size and was stationary, hard, and pulseless. Dr. Murray concludes that compression is therefore to be regarded as a cure for internal aneurysm, and he also thinks the case proves that sudden occlusion of the aorta may take place without the supervention of violent symptoms or great inconvenience.

XVIII. *Case of Congenital Imperfection of the Mammæ, Sexual Organs, Sternum, and Heart in a Woman aged twenty-two years.* By

EDWARD HEADLAM GREENHOW, M.D., F.R.C.P., Assistant-Physician to the Middlesex Hospital, &c.—The subject of this case was an unmarried female, who was admitted as an out-patient at the Middlesex Hospital, for a noisy cough, without expectoration, and who presented at first some of the symptoms of hysteria. On physical examination, a depression was found in the sternum; the chest was perfectly flat in the mammary region, and no trace of the mammary glands could be discovered. The heart's action was regular, and the sounds were clear and free from murmur when the patient was in the recumbent position; but it became at once irregular when she sat or stood upright, and a triple sound was then sometimes heard; the third sound, which appeared like a reduplication of the systole, was always of a murmurish character, and was frequently supplanted by a loud murmur intermediate between the systole and diastole. The sexual organs were examined by Dr. Hall Davis, who found the mons veneris very slightly prominent, with a scanty covering of hair; the vagina was very narrow, there was no cervix uteri, nor could anything like ovaries or other solid matter be felt beyond it. On examination by the rectum, there appeared to be some solid body when pressure was made against the anterior wall of this intestine, but the body seemed smaller and much less distinct than an ordinary uterus, and nothing resembling ovaries could be discovered.

XIX. *Pathological Researches into the Diseases of the Ear. (Supplement to the Seventh Series.) Sebaceous Tumours in the External Auditory Meatus.* By JOSEPH TOYNBEE, F.R.S., Aural Surgeon to St. Mary's Hospital.—In a former paper, Mr. Toynbee gave an account of eighteen cases in which sebaceous tumours developed in the external auditory meatus had caused absorption of the petrous bones; and in several of these cases caries had also occurred. Since the publication of that paper two cases of caries of the temporal bone from the presence of sebaceous tumours, and both of which proved fatal, have fallen under Mr. Toynbee's notice, and he therefore presents them in the present paper. It appears that the pressure of the tumour on the external meatus always causes simple absorption of the bony walls, whereas, in the tympanic cavity its effect is to induce caries; and the irritation within the tympanum may also give rise to an abscess in the cerebrum or the cerebellum, according to the part of the tympanic cavity implicated, but without the existence of any direct continuity of diseased structure from the tympanum to the brain. Mr. Toynbee remarks that the peculiarly insidious manner in which these sebaceous tumours make progress demands careful consideration, and should lead the medical man to make a thorough examination of the ear when the slightest symptoms of irritation in the meatus are the cause of complaint. The two cases related occurred in a male and female, both aged sixteen, and they illustrate the above remarks.

XX. *On the Condition of the Stomach and Intestines in Scarlatina.* By SAMUEL FENWICK, M.D., late Lecturer on Pathological Anatomy at the Newcastle-upon-Tyne College of Medicine.—This paper is intended to show, by a series of pathological observations, that inflammation of the œsophagus, stomach, and intestines, usually accompanies scarlatina; that desquamation of the epithelium of these parts takes place; that notwithstanding the anatomical changes in the stomach, the formation of pepsine is not prevented ; and that in this disorder the condition of the mucous membrane is similar to that of the skin. The first effects of the scarlatina poison seem to be to congest the bloodvessels of the stomach, and to strip the epithelium from the tubes and the surface of the organ, at the same time that the tissues are softened. The tubes are greatly distended by granular and fatty matters, or by cells intermixed with granules, while in other cases they are lined by a newly-formed membrane. The effects of inflammation upon the intestine seem, in slighter cases, to consist in the effusion of granular and fatty matters into the mucous membrane; but in more severe cases the tubes of Lieberkühn are choked with epithelial cells, while extravasation of blood takes place in the villi, and these with the rest of the mucous membrane are loaded with small cells and granules. Dr. Fenwick thinks that desquamation of the epithelium is a common occurrence in scarlatina, from the microscopic examination of the contents of the stomachs of those who have died from this disease; and he gives examples of the forms of casts of the gastric tubes as they appear under these circumstances. To prove that the condition of the skin is similar to that of the mucous membrane in scarlatina, Dr. Fenwick examined the integument in three cases, and found in one that the morbid appearance in the cutis consisted of an occasional slight extravasation of blood in the neighbourhood of the sudoriferous ducts, but the rete mucosum was much thickened, and numerous round cells with large nuclei were everywhere visible, mixed with the natural cells. The basement membrane of the several glands was thickened, and the epithelial lining was so much increased that in most cases it obstructed their channels. In the other two cases similar appearances were observed. Although Dr. Fenwick has, in accordance with custom, described the appearances of the skin and mucous membranes as the result of inflammation, he admits that the term is probably misapplied, and that if future researches should prove that a similar condition occurs in the kidneys and other organs, we shall have to look upon the structural changes produced as resulting rather from *increased physiological action* than from inflammation.

XXI. *On the Origin, Structure, and Mode of Development of the Cystic Tumours of the Ovary.* By Wilson Fox, M.D., Lond., Professor of Pathological Anatomy at University College, London.—In this paper, which is a long and very elaborate one, and is illustrated by a great number of drawings of microscopical objects, Dr. Wilson Fox examines the pathology of the cystic tumours of the ovary, with a view to determine more accurately than has hitherto been done the mode of growth of these diseases. Before giving his own opinions, the author discusses the views adopted by former pathologists with regard to the origin of these cysts, some authorities maintaining that *all* cysts found in the ovary are produced by a morbid alteration of the Graafian vesicle, or corpus luteum, while others attribute the origin of the *simple* cysts, whether single or multiple, to the Graafian vesicles, but regard such an opinion as untenable for the more complex forms, for which other modes of origin must be sought. Dr. Fox considers that although it is not improbable that aberrations in the formation of the corpus luteum may occasionally give rise to cysts, yet that such is not a frequent occurrence, and that cysts so originating do not attain a large size, or give rise to secondary growths. He regards it as an established fact that both the simple and the multiple cysts of the ovary take their origin in the majority of cases from the Graafian vesicles. This vesicle is, to all intents and purposes, a cyst with peculiar contents; and in the human fœtus of the eighth or ninth month it may be sometimes found of the size of a pea, and in the walls of the follicle numerous other follicles, in a less developed state, may often be found. Dr. Fox, in concluding his paper and summing up the facts which he has collected, remarks that the views of those who maintain that all cysts of the ovary proceed from the Graafian follicles can only be proved by the discovery of the mode in which secondary cysts may arise from these structures. Of such methods of secondary formation he has, he thinks, given convincing proofs by his researches; and he repeats an opinion which he before expressed, that there is no difference between the simple cysts of the ovary, which are admitted on all hands to originate in the Graafian vesicle, and the parent cysts of the more compound type, beyond those alterations in the walls of the latter which depend on the structures giving rise to the cysts of secondary formation.

XXII. *A Successful Case of Paracentesis Capitis.* By THOMAS YOUNG THOMPSON, M.R.C.S., L.S.A., Newcastle-on-Tyne.—The child who was the subject of this case was born on the 8th of June, 1861; and when fourteen days old it sustained a fall, three weeks after which a protuberance appeared on the crown of the head, at first circumscribed, but gradually becoming diffused. When the child was two months old the head was very large in comparison with the body, but otherwise there were the signs of good health. The enlargement of the head was general and uniform, the fontanelles not protruding, and the sutures were all widely separated. When the head was placed between the candle and the observer, it was seen to be transparent. Under these circumstances a variety of remedial measures were tried with a view of removing the fluid, as tincture of iodine applied to the scalp, calomel and afterwards iodide of potassium given internally, with cod-liver oil and the phosphate of iron, and occasionally the application of the croton-oil liniment to the scalp. There was, however, no improvement, and the collection of fluid continued to increase; when Mr. Thompson, after carefully reviewing the whole of the circumstances, having consulted some of his fellow-practitioners, and having obtained the consent of the parents, introduced a trocar and canula through the coronal suture on the left side, selecting a spot quite free from superficial veins. Ten ounces of a clear fluid passed through the canula, and the head was then strapped up with adhesive plaster. In rather more than a month the head was nearly as large as before the operation, but the bodily condition was nearly the same. The operation of paracentesis was performed a second time, and about four ounces of milky-looking fluid were withdrawn. No untoward symptoms occurred; and on the 8th of June, 1864, when the child was three years old, it seemed in good general health, and the size of the head was diminished. Mr. Thompson observes that it was difficult to determine where the fluid was situated, but he thinks it was in the sac of the arachnoid membrane.

XXIII. *On the Causes of Hernia.* By JOHN A. KINGDON, F.R.C.S., Surgeon to the City of London Truss Society.—The author divides the causes of hernia, as they have been described respectively by the followers of Scarpa and of Richter, into the "mechanical" and the "pathological." The supporters of the mechanical theory assert that the abdominal viscera are maintained in their several positions by the pressure of the muscular parietes, and that the mesenteries, ligaments, and peritoneal folds, are nutritive attachments rather than mechanical supports; that the intestines are normally prone to displacement, and that hernia depends upon a loss of balance between the muscular power of the parietes and the resisting power of the fibrous fabric of the inguino-crural aponeuroses. The advocates of the pathological theory, however, maintain that the intestines, with few exceptions, are not prone to displacement in the normal and healthy condition of the mesenteries, ligaments, and peritoneal folds. They admit that the protrusion is the result of the mechanical action of the muscular parietes, but they maintain that the intestines do not come within the sphere of that expulsive action until they have descended somewhat in the cavity of the abdomen, either by relaxation, hypertrophy, or other lengthening of their attaching membranes. Mr. Kingdon, while admitting that popular belief is in favour of the mechanical theory, inasmuch as patients and their friends generally attribute a "rupture" to some violent effort, argues in favour of the pathological theory, but agrees that when the essential conditions exist muscular effort unquestionably effects protrusion; all he argues is that the part protruded must first come within grasp of the protruding power, and that in the normal and healthy condition of the peritoneum in its whole extent, the viscera do not come within such grasp. Mr. Kingdon, holding these views, considers it clear that no operation, whatever its results, can rightly be called a "radical cure" that aims solely at closing the aperture through which a hernia has passed.

XXIV. *Report of the Committee appointed by the Royal Medical and Chirurgical Society to Inquire into the Uses, and the Physiological, Therapeutical, and Toxical Effects of Chloroform, as well as into the*

Best Mode of Administering it, and of obviating any ill consequences resulting from its administration.—In order to ascertain how chloroform destroys life, a series of experiments were made, chiefly on dogs, which were made to respire various proportions of chloroform vapour in atmospheric air. The experiments with the more dilute forms of the vapour were made by means of Mr. Clover's apparatus; but when the results produced by the strongest possible doses were under investigation, an inhaler was used in which the temperature of the chloroform was raised to about 150°, and its evaporation was thereby much accelerated. In the first experiments the chloroform was administered by a closely-fitting inhaler or a saturated cloth; but as the breathing was sometimes arrested by this plan, it became necessary to compare the results obtained from natural breathing with those produced by administering the vapour through an aperture in the trachea.

It was ascertained that the duration of animal life was inversely proportionate to the strength of the anæsthetic—the more concentrated the vapour the shorter the duration of life, and *vice versâ*. Insensibility could be induced and maintained when the inhaled air contained no more than 1 or 2 per cent., and the inhalation could be continued for a very long time without apparent danger to life; but the strongest doses inhaled through the mouth and nostrils caused the pulse and respiration to cease nearly simultaneously in from one minute twenty seconds to one minute forty-five seconds, while the heart's action continued for a short time longer. In the majority of cases the pulse stopped before the respiration, and in all instances the action of the heart could be distinguished for some time after the pulse had ceased to be felt.

In all the instances of poisoning with the smaller doses of chloroform, it was observed that the pulse was imperceptible for some time before the heart ceased to beat, from which it was evident that the organ became enfeebled before its contractions finally ceased. The extent of the failure in the force of the heart's action was marked by the hæmadynamometer, which was set at zero, and connected with the femoral artery, when the mercury at once rose, indicating the pressure of the blood in the vessel. A double pulsation was then observed corresponding to the movements of respiration and the arterial pulsations. The first effect of the administration of chloroform was to cause the mercury to rise, but this elevation was of very short duration, and then it began to fall. It would thus appear that the immediate effect of small doses of chloroform is to stimulate the action of the heart. After the transient rise of the mercury, it gradually fell, and sank lower and lower as the influence of the chloroform increased, but this uniform depression was liable to certain interruptions.

If, when the force of the heart's action was fully under the influence of chloroform, the respiration of fresh air was permitted, the mercury at once rose, and the heart recovered much of its force; but on the renewal of inhalation the mercury rapidly sank again.

On carefully examining the state of the heart, it was found that it sometimes retained a certain power of movement after the cessation of its rhythmic contractions, but in several cases it seemed as if it had been at once paralyzed. From the results observed, it appeared to the Committee fair to conclude—1. That in many instances all movement of the heart is arrested very soon after its regular action has ceased; 2. That in a few cases imperfect contraction may continue for some minutes after the stoppage of the normal movements; and 3. That in many instances the heart is so far amenable to the action of stimuli, that exposure to the air occasions an imperfect renewal of its beat.

With respect to the effect of chloroform on respiration, it was found that the inhalation of the concentrated vapour through the mouth at first arrested the process, the result being apparently dependent on a spasm of the fauces and glottis; but this arrest of respiration lasted but a short time, and the actual inhalation of the chloroform then commenced. By continuing the inhalation, the depth of the respirations became less and less, and after the stage of perfect insensibility was reached the amount of air entering the chest was extremely small, and if the inhalation was still persevered in the movement was at last completely arrested. This arrest of respiration, however, was not necessarily final, for it frequently happened, especially when the amount of vapour inhaled had been small, that after some twenty or forty seconds the respiration recommenced.

In order to ascertain the effect of inhaled chloroform on the heart, apart from the influence exerted upon it by the pneumo-gastric nerves, those nerves were in some cases divided after the animals were under the influence of chloroform, and in other cases the nerves were divided first and the chloroform was administered afterwards. The usual effects of the division of the pneumo-gastric nerves in a healthy animal are that the number of the inspirations is diminished, and the frequency of the heart's action is increased in an inverse ratio. When an animal is placed under the influence of chloroform before the nerves are divided, the usual effects of the section are modified, and in some cases are even absent; and in like manner, if chloroform is inhaled after the division of the nerves, the discomfort of the animal is manifestly relieved, the chloroform apparently bringing about a greater toleration of the loss of function of the pneumogastrics.

When dilute chloroform vapour (5 per cent. or less) was blown upon the fauces or vocal cords, very little inconvenience ensued; but when air saturated with chloroform was employed, an instant and violent effort at deglutition was produced, and with this effort the whole pharynx was seen to become contracted, the larynx advanced, and the epiglottis became hidden by the act of swallowing. This action gradually became less vigorous, and after about a minute it ceased, as the animal passed under the influence of the anæsthetic. The epiglottis then became fixed; it projected forwards both during expiration and inspiration, and the vocal cords approximated at each expiration. This action was modified when the chloroform was administered by the trachea.

In comparing the effect of ether with that of chloroform, the former agent was employed in a similar manner to that above described, and, as in the case of chloroform, the extinction of life was proportionate in rapidity to the concentration of the vapour. Ether was found to be the weaker agent of the two, and therefore the effects produced by ether in a strong state, and by chloroform in a dilute form, were somewhat similar. In their action on the heart the two anæsthetics differ very materially, for chloroform depresses the action of that organ, and frequently kills by syncope; but ether produces only a very slight depressing influence on the force of the heart's action. Death, when produced by ether, is almost invariably due to the failure of the respiratory movements.

The first operation of both ether and chloroform on the heart is to stimulate it, and increase the force of its contractions; but chloroform subsequently depresses the heart's action, while ether exerts but little influence upon it. The stimulating effect of ether is both less sudden and more sustained than that of chloroform, and therefore ether may be regarded, in a certain degree, as a stimulant to the force of the heart's action. The effect of ether on the respiration is, like that of chloroform, to arrest the process for a short time, but this is less marked in the case of ether.

In the post-mortem examinations of the animals poisoned by chloroform, it was found, as a general rule, that all the cavities of the heart contained more than the natural quantity of blood, and those on the right side were more full of blood than those on the left. The blood itself was generally liquid, but, in several instances, well-formed and large coagula were observed. The prevailing colour of the blood was a brownish-red, its hue on the right side being in all cases dark, and in some very deep. The microscopical characters of the blood were examined in six instances immediately after death, and it was found that the blood-corpuscles were seen to have a tendency to become crenate, and that they did not collect so much in rouleaux as in blood from a healthy animal.

The lungs, in some few cases, contained more than the natural quantity of blood, and were therefore darker in colour, but they were generally bright and florid. The liver, spleen, and portal system were almost always found to be congested, but the amount of congestion varied extremely. In six cases, in which the head was examined (the chest not having been previously opened), the vessels on the surface of the brain were found full of blood, but those of the interior contained no more blood than usual.

From the post-mortem appearances, it is clear that the pathological phenomena after death from chloroform are very different from those observed when life has been destroyed by asphyxia. In death from chloroform all the cavities are distended, and the cases are only exceptional in which the left side is empty. But the right cavities always contained more blood than the left.

In considering the means by which accidents by chloroform might be avoided, the Committee have collected 123 cases, in which death could be positively assigned to the inhalation of the anæsthetic; but this number is far short of the aggregate mortality which must have ensued from its use in various parts of the world. In consequence of the great importance of the question, attention was carefully directed, first, to the agent employed, and, secondly, to the method of administering it.

A mixture of from 2 to 4 per cent. of chloroform vapour, and 98 or 96 of atmospheric air may be inhaled without much, if any, risk to life; but a large dose, as 10 per cent., is liable to cause alarming symptoms. Now ether is an agent which produces the requisite insensibility, and yet is not so dangerous as chloroform; but still, its odour is disagreeable; it is slow in its operation, and gives rise to greater excitement, and, on the whole, the committee concur in the general opinion in this country against its use. The differences in the action of the two anæsthetics suggest that by mixing them, the more dangerous properties of chloroform would be neutralized or modified; and this might be inferred from the influence they respectively exert on the heart's action, the one depressing it almost from the first, the other sustaining, or but little diminishing its force.

The Committee conducted experiments with mixtures of chloroform and ether in different proportions, designated respectively as A, B, and C. In A, there was 1 part of alcohol, 2 of chloroform, and 3 of ether; in B, there was 1 of chloroform, 4 of ether; in C, there was 1 of chloroform, and 2 of ether. The second and third are mixtures which are believed to have been extensively used in America. The result of the experiments was to show that a mixture of ether and chloroform (such as A or C), is as effective as pure chloroform, and a safer agent when deep and prolonged anæsthesia is to be induced; but the mixture B produced effects very similar to those of simple ether, and was open to the same objections as ether itself. The Committee think it possible that at some future time an anæsthetic may be discovered which will fulfil the required conditions better than any of the above mixtures; but in the meantime they suggest that A and C should be more extensively tried than they have hitherto been in this country, and of these two they think A is preferable on account of the uniform blending of the ether and chloroform when combined with alcohol, and probably the more equable escape of the constituents in vapour.

In reference to the mode of administration, it is shown to be desirable to adopt some method by which the quantity of the vapour actually being inhaled may be graduated, and the only apparatus at present known to the Committee as fulfilling the necessary conditions, is that contrived by Mr. Clover, which appears to afford the greatest, if not absolute, safety in the use of anæsthetics. But this apparatus is not very portable, and requires some amount of experience in its use; and in its absence, the plan of administering the anæsthetic on a handkerchief or lint appears to be the least open to objection.

In investigating the subject of resuscitation, the Committee found many difficulties in arriving at precise conclusions, and in many cases it was not certain that the animals on which attempts at resuscitation were made would not have recovered without artificial means of restoration; while the peculiarities of certain animals made their positions very different in regard to their prospect of recovery, although the experiments were pursued at the same period and with equal doses of chloroform. It appears, however, to be positively established, that the mere failure of respiration, while the circulation remains good, almost always denotes a recoverable condition; but if the heart has altogether ceased to beat, or has become irregular, and there is no arterial pulsation, then restoration by any method is doubtful, though even then it is not absolutely impossible. *The failure of the circulation to any considerable extent always involves extreme peril.*

Of the different methods of resuscitation which have been proposed, artificial respiration was easily distinguished as being the most efficacious and the most easily applied. Electro-galvanism and electro-magnetism are also very useful, but an habitual resort to them in desperate cases would too often involve a fatal loss of time.

For resuscitation in the human subject, the Committee consider artificial respiration to be the most efficacious measure, though other methods may be employed as auxiliaries, and it is of the most pressing importance that artificial respiration should be commenced the moment that alarming symptoms present themselves. Dr. Sylvester's method is that which is preferred, and the bellows adapted for artificial respiration by Dr. Marcet is mentioned with approbation as effecting a yet more perfect and deep artificial breathing than can be obtained without its use.

The sequence of the physiological phenomena produced by chloroform in man and the lower animals is similar, and the results produced are nearly uniform if the same percentages of the agent be administered. The force of the heart's action is increased for a short time, but when complete anæsthesia is produced, the heart in all cases acts with less than its natural force, and the strongest doses of chloroform vapour arrest the action of this organ, and thus destroy life. The action of ether is similar in many respects to that of diluted chloroform, but it increases the force of the heart's action at first more than chloroform, and afterwards, when insensibility ensues, ether does not produce an equal degree of depression. Ether seems to destroy animal life chiefly by arresting the movements of respiration. The Committee, while concurring in the disuse of ether as an anæsthetic in this country, consider that a mixture of ether and chloroform is as effective as pure chloroform, and a safer agent when deep and prolonged anæsthesia is to be induced.

As to the rules to be observed in the administration of chloroform, the Committee recommend that it should on no account be given carelessly, or by the inexperienced; that provision should be made for the free admission of air during the patient's narcotism; that the recumbent position of the patient is the best; that an apparatus is not essential to safety if due care is taken; that the chloroform should always be given slowly; that the respiration should be watched; that sudden paleness, or sudden failure of the pulse, or feeble or shallow respirations indicate danger, and necessitate the immediate withdrawal of the anæsthetic until those symptoms have disappeared. If the symptoms should become so urgent as to threaten death, then all the means of resuscitation should be immediately employed, artificial respiration being the preferable plan.

The existence of heart-disease is no obstacle to the employment of chloroform, although when there is evidence of a fatty, weak, or dilated heart, great caution is demanded. In phthisis, anæsthetics may be given with impunity when an operation is indispensable. There are very few surgical operations in which anæsthetics may not advantageously be administered. The results of 2586 capital operations performed before, and of 1847 performed since the introduction of anæsthetics, show that these agents have in no degree increased the rate of mortality.

In reference to the important question of the use of chloroform in obstetric practice, the Committee consider that the careful administration of anæsthetics during labour is not attended with special danger, there being no well-authenticated case of sudden death recorded, so far as is known, where they have been properly administered. Anæsthetics have a decidedly beneficial effect in promoting dilatation of the maternal passages, and their employment in natural labour does not predispose to puerperal convulsions, apoplexy, or other similar complications on the part of the mother, and with very rare exceptions, and those doubtful, it has no injurious influence on the child.

In abnormal labour, anæsthetics may be employed with advantage in various obstetrical operations, as turning, forceps, craniotomy, and extraction of retained placenta, making the operations more easy for the practitioner, diminishing the sufferings of the patient, and favouring convalescence. Anæsthetics may be employed advantageously to check the paroxysms of puerperal convulsions; but in the majority of cases their use will not enable the practitioner to dispense with other aids, such as bleeding.

Among the most important rules laid down in relation to the administration of chloroform in labour, it is recommended that it should generally be given at or after the termination of the first stage; that it should be given only during the pains, and withdrawn in the intervals; and that it should be given more freely when the fœtal head bears on the perinæum, in order to promote relaxation and relieve the increased pain.

REVIEW VI.

Entoptics, with its Uses in Physiology and Medicine. By JAMES JAGO, M.D. Oxon., A.B. Cantab., Physician to the Cornwall General Infirmary and Truro Dispensary.—*London*, 1864. Small 8vo, pp. 188.

WE have read this work with pleasure and interest, and can recommend it not only to the physiologist and scientific ophthalmologist, but also to the general surgeon.

Hitherto the writings upon entoptics have been fragmentary, and scattered throughout various British and foreign periodicals; thus necessitating considerable trouble and research on the part of any one desirous of acquiring information upon this subject. We therefore welcome this book as most seasonable, for it furnishes us with a complete and scientific treatise upon the whole subject of entoptical research.

Dr. Jago has evidently pursued his investigations *con amore*, and has devoted much time and labour to the elucidation of entoptical problems. His great mathematical powers have been of service to him, for they have enabled him to conduct his researches with an accuracy and precision in which other writers upon entoptics have been somewhat deficient. He has carefully worked out the whole subject *himself*, for the book bears evidence of much original research, and ingenious explanations are suggested of various and obscure phenomena. The woodcuts are also good and accurate, and, with the exception of three, are taken from original drawings.

The author expresses a hope that his work will prove acceptable to the intelligent medical practitioner. We have no doubt that it will do so; but we think that its circulation would have been still wider if the subject had been treated in a more popular manner. Such treatment, moreover, would not have necessitated any abridgement of the theoretical and scientific portions of the work, but it would have done much to lighten the labour attending the investigation of a subject itself somewhat obscure. And here we would emphatically protest against the increasing and unnecessary employment in scientific treatises, which claim to be complete manuals of their respective subjects, of a terminology which requires the aid of a scientific dictionary. In science everything "knowable" should be clear and unmistakable. Its data and postulata should be intelligible to the uninitiated. It is positive cruelty to the overworked brains of this generation to compel them to study closely not only an author's thoughts, but an author's language, before they can get at his thoughts. Scientific terms may commend themselves on the *multum in parvo* principle; but though brevity is the soul of wit, the soul of science is cast in a different mould. "Dum brevis esse laboro obscurus fio" cannot be too strongly impressed upon the present generation of authors. Writers, and above all scientific writers, should take Buffon's advice, and learn to brood over a truth until it shines. If authors are content to think, with the witty Frenchman, that speech is given to man to enable him to conceal his meaning with words, they will most assuredly make the pursuit of science a "proper brain-cracker"[1] to the modern student.

In the case of the book before us, we do not say that its style errs in these respects, or is obscure; for to any one already acquainted with the rudiments of physiological optics it will not present any difficulties, but from the student and practitioner of medicine it may demand an amount of close study and attention, which may induce them to lay it quietly aside as "unpractical" and "too abstruse." A little fuller explanation of some of the problems and experiments, and greater conciseness in some of the sentences, would to a great extent have remedied this defect; and we trust that the author may be induced to take this into consideration in a second edition.

Although the practical surgeon may with justice urge that, since the discovery of the ophthalmoscope, the study of entoptics is of little if any practical utility, we would still recommend at least a superficial acquaintance with the subject. In practice we are often called upon to distinguish between those *muscæ volitantes* which are indicative of disease, and those which are more or less common to every healthy eye. In the determination of this question a knowledge of entoptics will prove of some service, although our chief and indispensable guide must be the ophthalmoscope.

In the introductory chapter the author describes shortly the anatomical structure of the eye, and enters into some points connected with the refraction of light.

The second chapter is devoted to the explanation of the various methods employed in entoptical research, which the author designates "Entoptical Methods."

He says:

"The light that enters our eye causes us to see, under certain conditions, a series of objects that exist in the organ itself. An investigation of these conditions is called entoptics.

"Such apparitions as we allude to arise generally from certain rays being absolutely or comparatively blocked from the course they would otherwise pursue; or else turned aside by refraction, reflection, or inflection at some object they encounter. But since the pupil is occupied in common by the pencils of rays from *all* visible points, whilst they again separate as they get near the retina, it is only when the phenomena originate far back in the eye that they are discernible in the diffused light of day. Or, to view them in other cases, we must regard a bright space of limited extent.

"And to make *precise* observations, we should resort to pencils of rays which do not return to foci upon the retina, so that effects once evolved may not afterwards blend with and obliterate one another; as by using rays diverging from some point external to the eye and within its least focal distance, or rays converging to and then diverging from some point within the globe.

"When a portion of the rays of such a pencil find some body in their path, if a simple shadow is not the consequence, some appearance sufficiently indicative of the body's contour to warrant our currently mentioning it as an image of it, will be projected in the line of the shadow. So that, for the geometrical

[1] Southey's Life of Wesley.

purpose of discovering the seat of the intervening body—a prominent problem in this essay—we may regard the image as a shadow; as also, with certain precautions, for ascertaining the size of the body. Our ideas of the nature of the body must be derived from a more particular examination of the phenomena it yields under different physical conditions."

Our space will not permit us to give a summary of the different modes of investigation; in fact, we could not render them readily comprehensible to the reader in a mere *résumé*, especially without explanatory diagrams. In order thoroughly to understand them, we should advise the student to repeat and vary these experiments, and to work out for himself the propositions submitted by the author.

After considering at some length the various apparitions which may arise from the eyelashes, eyelids, and conjunctival fluids (Chapter III.), and after viewing the iris and lens entoptically (Chapter IV.), Dr. Jago passes on to the most important part of his book—viz., "the structure of the vitreous body determined entoptically." (Chapter V.) It is his most important subject, because he here propounds a novel and ingenious theory as to the structure of the vitreous humour, based upon entoptical examinations. This theory certainly deserves careful attention, for it would appear to explain all the phenomena observed; besides, anything that may assist in determining the true structure of the vitreous humour will be received with interest. At present this is not definitely settled, for it is doubtful to what extent the concentric lamellæ, and even the filamentous septa, are due to the reagents employed in preparing it for microscopical examination.

Dr. Jago thinks that—

"*From the walls of the cavity behind the crystalline lens, as far as it is lined by the hyaloïd membrane, there springs into view a lax network of beaded fibre, which is the frame of an invisible membrane that divides the peripheric portion of the vitreous into a certain number of little chambers, separating them from each other, and from a larger middle one.*

"*These compartments are filled with fluids of graduated density, in such order that the densest lies next the capsule of the lens, and the rarest next the retina; so that the vitreous body is, in all probability, a compound optical instrument, whose anterior constituents excel the posterior in refractive power.*

"Before we enter upon the exploration of our visual organs for the verification of this statement, let us consider for a moment what forces are likely to act upon a reticulation thus attached in a cavity filled with fluid, so as to occasion its parts to migrate.

"First, it must be remembered that when the globe rotates, the fluids within will relatively rotate. No matter about what axis the rotation ensues, whether about one through the globe's centre by turning in its orbit, or about any other by the movement of the head, or of our whole person, the vitreous fluid will strive to abide absolutely at rest; or, translation of the orbit apart, to rotate within its cavity, through the same angle. But in consequence of the obstructions from the web, if not from some friction between the fluid and the parietes of the cavity, the latter must ultimately concur in the rotation. And as to the objects visible in the fluid, their connexions must exercise control over their movements. Thus we have a modified result, or, upon the whole, the objects in the vitreous will travel in the direction of the rotation, but will start from their places at later respective instants than the beginning of that act; and will then go equally with the rate of rotation. And when the ocular rotation is arrested, they will continue theirs awhile longer, through the *inertia* of the now rotating fluid, until the fluid ceases to move, or until they reach the end of their tethers; when, after a momentary pause, they tend to regain their original sites as if by retraction, or the web's elasticity. Independently of these connexions, rotation of the fluid in its vessel would cause the objects nearest the wall to journey through the greatest linear spaces, and the others gradually through less, until at the centre of the entire chamber they would remain at rest.

"Though the principles here sketched are found on trial to be generally agreeable with the movements of the bodies visible in the vitreous, yet we discover that their operation is disturbed by the influence of a force causing movements solely in the vertical direction *at the instant*, whatever point of the eye's circumference happens to be then uppermost; and which must, therefore, proceed from a difference in specific gravity of some of the contents of the vessel.

"If the axis of the eye be horizontal, whether we stand erect or lie on either side, or let the head depend, and we now look to a higher point, the objects in the back part of the vitreous will *actually* rise, as far as their connexions permit, exceeding the angle of rotation far beyond what happens in horizontal rotations, through a considerably greater angle than the axis has turned through; whilst those in the front part of the vitreous will *actually* descend through angles equal to those risen through by the former objects, which are severally at corresponding distances from the wall of the cavity. But if from a horizontal direction of rest we turn the regard to some lower point, both the anterior and posterior objects so accompany the movement as not to rotate at all in the eye. And similar effects respectively take place either in looking from any lower to a higher point, or *vice versâ*, no matter through how great an angle.

"Hence the posterior objects are, relatively, so strongly buoyed up, and the anterior ones pulled down by a difference in specific gravity in some of the contents of the entire chamber, as to more than counterbalance the effects of friction in the rotatory act.

"Nevertheless, with the optic axis vertical, whether we look upwards or downwards, neither the objects nearest the foramen centrale retinæ, nor those nearest the lens, approach appreciably, or depart from the wall of the vessel respectively nearest them. And it is as much as ever we can detect a very slight vertical movement in objects rather further removed from the wall than either of the examples mentioned. As, therefore, the difference in specific gravity which we have found to exist does not manifest itself decidedly under circumstances when it must have a great tendency to do so, the objects we regard must, immediately or mediately, in some fashion be tied to the parietes of the cavity.

"When we wish a deliberate inspection of an intra-vitreous body, we had better look downwards, because this is a direction agreeable to the ocular muscles, and the body will remain steady whilst we survey it."

The muscæ volitantes of the vitreous humour are of various kinds. Some are *apparently* small, isolated beads or globules; others are arranged in rows like strings of pearls. Dr. Jago thinks that there are no *loose* beads in the vitreous, but that every bead forms a link in a fibre. These rows of beads are sometimes very densely interlaced, thus giving rise to appearance of trellised *sheets* of tissue:

"The image of a globule in a divergent pencil is a brightened circular area surrounded by diffractive fringes; in a convergent one, a darkened circular area, within a fringed brightened areola. The globule, therefore, is transparent, and of greater refractive power than the fluid in which it floats; but it cannot be of much greater, for were it so, globules residing near the retina would evince shady centres when we receive into the eye rays from a lucid point placed as far, or nearly as far, away from it as its anterior focus (9); for they should then be able to bring the rays that pass through them to a focus nearer to themselves than to the retinal seat of their image, and thus to project them away from the image's middle portion. However, in such a case, we may observe stray globules near the lens with obscure middles. What has been said of the globule may be considered to apply to the filaments.

"The objects near the crystalline lens are easy to see, and therefore could not be attached to its capsule without its being noticed. Whereas, on the contrary, every bead or filament thereabouts sweeps across the pupil, however broad this may be, without any check.

"If we now single out, with a divergent pencil, one of the smallest images, or a bead nearest the sentient points of the retina, and move the eye about gently, we can note that it accompanies the movement; whilst others nearer it, with broader shadows, pass over it and swim about. If the eye rotate through a very small angle, it does the same, though the others referred to remain at rest, not *yet* having been set in motion. And when the eye rotates sufficiently to cause the mass of globules less near the retina to appear to move, they will proceed even after the eye has ceased to move, and will regain their places by apparent retraction; whereas the object we are especially watching moves, if not exactly, *all but exactly*, with the eye, and stops with the eye. If we reflect that the smallest instance of images ever lessening for more posterior objects scarcely expresses the lucid and shady contrasts which reveal it, we can well understand that a like object behind the one that yields such an image would not be discernible at all. So that if all the forthcoming observations shall be found to harmonize with the notion, we may conjecture that a chain of one or more invisible beads is the mode of connexion with the parietal membrane, ending in the '*decumbent nuclei*' that histologists find thereon; especially if there is reason for believing that none of these threads spring from that portion of the membrane that covers the *punctum aureum retinæ*.

"If we now turn in succession to objects at different depths in the humour, we observe that their several excursions from positions of rest, consequent upon ocular movement, are in accordance with what we should expect from objects tied together as imagined, under the dynamical influences actually in play. In so far that, though we might never be able to divine how the seemingly solitary globules are retained in their relative places, we might be sure that they are parts of a *system*."

We now come to the second part of Dr. Jago's theory, viz.:

"*That the fluid in the anterior part of the vitreous is of greater specific gravity than that in the posterior*, and all difficulties in explaining the entoptical facts derived from the vitreous quickly melt away.

"Fig. 42 shows a vertical section along the optic axis of the membranes of the vitreous, in accordance with the scheme inferred, the axis being horizontal. The foremost membrane with the lenticular capsule encloses fluid of the heaviest sort, which therefore depends in a lobe below the level of the lens. The second membrane embraces the first, and with its aid holds a second bagful of fluid, which being dense, hangs down from the first. The fluid between the large central bag and the last striving also downwards, has forced the central one to rotate, so as to cause all the membranes that attach it to the walls of the vessel to lean towards it, below to the right, above to the left.

Behind the central one are bags of lightest fluid, and these necessarily, as far as the lengths of membranes permit, swim to the top, as is expressed by the sharp curves that bend in a similar style, one beyond the other, at the upper part of the three last membranes. It will be observed that all the membranes attached to the vessel are drawn stretched, as if the whole body of vitreous fluid had rotated in a direction from the lens to the bottom of the eye, and so round. Any number of cross connexions, and variously inclined to them, may be superadded to these membranes without injury to the scheme, provided that they all be stretched in conformity with it. A few more connecting membranes, as I deem ought to be the case, would have been drawn behind and before, did I not fear embarrassing the apprehension of the reader with too intricate a figure. Besides, I infer that in the recesses behind the lens and along the walls, out of the way of inspection, several membranes exist approximately parallel to the wall, just as before or behind, and that, with allowance for variation in conditions, they have movements like the others. The conception of a series of diminishing membranes of similar form with the vessel, one within the other, and fastened by radiating membranes to it, if fluid of the proper densities be assigned to the loculi of the different regions, would satisfy all the requirements I aim at.

"Now let us suppose the head turned upside down until the optic axis is again horizontal. It is obvious that the relative weights of the bags of fluid remaining as before, the whole body of vitreous fluid will rotate *with respect to the vessel* until the membranes that spring from the walls are inclined to them in a like fashion in the opposite direction. The middle bag will have turned, as it has free liberty to do, through a very large angle, the front membranes will have been warped over to the other side of the lens, and the hind ones will have transferred their overlapping curves or flexures to the other side of the optic axis. If the membrane can do this, its parts can rest in any intermediate position; and what has been done in the vertical can be equally done in any other plane in which the optic axis lies. In a word, all the excursions of the fibres which have been detailed are in exact accordance with the conception—the confined ones for those near the retina, the greater ones for those further from it, until at the most anterior of these they sweep, as they may plainly do by the figure, through a linear space of the third of an inch. Then, again, the fact of anterior ones flitting across the pupillary aperture is accounted for; also the certain, though very slight, amount of freedom enjoyed by the earlier and later fibres in the direction of the optic axis, and the twirls of some fibres when the eye is forcibly rolled in its socket, as the membrane is not so tightly braced but that portions of it may be much twisted by eddies impressed upon the fluid.

"We have merely insisted that the densest fluid resides in front; but were we to assume, further, that the vitreous is an aggregate of bags which are filled with fluids of graduated density, the specifically heavier, in any two examples, always lying nearer the lens, the visible movements could be no other than those we witness.

"If the internal rotation be produced solely by a heavy loading of the bags adjacent to the lens, the rest of the fluid being of uniform density, the tackle, if I may so speak, must be adjusted with singular nicety, to compel all the fluid of the vitreous under the action of this weight to move in a rotatory manner, and not to crop up sometimes in a direction opposite to such a current at the posterior portion of the central bag. Again, if the remainder of the fluid be of uniform density, there seems to be no end gained by so nicely subdividing it. Indeed, why, under a condition of such uniformity, enclosed by slack tissues, should the posterior fluid *always* tend to mount to the top, when from its specific gravity it might rest anywhere? It is hard to conceive any reason for such constant deportment.

"Thus, without suffering myself to be carried away by too much confidence, I find my mind disposed towards the view of a gradation of density."

We regret that Dr. Jago, whilst entering at so great a length into the supposed structure of the vitreous humour, has not devoted, as he so well could, more research to its pathological conditions, more particularly to the causes, modes of origin, and nature of the opacities of the vitreous humour which are met with in certain diseases of the eye. This is a subject of importance and interest, and our knowledge of it is at present incomplete and insufficient.

The sixth chapter contains an interesting description of "the retina viewed entoptically."

The central vessels of the retina may be seen entoptically. If the eye is turned towards the sky and kept quite still, the arteries of the retina may be seen.. At each contraction of the left ventricle of the heart the retinal arteries swell out. The pulsation will announce itself in the form of small, round, greyish spots; the centre of these is dark, and they are surrounded by a more or less bright areola; or longer portions of vessels may show themselves as straight or slightly tortuous grey bands, the edges and ends of which are phosphorescent. The retinal veins are not observable when the eye is at rest, but only when it moves. Even the "foramen centrale" appears to be pervaded by very small dots, so that it would appear that the yellow spot is also penetrated by very fine capillaries.

The retinal vessels may also be rendered visible by concentrating light upon the sclerotic by means of a strong convex lens. They will appear most distinct when the eye looks upon a dark ground.

In the appendix the author treats of "visual sentients."

If the finger be lightly pressed upon the sclerotic at some little distance from the cornea, it will give rise to the appearance of a luminous ring. The centre of this is dark, the circumference more or less bright and luminous. The ring will always appear at the opposite side to that on which the eye is touched. Thus, if the finger is pressed on the sclerotic at the nasal side, the ring will appear at the outer side. This luminous appearance is probably due to the creasing of the retina. Spasmodic contraction of the muscles of the eye will also produce the appearance of waves of light passing before the eye.

Serre d'Uzès proposed to turn this to practical account. He thought that the degree of sensibility enjoyed by the retina might thus be readily tested, in cases in which the ophthalmoscope could not be used on account of the opacity of the refractive media, as for instance in cataract. But we find that little dependence can be placed upon this method of investigation. The intensity of these phosphènes (as these luminous appearances have been termed) by no means always corresponds to the degree of perception of light enjoyed by the eye. Thus, the phosphènes may be very marked and easily produced in eyes in which the perception is greatly impaired, and *vice versâ.* The only certain method of determining the degree of perception of light, and the extent of the field of vision in cases of complete cataract, is by means of a lamp, or by the light thrown into the eye by the ophthalmoscope.

In conclusion, we must notice the question of priority raised by Dr. Jago. In speaking of Dr. Mackenzie's contribution, "On the Vision of Objects on and in the Eye,"[1] Dr. Jago says, in his present work:

"I have not had an opportunity of perusing this; but its author, in his fourth edition of 'Diseases of the Eye,' registers an essay of mine, published on May 9th and 16th of this very year, which possibly might have been the incentive to his publishing his own remarks on the same subject matter." (p. 113.)

We have before us a letter from Dr. Mackenzie to Dr. Jago, respecting this question. After having perused this letter very carefully, and after having fully weighed the evidence on both sides, we cannot in honesty resist the conclusion that Dr. Jago's supposition is quite unfounded. Dr. Mackenzie's paper is dated Dec. 30th, 1844. Early in January, 1845, the manuscript was sent to Dr. Craigie (Editor of the 'Edinburgh Medical and Surgical Journal'), and appeared in that journal in July, 1845. Now, Dr. Jago's paper, entitled "Points in the Physiology and Diseases of the Eye," is dated March 12th, 1845, and was published in the 'London Medical Gazette' of May 9th and 16th of the same year. It is, therefore, proved that Dr. Mackenzie's paper had been finished nearly three months prior to the date of Dr. Jago's.

We also find the following observation (p. 124): "Mackenzie, in his fourth edition, in appending a long list of authorities, often neglects to tell us what observations were theirs, so that one cannot feel sure whether a given idea originated with himself." We certainly read this sentence with surprise, for we know of no author who is more honest and conscientious than Dr. Mackenzie in giving chapter and verse of his authorities. A great amount of space is devoted in his book to references. Indeed, the same insinuation might be urged against Dr. Jago himself in his present work. We are sorry to be obliged to make these strictures, but justice has compelled us to do so.

[1] Edin. Med. Journal, July, 1845.

REVIEW VII.

Practical Dietary for Families, Schools, and the Labouring Classes. By EDWARD SMITH, M.D., LL.B., F.R.S., &c.—*London*, 1864. pp. 265.

THIS is a work which we have no hesitation in saying will not disappoint the reader; and we are equally confident that it will be of much use to the general public, for whom it has been composed. Its author has well prepared himself for his task by his previous physiological researches, which during the last six or seven years have been published in the 'Transactions' of the Royal Society, of the Society of Arts, and in the Public Health Reports. In his preface he designates the book "as essentially practical and popular in its aim, and therefore contains directions rather than arguments; but at the same time it is based upon the most advanced state of the science, and, except in the exclusion of many scientific terms, it is scientific as well as popular"—a statement we can fully confirm after a careful perusal.

Of the parts into which the work is divided, the first, which is on "Foods," is likely to interest most professional readers; whilst the second part, which is on "Dietary," will probably attract more the unprofessional; but inasmuch as the second cannot be well understood and appreciated without a knowledge of the first, we hope that this will not be passed over, but be carefully studied, and that a taste may thus be acquired for the science, the physiology of the subject, than which no branch of knowledge is more important, relating as it does to our immediate wants, to the support of life in its different stages from infancy to old age, to the best means of supplying the materials required for growth, and to meet the waste of the body, in constant progress, the result of organic functional life, which is indeed life itself.

It is not our intention to attempt an analysis of the contents of the volume—that would be a work of supererogation—keeping in mind that the materials of which the work is formed belong to the common stock of acquired information—the products of laborious scientific research. What we shall attempt will be little more than to offer a remark here and there on points which seem to us to call for such, and to make a few extracts with the intention of giving an idea of the manner and style in which the book is written.

Dr. Smith, as regards the value of food in relation to its nourishing power, or power of administering to growth and supplying functional waste, takes as the best criterion, the proportions of carbon and nitrogen which enter into the composition of the different articles. No better, perhaps, at present can be mentioned; yet we think it must be admitted that this criterion is not altogether free from objection, and that there are many instances to which it is not applicable. Were the proportions of these two elements a perfectly just index of the nourishing quality, there would be no occasion for doubt or question as to the sustaining power of gelatin. Certain sea-weeds, such as Iridæa edulis, Porphyra lanciniata, Rhodomenia palmata, and others, ought to be more nourishing even than wheat, as they contain in their dried state a larger proportion of nitrogen;[1] nor should salted meats or lean meats be inferior in the same quality to fresh meats of the same kind,—the muscle, the most important part, not having its elementary composition altered, that we are aware of, by the action of salt. Taking the largest view of the subject, must we not confess—and this we think no one would be more ready to acknowledge than Dr. Smith himself—that there is a certain degree of mystery in relation to the action of organic compounds on the living animal, otherwise we should not have the adage, that "what is one man's meat is another man's poison;" there would be no line of distinction between vegetable products, whether wholesome or unwholesome, whether fit for food or for medicine. The mere analysis of the poison of the most poisonous snake would afford no proof of its deadly quality, or that it might not be used with advantage as a nourishing article of diet.[2] Other, and many other, instances might be adduced in proof that, as in the atmosphere we breathe there are often malaria-elements which cannot be detected by the most refined chemistry, so there are occasionally in what is used for food, whether solid or fluid, principles detrimental to health, and even fatal to life, known only by their effects. Cheese in a certain stage of decay, as is well known, has proved a poison; so too has German sausage; and hardly less so new rum.

The chapter on the qualities of food the author opens with remarks on wheaten flour,—this the most important of all the vegetable substances which have come into and have continued in use from time immemorial, so as to have well earned the title of the staff of life. On account of its importance we shall give an extract or two, conveying information which ought to be generally known. By the process of grinding, wheat is divided into two parts, bran and flour, the first being the covering, the latter the included fecula:

"The bran is found to consist of several layers, the outermost of which is in thick scales, whilst the inner ones are thinner, and much lighter in colour. The larger scales are from the outer bran, and from their size are divided into bran and coarse pollards, whilst the smaller particles are called fine pollards and sharps. The proportion which these comparatively refuse matters bear to the fecula varies with the size and quality of the wheats and special characteristics of the season. A fair average is 14 lbs. to 17 lbs. in the bushel of wheat, but inferior samples will yield from 20 lbs. to 30 lbs. in the bushel. The importance in a commercial point of view—of removing the bran from the flour—may be estimated by quoting the value of the several parts of the flour. Thus:

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[1] According to the analysis of Dr. Apjohn in a paper on certain sea-weeds by Dr. J. Davy, in Edinburgh Phil. Journal, vol. iv., for 1856.

[2] It has lately been found that the poison of the viper, taken into the stomach, contrary to what was before supposed, has a noxious influence.

					s.	d.
1 bushel of	seconds	weighing	56 lbs.	costs	7	9
,,	bran	,,	12 lbs.	,,	0	9
,,	coarse pollards	,,	14 lbs.	,,	0	10
,,	fine pollards	,,	18 lbs.	,,	1	0
,,	sharps	,,	26 lbs.	,,	2	0

Hence it is evident that the intrinsic value of the whole ground meal, which contains all the bran, is much less than that of the flour which has been partially or wholly freed from it.

"There can be no doubt that the outer part of the bran is glazed over with a layer of flint, and is quite indigestible, for it may be seen in the dung of all animals which have been fed upon it, and therefore is not nutritious. But more than this, it is universally allowed that the bran irritates the bowels, and purges, and by removing the alimentary matter from the bowel too rapidly, causes the loss of nutritive material. Regarding the subject in a medical point of view, if any one desire to take bran as a laxative, and do not heed the expense of it and the loss of food which it will occasion (by which it will become an expensive medicine), he may do so; but it should be added, that as bran acts as a laxative by irritating the bowel, so by adhering to the throat, as may often be seen after a meal, it causes irritation there, and gives rise to a troublesome form of indigestion. It is, upon the whole, better, when a laxative is required, to take it in the form of a medicine, and limit its use to the occasion.

"When the outer bran is ground into very fine portions, and mixed with the flour, it still remains innutritious, and as it has lost its irritating quality, it is useless, and requires other agencies to remove it from the body.

"It is probable that the inner husk of the bran, or sharps, possesses a true nutritive value, for although the proportion of starch which it contains is much less than that contained in the fecula, the proportion of nitrogenous matter is greater; and although we are not able to apply the test of vision to ascertain whether it is digested or not, there seems no reason to doubt its digestion. Hence it is probable that the household flour, which contains a notable proportion of it, is the form most fitted for the nourishment of the body; and in proportion as the price charged for it is less than that demanded for the whiter flour will it be an economical food."

To most of these remarks we can give our assent; but we are inclined to think that Dr. Smith refines too much in his objection to bran, especially when used as a laxative, that quality probably depending in part on the bulk of the undigested portion, a certain distension of the bowels conducing oftener to a laxative effect than mere stimulation. We see in certain animals, such as the dog, that they can preserve health when living on bones alone, and yet perish if the attempt be made to feed them on the gelatin extracted from the bones. Man, it should always be kept in mind, has a great adapting power, especially as regards food. As there is no peasantry healthier than those who make most use of oatmeal, the husk of which is certainly more irritant than that of wheat, we think that those persons who like brown bread may indulge their taste with safety, and sometimes with advantage—that to be determined by individual experience.

Dr. Smith gives due praise to the potato, justly remarking that, of all our garden vegetables, there is no one on the whole so valuable and economical. He remarks that, when long kept, it becomes dry and shrivelled, and loses much of its nutriment, and also when kept so long as to sprout. According to our experience, the shrivelling and loss of nutritive substance is only in consequence of its sprouting. If the skin be removed the sprouting is prevented; the potato dries rapidly, owing to the evaporation of its watery parts, and in its dried state it may be kept for almost any length of time without undergoing a further loss of substance. He further observes, that in relation to nourishment it is not material whether the potato be boiled or roasted; adding, that in point of "economy and convenience it has been found better to boil than to roast them; for whilst the loss in boiling upon a pound of potatoes scarcely exceeds half an ounce, that in the most careful roasting is from two to three ounces." We apprehend a fallacy lurks here, the greater loss from roasting being owing to the larger proportion of water that is dissipated in the process. We are of opinion, founded on the experiments we have made, that boiling occasions the greater loss, especially of the nitrogenous element; the water after the boiling is not only found to contain a little starch, but also to have a slightly pleasant taste, like that of very dilute meat-broth.

In treating of sugars, Dr. Smith omits taking notice of one circumstance of difference between the crude brown, the Muscovado kind, and the pure, refined, crystallized kind—viz., the presence in the former of a small quantity of albuminous or glutinous matter. It is owing to this ingredient of Muscovado sugar, acting as a ferment, that it is subject to change from keeping; and that the impure article is more nourishing than the refined is, we believe, owing to the same cause. Of this there seems to be proof in the high condition of the negroes in crop-time, when they have a free use of the fresh juice, from which none of the nitrogenous substance has been separated.

The following extract, on butcher's meat, contains some judicious remarks:

"It is needless to dwell on the value of this food in the dietaries of all classes, since it is almost universally acknowledged, and its use is limited far more by deficiency of means wherewith to obtain it than by any doubt as to its utility. Its chief merit, however, rests upon the fact that it is composed of the material which corresponds to the bulk of our own bodies, and it is thus a form of food the most fit for conversion into our own tissues. Hence it is found that, in its digestion, there is less refuse matter left after the process has been completed than occurs with any other food; and it is worthy of note that the bowels as well as the stomach of the flesh-feeding animals are very much less in size than those of vegetable-feeders. But when we compare its nutritive elements with those of flour, for example, we are liable to doubt either the correctness of the statement of its nutritive elements, or its great superiority as a food, for in their ultimate composition they do not differ very greatly; but the explanation (at least in great part) is found in the fact that there is much more water in flesh than in flour, and consequently that the really nutritive part of meat occupies only a small part of the whole."

There is only one part of this passage on which we shall offer a comment—that in which it is stated that in the digestion of meat there is less refuse matter than with any other food. This, we would remark, may be true when the proportion of meat in a mixed diet is small or moderate, but does not appear to be so when the diet consists entirely of animal matter. The regular allowance of flesh-meat to the hunter of the Hudson's Bay Company, when using no vegetables, is nearly the same (from 8 to 10 lbs.) as the average quantity of potatoes consumed by the Irish peasant when subsisting mainly on this tuber. Evidently, in the instance of the hunter, a considerable portion of what he eats must be ejected only partially digested. And in corroboration we are assured—showing the advantage of a mixed diet, for which man seems specially adapted—that two pounds of meat with one of corn-flour is found to be as supporting as the very large allowance of meat alone.

The next extract we shall make is worthy of attention for the ingenious and, we think, satisfactory manner in which Dr. Smith explains the degrees of digestibility of different kinds of meat:

"There is a general belief that the digestibility of meat varies, so that poultry and game are the most easily digested; then mutton, then beef, and lastly veal and pork; and this, to a great extent, is borne out by the observations which were made in America in the case of a man who had an external opening leading to his stomach, through which various kinds of food were admitted, and the effect of digestion upon them ascertained after certain periods had elapsed. There are, however, two ideas involved in this statement: one the rapidity of digestion, and the other the ease and comfort with which the process is effected; but, except in cases of disease, the latter need not be discussed. The evil effects which are so generally admitted to follow the use of pork and veal have not, I believe, any connexion with the composition of these meats, but depend on the imperfect way in which they are masticated and prepared for the process of digestion. The flesh of pork is hard, whilst the fibres of the flesh of veal are held together loosely, so that in the former case the teeth separate the fibres with difficulty, and in the latter the fibres are apt to elude the grinding process of mastication; and in both cases the meat is swallowed in masses too large for the ready action of the gastric juice. I do not doubt that the experience of mankind is correct in this matter, and that, of all flesh, beef and mutton are the most suited for regular food, and poultry and game as adjuncts or as occasional food."

Probably few persons have duly appreciated the value of bacon in the dietary of the labouring man. The following circumstances are stated by Dr. Smith in its favour:

"1. It can be obtained daily at any hour, whereas in villages meat can usually be bought only once a week. 2. It can be bought in very small quantities, as the money will afford. 3. It can usually be bought at the grocer's with the weekly supply of goods on credit. 4. It may be more conveniently cut into small pieces, and cooked with a less amount of fire and with very few utensils. 5. The fluid fat which runs out in the frying is spread over the children's bread and satisfies them, whilst the solid portion is eaten by the parents; or, when it is boiled, it greases the cabbage and enables it to be more pleasantly used as food. 6. It is sapid and highly relishing when hot and cold. 7. When cold it is more conveniently carried into the field than could be the case with other fat meat, since it is of firmer consistence. 8. It enables the housewife to make a more relishing meal when cold cooked potatoes or cabbage have to be warmed up again."

Dr. Smith is not an advocate for a fish diet; he not only considers it of less nutritive value than flesh, but also as less wholesome. That it may be inferior in nutritive quality we can grant, but we must question its unwholesomeness even when largely used. He states, "when fish is eaten in considerable quantities and in the absence of meat, indigestion prevails, the general health is ultimately lowered, and a scorbutic state of the system produced." He adds, "in the south of Spain it is usual to ascribe the occurrence of leprosy to that cause." Referring to a document lately printed, not yet published, with a copy of which we have been favoured, containing information from various countries respecting this horrid disease,[1] no one cause is assigned, as regards diet, to which it can be traced. The most general circumstances with which it appears to be connected are squalid poverty, bad food, damp low sites, neglect of cleanliness, personal and domestic. In a few instances fish diet is conjecturally stated to be its probable cause; in a few other instances, pork; but more are given of its occurrence inland where no fish is used. The proofs we have at home of the state of health of the inhabitants of our coasts, of the fishing villages where fish is most used, are, as well as we can judge, more in favour of than opposed to it as regards its wholesomeness. Rarely do you see a healthier people than those of the Mount's Bay in Cornwall, of Musselburgh in Scotland, of the Isle of Lewis, of the Hebrides. As far as we have been able to learn, where fish is much used, there pulmonary consumption is rare. This may be partly owing to the iodine which enters into the composition of sea-fish, which has been overlooked by Dr. Smith—at least he makes no mention of it. Need we remark that fish is a prized article, and that with many it proves more easily digestible than butcher's meat? That it may disagree when eaten by those not accustomed to it in large quantity, is easy of comprehension. Dr. Smith points out how different species of fish vary in their qualities, as to fatness, firmness, flavour, and other conditions. It is worthy of remark that fish, more than any other article of diet, probably vary as to their effects, and afford some of the most striking examples of that mystery in dietetics to which we have already adverted. We have known a family poisoned by eating of cod from a London fishmonger when that fish was in season; we have known a person who could not venture to partake of a fish most in request and considered most wholesome—the sole.

Dr. Smith makes some excellent remarks on tea, coffee, and chicory; the two former substances owing their value almost exclusively to a volatile oil which imparts flavour, and to a peculiar substance, theine and caffeine, on which their special qualities depend. He confesses his belief that there are necessities in food, not from requirements of the body, but from acquired habits and tastes, and that tea and coffee have become such. The following is his account of the agency of each:

"Tea is a powerful agent when taken into the system, and acts with great rapidity. This was proved by many hundreds of experiments made by me in

[1] Abstracts of Replies to Interrogatories proposed by the Leprosy Committee of the Royal College of Physicians; to which document see our reference at p. 281 of our last January number.

1858 and 1859, and published in the 'Philosophical Transactions' of 1859, which show that immediately after tea has been taken the quantity of carbonic acid emitted by the lungs, and the quantity of air inspired, have been increased, whilst there has been a greater depth and freedom given to the respiration. It is chiefly in its power to increase the respiratory process that it acts so favourably, and in so doing the transformation of starchy and fatty food is promoted; but in addition to this, it tends to increase the action of the skin, and, by inducing perspiration, to lessen the heat of the body. Its action upon the respiration takes place whether the infusion be drunk when hot or cold.

"The action of both tea and coffee, but particularly the former, upon the brain, is well known, preventing sleep, and inducing in many persons extreme excitability and irritability. The importance of this action is not so well appreciated as it ought to be, but I am fully persuaded that it has often a most injurious influence upon health and even upon sanity. I know of many cases of over-worked brain where it has been found absolutely necessary to prevent its use, and others who, in order to avoid an irritable state of mind, must intermit its use from time to time."

Its uses he then sums up:

"*Tea is useful* to the corpulent, the over-fed, after a full meal; at the end of the day, when the food has accumulated in the system, when digestion and other vital changes proceed slowly; for the old, for hot climates, for the sedentary, for those who do not perspire freely, for those who eat much starchy food, for soldiers on the march in hot climates; and as a restorative in cases of drowning, or wherever it is desired to increase the respiratory functions. *Tea is hurtful* in the absence of food, after a long fast (as at breakfast), to the poor and ill-fed, the spare and the young. It is not adapted to sustain exertion, to prison dietaries, to low temperatures or to hot climates when the appetite is defective and the skin active, or to those who perspire freely; neither should it be taken with our principal meal."

Relative to the last prohibition we entertain some doubt, having found it, after taking severe exercise during the day, to be most acceptable with a late dinner in place of wine or beer, then proving, with a good allowance of food, wonderfully refreshing; and from what we have learnt in conversation, the experience of arctic and tropical explorers is in accordance with ours.[1] We must add what he says of coffee:

"Coffee lessens the action of the skin, increases the action of the heart, and when strong is apt to act on the bowels; whilst tea increases the action of the skin, and does not usually increase the action of the heart otherwise than by the hot water with which it is taken. Hence, so far they are adapted to different classes of persons. . . . . . The action of coffee upon the respiration is somewhat less than that of tea; but, like tea, it contains an extremely minute quantity of the elements of nutrition, and is valuable almost entirely

[1] An interesting account of a dinner is given by the Hon. A. Gordon, when exploring the wilds of New Brunswick, at which their substantial fare "was washed down by strong tea, and *nothing else*." The italics are the writer's; and what he adds is well worthy of record. "A total abstinence from all spirituous liquors makes the whole difference as to comfort on such excursions. The slightest use of them makes the assault of the black flies and other noxious insects a serious torture instead of a matter of comparative indifference; and the great parties of wood-cutters or lumberers almost invariably confine themselves to tea whilst in the woods."—Vacation Tourists, or Notes of Travel in 1862-3, p. 462.

as forming an agreeable hot beverage, and as promoting digestion and assimilation of food. It is more fitted for breakfast, whilst tea is more adapted to the requirements of the body at night. In its action upon the skin it resembles alcohol, whilst that of tea is opposed; hence brandy and coffee is a more frequent compound than brandy and tea, and both coffee and tea are fitted to aid the expulsion of alcohol, and so far are remedies or antidotes."

As wines now, and especially the lighter wines, are having the consideration which they deserve, we shall give Dr. Smith's estimate of them, which quite accords with our own views respecting them, with this qualification—that we think their use in moderation something more than a luxury, and conducive, especially in those advancing in years, to bodily health and vigour of mind. It is remarkable that no people have been distinguished for high intellectual advancement amongst whom the use of wine has been prohibited.

"The flavour of the wine chiefly determines its value, and this is dependent upon the quality and quantity of the alcohol, the amount of sugar, tannin, salts, acids, and the ethers which have been produced from the particular grape, or by the influence of time. The volatile ethers which are inhaled on smelling wine excite a special influence upon the body, for whilst the wine when drunk may somewhat excite the respiratory processes, these when inhaled, in my experiments, lessened them. . . . . . All the elements which give value to wine, except the alcohol which has been added to it, are found equally in the so-called light wines and the strong wines of Spain and Portugal; and hence ordinary claret is quite as valuable to the system under numerous conditions, both of health and disease, as port or sherry. This fact is neither so widely known, nor so well appreciated as it ought to be; and I feel convinced, whether as a luxury or a medicine, the so-called light wines should yet further supplant the intoxicating wines with which we are more familiar. I do not think that wine can be regarded as a necessary food; but, on the other hand, I am convinced that its use is quite unnecessary in the ordinary conditions of health. Its proper position is that of a luxury and a medicine."

On the second part of the work, comprised in three chapters, on the Dietary of Families, Schools, and of the Labouring Classes respectively, we have few remarks to offer. We find much to approve, and little that is questionable. Mothers will do well to study carefully the section on the "Dietary in Infancy," and it cannot be too strongly impressed on their minds that "when food other than the mother's or the nurse's milk is required, it should be milk only—that is to say, it should consist of milk, without the addition of bread, arrowroot flour, biscuits, or any other substance whatever except sugar." He adds very properly:

"The reasons for this are, that the milk still contains all the elements of nutrition required by the child, and that the absence of a nitrogenous principle in the juices of the stomach and bowels of infants [and in the saliva] either entirely prevents the transformation of the starchy food, or very greatly lessens it."

The rules which Dr. Smith lays down regulating the diet in childhood and youth, in adult and middle life, and in old age, are of the most liberal kind, and especially for the schoolboy and the girl at school. At the same time that we entirely agree with him when he expresses his conviction "that whilst over-feeding may render the boy sluggish and inapt at learning, a full and generous dietary is calculated to give energy both to the body and the mind, with independence and force of character, and to fit him both for the battle of precedence in the school and for the struggle in which he will be called to enter at a later period of life," yet in his scheme for a school dietary we think he carries his principle to an extreme; for instance, when he insists that the meat should be of "the finest quality," and that, to insure the having hot food in large schools, hot-water plates should be brought into use. There is a happy medium which, we are of opinion, ought to be observed. Boys should be well fed, but not over-delicately fed; whatever tends to the formation of luxurious habits must be injurious, and nowise fitting, when they become men, to enable them to bear privations, whether they enter the army or navy, or even should they prefer a learned profession. No less a man than Milton, in his 'Tractate of Education,' of that "complete and generous education which fits a man to perform justly, skilfully, and magnanimously, all the offices, both private and public, of peace and war," dismisses the subject of diet in the very few words, "that it should be plain, healthful, and moderate."

A classical writer points out one of the distinctions between man and pecora, "quæ natura prona atque ventri obedientia finxit." Referring to this distinction, and considering, after the manner of the old philosopher, that we should eat to live, and not live to eat, we are of opinion that Dr. Smith is somewhat over-precise in the regulation of the hours of meals, and too liberal in the number he recommends—thus, in middle life, the meals of breakfast, dinner, tea, and supper. Such a succession, in regular order, may suit well the well-to-do citizen leading a quiet, uniform life, but is little fitted for those who engage in more energetic pursuits. For such, whilst in the vigour of life, two good meals, with a slight intervening one, we think, should suffice—an abundant early breakfast and a late dinner, with a slender luncheon. The huntsman, the sportsman, the enterprising traveller, the soldier on active service, afford the best example of vigorous bodily health, so limited; and we know instances of professional men who have even restricted themselves to two meals, who have been as good examples of mental vigour. We have heard a distinguished lawyer, and distinguished also in science and literature, now of the House of Peers, and of a very advanced age, deprecate luncheons. He said of one who allowed himself this indulgence—a *confrère*, and who also attained the peerage, though not an advanced age—that in going to his luncheon he was going to his poison.

The chapter on the dietary of the labouring classes displays a minute knowledge of the condition of these classes—of their wants, means, and deficiencies, and contains excellent advice and instruction founded on this knowledge. We are glad to see for what a small sum, as about two shillings per head a week, working men can provide themselves with a sufficiency of wholesome food. We recommend the study of this portion of Dr. Smith's work to the inspectors of prisons, to visiting magistrates, and to lunacy committees and commissioners, as affording proof that a cheap and moderate dietary is compatible with health.

Should a second edition of the work be required, we would express the hope that Dr. Smith would add a chapter on salted meats. It is a subject now of special interest, since mercantile arrangements have been made to import beef, salted and pressed, from South America, for sale at a low price. The value of such meat is questionable. According to the researches of Liebig, its nutritive quality should be low, inasmuch as, from the mode of preparing it, the greater part of the juices to which he attaches so much importance must be extracted by the action of the salt. The subject, moreover, of salted meats is highly important in relation to the health of our soldiers and sailors, both of whom, ample and sad experience has proved, have too often felt the bad effects of such a diet in the impoverishment of their blood, in impaired vigour and proclivity to disease, and when used to the exclusion of fresh meats and vegetables, the production of scurvy.

Having commenced our notice of this book with commendation, we feel in duty bound not to conclude without a renewal of our approval, and the expression of our belief that, though we cannot accord with him in all his views as to diet, we know of but few volumes to which, as a whole, we can give so hearty an assent.

Review VIII.

De l'Atresie des Voies Génitales de la Femme. Par le Dr. Albert Puech, Ancien Chirurgien Chef Interne des Hôpitaux Civils de Toulon, &c. &c.—*Paris,* 1864.

Atresia of the Female Genital Passages. By Dr. Albert Puech, &c. &c.

The above work, the result of five years' thought and research, from the pen of a man no novice in the study of the diseases of women, is, we believe, the first devoted entirely to the singular cases of which it treats. It would be valuable were it a mere *résumé* of the experience of others, but it has worthier claims on our notice. Those who have not given particular attention to the matter may readily feel surprise that so much can be said about it, and probably it would not have occurred to an Englishman to construct an elaborate treatise on so obscure and uncommon an affection; but it is not unusual for a Frenchman or German to labour patiently at such a task, with little chance of the practical rewards that authors in this country hope to secure. Dr. Puech has in the present work collected every case of uterine and vaginal atresia that he could discover in foreign literature; and the amount of labour involved in such researches, as his references to books attest, proves his industry and enthusiasm in his subject. The English works quoted seem fewer in proportion to the rest than we should have expected, and we miss the names of a few of our observers who have recorded such cases. We also see no reference to the work of Kussmaul, nor to that of Negrier, who has related an instance of bifid uterus and vagina, in his treatise on ovarian disease. It is a curious fact, that most of the cases referred to in the standard English works on female diseases, are simply quoted from Nægele or other foreign writers, and if this must be held to indicate any remissness in observation, a reference to the work we are now considering will, we hope, stimulate obstetric practitioners to remedy the deficiency.

The term "atresia" should properly be restricted to the *complete* closure of an aperture or canal, but it is too often used more loosely, and words have been regarded as synonyms, which express another idea than that of mere obstruction, as for instance, "imperforation," implying a congenital origin, and "obliteration or occlusion," phrases which signify the previous existence of a pervious canal. Passing by, then, the contractions or strictures of the canals, we shall confine our attention simply to cases of complete closure, from whatever cause the accident may arise.

In a matter where personal experience must be so limited, the records of the labours of others become of the greater value, and one turns accordingly with motives of more than mere curiosity to see what opinions the surgeons of past ages have expressed as to this condition and its treatment; nor does such a retrospect disappoint our expectations, for among the earliest writings may be found references to this malady. Hippocrates speaks of adhesions of the parts after labour, and of a closed uterus; Aristotle discusses these cases and their accidental and congenital origin; Celsus devotes a chapter to them, and among others the names of Aetius, Avicenna, Lanfranc, Wier, Ruysch, Mauriceau, Roonhuysen, &c., bring down the list to the eighteenth century. Heister was, however, about the first to originate anything on the subject, to be soon followed by Boyer; but the more daring achievements of Amussat and Debron, who, not content with acknowledging the existence of this morbid condition, took in hand cases hitherto considered beyond the reach of surgery, and constructed a vagina anew, gave a fresh stimulus to the study of this subject. This condition of atresia may have its seat either in the vagina or cervix uteri, and its importance varies according to its position.

Its varieties may be enumerated under three heads, according as it is situated at the vulva, the vagina, and the cervix uteri; and this classification again admits of further subdivision.

1. Atresia of the external parts may occur in three ways—viz., *a*,

by adhesion of the labia majora; *b*, of the nymphæ; and *c*, by closure of the hymen, though this last may be more properly considered with the vaginal affections.

The first two methods—viz., adhesion of the labia—are always accidental in their origin, while the last is congenital.

The common causes of adhesion of the labia are want of cleanliness, and concretions from the urine in its passage over the surface; but others exist, such as the results of burns and of small-pox. The curious have also discovered another possible cause in the cruel and disgusting practice pursued by some barbarous African tribes, of producing this condition in order to ensure virginity.[1]

Micturition is the function most impeded in such cases, the urine being passed *guttatim*, and when the meatus is encroached upon more dangerous symptoms arise.

Adhesion of the nymphæ is especially a disease of infancy, though it may be observed at any age, and in this condition also painful micturition is the prominent symptom.

Imperforate hymen is, however, the most common of these anomalies, and of this our author has collected not less than one hundred and fifty-one examples. This form of atresia, though so simple, may have some complications, for on division of the hymen other obstructions have been occasionally found higher up, either in the vagina or cervix, and M. Nélaton once encountered three different layers of membrane one above the other.[2] Although it is the rule, too, that this condition of the hymen is not evident, or at least requires no treatment before the age of puberty, there are some exceptions, for the mucus secreted by the cervix may cause a distension of the membrane, and thus excite notice. Several instances of this condition are on record, one by Dr. Puech, who removed about half an ounce of a thick fluid from behind the hymen at an autopsy he made on a child; and another by M. Depaul, who collected nearly three and a half ounces of a fluid like thin rice water, under similar circumstances.

2. Vaginal atresia may be either congenital or accidental, and is less frequent than the last category, though liable to more complications. The congenital cases may, in their turn, be divided into three classes, according as the obstruction is confined to the vagina, or exists in the cervix as well, or as it occurs in one of the canals of a bifid vagina.

The simple vaginal obstruction is caused by a membranous partition formed by a double mucous membrane and some connective-tissue, sometimes mixed with thin muscular fibres.

The cases in which the cervix is closed, as well as the vagina, by separate obstructions, are not common; and still more rare are those where the vagina is bifid, and one of its canals is impervious. Such a coincidence has been recorded three times, including a well-known

[1] See the observations of M. Roderic à Castro.

[2] Thèses de Paris, 1856, No. 238.

specimen in the Pathological Museum of Vienna, described by Rokitansky.[1]

Of another instance which Dr. Puech details at some length,[2] we give the following abridgment:

Bilobate Uterus and Vagina; Menstruation by the Left Vagina and Uterus, the Right being Imperforate, with Dilatation of the corresponding Cornu.—H. T., aged nineteen, began to menstruate at seventeen, and some months afterwards married. When about eighteen and a half she began to complain of pains in the uterus, and particularly in the vagina. These pains became very intense at the menstrual periods, then slowly left her, to return with as great violence at the next epoch. At last her sufferings became so acute that she sought advice, and was admitted into the Royal Hospital of Versailles. On examination it was found that about an inch from the entrance of the vagina a tumour of some size existed, big enough to fill the cavity of the pelvis. Through the abdominal walls the tumour could be felt as high as the umbilicus, and resembling the uterus at the sixth month of pregnancy. Considerable doubt was felt by the medical men as to the nature of the tumour, but it was decided to explore it, and a trocar was plunged into the part projecting into the vagina. A large quantity of a dark thick fluid escaped through this opening, and everything seemed to promise well, when four days later symptoms of peritonitis set in and proved fatal.

Post-mortem.—General peritonitis with puriform effusion was found on opening the abdomen. The genital organs, on being removed and examined, presented this arrangement: The left division of the vagina was four and a half inches long; on its right side and about an inch from its orifice was the opening made in the tumour (in the right division of the vagina); at its upper part was the entrance to the uterus. The uterus was about one and a half inch broad, and terminated in two cornua, two inches long, at the end of which were the Fallopian tubes and ovaries. An incision commenced at the left utero-vaginal opening showed a cavity extending to the top of the left cornu. This part, which formed exactly one-half of the organ, was separated from that of the opposite side by a fleshy partition, extending from the fundus to the vagina in such a manner that the left cavity had no communication with the right. On the right side a similar arrangement was observed, but this cavity had no *external* communication, being closed at its lower part; and the accumulation in this division of the uterus was seen to have formed the tumour which had been operated on.

The "accidental" cases almost always result from injuries due to severe labours.

3. When the cervix uteri is the seat of obstruction, this is generally single, but it may be complicated, as when the uterus is bifid. The favourite position of the obstacle is at the meatus, or entrance of the

[1] Zeitschrift der Gesellschaft der Aerzte zu Wien, 1860, No. 31.
[2] Journal des Connaissances Médico-Chir., 1835, tome ii. p. 181.

cervico-uterine canal. Of twenty-one cases collected by the author, there is but a single exception to this rule—viz., one by Mattei, who says:

"I have seen a very curious case of a Russian lady who had ceased to menstruate since her marriage. The cervix is permeable in all its length; it is only the internal orifice which is closed. I proposed to empty the uterus by puncture through the normal passage, but by a lucky chance this lady reached the climacteric period, and for some months has had no more menstrual crises, and the uterine tumour continues to diminish daily. She will probably be cured without operation."—(*Revue de Thérapeutique Médico-Chirurg.*, 1858, p. 487.)

Etiology.—Among the causes of these affections we must place in the first rank that of prolonged and severe labours. When the pelvis is small, or, for other reasons, the uterine efforts do not advance labour, the mucous surfaces of the vagina and uterus are very liable to suffer from the long-continued pressure, if not from actual laceration. But there are other possible, though rare, causes.

Four cases are on record (one by Dr. Rigby, another quoted in Ranking's 'Abstract,' 1850,) in which the result is attributed to the use of caustics employed in three instances for the cure of cervical ulceration, or hæmorrhage. Under the same category may be included injections of powerful astringents, which have, in the experience of some, produced adhesions of the vaginal surfaces; and a certain M. Nevizan cites the case of a lady "quæ ut placeret marito suo tantum se astrinxit ut nec ipse nec alius potuerit amplius cognoscere." The genital organs are also liable to suffer in the course of some diseases, such as small-pox; or, according to Scanzoni, of diphtheria and scarlatina. Gangrene may also attack these parts, and in two forms, arising either spontaneously in the midst of apparent health, or in the course of other diseases; and probably the cases just alluded to should be included under this denomination. Those arising spontaneously are rare. Bernutz gives a case which occurred to M. Velpeau in 1857, and Dr. Puech vouches for another; but as consequences of cholera, typhoïd fever, &c., this result is not so unusual.

Atresia of the cervix is not uncommon in old women, but agreeing with Dr. Puech that the study of such cases is "*plutôt de luxe que d'utilité*," and that they never require treatment, we will not stop to consider them further.

The symptoms due to atresia of any part may be classed as those furnished by the patient's sensations, and those discovered by local examination. The former are alike wherever the seat of obstruction, but the latter vary with its position.

The old writers summed up the question in the pithy phrase—"Impediuntur coitus, conceptio et purgatio;" and we have not much to add in the present day as regards the subjective symptoms. The existence of an obstruction in the canal of the vagina or cervix gives rise to no special symptoms to arouse the patient's attention, and the nature of the malady in most cases must rest unknown till some accident compels the surgeon's investigation of the parts. When the vagina is obstructed at its lower part, difficulties in marital intercourse generally lead to an early and correct diagnosis; but as it more generally happens that the obstruction is higher up, and though complete does not cause the same inconvenience, there remain but two positive symptoms to indicate the nature of the malady—viz., sterility and amenorrhœa; and as these are common to other morbid conditions, the diagnosis is apt to remain for a long time uncertain. The slight barrier interposed by a closure of the cervix uteri is as serious in its effects as the most complete obliteration of the vagina, or its closure by an impermeable hymen, and in all three cases the symptoms will be the same—i.e., impregnation is impossible—and more important far, there is no escape for the menstrual fluid. It is this last which is the essential element in the question, for at every return of the menstrual crisis the increase of fluid gives rise to an aggravation of pain and suffering, and the expulsive efforts of the uterus become more forcible, but not more efficacious. Where the atresia is congenital, the nature of the disease may remain undetected for an indefinite period, as the continuance in young girls of amenorrhœa suggests any cause but the right one, and it is long before the accumulation reaches such limits as to give rise to alarming symptoms; but even in cases where injury has followed complicated labours, it has generally happened that the diagnosis has not been made till some serious mischief is threatened.

The physical signs suggest themselves at once, and are not open to much misinterpretation. Whether the hymen is imperforate or the walls of the vagina are adherent, the result is much the same, and the uterus is felt, on examination by the rectum or bladder, distended with fluid, while it forms a tumour in the hypogastric region perceptible through the abdominal walls. Generally this tumour is single; but there are sometimes two or three, in which case the additional size is due to the distension of the Fallopian tubes, or possibly of a bifid uterus.

Modes of Termination.—There are several ways in which cases of atresia terminate spontaneously, but they may be summed up in two divisions: 1. Vicarious menstruation may relieve the symptoms; or 2. An accumulation takes place above the obstruction, in which case it happens either that the obstacle gives way, the uterus is ruptured or is perforated by a slow process, or the Fallopian tubes become dilated. It may further happen that the arrival of that age when the function ceases may put a stop to the symptoms, which will then decline or become quiescent; or, as is stated by Van Swieten, a sort of consumption may destroy life. This last mode, however, must be accepted *cum grano salis*, for one is hardly disposed to believe that the arrested menstruation would affect life so seriously and leave no structural lesion.

The following case is related by Dr. Puech as a curious instance of vicarious menstruation, and deserves notice:

"Anne R., married, aged forty-seven. At the age of fifteen she had the usual premonitory signs of menstruation, but no discharge followed. She subsequently married, but never had any menstrual flux or signs of pregnancy.

At seventeen, the uterine pains which had troubled her every month left her and gave place to frequent headaches, and at the same time her physiognomy underwent a marked change, owing to the appearance of varices of the facial and superficial temporal veins and their tributaries. These varices increased gradually, but at certain times acquired considerable size, and one of them on the head burst, allowing the escape of a large quantity of blood. These hæmorrhages recurred very irregularly, but so far from exhausting, greatly relieved the patient. From time to time the left ocular conjunctiva became congested, and once a good deal of blood was lost at this place. The hæmorrhages from the head ceased after some time, and were replaced by frequent epistaxis. The cessation of epistaxis was followed by lumbar pains, the prelude to an abscess which opened in the left thigh, while another formed in the right groin. Except leucorrhœa, she had no other symptoms of consequence." (Observation 13, p. 53.)

At this time she came under the care of Dr. Puech, who was led to examine the genital organs, and found that though their external appearance was normal and the vagina healthy, there was no opening into the uterus, which was itself not remarkable in size and extent. The usual seat of the os was marked by a small depression, but there was no canal.

Of the other terminations several cases are on record in which the obstacle has given way spontaneously during paroxysms of pain.

The uterus may also rupture, and unexpectedly, as in the following case:

"Obliteration of the cervix and retention of the menses; death in a paroxysm of pain; rupture of the fundus uteri, and escape of blood into the peritoneum.—A lady ceased to menstruate at forty, and at fifty she perceived a tumour in the abdomen, which increased to a great size. In a paroxysm of pain she felt a peculiar sensation in the abdomen; the pain ceased, the tumour disappeared, and she died next day. On opening the body, the peritoneal cavity was found filled with an enormous quantity of dark and decomposed blood. The uterus was rent at its fundus, at which point the walls were thinned. The cervix was cartilaginous and completely obliterated."

It sometimes happens that the contents of the uterus escape outside the peritoneum and make their way into the bladder, and there remains a fistulous communication with the bladder. Such a case is given by M. Freteau, who had under his care a girl of seventeen in whom the vagina was wanting. The surgeon, after a very careful use of the knife, introduced a trocar and let out ten ounces of a thick fluid like the lees of wine. An elastic tube which was introduced escaped from its position and could not be replaced. The next day the patient made water three times, and each time the urine was tinged with a matter similar to that which escaped by the tube. This continued for eight days, when the urine became clear, but every month, after some abdominal pains, it was coloured in the same way, and continued so for seven or eight days. Five years after the operation several surgeons examined this case, and satisfied themselves as to this peculiarity.

Many published cases, both in English and foreign journals, attest the occurrence of deaths from rupture of the Fallopian tubes when distended by retained menstrual blood; as our author observes, this mode of termination is "never a source of cure, and frequently a cause of death." The escape from the Fallopian tube, however, of this fluid is not of necessity fatal, as two things may happen—the fluid may become encysted around the opening in the tube, constituting a sort of "peri-uterine hæmatocele;" or, as in the cases related by Amussat and Bernutz,[1] the fluid may escape by the anus, and a natural cure may result through the formation of a tubo-rectal fistula.

Pathology.—The necessary result of this accumulation is the dilatation of the uterus and sometimes the upper part of the vagina; but there are some differences between the progressive increase in size from this cause and from pregnancy. In the latter, increased vascularity is one of the most remarkable features, but this is by no means present in cases of obstruction. The vagina and uterus are not affected in an equal degree by the continued pressure; for while the former maintains its thickness, the walls of the latter become thinned. The mucous surface of the uterus is stained with a blackish or reddish material, an effect due to the mere stasis of blood. The ovaries are generally healthy, but they are sometimes the seat of small hæmorrhages; at others, are softened, injected, or even in a state of suppuration. The Fallopian tubes do not, as a rule, share the dilatation of the uterus, but they have been found doubled in size, and even containing a pint of fluid (Paget).

The fluid found in cases of obstruction differs from that of healthy menstruation, but only in the proportion of its ingredients. The elements are the same, but the blood is less, because some of it is absorbed, while the mucus increases as it continues to be secreted during the intervals of menstruation. The viscidity, tarry look, and offensive odour of this fluid, are its other most notable appearances. There remains, however, the question of its quantity, and this point involves several peculiarities.

Dr. Puech has, with great industry, compiled a series of tables, in which are distinguished the several forms of atresia, according to their seat, and it appears from these that the average quantity of fluid given out in such cases is only about one-fifth or sixth of that which escapes when the function is performed in the normal way, taking as the standard a monthly average of from 8½ to 10½ ounces. The calculation is made by reckoning the number of months between either the last normal menstruation or (in congenital cases) the first epoch marked by the usual pain and uterine efforts, and the escape of the retained fluid by operation, and then dividing the quantity of fluid by the number of months during which it was retained.

The fourth table, which gives a *résumé* of the results obtained, we subjoin:

[1] Amussat: Gazette Méd., 1835, p. 785. Bernutz: Clinique Méd. des Maladies des Femmes, tome i. p. 308.

Atresia of	Cases.	Time Retained.	Quantity of Fluid.	Monthly Average.
Hymen	... 32 ...	1040 months ...	133 pints, 5½ oz. ...	2 oz. 5 drs.
Vagina	... 14 ...	465 „ ...	27 „ 1 „ ...	1 „ 2 „
Cervix	... 12 ...	459 „ ...	30 „ 4 „ ...	1 „ 3 „
Total	... 58	1964 „ ...	190 10½ „ ...	
				General average, 2 oz.

These 58 cases represent the proportion out of 251 in which the quantity was exactly observed.

It is not probable that this estimate correctly represents the amount of fluid secreted, as the serum is absorbed by the uterine walls, and we see that the tumour increases at the epochs and diminishes in the intervals, showing a decrease in volume, but the difference is too great to invalidate the conclusion that the quantity is much less than in normal menstruation.

Diagnosis.—The diagnosis of such cases is surrounded with difficulty, more from the moral impediments to a local examination than from any other reason. The dislike to press for an examination in the case of young girls, the many hypotheses open to explain amenorrhœa—the main symptom—these, among many other considerations, tend to disarm suspicion, and lead the surgeon's thoughts away from the question of mechanical obstruction, yet the fact of regularly recurring pains at the monthly epochs without the usual result, and the formation of a uterine tumour, should be more than enough to put an observant practitioner on his guard. The consequences of an error in diagnosis have some importance in a social point of view, for it has often happened that the character of a girl has in this way been most unjustly impugned, entailing of course the greatest misery and distress of mind. Wier relates that he was called to a young lady suffering from severe pains, which her friends felt convinced were those of labour. In vain she asserted her virtue, they replied by pointing out the father and preparing for the accouchement. The uterine contractions continued, and the doctor was sent for, when by a skilful diagnosis he allayed the terrors of all parties, and demonstrated the correctness of his opinion.

These mistakes have, however, also a ludicrous aspect. Smellie records a case where an imperforate hymen was taken for the bag of membranes, and a speedy delivery announced, though luckily the ambiguous terms of the prediction enabled the expectant accoucheur to rectify his diagnosis; and a M. Rossi[1] is said to have fallen into an opposite error, for when called to a woman with some malformation of the genital organs, he made an incision in the direction of the vagina, and, instead of menstrual fluid, *a fœtus surprised him by its escape!*

The diseases for which the uterus distended from obstruction is liable to be mistaken are those rare cases of serous collection described as hydrometra, and those where there is a collection of blood—or

[1] Annales Cliniques de Montpellier, 1804, tome xiii. p. 39.

hæmatometra—and retroversion of the pregnant uterus. The first is to be distinguished chiefly by the painlessness of its increase, and the second by its sudden origin.

The treatment of these cases resolves itself simply into a discussion of the operation, for it is clear that medicines can have no influence beyond allaying the severity of the symptoms produced. To prevent the formation of these obstructions is, of course, the first duty of the surgeon when he meets with cases of sloughing vagina, or injury likely to be followed by contraction; but apart from this, he has only to deal with barriers already firmly fixed. In congenital cases, the question arises, when is the best time to operate?

M. Velpeau urges operating in early infancy; M. Boyer, on the contrary, thinks it better to wait till puberty; but Dr. Puech gives his decided opinion that "the best time for operation is just before the first menstruation, provided there is reason to suppose the uterus is properly developed." The age of the patient requires to be taken into consideration, for an operation justifiable at the age of twenty to thirty is no longer so after forty, and the deaths proved to be due to dilatation and rupture of the Fallopian tubes are a sufficient warning of the dangers of delay.

There are two methods of operation available, the direct and indirect. The latter consists in penetrating to the tumour through the bladder or rectum, and establishing a permanent fistula between either one or the other, but this has only been attempted by the latter means. There are, however, so many objections to this proceeding that it is not at the present time resorted to. The direct method is the name given to the operation by which the uterus is reached through the vulva. Hippocrates, and since him a few others, have advocated the use of caustics for this purpose, but this has been long ago abandoned in favour of the knife.

Where the hymen is imperforate, Dr. Puech practises the excision of a circular piece in preference to simple incision or puncture; and though this mode is but little dangerous in itself, death has often followed from other complications — as many as 6 times in 139 operations.

When the vagina is the seat of obstruction, several plans have been proposed, but the dangers attendant on any of them were so well known that, even so late as 1839, writers of some note considered it better to leave women to their fate than to risk an operation.

Amussat, in 1832, advocated forcible pressure on the mucous membrane, continued till the parts were softened and gave way; and when fluctuation was felt, a knife or trocar might be used to complete the operation.

Dupuytren's plan was of a mixed nature, and consisted partly of cutting and partly of tearing apart the cellular tissue. The circumstances of the operation admit of but little variety in detail; the chief point is to bear in mind the sources of danger.

The bladder and rectum are either or both liable to be wounded; and M. Verneuil relates a case in which three operations were undergone: in the first the bladder was opened; and in the second the rectum, after which Dieffenbach made a last and successful attempt.

Hæmorrhage may also prove a serious drawback; in such an event it may be advisable, as suggested by M. Guerin, to operate as it were by instalments, taking care to keep the wound dilated after every incision.

Supposing the operation completed satisfactorily, there are complications which may, after all, prove fatal, such as inflammation of the uterus or Fallopian tubes, peritonitis, and pyæmia. The cure is generally permanent; but subsequent inflammation does occasionally undo all the good effected by operation.

The effects of a successful operation are not merely local, for the restoration or establishment of the menstrual function exercises a beneficial influence on the whole economy. It is observed that the uterus after operation is always larger than in barren women, and this increase is not in one diameter more than another. The cervix, too, has not its virgin form, but remains with the os half-open, as after parturition. Menstruation is generally established immediately, and women have frequently conceived within a month of the re-establishment of the function.

PART SECOND.

Bibliographical Record.

ART. I.—1. *Letters on the subject of the Utilization of the Metropolitan Sewage, addressed to the Lord Mayor of London.* By BARON LIEBIG, President of the Royal Academy of Science at Munich. *With the Report of the Coal, and Corn, and Finance Committee of the Court of Common Council.—London*, 1865. pp. 44.

2. *Suggestions for the Improvements in the Sewerage of Cities and Towns.* By C. F. MOORE, M.D., &c.—*Dublin*, 1854. pp. 12.

3. *Water: its Impurities and Purification.* By the LONDON AND GENERAL WATER PURIFYING COMPANY (Limited).—*London*, 1865. pp. 43.

4. *The Present State of the Town Sewage Question.* By GILBERT W. CHILD, M.D., of Exeter College, &c.—*Oxford* and *London*, 1865. pp. 34.

5. *Sanitary Statistics of Cheltenham.* By E. T. WILSON, M.B. Oxon., &c.—*London*, 1865. pp. 46.

THE subject of sewage, so long neglected, is at length receiving the attention which its manifold importance deserves. The evils resulting from the neglect have been many and serious—the pollution of our rivers, the contamination of our wells, a waste of valuable manure, and the impoverishment of our agriculture, not to mention other bad effects endangering the public health.

When we reflect on the consequences of such neglect, it appears strange, and almost unaccountable, that they should have been so long tolerated without any attempt made to correct the nuisances. The fact is, that the bad effects of neglected sewage have of late years been rapidly increasing, so as to become more apparent and more felt; and this owing to several causes, of which the chief may be said to be the more general use of waterclosets, and the great augmentation of the population of our principal towns, especially of the metropolis, that of the latter amounting to two millions, at least. Moreover, whilst the effects were increasing, there were circumstances which especially drew attention to them: a hot summer rendered the Thames an offensive river; an outbreak of cholera, and inquiry into the quality of the drinking water in use, connected the disease, in part, with wells rendered impure by adjoining cesspools; and the many millions of money expended on foreign manures, especially on guano, brought palpably to the minds of landed proprietors and intelligent farmers the immense loss to the country of the fertilizing manure swept away, in allowing the sewage to run to waste.

Happily, during the period that the evils referred to have been in progress, science has been advancing—engineering science and chemical science. And, although many points remain unsettled in relation to the sewage problem, and further research is needed, yet a good deal of a very interesting and important kind has been ascertained applicable to its practical solution. To inquirers, our fellow countrymen, and especially to Professor Way, we are indebted for the discovery of the influence which the plant-bearing earth exercises on the sewage; how it has the admirable property—one of the greatest in nature, as designated by Liebig—of arresting the fertilizing matters; as the loadstone attracts iron, or the fabric to be dyed attracts that which imparts colour, so the earth by certain changes which it effects renders the matter noxious to animal life beneficial to vegetable life.

This property of the plant-bearing earth may be viewed as the great principle of the utilization of sewage in its application to agriculture. The soil which possesses it in a marked manner is loam or clay, composed of several earths—alumina, silica, magnesia, lime, &c.—in brief, any soil of ordinary fertility. On the contrary, sand—pure sand of any kind—is destitute of the quality, and can be rendered active only by the addition of that in which it is deficient. Happily, considering the great extent of surface in the British dominions, especially in Ireland, of bog, or ground covered with peat, bog-turf or peat has been found to possess also the power of separating and retaining the fertilizing matter of sewage, and so enriched, reduced to coarse powder, to be equal in fertilizing effects to an equal weight of stable dung.

Baron Liebig, who has carefully investigated the subject of sewage, and may be considered as the highest authority on all that relates to it, in his admirable letter to the Lord Mayor of London, shows that the chief value of it lies in this, that it supplies what is wanting in other manures, especially potash, so as to secure from their use the maximum fertility of the soil. Its other ingredients, all aliments of plants, are ammonia, phosphoric acid, sulphuric acid, lime, magnesia, and common salt. The sewage of London alone, according to his calculation, receives daily from the voidings of its inhabitants, and the voidings of horses and cows, the enormous quantity of seventeen tons of potash and fifteen tons of phosphoric acid, and that the money-value of its contents per year is equal to 2,040,715*l.*—i.e., of 266 millions of tons, at the rate of 1·84 of a penny per ton.

The manner of using sewage is a great question, for, as Liebig observes, it is without mercantile value in a diluted state, as sewer-water, and the outlay of reducing its contents to a solid form would exceed their value when so reduced. Here, again, science steps in, and to a great extent solves the problem. It is proved that when distributed by hose and jet, in a certain moderate proportion, its fertilizing effect is most strongly marked in the production of a healthy growth of various crops; whilst, on the contrary, if used in excess, as by flushing, saturating the ground, it is injurious to many crops, poisonous to some, and favourable, if to any, only to the coarsest herbage. If this be proved, and we think it is, both experimentally and rationally—that is, by reference to the soundest established principles in agricultural chemistry—the scheme propounded by Messrs. Napier and Hope, and which they are endeavouring to get the authority of an Act of Parliament to carry into effect, must be pronounced to be delusive. They propose to direct the sewage of the north side of the metropolis to the Maplin Sands, on the Essex coast, with the expectation of converting these sands into meadows, yielding a rental of 40*l.* per annum an acre, founded on the supposed analogy of that surface to the Cragentinney meadows, in the neighbourhood of Edinburgh, which have been irrigated by the sewage of that city, and with such an increase of fertility as to enhance their value from 6*l.* 10*s.* per annum to 30*l.* per annum. But, as Liebig shows, the condition of the two surfaces is different, and the Maplin Sands, to be brought into a state to be benefited by sewage, would need the addition to them of two million tons of clay.

If the opposition which is making to this scheme be successful, the great question will still remain for solution—how is the vast sewage to be expended so as to be turned, agriculturally, to the best account? We have so much faith in the resources of science as to have some confidence that our engineers, aided by our chemists, will be able to accomplish the great desideratum. One favourable circumstance is established, that in its flow through pipes it slowly undergoes a change, and after an incipient fermentation, if conducted to a considerable distance, it flows out in a state comparatively little offensive, as regards its smell.

Apprehensions have been entertained that sewage, used agriculturally, may, by its emanations, give rise to malaria, or impart to the atmosphere an unwholesome taint. If the sewage be properly used, this fear appears to be groundless, owing to the wonderful property already adverted to of the plant-bearing earth. Were it, however, to flow over the land in excess, there is some reason to infer that it might poison the air. A large induction seems to establish the fact that a neglected agriculture, a wild vegetation, favours the production of malaria; and, on the contrary, that good tillage and a regular succession of crops, with drainage, so essential to their success, tend to check or destroy malaria.

As regards the state of our rivers, and many of the sources of water-supply, it is clear that, for the sake of salubrity, they should be guarded against the admission of sewage, in the certainty that wherever they are allowed to be its recipients, in proportion to the amount received must the quality of the water be injured. In our great manufacturing country, with a people priding themselves on freedom of action, hardly a mill has been opened, hardly a chemical work established, that has not been injurious either to the water or atmosphere in the vicinity, poisoning more or less both. The Earl of Derby made a statement but a few weeks ago, in the House of Lords, which, relating to a great nuisance and its correction by legislative interference, was peculiarly interesting. By the Alkali Act, which he introduced, and which was brought into action hardly a year ago, the destructive acid (the muriatic), previously allowed to escape to the amount of a thousand tons per week, has been diminished to forty-three tons, with the expectation of a further reduction. And the Salmon Fishery Act, only about two years in operation, if not so eminently successful, has at least been of some service in affording security to streams not yet contaminated of being preserved in a wholesome condition fit for the breeding of fish.

As the subject of the London sewage has already received much consideration from Parliament, in connexion with the Thames embankment, we trust the Government will soon be able to decide on its disposal, and that the Act directing it will afford another instance of successful legislation.

Our limited space does not allow us to notice, except in the briefest manner, the papers which constitute the heading of this article.

Baron Liebig's letters to the Lord Mayor of London, with the reports which accompany them, of a Committee of the Court of Common Council, are deserving of careful perusal. These letters are every way worthy of him, and must enhance his reputation, already so high, as a philosophical and agricultural chemist.

Dr. Moore's pamphlet contains some good remarks on the evils of neglected sewage, with suggestions for their correction on a limited scale, but we fear too much so for extensive use. He proposes, amongst other articles, the employment of peat in powder, and peat charcoal, and coal ashes, as deodorizing substances, which we are satisfied might be advantageously used in detached houses and in villages, and which, with receptacles rendered water-tight, might be profitable substitutes for wasteful waterclosets.

The pamphlet of the Water Purifying Company contains some good observations on filters and the impurities of water, and the means of testing its purity. The account in it of the risk of health from the use of water, such as is commonly supplied in London, is, we think, somewhat exaggerated.

Dr. Child's is a well-written critical paper, very suitable for the society before which it was delivered—the Ashmolean, of Oxford, and well adapted to elicit discussion on the important subject of which it treats.

The last in the list—the Sanitary Statistics of Cheltenham—is a good example of its kind, and has much value as descriptive of the history and of the sanitary condition of a town, the great attraction of which is the promise it holds out of being beneficial to the invalid. What its author, Dr. Wilson, most insists on, is that the additional supply of water at present needed should be obtained not from the contaminated Severn, but from purer hill-sources; and in urging this, we think he is consulting the health of the inhabitants, and the prosperity of the town as a watering-place.

ART. II.—*Nota sobre a Urethrotomia Interna, a proposito de dois casos de apertos organicos da uretra curados por esta operação, &c. &c.*
A brief review of the Operation of Internal Urethrotomy, suggested by two cases of Stricture so treated. Presented to the Royal Academy of Sciences of Lisbon, by ANTONIO MARIA BARBOSA, Member of the same.—*Lisbon*, 1864. p. 15.

THE name of Senhor Barbosa being familiar to us as a skilful and scientific surgeon, we are naturally attracted to the line of preference displayed by him among the various surgical means which present themselves for the cure of inveterate stricture. The method of Syme seems to have succeeded perfectly well in the hands of that distinguished operator; but somehow, as time goes on, it has unaccountably failed to secure a very general acceptation, leaving room to the suggestion that the surgical principle on which it rests has no very broad basis, or what is still more probable, that there are secondary points of importance concerned, the neglect of which has gone far to impede its measure of success. It is also rather a harsh mode of proceeding towards the patient, and requires a bold surgical hand. No wonder, then, that Holt's method of splitting up the stricture by a suddenly applied, mechanically dilating force has been received at a later date with a degree of favour which it maintains at the present time. It has lately, indeed, been stated, but we believe on insufficient grounds, that the occasional use of the catheter is sometimes indispensable at long intervals after its performance. The brilliant results of Dr. Dick, by the method of subcutaneous section, promise excellently well, and have not perhaps interested the profession so much as their merit has deserved. Senhor Barbosa's attention seems to have been greatly attracted towards the mode of operation now employed by Maisonneuve, of Paris, mainly through having witnessed the performance of that operation, by M. Déclat, on a gentleman of Lisbon. The relief obtained in that case was imperfect, on account of the incision (superiorly) proving insufficient. Senhor Barbosa's acquaintance with Maisonneuve's instruments was, however, of prior date. These consist of a slender gum elastic bougie, which is first introduced into the stricture as a guide, and to its external extremity a grooved staff or metal catheter is joined on by the medium of a screw; the staff is made to follow in the track of the bougie, to the seat of stricture, and serves as guide to a urethrotome which is lanceolate at its extremity, and presumably, at least, of such size and construction as to protect the sound parietes of the urethra. Senhor Barbosa prefers using the urethrotome for incising the urethra superiorly and laterally, to the plan of cutting the inferior surface of the urethral passage, this being by much the more vascular part. Accordingly, he has the metal conductor grooved on the concavity, and not on the convexity, as used by other surgeons. Previous to the date of these operations, neither Syme's operation nor any novel methods of internal urethrotomy had been practised in Portugal, or at least in Lisbon—we except the scarifications of Amussat, Leroy D'Etiolles, and others, as well as cauterizations, all of which had fallen into disrepute. Certain cases which had returned from Paris, after operation there, under the hands of M. Guillon, were still subject, it had been observed, to the inconvenience of having to use the catheter in order to maintain a proper flow of urine. Senhor Barbosa also remarks on the tedious instrumental preparation which is indispensable previous to the operative proceedings of Guillon and Reybard, so many weeks being spent in dilating the urethra as to render these methods not obviously preferable to the ordinary tedious plan of dilatation by bougie and catheter. It is to be observed, too, that the process of Reybard—rewarded as it was in 1852 by the Royal Academy of Medicine at Paris with the prize of the Marquis of Argenteuil, 12,000f.—has been occasionally followed by hæmorrhage and phlebitis, even of a fatal character. It is therefore no subject of wonder that Parisian surgeons, like Nélaton and Michon, as well as distinguished specialists, among whom we name Ségalas and Philips, have abandoned all means but that time-honoured one of dilatation. The experience of our metropolis has tended in the same direction. Mechanical views have too exclusively prevailed in this part of surgery; we deem the necessity for cutting operations on the stricture itself, always attended with a certain measure of insecurity, to be reduced to a *minimum* by a fair estimate of the advantage to be derived in extreme cases from the *boutonière*, an operation which, from the inevitable dilatation of the passage posteriorly to the stricture, is generally pretty easy of performance, and which when performed reacts most beneficially on the tissues of the stricture, and renders it amenable to after treatment; nor are we now subject to the same terrors about puncturing the bladder through the rectum in bad cases, which influenced us formerly. We are far from saying, however, that certain cases are not appropriate for the benefit or risk, whatever it may be, of internal urethrotomy or of Syme's operation. A fat perinæum, a stricture close upon the prostatic portion, the existence of sinus, peculiar circumstances of convenience to the patient, may justify or recommend them as operations of election. The difficulty of accounting for their failures and imperfections must not blind us to the ingenuity of their advocates. We are not altogether without hopes that the endoscope may be brought to bear upon the subject, and that the hopes entertained by Mr. Avery on this head may be in some sort realized at no distant date. In the first case operated on by Senhor Barbosa, it was only possible to pass a gum elastic catheter, of the size of 1½ millimètres, through an old stricture situated in the posterior part of the membranous portion. The man's age was forty. His health was deteriorated with chronic cystitis and general irritation. The operation was performed on the patient in bed, in a sitting posture, having the knees raised; the metal instrument connected with the gum elastic conductor was of 2 millimètres merely. The urethrotome was of 7 millimètres, and with this instrument the strictured part of the canal was incised superiorly, and again, with another instrument of 7 millimètres, bi-laterally; in the withdrawal of the instruments only a few drops of blood followed. Senhor Barbosa then introduced a gum elastic catheter, also of the size of 7 millimètres, with an olivary extremity, into the bladder, but without retaining it there. The patient had some slight constitutional disturbance, but gradually regained power over the bladder. He got up on the fifth day from the operation, but not until 12th October—i.e., twelve days after the operation—did Senhor Barbosa introduce an olivary gum elastic catheter of the same size as before—i.e., of 7 millimètres breadth—when he found the passage quite free. In two or three days' time the patient was dismissed.

The other case was even more severe. It was one of very narrow stricture, in a young man of twenty-six years of age, but with a good constitution; he had a very small passage in the posterior spongy part of the urethra, and about two centimètres further back was another stricture. In this case Senhor Barbosa was only able to pass a gum catheter of filamentary dimensions at its extremity, and measuring $1\frac{1}{2}$ millimètres in the remainder of its length. The urethrotome was of 7 millimètres. There followed a degree of constitutional disturbance about equal to that in the other case, continuing for about 48 hours, but on the 6th day he was walking about, and after having a catheter, of dimensions equal to the urethrotome, passed on the 11th day, he was dismissed on the 15th. The operations were quite recent at the time of publication, and ultimate results are out of view. The observations which Senhor Barbosa has appended to his paper, point chiefly to the over use of instruments in immediate sequence to the operative proceeding. The circular contractile fibres, he says, immediately under the mucous membrane of the urethra, are perpendicular to the course of the canal, and they require no tensive force to keep them asunder, and have no tendency of themselves to form a scar. This has been proved by the experiments performed by Reybard upon animals; it is no less our ordinary experience, from the results of lithotomy. It has mostly happened that cicatrization has been brought on artificially, according to him, by the pressure of an irritating foreign body, inducing suppuration or effusion of reparative lymph, which ultimately becomes as retractable and obstructive as the original stricture itself. He objects, also, that the gum catheter, when left in the bladder, draws the urine, by a sort of capillary attraction, to the point of lesion, where it remains as a source of irritation, which is not intermitting, but permanent. On the other hand, the cut part, if left to itself, films over with a little thin lymph, and speedily takes on the habit of a mucous membrane.

ART. III.—*On the Food of Man in relation to his Useful Work.* By LYON PLAYFAIR, C.B., F.R.S., Professor of Chemistry in the University of Edinburgh, &c. &c.—pp. 54.

THIS is a paper deserving of an ampler notice than, owing to its having been received late, we can give it. Of large views, founded on advanced physiological and organic chemical knowledge, it will well repay perusal and study. The subject is discussed by the author with a precision near akin to mathematical, and the conclusions he draws, for the most part, appear to us unquestionable.

A follower of Liebig, he adopts, *in toto*, that philosopher's great generalization as to the nature of food, holding that whilst the nitrogenous plastic materials may serve vicariously for the production of heat in the animal body, the other class, the amylaceous and saccharine, the natural heat-givers, are incapable of becoming flesh-feeders.

Proceeding on the principle that all dynamical effects of the animal depend on the transformation of tissues, and that the plastic element of food is the exponent of dynamical action, he adopts, with some modification, the hypothesis of the Rev. Dr. Haughton, that the urea excreted may be taken as the measure of work, and that there is a direct ratio between the food used and the work done, much in the same manner as in a steam-engine, with this difference, however, that in the one, the engine, the fuel, the material production of the working force, is supplied directly from without, whilst on the contrary, in the other, the animal, the material generating the force is supplied from within, from the active muscles themselves, the proportion of urea formed indicating their waste, and that waste showing nearly the quantity of food required to keep the muscles in working order.

Besides the urea, Professor Playfair shows that the nitrogenous material of the alvine excretion should be taken into account in the calculation of expenditure of food, and of the proportional quantity required according to the work to be accomplished. He is of opinion that the fæcal matter, in the instance of health, does not contain any refuse food, but is entirely formed of excreta evolved in process of digestion—a view which, we think, requires further research, the facts advanced being hardly sufficient in proof of its correctness.

ART. IV.—*On the Method of the Study of Mind: an Introductory Chapter to a Physiology and Pathology of the Mind.* By HENRY MAUDSLEY, M.D. Lond., M.R.C.P., &c.—*London*, 1865. pp. 31.

THIS introductory chapter of Dr. Maudsley's contemplated work we have read with pleasure, and, from the philosophical spirit and logical manner in which it is written, feel that it augurs well of what is to follow.

He describes, with some eloquence, the progress of knowledge, of that knowledge with constitutes science, discriminating well the difference between the ancient and the modern method of inquiry,—the one barren of practical results, as much as the other has been fruitful of them.

As an example of his vigorous and thoughtful, though, as we think, somewhat unduly abstract style, we quote the following passage, descriptive of the latter method, and of the instrumental aids to which it owes so much of its success :

"The adoption of the inductive method, which makes man the servant and interpreter of nature, is in reality the systematic pursuance of the law of progress in organic developments : it is the conscious intending of the mind to external realities, the submitting of the understanding to things,—in other words, the increasing speciality of internal adjustment to external impressions; and the result is a victory by obedience, an individual increase, through adaptation, to outward relations, in accordance with the so-called principle of natural selection. The mental capacity of one who is deprived of any one of his senses, which are the inlets to impressions from without, or the gateways of knowledge, is less than that of one who is in full possession of his senses; and the great advances in science have uniformly corresponded with the invention of some instrument by which the power of the senses has been increased, or their range of action extended. Astronomy is that which the eye has been enabled to see by the telescope; the revelations of the inmost processes of nature have been due to the increased power of vision which the microscope has conferred; the extremely delicate balance has supplied to science a numerical exactness; the spectrum has furnished a means of analysing the constitution of the heavenly bodies; and the galvanometer already gives the most hopeful presage of important discoveries in the nervous function. Through the senses has knowledge entered; and the intellect has in time devised means for extending the action and increasing the discriminating exactness of the senses : there has been action and reaction, and progressive specialization and complication thereof. The two aspects of this relation we designate, in their highest manifestations, as cognition and action, or science and art."

He next proposes to himself whether this method, the true inductive and objective method, is applicable to the investigation of psychical as well as physical nature, coming to the conclusion, that rightly, judiciously used, not neglecting the subjective, it is so applicable.

He controverts ably the idea that self-consciousness suffices to furnish the facts of true mental science, as maintained by Descartes, and in an empyrical way by the Scotch school of metaphysicians.

He holds, "That the deep basis of all mental action lies in the organic life of the brain, the characteristic of which in health is, that it proceeds without consciousness;" and that the right way to cultivate mental science is by associating it with the study of physiology and pathology, human and comparative, expressing the confident hope that as these are advanced, so will that advance. He concludes with the ancient and well-grounded maxim, "Learn to know thyself in nature, that so thou mayest know nature in thyself;" to which we will add another maxim, new to us, and which we believe we owe to the author : "Happily, it is certain that in the mortality of man lies the salvation of truth."

ART. V.—1. *Dr. Spencer Thomson's Handy-Book of Domestic Medicine, containing the latest Information on the Treatment of Sickness and Disease.* Part I.—*London*, 1864. pp. 46.

2. *A Manual of the Domestic Practice of Medicine.* By W. B. KESTEVEN, F.R.C.S.—*London*, 1865. pp. 339.

OF the use of works on domestic medicine, there is ample scope for discussion and difference of opinion. To have what is their first requisite, safety, they require in their authors the soundest judgment and the most exact knowledge, and a limit as to details, affording security that they are not designed to render their readers domestic practitioners, superseding the educated physician and surgeon.

We think that Dr. Thomson's Handy-Book, in the form of a dictionary, is little open to objection, and that from its comprehensiveness, not restricted to "sickness and disease," as its title would indicate, but including anatomical, physiological, and sanitary information suitable to the general reader, it is deserving of commendation, and likely to be extensively useful: that it has passed through eight editions, as the author informs us, is a proof at least of its popularity.

Of Mr. Kesteven's manual we have to express a more careful opinion. The introductory chapter, on hygiene, diet, &c., however, is most sensibly written, and contains safe and useful directions. The after portions, the strictly medical ones, appear to us to be too medical, and not always quite in accordance with our experience. Thus, in the table of prominent symptoms, "a high-coloured and abundant urine" is assigned as distinctive of diabetes; and further on, where treating of diseases, we are informed that "worms" do not constitute a disease, and that the so-called symptoms of worms "are common to most disorders of the bowels."

The author specially advises "the use of such medicines only as may *safely* be entrusted to a prudent person," and yet we find very few of the whole Materia Medica excluded. In his classed list, under the head of narcotics and sedatives, are the following:—Belladonna, camphor, chloric ether, creosote, Dover's powder, hemlock, henbane, laudanum, morphia, paregoric.

So far as we have referred to those pages relating to treatment, in no instance do we find him, even in the most dangerous and alarming diseases, exhorting the having recourse to professional aid as soon as possible, not even in angina pectoris and apoplexy. And so extensive is his range of diseases of which the symptoms and treatment are assigned, that even beriberi is not passed over. The only reason we can imagine for this amplitude of medical instruction, is that the book may be consulted where no professional aid is procurable. We remember once being so situated; it was in a wild part of the Highlands, where angling tempted us. The keeper of the preserved waters met us on the high road, driving a cart, conveying his little pallid and feeble daughter to the minister, to have his advice about her ailment. At our desire, he went on, and met us, bringing the child with him, the following morning. The diagnosis of the minister was that she was troubled with worms. We examined her, and found her labouring under pneumonia, with partial consolidation of lung.

In the majority of cases, especially of acute disease, it is a question whether it would not be better to trust to the *Vis Medicatrix* than to domestic medication, necessarily hazardous in proportion to its activity, and the potency of the drugs administered.

ART. VI.—*Delineations of the Brain in relation to Voluntary Motion.* By JOSEPH SWAN. With Plates.—*London*, 1864. 4to, pp. 28.

IT was with feelings akin to reverence that we took up this work of the veteran anatomist who in our early days, by his lucid descriptions and delineations, helped us to our first acquaintance with the nerves, and their distribution in the human body. We cannot refrain from the expression of this sentiment, as we shall be compelled to withhold our entire assent to the illustration of the structure of the brain by Mr. Swan.

Mr. Swan divides each hemisphere of the brain into three longitudinal regions—the median, the intercedent, and the external. The *median*, occupying the convolutions placed near the median line, are continuous with those of the opposite hemisphere by the great commissure, and, according to the author, not receiving any tracts from any organ of the body, is appropriated entirely to the intellect. The *intercedent* region is, between the median and the external regions, connected, Mr. Swan states, with all the cerebral and spinal nerves, which are traced by the author through their several tracts to the convolutions in order, from before backwards. The *external*, or *motive* region, is continuous by the external convolutions with the intercedent region. These regions are again subdivided into separate sections and tracts of convolutions. They are further traced by the author as distinct tracts, passing down into the crura and medulla, these tracts being delineated in eighteen plates, comprising forty illustrations. The drawings are well executed, but just a doubt passes through the mind as to how far some of these tracts may have been drawn from the author's imagination. In venturing thus to hint the slightest dubiousness on the demonstrations proffered by Mr. Swan, we are bound to show some ground for this want of faith. In the following quotations we have indicated by italics the views from which we are compelled to dissent:

"It will be seen that the nervous roots in the anterior and lateral portions of the spinal cord, bounded by the denticulated ligament, and constituting the motive nerves *arising from the spinal cord, are actuated by corresponding tracts proceeding from the sections of their respective layers in the exterior region of the brain. The more central tracts and nerves arising in the deep fissure, therefore, belong to the flexor and extensor muscles of the spine itself; those placed more outwardly to the flexors and extensors of the lower extremity, than those of the* *extensors and flexors of the upper extremity and neck, and the outermost of all those of expiration.* On the posterior part the nerves belong to the sensitive and involuntary functions. *The nerves appear to issue from the grey matter of the spinal cord itself, and to be conducted through the white fibres in layers placed somewhat obliquely, for reaching each of the several tracts descending from the brain,* and being then very delicate, are accommodated and sustained beneath the pia mater, just before they become fibrils, for collection into their respective nerves." (p. 5.)

Again:

"Two distinct powers are required for corresponding with two different sets of muscles, for flexion and extension, and the layer appropriated to each power is divided into sections, and each section terminates in a tract. The tracts of either layer do not become combined into *a single column in their course to the spinal cord, but a tract from each layer meets together to form a separate pair, and each pair passes through the crus and the medulla to the spinal cord, and one pair only through the oblong medulla alone to the spinal cord.* There are therefore four distinct pairs of such tracts entering the spinal cord and giving off their respective nerves." (p. 5.)

Without hesitation, but with much deference, we submit that no such tracts as are here described can be discovered either in the spinal cord or in the medulla oblongata, neither by longitudinal, nor by transverse sections; neither do there exist in those structures anatomical differences to warrant the physiological differences laid down by the author. The *tractus* intermedio-*lateralis* of the spinal cord, consisting as it does of a group of cells, in connexion with the lower roots of the spinal accessory, is in no respect comparable with a tract of fibres in communication with cerebral convolutions. The existence of fibres extending throughout the length of the cord, or even of any considerable portion of the cord, has never yet been seen by the most careful microscopical observers. Since, therefore, the most careful observers have failed to detect any such arrangement as described by the author, in the medulla or cord, we are compelled to accept with some hesitation the views propounded by the author, with regard to the structure of the brain, although we are quite prepared to admit, with Mr. Swan, that

"The division of the exterior region of the brain into layers, sections, and tracts, is in the highest degree convenient for allowing the properties and functions of each to be administered with precision for exciting the required kind of emotion of the muscles, either in large or small groups," . . . . . and that "The same arrangement is most beneficial for obviating the spread of disease. It permits the morbid actions begun in any particular section to be confined there, and the symptoms thus partially produced to be often sufficiently premonitory for giving time, not only for curing the disorder, but for preventing its communication to neighbouring parts, or to other sections and tracts."

We can see how much support is afforded to these anatomical views by the phenomena of various forms of paralysis, in which we often see the affection restricted to single organs or limited parts. We know from experience that a greater or less extravasation of blood will produce extensive or partial paralysis; or, annihilating at once all nervous power, prove wholly fatal in sudden apoplexy. Such generalities, however, do not partake of the precision with which the author has delineated separate tracts of brain structure reaching from their appropriated superficial convolutions in distinct bands, to traverse the cerebral organs, and enter the medulla and spinal cord. Morbid anatomy not unfrequently shows extensive functional derangement to have proceeded from very small local damage; and, on the other hand, extensive morbid changes, without even recognisable symptoms having occurred during life.

Notwithstanding that we cannot follow the author in his conclusions, we should be among the last to withhold the thanks due from the profession of medicine to Mr. Swan for the labour he has undertaken, and the efforts he has made throughout his life to advance our knowledge of the anatomy and physiology of the nervous system.

ART. VII.—*Notice sur l'Hôpital Saint Jean : Étude sur la Meilleure Manière de Construire et d'Organiser un Hôpital de Malades.* Par ANDRÉ UYTTERHOEVEN. Deuxième Edition.—*Bruxelles*, 1862. pp. 290.

Notice of the St. John's Hospital: an Essay on the Best Plan of Construction and Organization of an Hospital.

THIS work has but recently been brought under our notice, although it has reached a second edition, the first edition having been published in 1852. It is the production of a medical man, an honorary surgeon-in-chief of the Brussels hospitals. The account of the St. John's Hospital serves, so to speak, as a text for discussing the various principles of hospital construction and organisation. The particular hospital in question was commenced building in 1838, but not completed for the admission of patients until the autumn of 1843. It is situated within the city, on the wide Boulevard du Jardin Botanique. This situation, within the boundaries of the city, is regarded by the author as an error; the proper site would be outside the town, on an elevated and dry spot. The hospital consists of two principal portions—one abutting upon the boulevard, and forming a hollow square, being occupied with the general offices and the residences of the various officials, the museum, library, &c.; the other, composed of nine detached pavilions, arranged in two rows, one on either side a wide central avenue, or garden, is devoted entirely to the accommodation of patients. The ground-floor of each pavilion is occupied by male, and the floor above by female patients. Three of the pavilions are set apart for fever cases, and the upper floor of two others is used for lying-in wards; the operating theatre constitutes the terminal building on the side on which only four pavilions are present. The pavilions on each side are united by a covered corridor. Though approving this pavilion system, the author points out that, in the Brussels hospital, the courts interposed between the several pavilions are too narrow, and that, in consequence, the necessary isolation, the circulation of air, and the ventilation, are rendered defective. Moreover, the corridor of communication is continued not only on the ground-floor, but also along on the level of the first floor, and being enclosed and closely attached to the several pavilions, it becomes, as is rightly observed, a common channel to all of them for the reception and mixing together, and diffusion of their foul air and exhalations.

Contagious maladies, such as small-pox and cholera, M. Uytterhoeven would not treat in town hospitals, but remove their sufferers into the country immediately on the appearance of the diseases; not, indeed, to a specially constructed, costly structure, but to the simplest form of building, affording shelter from the weather. Cases of fever, of scarlatina, measles, dysentery, and of infectious skin diseases, he would likewise exclude from a general hospital, and treat them in special institutions. The divisions recognised by him as necessary are—for children, for accidents, for chest diseases, for delirious patients, for patients who have undergone operations, for lying-in women, and for convalescents.

The author proceeds to describe in detail the construction and fittings of the wards of St. John's Hospital. Into the particulars of his description we cannot, however, follow him; suffice it to say, that each ward contains twenty-four beds, arranged in pairs between the windows along the opposite sides of the room; the beds are three feet apart, and a central space, twelve feet in width, extends the entire length of the ward. Six cubic mètres of perfectly pure air, supplied hourly to each bed, he adjudges necessary to be secured by an efficient system of ventilation. In the hospital in question, ventilation is provided for by means of a chimney at each end, and of three apertures placed above as many windows on each side the ward, and communicating with the external air by small shafts rising a certain height above the roof. The provision thus made, M. Uytterhoeven holds to be insufficient; and after a brief, but sensible examination of the principal plans of ventilation proposed, this gentleman proceeds to describe his own views and projects, illustrating them also by suitable engravings. By permission of the hospital authorities his plan has been carried out and tested in one of the wards, and apparently has succeeded admirably. It consists in placing an extracting shaft at each end, and on each side of the ward, to withdraw foul air, and in introducing fresh air from without, through square zinc pipes, opening at each corner, and also near the centre of the room, in the immediate vicinity of the stove for heating.

In a brief notice like the present we are unable to cull more from the author's examination of the details of structure and management as we might otherwise wish to do; but we have much pleasure in recommending the work to the careful study of every person interested in the construction or in the government of public hospitals, on which topics it forms an excellent and well-written manual. The dietary is described at large, and also the rules for nurses and for the general direction of the establishment.

ART. VIII.—*A Dictionary of Science, Literature, and Art; comprising the Definitions and Derivations of the Scientific Terms in General Use; together with the History and Descriptions of the Scientific Principles of nearly every branch of Human Knowledge.* Edited by W. T. BRANDE, D.C.L., &c., and the Rev. GEORGE W. COX, M.A., &c., Parts I., II., and III.—*London.*

THIS dictionary, in former editions, has secured to itself a very high position among works of a similar scope and character; and in the edition now in course of publication, in monthly parts, it promises well to maintain it.

The editors tell us that the progress of knowledge has been so great since the first edition appeared that it has "been considered advisable to re-write or re-edit it throughout, and thus to make it an entirely new work."

"The plan of this edition differs slightly from that of the former .... it has been the object of the editors, while retaining the readable character of the work, to diminish the extreme length of some of the articles, and to increase their number."

We have examined the three parts as yet published, and can, from the insight they afford us as to the character of the work, and from the manner in which it is produced by printer and publisher, strongly recommend this dictionary to our readers. Embracing as it does within its scope the terms and the leading principles of science, literature, and art, the definition of the terms used in those branches of knowledge, and the exposition of the leading facts pertaining to them, are, for the most part, necessarily brief.

Naturally, we have examined more carefully the definitions of medical terms and the fuller expositions given of the leading divisions of medical science; and we regret to have to state that this medical department of the dictionary is the least satisfactory in its performance. An indifferent execution is also discoverable in some of the physiological and zoological articles.

Indeed, we think medicine and medical terms might have well been omitted without detriment to the work; at all events, the feeble and summary notices of treatment should not have place in it. Even where few might question the positive correctness of the treatment indicated, though oftentimes the measures advised are at best of doubtful expediency, the statements made are too sketchy and indefinite, and can impart no other than that amount of knowledge which, in physic certainly, is a dangerous thing. The following is a string of articles and definitions to which objections may be urged by reason of manifest deficiencies and inaccuracies: Anatomy, apophysis, apoplexy, acineta, amorphozoa, algæ, balneum, cancer, caries, cilia, desmidiaceæ, diatomaceæ, consumption, convulsions, delirium tremens, diarrhœa, digestion, diarthrosis, &c. The article Anatomy is of some considerable length. The biography of Dr. William Hunter occupies a very large space in it; a much shorter account is given of John Hunter, whilst Harvey's contributions to the science are summed up in a few lines. The muscles, we are told, are dependent for their powers of contraction and relaxation upon the nerves; and these last "enter into, and are, as it were, lost in the substance of the muscles and other organs of the body;" and ganglions are formed by the swelling of nerves into knots. The history of the digestion of food ends with the time of Dr. Hunter, whose celebrated description of what the stomach is not, in the work of digestion, is adduced as a sort of extinguisher upon further inquiry as to what the functions of that organ in the human economy really are.

Consumption is a subject discussed in one column of page 539: its symptomatology, pathology, and treatment. Such an account is valueless to the non-professional as well as to the professional reader. An attempt to act upon the directions for treatment would be mischievous in its results. It is unnecessary to justify our critique upon the descriptions of the other medical terms in the above list; a medical reader will at once discover in them either defective or inexact information. But in the list in question are other words, the account of which is equally open to criticism. Subjects relating to the lowest forms of animals and plants seem to have escaped the examination of any person thoroughly versed in them. Acineta is most erroneously described as a genus of infusoria allied to Vorticella, and the exploded transformation theory of Stein thus improperly revived. The algæ are said to be destitute of all signs of sexual organs, and yet it is added, "The zygnemas actually copulate;" and recent researches go more and more to demonstrate sexual variations in the reproductive organs of this class of plants. What aquatic plants are included among algæ is undefined.

Amorphozoa is stated to be the lowest organized class of Protozoa or Acrita, and to comprehend porifera, desmidieæ, diatomaceæ, and gregarinidæ; whereas all modern observers refer the desmidieæ undoubtingly to the vegetable kingdom, and most among them allocate the same position to the diatomaceæ. Further on, too, the desmidiaceæ are spoken of as "plants" (p. 655), "made up of a chain of connected joints, increasing by the continued addition of two new half-joints in the centre." However, this chain-like structure belongs not to the desmidieæ as a class, but only to two or three of its many genera. The whole account presented of the desmidieæ, and of the diatomaceæ also, is meagre, and conveys no accurate conception of the beings intended. To cite one other word of a more general character, viz., Balneum; we take exception to the assertion that the public baths of the Romans were what we should call warm baths; for they were assuredly much more than this, and deserved a less summary notice. Something more, indeed, is said about Roman Baths, under the heading "Bath;" but, after all, the reader acquires no knowledge of their real character and arrangements.

To a medical man the defects pointed out, applying as they do chiefly to medical matters, will detract little from the general merit and utility of this Dictionary. He will certainly not refer to it for a definition of medical terms, but to a medical dictionary; and will as certainly take no heed to the abortive description of treatment to be followed in various maladies, a description which only encumbers its pages.

In future parts of the work we trust to find fewer imperfections in the medical articles introduced, and a more satisfactory and accurate account of the animal and vegetable forms of microscopic existence.

ART. IX.—*Como Actuam as Substancias Branca e Cinzenta da Medulla Espinhal na Transmissão das Impressões Sensitivas e Determinacões de Vontade.* Pelo Dr. PEDRO FRANCISCO DA COSTA ALVARENGA.

On the Mode of Action of the White and Grey Substances in the Spinal Cord in the Transmission of Sensation and the Dictates of the Will, Thesis, &c. By Dr. PEDRO FRANCISCO DA COSTA ALVARENGA, Member of the Royal Academy of Sciences at Lisbon, &c.—*Lisbon*, 1862. pp. 37.

THE pamphlet before us is a university thesis, if we may give that term to a *tour de force* of intellectual character, made under the most stringent regulations in a particular period of a professional career: in fact, a *concours*, or examination by competition. We hope that there are many among us who are practically as familiar with the bearings of the facts enunciated in this little work as with the ordinary duties of the profession. This will not, however, prevent us from remarking on the merit which can so readily and with such completeness sum up the life-wearing anticipations of the devotees of science in short well-ordered paragraphs. Although the choice of a subject was in this case wholly denied, yet we are not permitted to perceive any want of that copiousness and lucid arrangement which have been supposed to result exclusively from a well-pondered selection. Nowhere have we been more pleased with the perusal of scientific truths, written in a language which only differs by a shade from the Latin. It remains to be said that this facility and this fulness are precisely what we had reason to expect from the accomplished editor of the Gazeta di Lisboa.

ART. X.—1. *Transactions of the Odontological Society of Pennsylvania.* Vol. I.—*Philadelphia*, 1864. pp. 149.

2. *Kingsley's Treatment of Congenital Cleft Palate and Artificial Velum.*—*New York*, 1864. pp. 19.

3. *Cleft Palate and its Surgical and Mechanical Treatment.* By EDWIN SERCOMBE, M.R.C.S. ('Med. Chir. Trans.')—*London*, 1857. pp. 100.

IT is seldom our fortune to have in hand a more readable and better got up volume than the one at the head of our list, published by a society of dentists at Philadelphia. There is, indeed a faculty of combination in American society which seems derived from a German source, nothing weakened by an Iberian intermixture, and it bears, in in a thousand ways, such kindly fruit that it may be worth while to survey its "modus operandi," in order to remark wherein it differs from our own. The constituent members of the society seem not at all necessarily many—let us say a dozen. They indulge, to all appearance, in exclusiveness further than we are accustomed to see it allowed. In the past century, when America was founded in adversity, equal precautions may possibly have been in practice with us here; for example, in one of the most important of their rules we see all written recommendations for membership are to be presented under signature of two members of the association.

Article I.—The name of the candidate shall then be referred to the Executive Committee (consisting of three members), and if his qualifications shall be satisfactory to a majority of that committee, &c., &c., he shall be balloted for, two-thirds of the votes cast being necessary to his election.

We draw attention also to the following.

Article XI.—The Executive Committee, with the president, and two seecretaries (recording and corresponding secretaries), shall have a general superintendence over the affairs of the society, particularly the publication of its transactions, &c., &c. They shall select twelve or more members annually to prepare essays to be read at the monthly meetings.

Article XII.—In accordance with the constitution of the American Dental Association, one representative for every five of the active members of this society shall be annually elected as delegates to that body.

We shall indulge lightly in a very few remarks on the further contents of this work.

The opinion that the use of tobacco, except when taken as snuff, is generally favourable to the preservation of teeth, is one we see generally maintained in the course of the first essay read at the Pennsylvanian society's meetings, namely, that on dental caries, by Dr. C. P. Fitch, of New York, and we observe it reiterated in the course of the discussion; if accepted as a fact, we must suppose it to be due to the alkaline character of the saliva which increases in its flow under use of the weed. An assertion also meets our eye, that the French and Spanish races in the Southern States are comparatively free from dental decay. On the other hand, the Irish immigrants, not unfrequently arriving with perfect teeth, in the course of a year or two of residence in America, lose all superiority in that respect; whether from varied diet or bad habits of feeding, their teeth are observed to fall into caries with most extraordinary rapidity.

It is unnecessary, as well as impossible, for us to specify what points of discussion and conclusions of practice engaged the attention of this society: we shall merely mention the valuable assistance it appears to have derived from the co-operation of Dr. MacQuillen, professor of anatomy, whose paper on the anatomy and physiology of expression is so agreeably written as to form a pleasing addition to the transactions. This paper is followed by a descriptive essay on the teeth, in relation to mastication and speech, from the same hand. It is by such productions, every way appropriate to the hour, that local reputation is supported, and a certain rate of progress maintained, which gives to the American dentist, all the world round, a prestige and confidence which have resulted in a sort of priority of claim over his neighbours. We have, it is true, met with English dentists who are accustomed to speak of their American *confrères* as afflicted with a real dearth of invention, and as only happy in parallel discoveries, and a rapid knack of borrowing per steamer; and they refer to the pages of American dentistry for proof. The fact that inventive power is indwelling in the transatlantic nation, whether developed in activity or not, none, we think, will presume to question, any more than we should deny the benefit which has accrued to humanity from the discovery of the application of anæsthesia to surgery, through the ingenuity and persevering talent of an American dentist.

In a path far less novel and striking than this last mentioned, Mr. Kingsley deserves credit for his diligence and application, in endeavouring to mitigate one of the most distressing defects under which a sensitive and intellectual person can labour, namely, fissured palate: this mal-formation is a stumbling block in the advance of surgical art, which has baffled the keen wit of many an endeavourer; in its treatment, we have too often met with apparent successes, which do not improve by time, nor are we reconciled to their results by the most prolonged acquaintance.

We cannot but say, however, that in dealing with these cases, purely mechanical contrivance has, of late years, given striking signs of progress; and it is in this direction that success seems to lie most open to the talent of the operator.

Dr. Kingsley's instrument, as described by him at the Society ot Pennsylvania and elsewhere, is undeniably complex, and it cannot, with any degree of correctness, be affirmed that it may be modelled with ordinary facility, and with ease to the patient; nor can it ever, we think, offer itself as other than an expensive instrument. Moreover, it does not appear adapted to cases of destruction of the soft palate by disease. It requires, indeed, that the muscular machinery which moves the moieties of the natural velum should be in an active and efficient state, for it is upon the mobility imparted to the apparatus by the muscles that its usefulness depends; the material also, from not being so highly vulcanized as to destroy its elasticity, is liable to be acted on by the animal fluids, and would necessarily require renewal throughout from time to time—a renewal which, as it seems to us, would severely tax the skill of an ordinary dentist. When longer trial has tested the validity of these *primâ facie* objections, we shall be able to appreciate the value of such original features as belong to it. The speech of the patient is, as might be expected, at first only more embarrassed under the use of the instrument, but subsequently, according to the inventor, it is much improved, so long at least as the instrument is worn; but after having made use of it for a time, the patient is entirely dependent on it, as whenever he omits its use, his speech is more defective than ever.

For these reasons we are inclined, in part, to suspend our judgment until we witness results which are superior to the method of Sercombe, the great merit of whose plan lies in its simplicity, there being no aim higher than that of arriving at good results by simple means. The abnormal parts are in this method artistically covered in and not otherwise disturbed. Although originally intended for congenital cases, it is equally applicable for the devastations which are the result of disease; we are inclined, too, to give to this method a decided preference over the surgical proceedings of Roux, Fergusson, and Pollock, certainly so long as the voice is not entirely established by their operations; for this is the principal, if not the only object, and it is not on this point we think that they would challenge superiority.

In concluding, we cannot refrain from noticing a certain claim to priority both as to form and intention, which Mr. Stearn, a countryman of Dr. Kingsley's, once practising in London, possesses. This gentleman's method is published in the 'Lancet,' 1845; his practice was, we believe, only in few cases successful.

It is the due of every man who obliges society by his talent and patient industry, that he should be valued in proportion to the extent of benefit which humanity obtains at his hands, so far as the fruit of his ingenuity is offered in simplicity, and with an ungrudging heart. The compliment paid by one of the Committee of the Society of Pennsylvania to Dr. Kingsley for the "high stand" taken by him in not holding back his "secret," and patenting it, seems to have resulted in the vote of a gold medal, or some such testimonial. It follows naturally that such compliments must have been paid at considerable expense to those inventive natures who prefer "a bird in the hand" to any such flattery as is implied in the adoption of their methods by their brethren in art. Though it may be rare, indeed, that an American can refuse to do "something smart," we shall acknowledge, with pleasure, an exception in the present instance, and if we are permitted to observe the early adoption of Dr. Kingsley's apparatus by the surgical profession, we shall be among the first to congratulate him on having relieved the wretchedness of others when so many direct their thoughts to the profit which may accrue to themselves.

ART. XI.—*Beretning om Födselsstiftelsen i Christiania i Sexaars Tidsrummet fra* 1858 *til* 1863. Ved Dr. F. C. FAYE, Professor i Accouchement ved Norges Universitet, Overlæge ved Födselsstiftelsen og Börnehospitalet i Christiania.

Report of the Lying-in Institution in Christiania, for the six years from 1858 *to* 1863. By Dr. F. C. FAYE, Professor of Midwifery in the University of Norway, Principal Physician to the Lying-in Institution and to the Children's Hospital in Christiania.—8vo, pp. 128.

THE number of lying-in women in the institution during the six years over which Professor Faye's present report extends, was 919, of whom 765 were unmarried, and 154 were married. In addition, 75 females were treated for diseases of the genital organs, of whom 60 were married, and 15 unmarried; making the total number of women admitted 994, of whom 214 were married, and 780 unmarried.

Of the parturient cases, the head presented 655 times in the first position, 211 times in the second, once in the third, and twice in the fourth. The face presented twice, the breech nineteen times, the foot six times; compound breech presentation occurred once, transverse presentation occurred four times. There were 9 cases of twins; of these 18 children 13 lived, 5 died between quarter of an hour and some days after birth. In one case, the twins were born two months before their time. Premature birth occurred (independently of those cases where it was artificially produced) in 17 cases. In 11 instances the children were still-born, 5 died in the institution, and 1 left the house in good health.

The forceps was used 27 times, being once in 34 cases of head presentation. Turning was performed in 5 cases. Premature delivery was artificially induced in 4 instances, on account of narrowing of the pelvis.

Artificial removal of the placenta is an operation which has for some years been more and more rarely resorted to in the iustitution, as the observation has not unfrequently been made, that artificial assistance, under the circumstances existing in a clinical lying-in hospital (repeated examinations by the students and midwives in connexion with other obvious causes of disease in an hospital), more frequently gives rise to puerperal affections than when other means are employed to promote the contraction of the uterus, and the consequent spontaneous expulsion of the after-birth.

Hæmorrhage after delivery occurred in 10 cases, prolapse of the funis in 9; twisting of the funis round the neck of the fœtus occurred 171 times (1 : 5·4), in 137 instances with a single, in 25 with a double, and in 9 with a treble loop. In one case a true knot was found on the cord, but the loop was so loose that no compression of the bloodvessels took place. The child was living, and well developed.

The author next proceeds to describe the unhealthy state of the hospital during the six years; and first refers to 8 cases of delivery, already described in the thirteenth volume of the 'Norsk Magazin for Lægevidenskaben,' in which the result was fatal: five times from rupture of the uterus; once from the bursting of an ovarian abscess; once from thrombosis, with sudden collapse occurring after delivery; and once a couple of days after normal delivery, where the liver and kidneys were degenerated, and exhibited superficial extravasation of blood in a woman who had been addicted to the use of spirits, and in whom chloroform had been employed during labour. Of these cases, four belong to the period of the report. Besides these women, one died suddenly without previous indisposition, a week after normal delivery, with symptoms of suffocation and loss of consciousness. On dissection, no abnormity was met with in any organ. The diagnosis of thrombosis in the pulmonary artery was made; but, from the negative nature of the post-mortem examination, the case must be referred to the numerous instances of sudden death during labour and convalescence, the true nature of which is still unknown. Two other cases of sudden death are described; in one, embolism was suspected, but no post-mortem examination was permitted; in the other, the patient came in suffering from eclampsia, though her symptoms were rather those of sinking vitality. On post-mortem examination, an exostosis was met with on the inner surface of the frontal bone, which may gradually, by pressure on the brain, and in connexion with puerperal congestion, have produced the abnormal state; there was tubercular deposition in the lungs, and the walls of the urinary bladder were thickened and infiltrated with purulent matter. The author suggests that this patient had probably laboured under syphilis, though on this point no positive information could be obtained.

Since 1850 every effort had been made, by improving the ventilation of the wards, and by isolation of the sick, to free the institution from endemic influence; and the author had hoped that such means, with strict personal cleanliness on the part of the attendants, would have been successful. But in the year 1859, a peculiar affection, in the form of diphtheria of the genitals, attended with depression of the vital powers, remarkable in contrast to the inconsiderable local phenomena, broke out in the hospital, and in the first half of the year carried off 15 puerperal women. Some cases had occurred in the previous year. Thus, in 1858, in a lying-in woman, who subjectively felt quite well, and was entirely free from any abdominal pain or tenderness, the pulse began to increase in frequency, the face assumed an appearance of depression, a clammy sweat broke out, and the hands and feet grew cold. Death occurred under these symptoms so insidiously, and without suffering, that the patient herself said she felt quite well, except that she was weak. Close examination of the genitals showed that the mucous membrane, from the orifice of the vagina through the vagina and part of the cavity of the uterus, was lined with a viscid, very thick and cheesy matter. No exudation was found in the abdomen, but there was fibrinous and partly broken-up deposition in the ligamenta lata. A similar morbid tendency showed itself also outside the hospital, and diphtheritic affections were at the time frequent in the surgical division of the Royal Hospital; but the intensity exhibited by the disease in the wards of the lying-in institution could probably not be ascribed exclusively to an epidemic morbid constitution. It is worthy of remark, that the women affected belonged in general to the lowest class in society, whose physical and psychical condition makes them more liable to puerperal disease, and less capable of contending with the same than those who are more fortunately circumstanced; still it was evident that an endemic influence was at the same time at work. In other words, it could not be doubted that the morbid matter (ferment, contagium) which found an entrance through the genitals, and perhaps through the lungs, and produced the peculiar adynamic febrile state, was intensified in the wards of the institution, as has so often been the case in different epidemics.

The failure of such means as particularly careful ventilation, a more limited occupation of the wards, and a strengthening, prophylactic treatment of the patients from the time of their admission, to prevent the occurrence of the diphtheritic affection, directed the attention of the author to an arrangement which had some months previously (namely, at the close of 1858) been adopted precisely with a view to act advantageously upon the hygienic state of the air in the wards; but respecting the suitability of which plan Professor Faye now began to entertain great doubt. The plan in question was, in fact, the constant development of ozone in the wards; and the mode employed to produce this agent was to place in a cup with water a few pieces of phosphorus, so that the water might half cover the latter. Each cup was protected with a fine network of metallic wire, to prevent accident by fire, if the cup should be exposed to too great heat. In this way the oxidation of the phosphorus produces a constant development of ozone, but at the same time hypo-phosphorous acid is developed, part of which is absorbed by the water, while another portion of the oxidized phosphorus is diffused as a fine vapour through the air of the apartment. The author adds, in a note, that Meissner ('Untersuchungen über den Sauerstof,' Hanover, 1863) assumes the existence of an "ozone" which oxidises, and of an "atmitzon," which forms vapour, and combines with the water. This latter corresponds to Schönbein's "antozone." The vapours of phosphorus would, therefore, be a mixture of antozone and oxide of phosphorus. (See 'Medic. Jahrb., Zeitschrift' der k. k. Gesellsch. der Aerzte in Wien, 2 and 3 H. pp. 191, et seq.) To test the amount of ozone thus developed, ozonoscopic slips of paper were hung up in the wards, and were compared with an "ozonometer" (test-paper in a glass cylinder) suspended outside the house, in the open air. It was thus shown that ozone was much more abundantly present in the wards than in the open air.

The experiments were commenced in December, 1858, and were continued during the first four or five months of 1859, at a time when some cases of diphtheria had appeared in the Institution, and when similar affections, as has already been mentioned, manifested themselves in the town and in the surgical division of the Royal Hospital, where this morbid condition gradually became so prevalent, that extraordinary measures (emptying the wards and cleaning the walls) had to be adopted to counteract the evil:

"The sanitary state of the Institution was, during the first month, on the whole satisfactory, as the cases of illness which occurred among the lying-in women in general yielded to treatment, even although some diphtheritic exudation had been present. But soon after the morbid condition began to be more general, while it exhibited the peculiar stamp which marks its occurrence in puerperal women. The margins of a slight rupture of the perineum, if such had taken place during delivery, were liable to be covered on the first day, before any general affection took place, with a greyish-white investment, or the latter showed itself in the vagina, and extended up to the uterus. If the patient's general health was not immediately affected, it could with certainty be foretold that an adynamic febrile state would soon set in, and with increasing frequency of pulse, cold extremities, depression of countenance, and cold perspiration, death often took place, while the patients subjectively felt well, and did not at all suspect the existence of any dangerous illness. The whole aspect of the case was not unfrequently that of a state of poisoning, such as is manifested under the influence of paralysing animal poisons. Exudation in the peritoneal cavity certainly occurred in most instances, but that this was of a passive nature was shown by the absence of tenderness and pain, or by the fact that these were produced in only a slight degree on pressure. Fibrinous deposition, with breaking up of the exudation, took place in the ligamenta lata, when reaction of the system was established, and when the strength was kept up by strengthening and stimulating means, the disease was also often retarded in its course. In more than half of the acute puerperal affections combined with diphtheria, the result was favourable, after a longer or shorter stay in the institution." (p. 35.)

As we have already said, the great intensity of the diphtheritic tendency in the Institution, notwithstanding the stringent hygienic measures adopted, led the author to suspect the development of ozone as being favourable to the epidemic or endemic cause of the disease. Bearing in mind the researches of modern times, which have demonstrated the existence, in the air, of various organic corpuscles of vegetable or animal origin, and which have shown that by the accumulation of such corpuscles many kinds of ferments may be engendered, Professor Faye set on foot, with the ready assistance of Mr. Ditten, a series of experiments with a view to ascertain whether the bodies in question might not thrive and multiply, especially in an atmosphere of ozone. Such, in fact, appearing to be the case, it occurred to the author to try the effect of the combustion of sulphuret of arsenic and sulphur in destroying these organisms. The result being satisfactory, he adopted the following plan of disinfecting the wards: Whenever one became vacant he had sulphur burnt in it, on a chafing-dish. The room was then closed for twenty-four hours, at the end of which time it was carefully washed out. In this way all the furniture, such as mattresses, linen, &c., can be fumigated without the least injury to the materials of which they are composed. Smaller articles may in like manner be disinfected in a closed drawer. Professor Faye mentions in a note that fumigation with sulphur was recommended in the last century for a similar purpose, by Dr. Leake, physician to the Westminster Hospital in London, to the German edition of whose 'Practical Observations on Various Diseases of Puerperal and Pregnant Women,"[1] published at Leipsic in 1775, he refers his readers. Other preventive measures, also, were adopted under Professor Faye's direction; and it appears, from the report before us, that the change from the use of ozone to that of fumigation with sulphurous acid was unmistakably beneficial, as from the time it was adopted the diphtheria immediately began to disappear as an endemic affection.

We have dwelt so long upon the important subject which has deservedly occupied much of Professor Faye's attention, and to the

[1] We translate the title of Dr. Leake's work from the German, as quoted by Professor Faye. On referring to Dr. Leake's 'Practical Observations on the Childbed Fever' (London, 1772), it does not appear that he ever used the sulphur at the Westminster Hospital, though, on the authority of Lind, he mentions the burning of it as a very powerful disinfectant. In addition to thorough ventilation, he mentions (p. 156), the sprinkling of the wards freely with *vinegar*—"a method which was constantly observed at the Westminster New Lying-in Hospital during the epidemical season.'

elucidation of which he has so ably contributed, that we can only enumerate some of the subjects treated of in the remainder of his valuable report. We have a chapter on the prophylactic and curative treatment of puerperal fever; the history of a case of the epidemic diphtheria of the genitals, in which, when the patient was rapidly sinking, transfusion of blood was performed—the first effects of the operation were beneficial, but the patient subsequently collapsed and died on the fifth day; a chapter on the various affections attending the puerperal state, and one on the children born in the Institution and the diseases which occurred amongst them. An appendix is given, containing much interesting statistical information respecting menstruation, the duration of pregnancy, &c. Lastly, we are informed that in the school for midwives connected with the Institution, during the six years over which the report extends, 125 pupils received diplomas of competency.

ART. XII.—*A Manual of Chemical Analysis, Qualitative and Quantitative.* By H. M. NOAD, Ph.D., F.R.S.—*London*, 1864. pp. 663.

THE first part of Dr. Noad's work, that treating of qualitative analysis, has been some time before the public, and has already been noticed in our pages. We have, therefore, now to review only the second and larger part of the volume—that which describes the processes of quantitative analysis.

The author has apparently aimed at producing a practical and condensed account of the modern methods of analysis. Such a purpose involves extensive compilation; and we are consequently not surprised to find that in the general treatment of his subject, and also in some of its details, Dr. Noad has followed Fresenius rather closely. There is, however, a large accumulation of material from other sources, while many excellent processes are described which have not yet found a place in the bulky manual of Fresenius. We would especially cite in this connexion the very serviceable method of estimating nitric acid devised by the late Dr. Pugh; as well as Mr. E. O. Brown's rapid and accurate volumetric process for the determination of copper.

While allowing the plan of the book to be good, we are compelled to admit that the execution of its details is not equal in character. The descriptions frequently show marks of having been written under the pressure of want of time, and lack that guidance which is so essential to the success of the student who is endeavouring to follow the processes given. Leaving these general deficiencies, we find ourselves amidst observations and directions which run counter to the best ascertained chemical facts and the commonest rules of laboratory procedure. For example (on p. 612), the author is describing the analysis of commercial superphosphate of lime, and after directing a weighed portion of the sample to be "again and again boiled with water," and the *insoluble* matter to be collected and dried, he proceeds, in the next paragraph, to speak of the "ammoniacal salts" which this insoluble matter may still contain! An explanation of this strange insolubility of ammoniacal salts would prove most interesting. The chemistry of the succeeding paragraph is almost as peculiar; and we confidently assert that no determination of phosphoric acid could be made by following the directions there given: "To the filtrate from the oxalate of lime add tartaric acid and an ammoniacal sulphate of magnesia, which precipitates the phosphoric acid as ammonio-magnesian phosphate." A foot-note describes the composition of the ammoniacal sulphate of magnesia: it is to be made of 80 grains of anhydrous sulphate of magnesia, dissolved in *two pints* of water, with a certain amount of tartaric acid and chloride of ammonium; no free ammonia is mentioned. Now, we leave it to any practical chemist to say what results a student would obtain from this excessive dilution, and the omission of the caustic ammonia.

Again, Dr. Noad directs (p. 594) a soil to be tested for protoxide of iron, by adding to the hydrochloric solution of the soil yellow prussiate of potash, when if the precipitate appears of a "dark blue" colour, the absence of protoxide of iron is considered to be established! Are there any laboratory students who do not know of a better test for protoxide of iron than this?

It is not necessary to multiply further instances of processes imperfectly described, but we will now call attention to several misprints.

Chapter viii., p. 255, commences with a table of equivalents, the number 122 being there assigned to antimony. This is not the number usually received by chemists (120·3). Dr. Noad gives us no authority for the change; and further on in the book (pp. 404 and 406) he himself adopts 120 on two occasions as the equivalent. Yet this is not all; for at the end of the volume he again reverts to 122. In the same table of equivalents (p. 255) several other misprints or errors occur; thus, MnO_5 and MnO_7 are given as two oxides of manganese; MnO_3 and Mn_2O_7 being evidently intended. Peroxide of potassium, too, is given as KO_3 instead of KO_4, which is now known to represent its real composition.

Notwithstanding, the book contains the materials of an excellent manual of analysis, but it must receive a searching revision before it can be worthy of the entire confidence of the student.

ART. XIII.—*Om Resektion af Skulder- og Albueleddet efter Skudsaar.* Meddelt i det kgl. medicinske Selskab af Professor A. G. DRACHMANN. (Særskilt Aftryk af 'Ugeskrift for Læger,' 2den Række, 42de Bind.)

On Resection of the Shoulder- and Elbow-joints after Gunshot Wounds. Communicated to the Royal Medical Society of Copenhagen by Professor A. G. DRACHMANN. (Reprint from the 'Ugeskrift for Læger,' Second Series, vol. xlii.)—8vo, pp. 26.

IN his short but interesting and instructive *brochure*, Professor Drachmann informs his readers that the total number of resections of the shoulder- and elbow-joints from the late war was thirty—namely, sixteen of the shoulder and fourteen of the elbow. Of these twelve, being four of the shoulder- and eight of the elbow-joint, came under his own observation. From these twelve cases, as well as from twelve similar ones (namely, four of gunshot wounds in or near the shoulder-joint, and eight of gunshot wounds in or near the elbow-joint), treated without resection, the particulars of each of which twenty-four cases he briefly describes, the author feels justified in drawing the following conclusions:

"1. That gunshot wounds through the shoulder-joint, with lesion of the respective bones composing this joint, may be healed, without resection, with a satisfactory result as to the future utility of the limb.

"2. That gunshot wounds in the immediate neighbourhood of the shoulder and elbow-joints, with injury of the bone, do not always cause the opening of the joint, and may be healed without limiting the usefulness of the limb in any respect.

"3. That gunshot wounds through the elbow-joint, with lesion of the respective bones, may in general be healed with anchylosis of the joint, and then afford a result beyond comparison better for the future utility of the arm, than that which resection of this joint yields, when anchylosis does not ensue.

"4. That resection by no means prevents tedious fistulous sores in the vicinity of the resected part, but on the contrary seems to be inseparably connected with them." (p. 26.)

ART. XIV.—*A Short Description of the Thermæ Romano-Britannicæ; or, the Roman Baths found in Italy, Britain, France, Switzerland, &c.* By ROBERT WOLLASTON, M.D.—*London*, 1864. pp. 68.

THIS treatise addresses itself rather to the archæologist than to the physician, although indeed the author has "selected a few pages from professional writers, with a view to explain the advantages of the hot-air bath as a valuable medical agent, and to suggest the expediency of building such baths more extensively throughout the kingdom." But further, the author speaks from experience of the value of such baths, best known to us as (though improperly so named) "Turkish baths." He tells us he was in Turkey as a physician on the medical staff of the British army at the time of the Crimean war; that he derived great benefit from the bath "when attacked with severe fever, while doing duty in the hospital at Scutari;" and that during his stay in

Constantinople he frequently visited the baths in that city, and convinced himself of their utility as a simple means of curing disease. "No doubt (he adds), the bath has superseded to a great extent the necessity of building dispensaries and hospitals" for the Ottomans.

Some value must consequently attach to the opinions of a writer who has had such excellent opportunities of observing the value of the Roman bath as a therapeutic agent. We conceive that both the profession and the public in this country are prepared at the present day to acquiesce in the proposition that the utility of this agent has been much lost sight of in past years, in regard both to the sick and the healthy. At the same time, the want is felt of some sufficient and trustworthy statement of experience in the use of the bath, and of clear, definite rules as to when, how, and under what circumstances this agent is useful, or, on the contrary, injurious.

Dr. Wollaston's book does not supply the defect; it is nevertheless an interesting and instructive volume, and, by the excellent style in which it is got up, is well suited for the drawing-room table. An amount of information touching the remains of Roman baths in this country, and also in several parts of the Continent, is collected in it, such as we know not where else to seek. Nevertheless, the author does not pretend completeness in his descriptions, for he writes: "I am aware that I have omitted to mention several of the ruins of ancient baths, both British and Continental; but my object was rather to show the identity of structure of the Roman bath found in Britain, Italy, France, Switzerland, Germany, &c.; and I have collected a sufficient number to answer my purpose."

The notice of the construction and arrangement of the baths is accompanied by a descriptive account of the mosaics and paintings with which the walls, floors, &c. were embellished; but verbal description can never do justice to such artistic works; they need illustration, and we consequently regret Dr. Wollaston was not sufficiently encouraged, whilst preparing his treatise, to be induced to add illustrations in chromo-lithography, as he tells us he was prepared to do from drawings in his possession.

ART. XV.—*The Second Step in Chemistry; or, The Student's Guide to the Higher Branches of the Science.* By R. GALLOWAY. Pp. xvii., 771.—*London*, 1864.

MR. GALLOWAY'S 'Second Step in Chemistry' gives an intelligible and interesting account of the chief facts in chemical physics, and of the more important theories of the constitution of bodies. It is not a manual of descriptive chemistry, the author's object having evidently been to give the general features of classes of compounds, and of typical reactions or changes. Every chapter contains exercises upon the subjects discussed: these exercises are devised skilfully, and will serve to sustain the interest of the student. There is much information in the book on the subject of manipulation, while the numerous tables will be found of great use. At the end of the volume are several sets of examination papers, references being made to the page whence the materials for the answer to each question may be derived.

It would be impossible to criticise in detail the treatment which chemical theories receive in Mr. Galloway's work. We are inclined to think that the author, in his desire to represent fairly the position of old as well as new views, has sometimes given undue prominence to objections which have been finally overruled (*vide* pp. 194–197). We sometimes feel inclined to doubt the policy of introducing the student to several opposing theories, especially if no preference be indicated for any one of them. Yet though Mr. Galloway often refrains from expressing his own convictions on occasions when we would gladly have heard them, we cannot but thank him for a readable and careful digest of the most important subjects connected with the speculative aspect of chemistry and of chemical physics.

ART. XVI.—*Medicinskt Archiv, utgifvet af Lärarne vid Carolinska Institutet i Stockholm.* Redigeradt af E. A. KEY, Professor i Pathol. Anatomi; C. J. ROSSANDER, E. o. Professor i Chirurgi; och A. KJELLBERG, Adjunct i Pædiatrik. Andra Bandet, Andra Häftet. *Stockholm*, Samson and Wallin. 1865.

Archives of Medicine, published by the Teachers in the Carolinean Institute in Stockholm. Edited by E. A. KEY, Professor of Pathological Anatomy; C. J. ROSSANDER, Professor Extraordinary of Surgery; and A. KJELLBERG, Adjunct in Pædiatrics. Second Volume, Second Part.

THE number of the Swedish 'Archives of Medicine' now before us opens with "Notes on the Treatment of the Insane in Great Britain and Ireland, and on Gheel and Open Asylums for Lunatics," by Ernst Salomon, Principal Physician to the Central Hospital in Malmö. The author commences with an historic sketch of legislation in England on the subject of the care of the insane, dating from the reign of Edward VI., briefly alludes to the state of the same in Scotland and Ireland, devotes a long chapter to the statistics of lunacy in the United Kingdom, and having reviewed in detail many of our asylums, passes the following judgment upon the latter:

"The British asylums are situated in the country, and are splendid and well-administered institutions. Their fitting up is distinguished by a characteristic completeness even in the smallest details. The culinary department, the washing, bathing, and dressing-rooms, and the water-closets, are remarkably well arranged. The patients are liberally supplied with air, warmth, light, and food, and with warm and suitable clothing. The walls in the day-rooms are decorated with pictures and maps, while the apartments are in other respects furnished with all the comforts of home. Many plans are adopted to provide amusement, variety, happiness, and occupation for the patients, so that in this respect the British are far before the French institutions." (p. 57.)

As to Gheel, the author says:

"The so-called colony at Gheel is neither so good nor so bad as it has been represented by different parties. It is a form of public beneficence, which has its advantages and its disadvantages. In most cases it answers tolerably well for far advanced cases of chronic mental disease (paranoia and dementia in various degrees), which are in general those of quiet harmless persons, in whom the paroxysms of excitement recur only at long intervals, and easily pass off. These do not require any medical treatment, but need chiefly watching and example, like troublesome children. For all other cases, which require either medical or mental treatment, Gheel cannot replace the asylums for the insane. We ought to adopt what is good in the arrangements for the patients at Gheel —namely, *freedom* and *family-life*, and to endeavour to let the present institutions progressively develop themselves, so that they may gradually appropriate these advantages, without giving up their present quality of medical establishments.

"Gheel has last year, in order the better to fulfil its design, been obliged to take a step which approximates it to the enclosed institution, in opening the so-called 'infirmary' for the reception of some of its patients." (pp. 68, 69.)

In England the "cottage system," which is a step in the direction of Gheel, has been found useful as an auxiliary to the asylums, chiefly in the reception of convalescent patients who, if sent home on leaving the asylums, would probably relapse. The author refers particularly to the experience of Dr. Bucknill, of the Devon Asylum, upon this subject.

Dr. Salomon illustrates his elaborate paper with four plates, giving plans of the Cumberland and Westmoreland Asylum for the Insane.

P. A. Törnblom, Licentiate in Medicine, contributes a paper of fifty pages, illustrated with three plates, upon the first rib in man; and Sten Stenberg, Professor of Chemistry and Pharmacy in the Carolinean Institute, has one, also of fifty pages, upon the General Lying-in Institution in Stockholm, and the obstetrical instruction in connexion therewith, its origin and progress.

Professor Malmsten devotes thirty-six pages to a "Contribution to our Knowledge of the Curative Power of the Carlsbad Water," which he believes to be a mild but remarkably efficacious therapeutical agent.

The present number of the 'Archives' concludes with a "Report on the Instruction given in the Carolinean Medico-Chirurgical Institute during the Session 1863–64." The total number of medical students attending was 109.

ART. XVII.—*A Manual of the Practice of Surgery.* By WILLIAM FAIRLIE CLARKE, M.A., F.R.C.S., Surgeon to the St. George's and St. James's Dispensary, and Assistant-Surgeon to the West London Hospital.—*London*, 1865. 16mo, pp. 341.

IT may (with all deference to Mr. Clarke) be fairly questioned whether such a book as this should be written, its object being, in the words of the preface, "to meet the wants of those who desire a manual of surgery of smaller size than anything which is at present before the profession." Its size necessarily precludes all but the most bare and general statement of what is known respecting the forms of each disease, and the want of space forbids the sufficient discussion of any complications or varieties; nor does the author always express an opinion about even well-known methods of dealing with the primary disease—as, for example, under carbuncle, the only local treatment which he prescribes is that by incisions (p. 9), making no mention of caustics (except as sometimes applicable to the sore left by the incision), or of subcutaneous division, or of the expediency of sometimes letting them alone. Again, we much miss in Mr. Clarke's book the copious and exact references to other authors which would render it valuable as a guide through the bewildering maze of books and periodicals from which students find such difficulty in making a useful selection for their hours of study. For these reasons we cannot set so high a value on Mr. Clarke's manual as we should have been able had it been more comprehensive; still, we are prepared to accord to it the credit of clearness of language and precision of statement—great virtues in a work of the kind. And those parts of the book which deal with subjects capable of very curt treatment, as the dislocations and fractures, are very satisfactory. The author appears to be as well versed in the literature as doubtless he is in the practice of his profession, and is, we feel sure, capable of a higher flight than the present manual affords the scope for.

ART. XVIII.—*A Manual of Materia Medica and Therapeutics; including the Preparation of the British Pharmacopœia and many other Approved Medicines.* By J. FORBES ROYLE, M.D., F.R.S., and F. W. HEADLAND, M.D., B.A., F.L.S. Fourth Edition.—*London*, 1865. pp. 776.

THIS edition has been of necessity remodelled throughout on the basis of the British Pharmacopœia of 1864, the medicines of which are arranged in natural order, its preparations described at length, and its formulæ explained. The points of divergence between the London Pharmacopœia of 1851 and the new British one have been, as the preface assures us, pointed out, and the errors of the new one distinguished and corrected.

ART. XIX.—1. *Transactions of the Pathological Society of London.* Volume XV., comprising the Report of the Proceedings for the Session 1863-64.—*London*, 1864. pp. 272.

2. *A General Index to the First Fifteen Volumes of the Transactions of the Pathological Society of London, with a List of Authors and a Classified List of Subjects.* Compiled by T. HOLMES, M.A. Cantab., Hon. Secretary. Presented to the Society by PRESCOTT HOWETT, President.—*London*, 1864. pp. 147.

THE volume of Transactions is as conspicuous as any of its predecessors for the interest and variety of the cases related, and the care with which their details are given. The society not only retains, but, we believe, gains in popularity, and in our opinion most deservedly so. Each year, by its efforts, a mass of material is collected together and hoarded up, which but for it would, no doubt, be to a great degree irrevocably lost; and that the aggregate value of its work is most considerable may be gathered by even a casual glance at the accurate and elaborate Index, which, at a considerable cost of labour and money, has been presented to the society conjointly by the late President, Mr. Hewett, and one of the secretaries, Mr. Holmes. Mr. Hewett's presidentship will long be remembered, not merely by the munificence which prompted the gift above alluded to, but also by the fidelity with which the duties of his office were executed. The society is to be congratulated that it has secured for its new president one so favourably known in the ranks of his profession, and whose name is so eminently connected with pathology as Dr. Peacock.

ART. XX.—*Medicines: their Uses and Administration.* By J. MOORE NELIGAN, M.D. Sixth Edition. Edited by RAWDON MACNAMARA, M.R.I.A., Professor of Materia Medica, Royal College of Surgeons in Ireland, &c. &c.—1864. pp. 758.

BUT little need be said regarding a work so well and so favourably known to the profession as this. It appears that Dr. Neligan had associated Mr. Macnamara as joint editor with himself of this new edition, and had waited for the appearance of the new Pharmacopœia, but died somewhat suddenly before he was able to do anything towards revising the work. Thus it was that upon his intended colleague, Mr. Macnamara, fell the duty of making such additions and alterations as the progress of science and the appearance of the new Pharmacopœia demanded. In the part allotted to "Medicines" the student will find full explanations given, first verbally, and then in equations after each process and test; and he will also find added the tests for volumetric analysis, the description of many important and new remedial agents, and many new formulæ and prescriptions. Mr. Macnamara assures us that to this work he has devoted his "best faculties, a comparatively large portion of valuable time, and the accumulated experience and knowledge acquired by many years' teaching of these subjects." We can only say that, on examining the volume before us, the new editor appears in all respects to have executed his task with ability and precision.

PART THIRD.

Original Communications.

Art. I.

On the Toot Plant and Poison of New Zealand.[1] By W. Lauder Lindsay, M.D., F.R.S. Edin., Honorary Fellow of the Philosophical Institute of Canterbury, New Zealand, &c. &c.

§ 1. *Introduction.*

A. Destructiveness to Flocks and Herds.—In the course of a tour through the New Zealand provinces during the latter part of 1861 and earlier months of 1862, I was everywhere struck by the abundant evidences of the devastation produced among flocks and herds from their feeding on the "Toot" plant, one of the most widely-distributed and familiar indigenous shrubs of the country. One Settler friend told me

[1] The details given in this paper were mostly collected *on the spot*, in the form of notes of the oral evidence of various of the oldest settlers of Otago in the Middle, and Auckland in the Northern, Island:—authorities on whose veracity and intelligence I could thoroughly rely. My informants belonged to all classes of colonists, and were very numerous. Their evidence was frequently very conflicting, and sometimes apparently irreconcilable; the different results said to be producible on animals by "Toot" in the Northern and Middle Islands being particularly striking.

In *Otago* my information was chiefly derived from the following gentlemen, to all of whom my acknowledgments are due for every species of Colonial courtesy, and all of whom I am proud to regard as friends in the best sense of the term:—

1. William Martin, Esq., of Fairfield, Saddlehill, then Member of the Legislative Council of Otago—one of the "Old Identity," or original settlers when Otago was colonized (1847-8): who was, at one period of his experience as a pioneer settler, himself "Tooted."
2. John Shaw, Esq., of Finegand, on the Clutha, also at one time a Member of the Legislative Council of Otago, and one of its earliest colonists.
3. The Rev. William Will, East Taeri Manse, one of the first settled Ministers (of the Free Church of Scotland) in Otago.
4. John Cargill, Esq., of Greenisland, Member of the General Assembly of New Zealand, and of the Legislative Council of Otago, another of the pioneer settlers, and son of Captain Cargill, founder and first Superintendent (or Governor) of the Province.

Of North Island settlers, my acknowledgments are chiefly due to—

1. F. E. Manning, Esq., of Hokianga, Auckland, a "Pakeha Maori" of over thirty years' standing: the first local author of any note; whose historical works* on New Zealand are equally well known at home and in the colony. Mr. Manning took

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* 1. Old New Zealand: being Incidents of Native Customs and Character in the Old Times. By a "Pakeha Maori." London, 1863. And, 2. History of the War in the North of New Zealand, against the Chief Heke, in the Year 1845. Told by an Old Chief of the Ngapuhi Tribe. Faithfully translated by a "Pakeha Maori." Auckland, 1862.

of his having lost by "tooting" 250 sheep; another 80 to 100 sheep of a flock of 400; a third 7 of 16 bullocks; a fourth 6 of 24 cattle; a fifth 24 cattle; a sixth 6 of 8 cattle—each of these instances *in a single night.* Another flockmaster lost 400 sheep out of a flock of 2000, 25 being frequently dead of a night. In other words, he seemed a fortunate farmer or runholder, who had not lost more than 25 per cent., or one-fourth of his stock, from Toot-poisoning; while in some instances the losses were so high as 75 per cent., or three-fourths. Some of the colonists had suffered so severely from losses of bullocks by Toot-poisoning, that they were at the trouble and expense of attaching a boy to each of their bullock-teams, solely for the purpose of preventing these animals feeding on this pest of the colony. Such incidents I found were of daily occurrence. I met few settlers, who had not had at some period occasion from this cause to mourn the loss of sheep or bullocks—the former sometimes by the hundred, the latter by the dozen.

The illustrious Cook, one of New Zealand's earliest and truest benefactors, frequently bewails in piteous or pathetic language the losses caused among the animals he endeavoured to introduce and naturalise by their eating what, I doubt not, was "Toot." Speaking, for instance, of Queen Charlotte's Sound, in May, 1773, he says: "The ewe and ram I had with so much care and trouble brought to this place were both found dead, occasioned, as was supposed, by eating some poisonous plant . . . . . . Thus my hope of stocking this country with a breed of sheep was blasted in a moment."[1]

Referring to the same locality in November, 1773, and to two goats which he had previously put ashore, he remarks: "I had the misfortune to lose the ram soon after our arrival here in a manner we could hardly account for . . . . . . They seemed to thrive very well. At last the ram was taken with *fits bordering on madness.* We were at a loss to tell whether it was occasioned by anything he had eaten or by being stung with nettles,[2] which were in plenty about the place; but supposed it to be the latter, and therefore did not take the care of him we ought to have done. One night . . . . he was seized with one of these *fits,* and ran headlong into the sea; but soon came out again, and seemed quite easy. Presently after he was seized with another *fit,* and ran along the beach . . . . and was never seen more . . . . We supposed he had run into the sea a second time, and been

the trouble to commit his evidence, which is in various important particulars exceptional or peculiar, to writing. (January 18th, 1863.)

2. Captain Charles Blewitt, 65th Regiment, of Wanganui (now in the field in front of the rebel Maoris), who was my fellow-passenger home from Auckland in 1862, and from whom, in the course of a protracted voyage, I acquired a large amount of valuable information on New Zealand Natural History.

3. Robert Stewart, Esq., Member of the Provincial Council of Auckland for the Raglan districts.

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[1] Narrative of Second Voyage. Vol. iii. of General Voyages. London, 1821, p. 135.

[2] The commonest indigenous nettle of Otago, *Urtica ferox,* Forst., is a bush well deserving its name, abundantly furnished with very large, conspicuous, bottle-shaped stinging hairs or glands, sometimes a quarter of an inch long—the pain of the sting lasting in man four days.

drowned . . . . Thus every method I have taken to stock this country with sheep and goats has proved ineffectual!"[1]

This Toot-poisoning is undoubtedly a source of great loss to the settlers, who are mainly dependent on their flocks and herds—on which, indeed, the ultimate prosperity of the New Zealand provinces virtually or mainly depends. In every part of New Zealand visited I found concurrent testimony as to the ravages of Toot. The colonists were unanimous in their assertion that there could scarcely be a greater boon conferred upon them—short of a final settlement of the Native *questio vexata*—a greater barrier to their material prosperity removed, than by determining the nature of, and remedy for, the Toot poison. So fatal was Toot, during the period of my visit to Otago, to the dray-bullocks employed on the road between Dunedin and the Tuapeka gold-field, that the local Government gave instructions to the Provincial Surgeon to insert a standing advertisement in the public prints, warning settlers, and especially new comers, of its abundance, its attractiveness to cattle, and its dangerous properties: indicating the characters of the plant, and instructing them how to protect themselves and their flocks and herds from its poisonous action. The aim of the Government, however, could not be carried into effect in consequence of the very deficient and unsatisfactory knowledge of the natural history of the plant then in existence in the colony.

I have every reason to suspect the existence of a similarly deficient or unsatisfactory knowledge of its Natural History at home[2]—if, indeed, the plant is at all generally known as a poisonous one. This conviction or suspicion led me carefully to take on the spot notes of evidence on the action of the plant on man, as well as on the lower animals, with a view to bring the subject under the notice of toxicologists, chemists, botanists, and other scientific men likely to be interested therein at home. All that I am in a position to do in this memoir is to summarise the results of my observations and inquiries in New Zealand, so as simply to introduce the subject, and lead to its full investigation by competent scientific authorities. Dr. Murray Thomson, of Edinburgh, now Professor of Experimental Science in the Government College at Roorkee, Bengal, undertook, in 1862, a chemical investigation of the specimens I collected and brought home for analysis, with a view to obtain some accurate and reliable information on the nature of the poison, the laws of its action on the animal system, and the character of its appropriate antidote. His researches were partly defeated by the circumstances mentioned on p. 176, and were finally put a stop to by his translation to India in 1863.

B. Accidents to Man.—Scarcely subordinate in importance to its poisonous action on sheep and cattle is its toxic influence on the human subject. I am not aware of any well authenticated cases in which the eating of Toot-berries has proved *fatal* in the *adult*, though the conse-

[1] Narrative of Second Voyage. Vol. iii. of General Voyages. London, 1821, p. 245.

[2] I have at least failed to find any account of it in our public libraries, while the most eminent of our toxicologists have expressed or avowed their entire ignorance of the existence of the plant or its poisonous action.

quences otherwise have been serious enough; but there are a few cases on record of fatal results in *children*, generally from eating the tempting *berries*, which hang in rich racemes on the shrub; though sometimes also from eating other parts of the plant. Dr. Thomson refers to the death of several children as well as cattle, in the North Island, from eating Tutu *berries*.[1] He may be correct as to the children, but I suspect he is in error as to *cattle* having been poisoned by eating the *berries*. While I resided in Dunedin an inquest was held on a fatal case in one of two children, from eating the young *shoots* of the plant.[2] In another case—a girl—a nervous irritability of a distressing kind was attributed to her having been poisoned by Toot several years previously—with what truth, however, there were no data for forming a proper judgment. These Toot-poisonings were much more common at an earlier stage of colonization, when the poisonous properties of the plant were comparatively unknown; and now they are mostly confined to the freshly-arrived immigrants, who, however, in these days of gold digging, form a very large proportion of the population, especially in *Otago*, to which province my remarks principally refer.

§ 2. *Botanical Characters of Plant.*

The *Toot*, or *Tūtu*[3] plant, is a *Coriaria*, the *C. ruscifolia*, Linn. (*C. Sarmentosa*, Forst.) The plant is variously designated by Maoris and settlers in different parts of the New Zealand islands;[4] and this of itself indicates to a certain extent how familiar is the plant, and how widely and abundantly distributed. The designation I have given above, however, appeared to me the most general, comprehensive, or popular one. The genus *Coriaria*, which is a small one, confined, so far as we at present know, to New Zealand, America (from Mexico to Chili), Southern Europe, India (the Himalayas), and Japan, if not belonging to a subdivision of the *Ochnaceæ*, represents a separate Natural Order closely allied thereto, and to the *Rutaceæ*. But the most distinguished botanists are at issue as to its precise place and alliances in the vegetable system.

In 1862 I examined, with the following results, all the specimens and species of the genus *Coriaria*, contained in the

1. Hookerian Herbarium, Kew;
2. Benthamian Herbarium, Kew; and
3. Herbarium of the University of Edinburgh.

I. *C. ruscifolia*, L.—Specimens labelled New Zealand, and collected by Drs. Hookers and Sinclair, and Rev. Mr. Colenso, are precisely the Otago "Toot:" South Chili, Reynolds, and various other Chili specimens from the Paris Herbarium, also resemble the Otago plant; as do generally the South American specimens of this species. Chilöe, Capt. King, near rivers in the province of Valdivia. Environs

[1] Story of New Zealand, vol. ii. p. 60.

[2] Otago Colonist, October 25th, 1861.

[3] "Tutu" in the East Cape dialect is also applied to the juice of the Berry.

[4] Some of these are given in foot-note [2], p. 161. The only others that need be noted are, "Tupākė:" Coromandel district, Province of Auckland. "Tāweku:" Waikato dialect.

of Concepçion, Chili, 1855: Ph. Germain: leaves more acuminate than in majority of Otago specimens; Concepçion, Cumming. Raoul Island and Kermadec Islands, July, 1854; John MacGillivray, 'Voyage of H.M.S. *Herald*;' Bot. No. 977. Sub nom. *C. Cunninghamii:* Bay of Islands: the larger-leaved form of my Otago plant. (Hookerian Herb.)

New Zealand, Dr. Hooker, 1842: Includes two specimens—one with a broad ovate leaf, like the majority of the Otago plants; the other, with a greatly smaller leaf, intermediate between the typical size in *C. ruscifolia* and that in *C. thymifolia;* the shape, as well as the size of the leaf varying *in the same plant,* being ovate towards the base of a branchlet, and becoming ellipsoid, and finally lanceolate as we approach its apex. Sub nom. *C. sarmentosa,* Forst, New Zealand, Sir W. J. Hooker, 1838, has long acuminate leaves, and long slender racemes like the Himalayan *C. Nepalensis.* Near Concepçion, Chili, H. Cumming, 1831: Chili, Bridges; quite the Otago plant, though the leaves are somewhat more acuminate.—(Bentham. Herb.)

Concepçion: Leaf like that of the Otago plant; long, elegant, slender racemes. Valdivia: sub nom. *C. sarmentosa.* North Island, New Zealand, Dr. Sinclair: "Tūpakīhi" in the vernacular; exactly the Otago plant; like South American specimens, has long, elegant, slender racemes.—(Edin. Herb.)

II. *C. thymifolia.* Humb.—The majority of specimens have lanceolate, acuminate leaves; both plant, leaves, and racemes being smaller than in the preceding. Some of Colenso's specimens from the North Island of New Zealand (no precise locality given on the labels) are intermediate in size of plant and leaf between *C. ruscifolia* and *C. thymifolia.* Mount Egmont, Dieffenbach: a very small plant, with very small linear-lanceolate leaves, characteristically named, resembling our *Thymus serpyllum* in general aspect, though it is usually somewhat taller. This and other forms of *C. thymifolia* are probably referrible to the *C. angustissima,* Hook. fil. of Dr. Hooker's 'Handbook.' Milford Sound, Lyall: a tallish plant, with linear-lanceolate leaves and largish berries on a sparse raceme. Nelson, Bidwill: variously labelled *vars.* of *C. sarmentosa* or *C. thymifolia:* intermediate between the *C. ruscifolia* and *C. thymifolia* types. Sub nom. *C. lanceolata:* Colenso: seems more referrible to *C. ruscifolia,* and is an intermediate form between it and *C. thymifolia;* pedicels vary in length, occasionally as long as the bracts, sometimes longer. Mount Hikurangi, Colenso, 1844: a Thyme-like shrub as to size of plant and leaves (*C. angustissima,* Hooker's 'Handbook'). Tongariro, Bidwill: a larger plant; leaves sparse and larger; racemes sparingly covered.

Central American specimens; Mexico, Hartweg: whole plant, and especially in size and form of leaf, approaches *C. ruscifolia:* a somewhat lax shrub, with largish leaves. Different parts of Mexico, Galeotti and Linden: sometimes with densely-covered, smallish racemes. Generally speaking, the Central American specimens of *C. thymifolia* have leaves much more resembling those of *Ruscus aculeatus* than *C. ruscifolia* itself. New Granada, Pichincho, 12,000 feet, Hall: a dense shrub, with ovate or ovate-lanceolate leaves, and small, densely-covered racemes. Andes of Ecuador, Spruce, 1857–9: a shrub of similar character, save that the leaves are more acuminate and lanceolate. Peru, near Huanaco, Matthews: sub nom. var. *microphylla* of *C. ruscifolia.* Several other Peruvian specimens are labelled *C. phylicifolia*, and are all apparently referrible to *C. thymifolia.* New Granada, province of Rio Hache, Sierra Nevada, 10,000 feet, L. Schlimm's voyage: No. 808, 'Flora Neo-Granadina,' Bogotina, I. F. Holton, Oct. 1852: leaves more lanceolate and acuminate, and racemes sparser than usual. Caraccas, J. Linden, April, 1842; Quito, Jameson; Columbia, Linden.—(Hooker. Herb.)

New Zealand, Dr. Hooker, 1842: intermediate as to size and shape of leaf between *C. ruscifolia* and *C. thymifolia.* Sub nom. *C. myrifolia:* more shrubby and Privet-like. Quito, Spruce, Aug. 1837: branchlets densely covered with small ovate-lanceolate, acuminate leaves: racemes also closely covered. Santa Martha, Purdie: leaves vary greatly in shape in same plant (as is frequently the case with the species of *Coriaria*): generally small, ovate, oblong-ovate, or lanceolate, and mucronate.—(Bentham. Herb.)

Sub nom. *C. microphylla*, Peru, Matthews: in fruit: in no respect differs from *C. thymifolia:* ten feet high near Huanaco. Ecuador Andes, Spruce; quite the Peruvian plant.—(Edin. Herb.)

III. *C. Nepalensis.* Wall.—In general has a close resemblance to the Otago *C. ruscifolia.* Sikkim, alt. 5000 to 7000 feet: Dr. Hooker. Herbar. Indic., Hooker and Thomson; also Lachen, alt. 10,000 to 11,000 feet; and Samdong, alt. 11,500 feet, July, 1849; Chongtam, alt. 8000 feet, May, 1849. Kumaon (Nynee Tal), April, 1844, Thomson: more shrubby and fibrous than usual. Kapkot, Kumaon, alt. 3500 feet: Himalayan Herb. of R. Strachey and J. E. Winterbottom. Bootan, Griffith: North-western Himalaya, alt. 3000 to 6000 feet: Thomson. N. W. India, Royle. Dhara Dhoon: Jacquemont's 'Voyage to the East Indies': intermediate between Privet-like forms and Otago large-leaved forms of *C. ruscifolia:* shrubby.—(Hooker. Herb.)

Kumaon, Wallich, 1832. Himalaya; alt. 5000 to 8000 feet: M. P. Edgeworth, 1844: have the aspect of South American forms of *C. ruscifolia.*—(Bentham. Herb.)

Kumaon: resembles *C. myrtifolia* save as to size of leaf, which is here larger.—(Edin. Herb.)

IV. *C. Japonica*, Asa Gray. Japan: Herbarium of the U.S. North Pacific Exploring Expedition under Commanders Ringgold and Rodgers, 1853–6: bears a close resemblance to the New Zealand *C. ruscifolia* in the size of the plant, leaves, and berries; leaves more acuminate; racemes shorter.—(Hooker. Herb.)

V. *C. myrtifolia*, L. Spain: Boissier and Reuter, 'Iter Algeriensi-Hispanicum,' July, 1849: somewhat resembles *C. Japonica.* San Roque and Barcelona, Bourgeau's Spanish-Pyrenees Herbar., No. 487, April, 1847: a woody, dwarf, Privet-like shrub. Requien in the Cevennes. Algeria, May, 1837: also a Privet-like shrub, but larger than the Pyrenees specimens.—(Hooker. Herb.)

Perpignan: leaf lanceolate, resembling that of *Senna:* more rigid than that of the New Zealand *Coriariæ*. Montpelier. All these French specimens seem distinct from any of the New Zealand species of *Coriaria*.—(Edin. Herb.)

From the foregoing enumeration and comparison it would appear that—

1. *All* the species of *Coriaria*, wherever they occur, are more or less *variable*, especially as to the size of the plant, leaf, raceme, and berry; the leaf varying in shape frequently *on the same plant*.

2. The three New Zealand species (if these really are separate species) are preëminent above others, save perhaps those of South America, in their variability.

3. Several *Book-species* are probably only synonyms, or represent forms or varieties of other species. Such are *C. sarmentosa*, *C. lanceolata*, *C. microphylla*, *C. Cunninghamii*, *C. myrifolia*, *C. phylicifolia:* and such also, I am inclined to think, are the *C. thymifolia* and *C. angustissima* of Dr. Hooker's 'Handbook;' both of which, with all their intermediate forms, I would refer to *C. ruscifolia*.

4. Probably some of the more typical species, representative of remotely separated countries—such as the *C. Nepalensis* of the Himalayas and *C. Japonica* of Japan—may yet prove identical with, or at least forms of, the older and better-known species, such as *C. ruscifolia* or *C. myrtifolia*.

5. *C. ruscifolia*, as at present defined, appears limited to New Zealand and South Chili; but *C. thymifolia* has a much wider geographical range, occurring throughout New Zealand, as well as in America, from Mexico to Peru—ascending the equatorial Andes to 12,000 feet.

6. The species or forms designated in Dr. Hooker's 'Handbook' *C. ruscifolia*, *C. thymifolia*, and *C. angustissima*, pass into each other by gradations equally in South America and New Zealand.

7. Not only does the Genus, as developed in New Zealand, deserve and demand the attention of the local botanist; but the whole genus, wherever its species are distributed, would repay a critical examination, and should become the subject of a short exhaustive monograph at the hands of some competent authority, who has the necessary access, for comparison, to large suites of specimens from all parts of the world, and from every variety of habitat.

The following are the more prominent or main botanical characters of—

1. *C. ruscifolia:* A perennial *shrub*, generally a few feet high, sometimes attaining 10–20 feet, or upwards, and even assuming the form and dimensions of a small *tree*, 6–8 inches in diameter; generally forming with fern, flax, and other plants, "scrub" on open ground; sometimes, also, growing in the "bush" (forest). *Branches* angular. *Leaves* generally opposite, entire, 1–3 inches long, sub-ovate, acuminate, subsessile. *Flower-racemes* 8–12 inches long, drooping, many-

flowered, pubescent, axillary. *Flowers* very minute, green, and inconspicuous. *Petals* become, when the fruit is ripe, succulent and full of purple juice,[1] constituting what is generally called by settlers the *Berry*. *Fruit* consists of 5–8 small, oblong *Achenes*, or carpels, enclosed in the short, triangular, fleshy petals.

Dr. Hooker, in his 'Handbook of the New Zealand Flora,' recently issued,[2] enumerates other two New Zealand species of *Coriaria*, both of them smaller than *C. ruscifolia*, and less liable to be eaten in any of their parts—and especially their seeds or berries—by man or animals. Both, apparently, are *annuals*, while the larger *C. ruscifolia* is, as already stated, a *perennial*.

2. *C. thymifolia*, Humb., has more lanceolate leaves, $\frac{1}{4}$–1 inch long; it is generally more pubescent than *C. ruscifolia;* is sometimes only about a foot high; and has shorter racemes and smaller flowers. It grows in dry places, and ascends to 5000 feet.

3. *C. angustissima*, Hook. fil, *new sp.*, is a small, bright green annual, 6–18 inches high, with the habit of the preceding species, save that the branches are glabrous, very slender, and denser: and the leaves very narrow, linear-lanceolate, about $\frac{1}{4}$ inch long. It appears mostly to affect subalpine localities.

My conviction is strong that the two latter are mere forms of the first species: the differences in the size of all parts of the plant being produced by the differences in habitat:—the smallest forms, as a general rule, occurring at the greatest elevations and in the most exposed, driest localities.

§ 3. *Seat of the Poisonous Principle.*

To cattle and sheep the poisonous part of the plant is usually the young *shoot:* this, in spring, is tender and succulent, and resembles otherwise the shoots of Asparagus.

My friend, Mr. Manning, holds opinions—as to the parts of the plant which are poisonous—so far exceptional or peculiar, that I prefer giving them in his own words, only premising that his remarks apply to the northern districts of the North Island—some 800 or 1000 miles distant from Otago:

"The poison is *supposed* commonly, by *Europeans*, to exist in the *seeds;* but the *Natives* say it is not in the seeds, but in a very fine fur[3] or hairy, reddish excrescence, which grows on the stalk close to where the berry adheres to it; and that it is this which, when taken into the stomach, has the poisonous effect. This fur, or down, is so fine as to

[1] The juice of the stem and branches is colourless; but it uniformly produced on my fingers—after a little exposure to the air—a deep purple stain resembling that of our Blaeberry.

[2] Part I., Flowering Plants and Ferns. London, 1864. For fuller botanical diagnoses of the New Zealand species of *Coriaria*, reference is made to this model Colonial Flora, as well as to its parent and larger work by the same author, the 'Flora Novæ Zelandiæ,' with its magnificent plates by Fitch. Vol. i. (Phænogamia). London, 1853. A Plate of *C. ruscifolia* will be found in Hooker's (Sir W. J.) Botanical Magazine, Tab. 2470.

[3] Alluding probably to the *pubescence* of the raceme, which is least in *C. ruscifolia* and greatest in *C. thymifolia*.

be scarcely visible to the naked eye; and I am inclined to think the natives are right in their assertion, for many kinds of *birds* live entirely on the Tutu berries when in season, and I can assure you, swallow the seeds with great voracity. The '*Tui*,' or Blackbird (*Prosthemadera Novæ Zelandiæ*), I have kept tame and fed for months on nothing else. The bird, I observed, picked the berries off the stalk one by one and swallowed them whole, or at least seed and all, *leaving* the stalk—to which the supposed poisonous fur adheres—behind. This stalk is a small lateral stalk from the main one to which the berry adheres." It does not at all follow, however, that because *birds* are unaffected, the *seeds* are innocuous. The illustrations cited in pp. 169, 170, 171, and 175, of substances which, while innocuous to certain animals, become deadly poisons to certain others, sufficiently show the fallacy of any such line of argument.

To the human subject, the *seed* is usually the *corpus delicti*; though, as in the case of the inquest at Dunedin already referred to, the young shoot or the leaves are occasionally a cause of poisoning or death in children and adults. The seeds are contained in a beautiful dark purple, or blackish, berry (in reality consisting of fleshy, enlarged *petals*), resembling somewhat the blackberry—which grows in clusters (racemes), resembling those of our black currant. It is a very tempting fruit, the succulent portion whereof yields a juice,[1] and the latter, on fermentation, a wine[2] resembling elderberry wine, which

[1] The juice of the berry (fleshy petals) of a closely allied species, if it is not in reality a mere variety of *C. ruscifolia* (viz., *C. thymifolia*), is, under the name of "Chauchi" used as *ink* in New Granada, where the plant is hence known as the "Ink plant."* It is employed without admixture, its colour being at first red, but becoming in a few hours black. It has this advantage over ordinary ink, that it does not corrode steel pens.

[2] Dr. Seemann says† that the Maoris apply the term "Kawa" to a beverage made from the fruit of *Coriaria myrtifolia*, Linn.: their "Tūpa-kīhi," "Tūtu," or "Pūhou." In this statement, however, he has apparently committed several important errors. *C. myrtifolia* does not occur in New Zealand at all, unless, indeed, botanists should hereafter agree to conjoin it with *C. ruscifolia* as one species. The latter is the true "Tutu" of the Maori. Though he makes a wine therefrom, there is no evidence it is called "Kawa." This term, or rather the term "Kāwakāwa,"‡ is applied in New Zealand only to *Piper excelsum*, Forst. (N. O. *Piperaceæ*), which is allied to the "Kava" or "Kawa" proper of the South Sea Islands (*Macropiper methysticum*: the term "Kava" properly referring to its thick rhizome).§ Dr. Thomson also falls into some confusion on the subject of "Kava,"‖ in so far as he states that the "Kava" plant (*Macropiper methysticum*) grows abundantly in New Zealand, and that the Maoris have "forgotten the art of extracting [by chewing] an intoxicating beverage" (a narcotic) from its *root*: a practice which he says is common among Polynesians in more tropical islands. He appears to have mistaken the common North Island

* On the Ink Plant of New Granada, by Dr. Jameson of Quito. Proceed. Linn. Soc., vol. vii. p. 120; and Spruce (who says it is so used at Baños), in the Benthamian Herbarium, Kew.

† In his work on "Viti" (or Feejee Islands), Cambridge, 1862, p. 327.

‡ Williams: Dictionary of the New Zealand Language. Second edition. London, 1852.

§ Professor Balfour's Class Book of Botany. Edinburgh, 1854, p. 895.

‖ Story of New Zealand, vol. i. p. 193.

are great favourites equally with Maoris and settlers, and which are, in ordinary quantities at least, quite harmless.

Mr. Manning makes a qualified statement when he says, "The juice of the Tutu berry is not poisonous, and when pressed from the berry is a favourite drink with both Natives and Europeans, *who have got accustomed to it.*" In Otago the settlers are in the habit of squeezing the ripe berries in a pocket handkerchief, and sipping the juice, which exudes, with impunity. Dr. Thomson states that, prior to the colonization of New Zealand, the natives used the juice of the Tutu berries to sweeten water; converting it, I presume, into an equivalent to the French *eau sucrée*, or our lemonade; while they also sweetened and coloured with it the jelly of certain seaweeds, after the manner of our *blanc mange, et hoc genus omne.*[1]

§ 4. *Its Nature.*

It is probable that the same active poisonous principle, recently detected in *C. myrtifolia* by M. Ribau, and named by him *Coriamyrtine*, may also be the active poison of the New Zealand "Toot." This, however, has yet to be determined. The experimental effects of this substance resemble closely the poisonous effects on men and animals, on the one hand, of *C. myrtifolia*, and on the other of *C. ruscifolia*. In M. Ribau's hands, the symptoms of poisoning by *Coriamyrtine* in dogs and rabbits were, violent movements of the head, communicated to all the limbs; clonic and tetanic convulsions, returning by fits; contraction of the pupils, trismus, foaming at the mouth, and at last asphyxia. The principal *post-mortem* appearances were brownish coagulated blood in the heart-cavities, pulmonary artery, and inferior vena cava; brown spots on the lungs; and hyperæmia of the cerebral membranes. The intestinal mucous membrane and muscular contractility, however, appeared *un*affected.[2]

P. excelsum for the Polynesian "Kava" proper. Dieffenbach, who writes sixteen years prior to Thomson, and nineteen prior to Seemann, puts the matter much more correctly when he speaks of the New Zealand *P. excelsum* as the New Zealand "*Representative* of the *Piper methysticum* of the Sandwich and Tonga Islands." "Although bearing the same name," he says, "it is not used by the New Zealanders to make an intoxicating drink; its leaves, however, form a good and apparently healthy substitute for tea."*

Dr. Hooker, of Kew, the highest authority on the New Zealand Flora, writes me (January 31st, 1865), in reference to this subject: "The Kava Pepper is certainly, as you suppose, the *Macropiper methysticum*. It does not occur in New Zealand, though very near the *P. excelsum*, which is also a *Macropiper* according to Miguel, the founder of the genus. My own idea, and that of most botanists, is that *Piper* should be kept entire as a most natural genus; but I would not speak positively without going into the whole order."

[1] The Story of New Zealand. By the late Dr. Arthur Thomson, 58th Regiment. By far the best general work on New Zealand extant. Vol. i. pp. 161 and 155.

[2] On *Coriaria myrtifolia* as an Adulterant of Senna in France. Brit. and For. Medico-Chirurgical Review, July, 1864, p. 253.

* Travels in New Zealand. 1843. Vol. i. p. 426.

§ 5. *Its Physiological Action.*

A. On Man.—In action the Toot plant or poison is, like its congener, *C. myrtifolia*, apparently referrible to that section of *Narcotico-irritants*, or Narcotico-acrids, whose action is exhibited mainly on the brain and spinal cord; or, using the terms of another and newer, and more philosophical, classification of poisons, to the *Cerebro-spinal* section of *Neurotic* poisons.[1] The term narcotico-*irritant* is not strictly correct or applicable, in so far as there are rarely, if ever, symptoms of *irritant* action; the poison apparently being a pure *Neurotic, affecting primarily and chiefly the brain, and secondarily the spinal cord.*

In man the symptoms of Toot-poisoning may be shortly stated as, generally, giddiness, stupor, coma, with or without delirium or convulsions; but the details differ in different individuals. Sometimes there are symptoms like those of brain fever; occasionally the delirium resembles that of alcoholic intoxication, or delirium tremens; at other times it rather approximates that of acute mania, being marked by great muscular excitement, the patient requiring restraint of the most powerful kind—in some instances, the assistance of several strong men for several hours. One of the characteristics of the convalescent stage is loss of memory, with or without a vertiginous condition.

I append, as illustrations, reports from the Otago newspapers of one or two *fatal* accidents to adults or children from eating various parts of the Toot plant:—

"We regret to announce the death of a *child*, . . . which is reported to have been caused by his eating the young *leaves* of a small shrub called '*Toot*,' or '*Tutu*.' His sister, about seven years of age, was attacked the same day, and for a considerable time was dangerously ill. Two medical men were in attendance, but too late to preserve life in the younger child. The shrub, which has apparently been the cause of death, is fatal not only to man, but to cattle and sheep, being more deadly at some periods than at others. We have often heard of the injurious effects from children and grown-up men eating the ripe *berries*, but do not remember a similar instance to the present. . . . We would caution parents not to allow their children to stray where this shrub is prevalent, especially in the low and shady glens, where it appears most deadly in its effects."—*Otago Witness*, Oct. 12th, 1861.

"A fine young man, on his way to the diggings, has just met his death from partaking of the *Tutu* plant. He was camping near Wetherstone's, when he took some grass in his mouth and ate some of the poisonous plant or berry. He soon complained of illness; a doctor was sent for, and he was without loss of time conveyed to the hospital, where he died next day. . . . . He had *just arrived* from Sydney. The jury appended a rider to their verdict, *recommending the Government to publish prominent notices in the newspapers of the description of the*

[1] Taylor On Poisons in relation to Medical Jurisprudence and Medicine. Second edition. London, 1859, p. 1C1.

Tutu, together with a warning to new arrivals not to partake of it. Tutu is a small bush, with a berry like the Elder. The Maoris express an agreeable juice from the berry, but carefully avoid the *seed*, which, with the *leaves* and *shoots*, produce a narcotic effect, frequently proving fatal to both men and cattle."—*Otago Daily Times*, Nov. 15th, 1862.

The same case, apparently, is also thus referred to in the "Tuapeka [Gold Field] Hospital Report" (November 16th, 1862). "A somewhat strange case of poisoning from eating the *leaves* of the *Tutu* plant, was admitted into the hospital last week. From what I can learn, the person poisoned was a *new arrival*, unacquainted with the dangerous properties of the Tutu plant; and that, while waiting for his mates to bring provisions from Wetherstone's, he had eaten a few of the *leaves*. Shortly afterwards he was seized with severe pains in the bowels, and as he appeared to be getting worse, was removed to the hospital, where he lingered until the following morning. An inquest was afterwards held on the body .... and a verdict returned, 'That the deceased had died from eating the *leaves* of the poisonous *Tutu* plant.'"—*Otago Daily Times*, Nov. 18th, 1862.

Mr. Manning remarks, "The sickness occasioned by swallowing the Tutu berry—as I think, with the small stalk adhering, which has the poisonous fur—is just to all appearance the same as an attack of *epilepsy*. If a certain quantity is taken into the stomach, *certain death* will follow. Some French sailors, several years ago, poisoned themselves [about twelve men] by eating the Tutu berry. A quick recourse to the stomach-pump saved most of them; but about four, I think, *died*."

The following cases will suffice to illustrate the *poisonous, but non-fatal* effects of eating the tempting and luscious *berries*, including the *seeds*, on man :—

CASE I. Reported to me by my friend, Mr. Martin, of Saddlehill, Otago, who was himself the sufferer.—He had on many previous occasions eaten the berries in larger quantity, without bad effects. On the present occasion, after tea, about 7 or 8 P.M. of a harvest evening, he ate about half a pint of the berries of old plants; these berries were small and hard, and full of seeds. No sensible effect was produced until next morning, about 6 A.M., when he attempted to get out of bed and dress as usual. He got on his clothes partly, but suddenly lost all consciousness till about 11 A.M., when he awoke to find himself in bed, with a doctor beside him, and a broth plate, half full of thick blood, within view. This blood had just been drawn from his temporal artery by a penknife incision, it having refused to flow from a vein in the arm. He was conscious for a minute or two, but almost immediately relapsed into stupor, which continued for about twenty-four hours, so far as he can now recollect. When, at length, he emerged from this comatose condition, loss of memory was the chief or only peculiarity observable. For about half a day he remained in a semi-stupid state, not able to remember where he was, what he had been doing for the previous forty-eight hours, or how he had come there. He felt, indeed, as if he had been newly born into the world, and was overwhelmed with wonder at the novelty of all his surroundings. In the course of another half day he gradually passed into a condition of ordinary mental and physical activity, and there were no subsequent bad effects. Throughout his illness he had had *no pain;* there had been no effect on the bowels; and there was no treatment attempted save *bleeding*. It subsequently transpired that, after his seizure—that is, while in a state of unconsciousness—he must have descended an ordinary spar ladder leading from the attic to the ground floor, walked five or six yards along an embankment leading from the door of his house, and fallen over the said embankment, a height of seven or eight feet, before he was found, in a state of coma, by the friend with whom he resided. His friend had lost no time in carrying him again upstairs, putting him to bed, and sending for a doctor. The probability here is that, had Mr. Martin eaten the same quantity of Toot berries under other circumstances—*before* instead of *after* a meal—and more especially on an empty stomach, while the nervous system was depressed and weakened by fatigue as well as hunger, the result would have been *fatal*. He knows of several fellow-settlers (adults), who have also been affected by eating the *berry*, ripe or unripe; but the symptoms differed greatly in different individuals. Some became excited or violent: they laughed or they raved outrageously, or their conduct was simply grotesque in the extreme: the results, indeed, closely resembled those producible by "laughing gas" on the students of a chemical class. Others appeared as if under the influence of alcoholic intoxicants. He never heard, however, of any settler eating the young *shoots* or *leaves* and suffering therefrom, till the case of the two children in Dunedin, narrated in page 163.

CASE II. Reported by the Rev. Mr. Will, of the East Taeri, Otago, in whose house the following occurrence took place.—Two young gentlemen, who were staying in his house, about four o'clock one afternoon, partook of some Toot *berries:* the older gathering them from old Toot plants, the younger from younger plants. The younger, moreover, sucked the berries, but spat out the *seeds;* hence, probably, the reason that he was *un*affected. The elder, however, about 9 P.M. was seized with *convulsions*, which speedily became so violent that it required two strong men to manage him. These convulsions were severe for about forty minutes, when they gradually diminished, and the patient passed into a state of stupor. He continued in this state all next day, and when convalescing therefrom, resembled a person emerging from a brain-fever. He was utterly oblivious of the particulars of his illness, denying even that he had eaten Toot berries. For some days subsequently he was drowsy, and scarcely master of his actions, but he gradually became quite well. The only treatment had recourse to was a mustard *emetic*, but the recovery under this treatment seems to have been less rapid and satisfactory than under the blood-letting in Mr. Martin's case.

In the Dunedin district such cases of poisoning from Toot berries have now become rare, especially among the older settlers, because, on the one hand, the poisonous character of these berries is now abundantly recognised, and on the other the plant is now comparatively scarce, disappearing gradually under cultivation and the introduction and spread of alien or immigrant (mostly British) weeds.

CASE III. Reported by Mr. Stewart, of Raglan, Auckland province, who was himself the sufferer.—He had been in the bush; and being tired and hungry, with neither food nor drink of a more suitable kind at command, he ate a large quantity of Toot *berries*, including the *seeds*. During the night he was seized with *delirium*, accompanied by great muscular excitement and violence, resembling that of acute mania, necessitating the assistance of several men to restrain him. He was treated by means of some *mineral poison*, which was said by his medical attendant to be the *antidote* of the *vegetable* poison of the *Toot*, while water was thrown about him, and minor remedies were employed. He made a gradual, but, as in the other cases, a complete recovery. It is here most doubtful how far the presumed *antidote* proved efficacious, so that it is the less to be regretted that we are ignorant of its precise nature.

CASE IV. Reported to me by John Hislop, Esq., of Woodburn, Saddlehill; Inspector of Schools in Otago.—A girl at Saddlehill nearly lost her life from eating Toot berries, some years ago. The prominent symptoms were retching, vomiting, and convulsions, and the principal treatment emetics. She never completely recovered, there remaining to this day a peculiar form of *nervous irritability* not observable prior to this Toot-poisoning. It is questionable, however, whether this sequela is a "*propter* hoc" or a mere "*post* hoc."

B. On the Lower Animals.—In cattle and sheep the symptoms are of a parallel kind: there are usually one or other or all of vertigo, stupor, delirium, and convulsions. The affected animals generally stagger or reel, as if intoxicated; kick violently, and apparently causelessly; wheel round and round suddenly and rapidly; course swiftly over the country aimlessly, breasting all manner of impediments. In this condition they frequently rush blindly into pools and creeks, and are drowned. Both cattle and sheep—perhaps especially the former— are constantly being lost in this way alone. Sometimes they are affected with general tremors; frequently they die in convulsions resembling those produced by the toxic action of Strychnia. Popularly, "tooted" cattle are said to be *mad*, especially in the wheeling and steeple-chasing form or stage of Toot-poisoning.

In different districts of Otago, and in the experience of different settlers, the details of Toot-poisoning in cattle and sheep are the following:—

In the Green Island district, near Dunedin, the cattle usually affected are *young cattle freshly imported* from Australia, *in low con-*

dition and with empty stomachs. Arriving in spring, they are ravenous, and greedily eat the tender young *shoots* of Toot—a very few of which, under such circumstances, are sufficient to affect them. Some of them, when tooted, wheel round and round as if giddy, until they suddenly tumble over; and it is regarded a favourable sign, promising recovery, when, in the course of treatment, they can be got to move about somewhat in straight lines. Others shiver and become convulsed; while some rush wildly over the country as if possessed, or running a steeplechase, bolting at or over all obstacles, and frequently dying in convulsions. Newly-landed *sheep* are similarly affected under similar circumstances, causing great distress to their shepherds, who frequently awake of a morning to find several scores—quite well on the previous night—"tooted," and dying or dead. *Working bullocks* are also sometimes similarly affected *after a hard day's work*, especially in warm weather. On the other hand, cattle become *habituated* to the use of Toot, which is to them reckoned a fodder as rich and as safe as clover. Seldom or never are old, seasoned cattle affected by Toot. The enormous mortality in cattle and sheep on their way to, and at, the diggings from Toot-poisoning probably arises simply from the facts that the animals are mostly new comers, arriving in poor condition, starved or starving, and unaccustomed to the use of Toot, of whose baneful properties further their custodiers, also fresh arrivals from Australia, are ignorant. In the case of acclimated animals belonging to Otago settlers, the mischief arises probably from the accident or necessity of their feeding on Toot, after the depressing fatigue of long and toilsome marches with enormous loads, in the absence frequently, from its expensiveness or scarcity, of a more suitable fodder. Sudden deaths frequently happen from eating *in the morning and after rain* the fresh, juicy, young shoots. *Post-mortem* examination in these cases reveals great distension of stomach and intestines, similar to that produced sometimes in this country in cattle or sheep gorged with rich green clover under unusual circumstances. The settlers are unaware of any other pathological peculiarity.[1]

In the Lower Clutha districts (Inch Clutha, Warepa, Waihiku, &c.) the settlers remarked to me that the Toot appears to take effect only when the cattle lay down to ruminate, and that some of their heaviest losses occur after a night's frost. They regard Toot as most dangerous when the evening is dewy, or after rains, which add to the juiciness and attractiveness of the plant. Frequently no bad effects are perceived till the cattle are made to get up and move about, when the narcotism begins to be apparent. Cattle feeding on grass pastures containing only a slight admixture of Toot are unaffected; but if, after feeding for a time on grass alone, they are suddenly transferred to pastures where Toot prevails, and especially if they are turned out in spring on bare land, the herbage whereof was burned in the preceding

[1] I may add here, *en parenthèse*, that there seems a great dearth, if not total absence, of scientific or competent *Veterinarians* in Otago. To this circumstance I suspect it is due that we know so little that is satisfactory of the Pathology of Toot-poisoning, and the proper prevention and treatment of such poisoning.

autumn, where Toot is the first plant of any dimensions that sends up its tempting green shoots, the latter are eaten greedily, and the danger is great, if death is not certain.

In the North Island, at Wanganui, Captain Blewitt says: Bullocks and sheep, if first fed on Toot, would die, and sometimes do die in great numbers; but the danger is recognised, and they are generally fed previously on grass, and *gradually accustomed* to the addition of Toot. In Wellington, Toot is frequently very fatal to bullocks, especially over a tract known as the "Peninsula." Generally speaking, the newer the district, the greater the prevalence of Toot and the comparative absence of grass pastures, the greater the consequent risk to sheep and cattle from Toot-poisoning. In old settled districts, therefore, where good grass pastures are plentiful and Toot is fast disappearing, Toot-poisoning is rare.

In the Raglan district, also on the west coast of Auckland province, Mr. Stewart tells me, cattle are occasionally poisoned by the young *shoots*, but always under some such circumstances as the following: The animals have been feeding in the bush where there is no Toot, when they are suddenly driven upon lands where the young sweet Toot-shoots are just springing up; they are very fond of them, and eat them greedily. The chances are, that they are speedily "tooted:"—stagger, then whirl about, kick violently as if delirious, and frequently die in the course of the first night. The dead animals are found greatly "blown," or swollen. But Mr. Manning's idea,[1] that death results simply from over-feeding, and the swelling of the succulent food, and that it would be equally produced by young *grass*, is not regarded with any favour by the majority of the North Island settlers. As a rule, Toot is much less feared in the North than the Middle Island—as it appears to me, for the following reasons: I saw far less of the plant in Auckland than in Otago, and it would seem to be comparatively much rarer in the north than in the south of New Zealand, in proportion especially as open land is more abundant in the latter than the former. Flocks, and herds, and pastures are insignificant in Auckland as compared with Otago, so that thus the opportunities for mischief are greatly less in the North Island. In Coromandel, for instance, I was told that Toot is not very fatal. But the country is mostly forest-clad; there is little or no Toot, and few cattle or sheep. Even here, however, cattle are occasionally "tooted," the general symptoms being that they become "wild," "mad," and die in convulsions resembling those from Strychnia. This accident occurs only in the case of hungry and imported cattle, and was more common when the district was first settled and the cattle were newcomers than now, when they are habituated to the use of Toot. The animals tooted become "blown," but the settlers recognise *a poisonous action in addition to the mere sudden and mechanical distension.*

The original Otago settlers, before they had acquired sufficient experience to entitle them to be considered competent judges, evidently took Mr. Manning's view[1] as to the cause of the death of

[1] Vide p. 170.

animals from Toot. I find, for instance, one of the first "Pilgrim Fathers" of the Church in Otago, the venerable Rev. Dr. Burns, of Dunedin, thus writing from Port Chalmers on the 19th of April, 1848, the year in which Otago was first colonized: The Toot plant, he says, "is greedily fed on and *with safety* by cattle *acclimated;* but on cattle *newly arrived,* and especially *off a sea voyage,* it acts *as wet clover* does in England, the animal swells and dies."[1] It may happen, in some cases at least, that simple gastric distension—mere over-feeding with food which swells rapidly—is, though not *the* cause, *a* cause of death, assisting the operation of the Toot-poison—the *Coriamyrtine*—or other essential alkaloïd. At all events, before disposing of, or setting aside as inoperative, such a phenomenon as causative of death, we must remember that simple *distension of the stomach* is not an uncommon *cause of sudden death* both in man and animals.[2]

From the evidence of Mr. Manning, of Hokianga, it would appear that Toot-poisoning of cattle, sheep, horses, and other animals, in certain parts of the North Island, is, if not unknown, at least very rare.

"*Horses,*" says he, "eat of the *Tutu berry* wholesale—stalks and all—with impunity. I have seen them devouring the Tutu with the greatest avidity, and I have never known an instance of a horse being injured.

"I do not know an instance of any horned cattle eating the Tutu *berries.* Though I have hundreds of times seen cattle in the Tutu scrub, when the berries were ripe, I never saw them eating the berries; and, if they do, I feel sure they are not injured by them. No cattle are ever found dead here, or very seldom, *at the time the Tutu berries are on the tree;* or, if so, the death can be accounted for in another way than as arising from the berries.

"Cattle are, however, sometimes killed in whole herds by eating the Tutu, but not the *berries.* As the berries are *known* to have a poisonous effect on the *human subject,* this has, I think, caused the idea that cattle are also killed by the berries. This is, I believe, a misapprehension to be explained as follows: The Tutu bush grows in general in the midst of thick fern (*Pteris aquilina,* L. *var. esculenta,* Forst.) This fern grows from four to seven feet high in many places, and every third or fourth year becomes dry, and either catches fire accidentally or is set fire to, to clear it off. When this occurs the Tutu bushes are burnt off also level with the ground. This happens generally in the summer or autumn. During the next spring the root throws up great numbers of green, sappy, succulent shoots, which grow with surprising rapidity, and exactly resemble gigantic Asparagus, as thick as a man's arm and six feet long, before they begin to have the consistency of *wood.* These shoots are of a very bright green colour, and are so watery inside as to have barely sufficient consistency to stand upright. The least touch breaks them off like an icicle. Now, the cattle devour these shoots with the greatest greediness, and as almost

[1] Otago Journal, November, 1848, p. 41.
[2] Vide Taylor On Poisons, p. 152.

a matter of course *die.* But these shoots are not, properly speaking, poisonous; in moderate quantities they do cattle no harm at all, but when the cattle are killed, which they are sometimes in whole herds, the symptoms are exactly the same as those arising in Australia from eating *too much at once* of the young spring *grass*, or in England from eating green *clover.* In fact, the cattle are, as we used to say in Tasmania, 'blown;' I don't know what they call it in England. The same remedies as used in Tasmania and England are equally efficacious here, though seldom used, people being very careless, and in general letting the cattle live or die, as the case may turn out.

"I have never known either *sheep* or *pigs* to receive any harm from the Tutu berries, or from any part of the plant. Nor, indeed, have I ever observed that sheep or pigs feed on it, though I have had a flock of sheep and great numbers of pigs running amongst groves of Tutu for twenty years. Certainly I have never lost a sheep or pig from this cause, and I know to a certainty that both sheep, pigs, and horses refuse to eat the green *shoots*, which the cattle are so fond of, and which are so fatal to them.

"To the best of my belief I have never heard an authentic instance of any of the inferior animals, large or small, having been injured by eating the Tutu *berries*, or even the berries with the supposed poisonous stalk having the fur I have mentioned; though it is no doubt quite likely that they might be poisoned if forced to eat them contrary to their natural instincts.

"I shall again mention, that several kinds of *birds* feed freely on the *berries.*[1] *Sheep* and *pigs* I have never known to eat *any part* of the plant, or to be injured by it. *Cattle* I have never known to eat the *berries*, but they are killed in numbers by eating the green *shoots. Horses* refuse these shoots, but eat the berries—stalks, fur, and all—with impunity. But I must also remark that, for one horse that eats the berries, as I have seen, there are fifty that wont touch them; those which I have seen eat them in large quantities have suffered no bad effects whatever."

§ 6. *Conditions which regulate its Action.*

There are certain peculiarities connected with the action of the Toot-poison, which are worthy of attention. Under certain circumstances the Toot plant would appear indeed not to be poisonous; the exemptions are sufficiently frequent and marked to lead a small class of observers to doubt altogether its poisonous character, and to explain the so-called poisonings in other ways. My own inference, from very conflicting evidence, is that *the plant undoubtedly contains a poisonous principle; but that this poison requires certain favouring or predisposing circumstances or conditions for the development of its action.*

Cattle and sheep are generally the subject of Toot-poisoning under

[1] They are, when ripe, the favourite food of the "*Kakapo,*" or Night Parrot (*Strigops habroptilus*), which, like so many other native birds, is fast following the gigantic Moa to its doom, extinction.

some of the following conditions: The plant is young and succulent; it is, perhaps, more so after rain. The animals are hungry and voracious; perhaps they have just landed from a fatiguing sea voyage, and are underfed or starved, in bad physical condition generally, the stomach empty; or the bullocks are jaded with overwork, and have been feeding on unpalatable dry fodder; or they have been suddenly turned out of a pasture containing no Toot into one on which it abounds; or they are simply turned out on the highways and by-ways after a day's ordinary hard work under a hot sun; or it may be spring, when the favourite juicy shoots first appear, and the animals have not tasted them for many months. In a word, the animals in these cases are not *habituated* to the use of the plant. But a peculiarity resides in the fact that cattle, which have been *habituated* to its use, do not suffer; not only this, but Toot is then reckoned one of the richest and safest pasture foods, quite equal to clover. It is as great a favourite with the animals, whether they are habituated or not.

A correlative circumstance here to be noted is the fact that, while certain animals seem to be exempt from, or insusceptible to, their toxic action, they may, by feeding on certain species, or certain parts of certain species, of *Coriaria*, and assimilating or secreting the poison in their tissues, communicate poisonous effects to man or the lower animals, to which the first-named animals become food. This happened in 1862 in connexion with *C. myrtifolia*, several persons near Toulouse having been poisoned by a dish of snails, which had been fattened on its leaves and *young shoots*,[1] the symptoms having been those of narcotico-irritant action. The poisonous principle would appear to have passed unchanged through the digestive system, and to have been incorporated in the tissues and secretions, of the snails, which were themselves *un*affected thereby; and we now know that the vegetable alkaloïds can pass through an animal system undecomposed, and are detectable, under favourable circumstances, by appropriate tests. Instructive parallel cases are those of poisoning in the human subject by eating the flesh of hares, which have browsed on *Rhododendron chrysanthemum;* or of young pheasants, which have fed on the shoots and buds of *Kalmia latifolia;* the honey of bees, which have sipped it from certain species of *Azalea, Kalmia,* and *Rhododendron;* as well as the ever-quoted and over-quoted instance, from Xenophon's narrative, of the Ten Thousand Greeks, in their "Retreat," who died in consequence of eating honey collected from the *Azalea pontica*—the *Ægolethron* of the ancients; the symptoms in all these cases being those of narcotico-irritant poisoning—vomiting, purging, and giddiness.[2] An additional illustration was afforded two or three years ago by the narrative in the public prints of a case of poisoning in England by the flesh of Canadian partridges, which had fed on some particular noxious plant, not affecting themselves, but the

[1] Medical Times, Sept. 13th, 1862, p. 282.
[2] Taylor On Poisons. Second edition, 1859, p. 217.

poison contained in which was highly dangerous—in one case nearly fatal—to persons partaking of their cooked flesh.[1]

I have met with New Zealand settlers who have been "tooted" on certain occasions, but who have, on certain other occasions, eaten with impunity Toot berries, in equal quantity, and apparently under parallel circumstances. Colenso, who ought to be a good authority, goes the length of asserting that the *less juicy* berries of the several New Zealand *Coriariæ* have seeds that are not poisonous![2] A parallel fact, in regard to another species of *Coriaria*, is the statement by Royle that the fruit of *C. Nepalensis* is frequently eaten without inconvenience in the northern provinces of India; though it is doubtful here, and in similar cases, whether the *seeds* were consumed along with the succulent or pulpy part of the fruit. In regard to the more familiar *C. myrtifolia*, Peschier of Geneva states that tanners,[3] who employ its leaves as an astringent in tanning, use it also habitually for gleet, and that he gave a *decoction* of an ounce to dogs, chickens, and *men*, without any bad effects![4] Such conflicting statements show that there are peculiarities in the action of the poisonous principles of the *Coriariæ*, which require explanation at the hands of experimental toxicologists and chemists, and which explanation can only be the result of thorough scientific investigation.

§ 7. *Treatment of Toot-Poisoning.*

A. In the Lower Animals.—In different parts of New Zealand different remedies or antidotes are employed in Toot-poisoning in sheep and cattle. Of these, by far the most common is *Bleeding*, especially by slashing the ears or tail; and it is no uncommon event at a large sheep or cattle station for all the "hands" to be busily engaged in the wholesale slashing of the ears or tails of tooted sheep or cattle. Belladonna has been variously tried, and favourably reported on; and various Stimulants are by some regarded as specifics, such as carbonate of ammonia, brandy, and a mixture of gin and turpentine, locally known as "Drench." Whatever be the nature of the remedy to be applied or employed, there is no difference of opinion as to the necessity for the promptest treatment, for at a certain stage of the action of the poison all remedies appear equally inefficacious.

It is generally recognised as a rule that cattle and sheep which are known to have fed on Toot, but which are as yet exhibiting none of the active signs of poisoning, should not be interfered with by herdsmen or dogs. For it has been abundantly proved that, while the narcotic effects may gradually pass off if the animals are left quite undisturbed, if dogged, excited, or frightened, or if caused to get up from the reclining posture of cud-chewing and move about rapidly,

[1] Vide also foot-note [1], p. 175.

[2] Hooker's Flora Novæ Zelandiæ. London, 1853, p. 45.—Forster, in his 'Commentatio de Plantis Esculentis,' &c., includes *C. ruscifolia* among *edible* plants.

[3] The *root* of this European species is largely used, especially in Russia, for tanning leather.

[4] Christison On Poisons. Fourth edition, 1845, p. 913.

the poison at once becomes active and dangerous, and some of the symptoms or phenomena already described are manifested. In other words, no remedy, no disturbance is admissible till decided symptoms of poisoning have been manifested. Up to this period perfect rest and quiet are the only appropriate treatment.

The following may be cited as illustrations of the varying practice of the local Veterinarians,[1] amateur or professional, in different districts and under different circumstances :

In *Otago* the Green Island settlers slit the ears of "tooted" *cattle*, and encourage profuse bleeding. This is their only treatment, which they apply equally to *sheep*.

In the Taeri, affected *sheep* are frequently plunged into a pool of water, or are dosed with brandy.

In the northern districts of Otago, the flockmasters bleed tooted sheep from the *eye veins* that run up each side of the angle or root of the nose, or from the roof of the mouth. This *bleeding* generally proves speedily effectual, if the animal is to recover; it is heard to give a marked sigh as if of relief, and this symptom is regarded as the first herald of progress towards restoration. For about two days after this operation, however, the animal appears as if in a state of intoxication or semi-stupor. *Carbonate of ammonia* is also frequently used with good effect by the shepherds; a lump, about the size of a walnut, is dissolved in a pint of water, and a wineglassful is poured down the animal's throat. *Cattle* are treated in a like way, being bled from the roof of the mouth or from the tail; never from the *ears* in certain parts of Otago. So sudden and general is often the seizure, so large the number of animals "down" with toot, that all the inhabitants of a large station on such occasions are busied, with an earnestness and activity that indicate the importance of the interests at stake, for hours, if not for days, bleeding wholesale, as, under such circumstances, remedies cannot be too speedily applied, and every moment may be fraught with the death of valuable "stock."

In the North Island the Wanganui settlers use "Drench," a mixture of gin and turpentine; or they bleed; while they sometimes also pierce the side of the animals to evacuate flatus—real or supposed. The Raglan settlers, again, bleed promptly from the tail or ear, resembling in this respect the generality of the Otago colonists.

B. In Man.—In the human subject the nature of the remedy is still more varied, though Bleeding, Emetics, and Stimulants seem the most rational of those usually had recourse to.

Mr. Manning says: "The only *Native* remedy I have ever heard of for the fit, or epileptic attack, occasioned by eating the berries, is a very barbarous one, and simply consists in nearly drowning the patient by ducking or holding him under water till he is all but smothered, and, when showing signs of life again, repeating the operation. I do not *know* whether this is of any use, but I *think* the patient would recover or die just as well without the remedy! I must also say, however, that I never heard of an instance of a *Native*

[1] Vide foot-note, p. 167.

dying from the effects of the Tutu-poison. This, perhaps, is, because they know its effects, and, even when using it improperly, do so sparingly."

§ 8. *Properties of other Species of Coriaria.*

From the foregoing remarks it must, *inter alia*, appear that, while we know little, if anything, in this country, or generally in Europe, of the Toot plant or its poisonous action, at least one other species of *Coriaria*—a European one—enjoys an unenviable notoriety as a poisonous agent: the *C. myrtifolia*, whose leaves constitute a common adulteration of Senna. To the French this plant is well known as "Redout," or "Roudout." It is a common plant in Provence and Languedoc. Its leaves are poisonous, and are probably largely chargeable with some at least of the noxious effects generally attributed to *Senna*. Guibourt asserts that its *fruit* causes convulsions, delirium, and death in man and the lower animals; and De Candolle says that these effects were produced by its *seeds* on the French army in Catalonia.

Professor Christison and others of our most eminent toxicologists give, in their works, numerous instances of the poisonous action of this, the only European, species of the genus; some of which instances it is desirable, by way of comparison, to cite here, inasmuch as the effects both on men and animals closely resemble those produced under similar circumstances by the New Zealand species. There are various cases on record of *death* from eating its *berries*; but it is perhaps more usually deleterious or fatal when an infusion has been swallowed, as that of Senna, of which it is too commonly an adulterant. Professor Christison[1] mentions two fatal cases in children from eating the berries—one within a day, the symptoms resembling epileptic convulsions; in the other, a child of three and a half years of age, who had eaten about 80 to 100 berries, the symptoms were heat and pricking of tongue, sparkling and rolling of eyes, loss of voice, tetanus, and convulsions recurring in fits of eight or ten minutes' duration; death taking place within sixteen hours and a half. In another case, ten soldiers were simultaneously seized after eating berries, and two died. In the case of a male adult, death occurred within four hours after swallowing as medicine an infusion of Senna, which had been adulterated with *Coriaria* leaves, the symptoms being violent convulsions, tetanus, and *colic*. The latter affection is so very rare as a result of *Coriaria*-poisoning, that it is questionable whether *it* is not really referrible to the *Senna*. In a third adult, who had eaten only fifteen berries, convulsions, coma, and lividity of face were followed by death the same evening, though the greater part of the berries had been ejected by emetics.

More than twenty years ago its poisonous action on the lower animals was experimentally investigated by Professor Mayer, of Bonn, who found the prominent symptoms (in cats and kittens chiefly) were violent fits of tetanus, followed by apoplectic coma. ʒj. of extract of the *juice* killed a cat in two hours when swallowed; ʒss., applied to a wound, killed a second in 85 minutes; six grains in the same way de-

[1] On Poisons. Fourth edition, 1845, p. 913.

stroyed a kitten in three and a half hours. Ten grains of the extract of the *infusion*, applied to a wound, killed a kitten in six hours. *Rabbits* were found to be scarcely affected, whether the poison were administered internally or applied to a wound;[1] but one grain injected into the jugular vein caused, in about five hours, a single fatal convulsive paroxysm.

Notwithstanding cases so numerous and of so striking a character, doubts have been, and are still being, expressed by writers, as in the parallel case of "Toot," whether *C. myrtifolia* is poisonous at all!

I would venture to express here my suspicion that the whole genus *Coriaria* is poisonous; and, as such, my conviction that it forms a worthy subject for scientific investigation. An examination of the Toot poison will be incomplete without a review of the action on the animal system of the poisonous principles of the other species of *Coriaria*—all of which may prove to possess the same, or allied, poisonous principles, characterized by a Neurotic action.

§ 9. *Appendix: Other Poisonous Plants of New Zealand.*

I may add, by way of *Appendix*, that several other New Zealand plants are asserted or supposed to possess poisonous properties: which plants and properties should be made forthwith the subject of proper investigation by *local* botanists, chemists, and physiologists. I recommend the subject to the attention of *local* scientific authorities for this reason, that I found the large quantities of Toot I had collected in different stages of its growth while in Otago, on arrival at home, in a

[1] This is only corroborative of what the experimental physiologist constantly finds: that various of the lower animals are susceptible in very different degrees of the action of the same poison, which in some, indeed, may be quite innocuous. This occurred to myself in 1853, in the case of *dogs*, while engaged in a series of experiments instituted for the purpose of discovering the antidotes to certain common poisons (Opium, Strychnia, &c.) Vide paper "On the *Non*-susceptibility of the Dog to the Action of certain Poisons," Association Medical Journal, June 9, 1854. Sir J. Emerson Tennent, in his Natural History of Ceylon,* cites the following instances of deadly poisons, which are *innocuous to certain animals*. Speaking of the Mongous not being affected by poisonous serpents, he remarks: "Such exceptional provisions are not without precedent in the animal economy. The Hornbill feeds with impunity on the deadly fruit of the *Strychnos*;" and in regard to the same bird he elsewhere in the same work explains further: "The Hornbill abounds in Cuttack, and bears there the name of 'Kuchila-kai,'† or Kuchila-eater,‡ from its partiality for the fruit of the *Strychnos Nux-vomica*. The Natives regard its flesh as a sovereign *specific for Rheumatic affections*. . . . . The milky juice of some species of *Euphorbia*, which is harmless to Oxen, is invariably fatal to the Zebra; and the Tsetse fly, the pest of Southern Africa, whose bite is mortal to the Ox, the Dog, and the Horse, is harmless to man and the untamed creatures of the forest."

* p. 40.

† It may not be uninteresting here to note, as in another way connecting New Zealand and India, that the word "Kai" occurs also in the Maori language, both as substantive and verb, signifying, moreover, in New Zealand as well as in India "food" and "to eat."—Williams: Dictionary of the New Zealand Language.

‡ p. 242, note 4.

state unfit for examination.[1] Professor Thomson found it impossible to obtain any satisfactory results from the specimens I brought home specially for chemical analysis. Such an examination, I believe, with the necessary relative physiological experiments, can be properly carried out only on the native soil of the plant, whose properties become the subject of examination.

It would be improper here to enumerate *all* the indigenous plants possessing poisonous properties, real or supposed; but, as a hint or indication to the local experimentalist, the following will probably suffice as illustrations:—

1. *Phormium tenax*, Forst. (N. O. *Liliaceæ*), the common "New Zealand flax."—Captain Blewitt, of Wanganui, informed me that the *red gum*[2] at the base of its leaves is frequently poisonous in the North Island to starved bullocks and sheep put into a paddock to tread down and destroy the flax. The symptoms are simply gradually increasing emaciation, followed by death. *Post-mortem* examination reveals no visceral hyperæmia, or other indications of irritant action. Only undigested flax fibre is found in the intestines: which fibre and its indigestibility are supposed to have as much to do with the fatal result as the gum. Its *root*, however, is said to be purgative.[3]

2. *Sophora tetraptera*, Aiton (*Edwardsia grandiflora*, Fl. N. Z.), (N. O. *Leguminosæ*), the "Goai" or "Kowhai" tree: the equivalent in Otago of our *Laburnum*.—Dr. Hulme, the Provincial Surgeon of Otago, tells me he suspects its *wood* and *seeds* of poisonous properties.

3. *Coprosma linariifolia*, Hook. fil. (N. O. *Rubiaceæ*), the "Mikimik" of Otago.—Its *berries* and the smoke of its *wood* are said to be poisonous. The berries of other two species, *C. acerosa* A. Cunn. and *C. lucida* Forst., are eaten by the natives.

4. *Nesodaphne Tarairi*, Hook. fil. (N. O. *Laurineæ*), the "Taraire" of the North Island.—The kernel, or embryo, is said to be poisonous, *when raw*; but its berry is greatly eaten by birds, and, *when boiled*, by man. The berries of the only other New Zealand species, *N. Tawa* H. f., are eaten without qualification or reservation by the Maoris, to

[1] These included Toot in three different states or stages of growth, all from the neighbourhood of Fairfield, Saddlehill, *Otago*:

(1.) Young succulent shoots, like those of Asparagus; collected in the early part of November, 1861.

(2.) More mature shoots, expanding into leaf; or the tops of the young branches before flowering; collected in December, 1861.

(3.) Branches in young flower; collected in January, 1862.

All these suites of specimens were mouldy when unpacked from my repositories: but I had hoped they would otherwise have been of service in a chemical examination into the nature of the active poisonous principles of the plant.

Unfortunately I was obliged to leave Otago before the period of *fruiting* of the Toot, and so had no opportunity of collecting its *seed*; and the promises of the settlers to forward a sufficient supply of the latter for experimental purposes have not been fulfilled.

[2] In Otago I found this gum, which resembles gum-arabic, used as such by the settlers, and I have so used it myself. The flowers secrete a sweet, watery *honey*, a favourite dainty of the settlers, and of which I have often partaken. It appears to be quite innocuous.

[3] Hooker's Flora Novæ Zelandiæ, vol. i. p. 256.

whom the ripe berry is known as "Pōkerehū," and its pulpy portion as "Pōkere."

5. *Leptospermum scoparium*, Forst. (N. O. *Myrtaceæ*), the "Manuka," or "Tea-tree" of the Maori and settler.—In Otago cattle often eat a little of it, and apparently without bad effects; but if they are starved, and compelled to eat it in larger quantities, it may be fatal, or very deleterious. The Maoris and settlers alike use a decoction of its leaves as a substitute for *tea;* hence its familiar designation, "Tea-tree." A strong infusion of the leaves is sometimes emetic, like green tea, says the celebrated navigator Cook;[1] but a weaker or ordinary infusion is largely used as a substitute for tea by the colonists throughout Australia and Tasmania, as well as New Zealand.

6. *Corynocarpus lævigata*, Forst. (N. O. *Anacardiaceæ*).—The kernel or embryo of the *berry* (drupe), which is known as the "Karaka" berry in the North Island, is considered poisonous *un*cooked,[2] or till steeped in salt water;[3] but the pulp of the fruit is eaten raw, and the kernel when cooked.[4]

7. *Convolvulus sepium*, Linn. (N. O. *Convolvulaceæ*).—The large tuberous rhizome is said to be eaten by the natives;[5] whereas in Europe it is regarded as poisonous, and yields a gum-resin, resembling Scammony, possessed of purgative properties. This, indeed, is the general characteristic of the roots of the species of the genus *Convolvulus:* (though there are marked exceptions, as that of *C. batatas*—the Sweet Potato, which is saccharine, and amylaceous, and thereby edible). Dr. Hooker very justly remarks:[5] "The properties of the same species vary eminently in various localities. This is notoriously the case with many medicinal plants, which are of violent action in one climate and innocuous in others."

8. *Solanum aviculare*, Forst. (N. O. *Solanaceæ*).—The "Pōropōro," "Pōpero," or "Kohōho" of the Maoris. Referring to its *berry*, which he says "is eaten with avidity *by birds* and *the natives*," Dr. Hooker[6] observes: "Cook's sailors ate it *on the faith of the birds not being poisoned*—a very dangerous experiment, as animals eat many fruits and leaves that are poison to man."

The berries of *S. nigrum*, L. appear also to be eaten by the Maoris—at least in the North Island;[7] but I am, with Dr. Hooker, disposed to regard the use as food of the berries of *Solanum* as a "dangerous experiment." The berries of both the species mentioned are, however, eaten in other countries: that of *S. aviculare* in Australia under the name of "Kangaroo apple."[8]

S. aviculare is also mentioned among *edible* plants in Forster's 'Commentatio de Plantis Esculentis Insularum Oceani Australis.'

9. *Cotula* (*Myriogyne* Fl. N. Z.) *minuta*, Forst. (N. O. *Compositæ*),

[1] Vol. iii. p. 115. [2] Dr. Thomson's Story of New Zealand, vol. i. p. 167.
[3] Hooker's Flora Novæ Zelandiæ, vol. i. p. 48.
[4] Known to the Maoris, after steeping in water, as "Kōpia."
[5] Flora Novæ Zelandiæ, vol. i. p. 183. [6] Ibid. p. 182.
[7] Dieffenbach's Travels in New Zealand, vol. i. p. 431.
[8] Balfour's Class Book of Botany, p. 862.

is, under certain circumstances, possessed of pungent, irritant or sternutatory properties, causing sneezing when bruised under the nose.[1]

10. *Sicyos angulatus*, Linn. (N. O. *Cucurbitaceæ*), is probably poisonous, as are all plants of this order *in their wild state.*

It is satisfactory to be able to conclude my remarks by the statement that Toot is not now so dangerous, Toot-poisoning not now so common, as it once was in New Zealand. This seems to arise from two circumstances principally—that the plant is gradually disappearing from the soil with advancing cultivation and civilization; and that, its poisonous property being now more fully recognised, its fruit is now more generally and carefully avoided as a food or beverage for man, and its shoots as a fodder for cattle.

Art. II.

On the Early History of Uterine Pathology, and Use of the Speculum among the Ancients. By Henry G. Wright, M.D., M.R.C.P., Physician to the Samaritan Hospital for Women.

It is now nearly half a century since professional attention was sharply awakened to the inefficiency of the routine practice then generally pursued in treating Diseases of Women. It was only by a coincidence that the subject came under consideration both in England and France at nearly the same time. Such concurrent investigations (with sometimes even simultaneous but independent discoveries) are by no means rare in the history of science. Thereby is simply signified so general an advancement in knowledge, either general or special, that the same goal presents itself, and the same means are available to many eager observers; all pressing onwards in the same direction.

The works of Sir Charles Clarke and of Dr. Gooch in this country, and of Recamier and Lisfranc in France, may be accepted as those which exercised the most important influence in directing attention to the necessity for a more exact study of diseases of women. The distinguishing characteristics of the two schools of uterine pathology were just as strongly marked then as they are now. In this country there was, and still is, a tendency to regard uterine affections as intimately associated with, and in the main originally dependent on, some general derangement—to look on the uterine disorder as "a fragment of a constitutional malady." According to the doctrines of the French school, it is the local ailment which is almost exclusively regarded, the constitutional symptoms being attributed to the widespread influence exercised by the demonstrated uterine disease. Of this latter view the most zealous exponents were to be found among those energetic practitioners who first introduced into the practice of this country the methods of local investigation and treatment pursued in the French schools. It cannot be doubted that the sudden and

[1] Hooker's Flora Novæ Zelandiæ, vol. i. p. 130.

enthusiastic advocacy of a very general use of the speculum, prominently and persistently declared to be essential for successful treatment, was met by a somewhat injudicious and unreasonable antagonism; the use of a valuable aid to diagnosis and treatment being confounded with its possible abuse by unskilful or unscrupulous persons. Something of this strong opposition might also have been due to the bold proposition so frequently advanced even to this day, that the world was in dense ignorance about uterine diseases until the speculum of Recamier threw light on the subject.

"It was not till of late years," says Dr. Simpson,[1] "that we had certain means and measures of knowing when inflammation or when ulceration were present." "I have repeatedly been asked," writes Dr. Mitchell, "how it happened that our forefathers treated female diseases successfully, as well as the present generation of medical men, without the use of the speculum. To which I would reply, that many went to the grave with the seat of disease undiscovered."[2] Dr. Tilt commences his elaborate work[3] thus: "The dark ages of uterine pathology extend to 1816, when by showing the possibility of an ocular examination of the womb, and urging the frequent necessity of doing so, Recamier enabled his disciples to apply to diseases of that organ the recognised sound principles of general pathology. Those who followed have necessarily derived precision by adding ocular demonstration to the previously known methods of studying diseases of women." So enthusiastic, indeed, were some of the advocates of the use of the instrument that they did not scruple to adopt very exaggerated views. "What opposition," writes Dr. Balbirnie, "did not Harvey's discovery of the circulation of the blood create! He was an innovator. Jenner also was an innovator. The science of auscultation also was opposed in Great Britain; but all these have long achieved their triumph. Doubtless a similar opposition awaits the speculum. We go forth its advocate; we proclaim ourselves the apostle of the speculum; with that instrument we link our fate, and by that we will stand or fall."[4] Such statements may be fairly held to imply a strong belief that something new had been accomplished, something special to the age, and signifying a great advance in knowledge on account of recent discovery. But the counter arguments employed were just as indiscreet, and the statements often as exaggerated. And this was the more remarkable, since the key-note of the only true and scientific method of investigating uterine diseases had in reality been struck in the admirable works of Clarke and Gooch. It might have been urged that, according to the method of research of the English school, all constitutional causes producing disorder were to be investigated, all the teachings of physiology and general pathology held in mind, and all the extended knowledge of the influence of remedies to rules hygienic or medicinal were to be laid under contribution. This was the real innovation, for the use of the speculum, and of every one of the newly suggested means and measures of local investigation introduced by the French school, indicated only a revival of the

[1] Obstetric Memoirs, p. 3. [2] Practical Remarks on the Use of the Speculum.
[3] Uterine and Ovarian Inflammation. [4] Treatise on Organic Diseases of the Womb.

practice pursued in ancient times, when little was known of physiology or pathology, and still less of the rationale of treatment. Had this argument been strongly urged and upheld by the very substantial evidence which a little research might have supplied, it is probable that less prominence would have been given to that exclusive use of local means of investigation which chiefly led to uterine disorders first being considered as a speciality. The evil results which have followed are twofold: "Some men regard the local ailment as everything, others almost lose sight of its existence, and it is difficult to say which is the most mischievous."[1] The warm discussions which led men to range themselves into parties might possibly have given place to a method of research more consistent with true scientific advancement, had the curious history of uterine pathology, how it was anciently studied, and why it came to be disregarded, received its due share of attention.

The earliest records of medicine point to the Egyptians as studying it even in the most remote periods of their history. A recently translated papyrus[2] contains a treatise on medicine transcribed about the nineteenth dynasty, but believed by learned Egyptologists to have been written in the time of the early Memphitic kings (2600—3500 B.C.), at least a thousand years before the birth of Moses. Now a study of those parts of the law of Moses wherein special allusion is made to the hygienics of women, and precautions advised concerning them, indicates very clearly that the prudent regulations enjoined (so necessary under the conditions and climate in which the people lived) were derived from observation of the evils arising from neglect. Moses, we are told, was skilled in all the knowledge of the Egyptians, and the rules and observances mentioned were such as would have struck any acute and inquiring stranger living in a land where medical precepts had gradually influenced the domestic habits of the people. That the Egyptians maintained a world-wide medical repute, even down to far later times, we have abundant testimony. Homer expressly mentions them as skilled above all men, and directly descended from Apollo.[3] It is beyond doubt that the earliest Greek physicians derived much of their knowledge from Egypt; and if the essays ascribed to Hippocrates—certainly written in his epoch—represent the direction of observation in his time, it is evident that there was then a very advanced knowledge of the diseases of women.

The works of Aretæus and Galen strengthen this belief; for it is important to remember that dicta as to diagnosis and treatment of these disorders indicate very long and careful observation to distinguish accidental conditions compatible with health from those symptomatic of disease. In the works attributed to Galen occurs the earliest allusion to the speculum vaginæ as a distinct instrument from the speculum ani; whilst Aretæus describes ulceration of the womb with a precision which leaves little doubt that he also employed the instrument for diagnosis. These authors both studied at

[1] Dr. West: Diseases of Women. [2] In the Berlin Collection.
[3] Odyssey, book iv. l. 231.

Alexandria and practised at Rome. What Athens had been in philosophy and Corinth in arts, Alexandria continued, for several centuries, to be as a centre of medical lore; and even to have studied there was accepted as a qualification to practise. But there gradually arose at Rome an independent school. Celsus, its most distinguished writer, was an exception to the general rule, as he had neither studied at, nor did he love, the Greek schools. Unfortunately, his most important chapter on uterine maladies is, in great part, lost; but we may judge from a passage in his works that, even in his time, diseases of the genital organs were so far a speciality of the Greek school that he could make it a subject of covert sarcasm. In treating of them he says, "their nomenclature among the Greeks is not only tolerable, but now fully sanctioned by practice, for they are freely employed in almost every volume, work, or treatise of the physicians; but with us Romans these terms are filthy, and never employed by any one who has a proper regard for modesty in language; therefore it is evident that there is no small difficulty in maintaining at the same time a delicacy of expression whilst delivering the precepts of the art." Whether it was jealousy, or a continuance of that same bitter feeling towards the Grecian schools of medicine previously exemplified by Cato[1] and Pliny,[2] it is evident that some other than the alleged motive prompted Celsus to write this sentence; for, being a shrewd practitioner, he must have known that the morality of the Romans—as described in the sixth satire of Juvenal—scarcely required such tender solicitude. Soon after the death of Galen the great medical school of Alexandria was broken up. Its fame had gradually waned, but the well-stored library still remained, enriched by the addition of the manuscripts from Pergamos, another medical school. So vast were the literary treasures, that it is reputed 700,000 volumes were destroyed when the library was burnt by Omar in A.D. 642. How many of these works treated on medicine we can only conjecture. Alexandria had been for centuries the centre of medical teaching; and here must have lived and worked those masters of the art to whom the pupils came for instruction; and here, about a hundred and fifty years before the final destruction, an industrious compiler laboured his lifetime through to condense into practical form the literature of medicine of the period, working among the stores of the great library. His Magnum Opus is still extant, and is, without doubt, the most valuable existing work on ancient medicine.

Aëtius lived at Alexandria, and probably practised there, as he makes mention of cases under his own care. But the chief labour of his life must have been the compilation of his book. It was an endeavour, and probably a successful one, to represent the practice then taught and followed in whatever concerns the diagnosis and treatment of disease; omitting, as far as possible, the discussion of theories and allusions to prevalent squabbles about systems. He refers to and gathers from many authorities, but conscientiously acknowledges the sources from which his information is drawn; and he condenses with

[1] Letter to his son Marcus. [2] Lib. xxiv. cap. viii.

admirable clearness. His work embraces the whole range of medical science as then known, but I purpose only alluding to that section in which he treats of diseases of women. In addition to its special historical interest, there are some grounds for believing it to be the only authentic and complete treatise on the subject now extant out of all those which were written previous to the time when Aëtius lived; for Hieronymus Mercurialis attributes the treatises of Hippocrates on the nature and diseases of women to one of his disciples[1]—a view supported by Schultze and others. The chapter in Celsus is imperfect, as also is the history of treatment in Aretæus.[2] The book 'de Gynæciis,' in Galen, has been held to be fictitious by most editors. Of the works of Soranus, Oribasius, and Rufus, only fragments remain, whilst other authors to whom Aëtius refers have their names on the roll of the history of medicine, but their works are entirely lost. Such are Philumenes, Archigenes, Pelaginus, and Asclepiades. This last (from whom Aëtius takes his chapter on healing of ulcers of the womb) is the only one to whom we find any collateral reference, since Cicero speaks of him as his physician and his friend. Lost also is any notice of that first Moschion to whom Pliny attributes a tract 'de Pessariis,' and of Antyllus, from whom Paul of Ægina derived a chapter on the same subject.

In the sixteenth book of his work Aëtius treats principally of disorders of women, devoting to the subject a hundred and twelve chapters, varying in length from a few lines to several such pages as these. Thirty-seven of these chapters treat of pregnancy, of parturition, and of suckling. There are six chapters on various kinds of ulceration of the womb, three on abscesses, two on displacements, two on obstructed and imperforate uterus, seven on growths occurring in the vagina or uterus, and eighteen chapters on menstruation and its disorders. He describes hysteria, fibrous tumours, pelvic abscess, and hæmatoma, and devotes a long chapter to inflammation of different parts of the uterus and its treatment. Only a series of extracts could convey a just estimate of the extent of special knowledge indicated in these descriptions. But so far as concerns the use of the speculum, it is especially worthy of note that he refers again and again to its employment, as a matter of course, in the diagnosis or treatment of ulceration, of tubercula (polypi) in the neck of the uterus, of sessile growths in the same situation, and of calculi and hæmorrhoïds of the womb; of imperforate uterus, and abscess of the womb. Digital examination is also mentioned as a matter of course, "particularly when there is pain denoting ulceration, which is especially liable to happen on the cervix uteri." The treatment he describes includes most of our modern appliances, in addition to a special description of the use of the speculum. First and most constantly recommended are medicated pessaries, for which he gives upwards of a hundred formulæ.[3] They included not only the rags smeared with ointment, to which previous writers had referred, but also certain preparations

[1] Lib. iv. cap. xx. [2] Lib. ii. cap. xi.

[3] "Dr. Simpson first introduced medicated pessaries into use several years ago!"—Ed. Med. Journal, June, 1848, p. 886.

compounded and used exactly as they are now-a-days described. The ingredient which forms the basis must be of such kind that it melts at the temperature of the body; it must be so firm that, when cold, it can be neatly introduced, and the relation of these component parts must be varied according to the nature of the conveyed medicaments. In modern practice wax and lard form the vehicles. The ancient writers used other ingredients, such as beef and deer marrow, goose fat, &c.; and Aëtius describes how, in making suppositories of this kind, the ingredients are to be melted and mingled and allowed to cool before being used.

The use of sponge tents is also very accurately described by Aëtius; how they must be well dried and smeared with unguent, and introduced (with a thread attached) successively until full dilatation is accomplished. In cases where the canal of the cervix has been imperforate, a tin tube is to be inserted in order to maintain the passage, and a speculum subsequently employed, any exuberant granulations being touched with verdigris.[1] The importance of injections, the use of hip-baths both plain and medicated, the employment of the douche, and application of fumes and vapours by means of a reed introduced into the vagina and connected with a vessel containing the medicated fluid, are all mentioned as ordinarily employed in practice. We may fairly infer this; for Aëtius, throughout his work, so carefully refers any special method of practice to the originator, that whenever his description of treatment has no such acknowledgment we may conclude his description to apply to the treatment ordinarily pursued by the most able practitioners of the day.

In his description of the various displacements of the uterus, Aëtius states, among other suggestions as to treatment, that their correction may be effected *specillo et digito*. Here he probably only referred to an ordinary long probe; the recognition of an instrument, specially used as the uterine sound is employed, was of later date.[2]

Before tracing further the history of the speculum, I may allude to a matter naturally suggested when considering what the practice was in the time of Aëtius, how thoroughly it fell into desuetude and has only been revived in comparatively recent times. There was the experience of many centuries, there was the testimony of acknowledged authorities, and there were always suffering women urgently needing help in old times, as in the present time. And if there was any faith in what Aëtius wrote, and in those whom he quotes, why were their teachings disregarded for upwards of a thousand years? It forms a somewhat curious and significant episode in professional history. After the dispersion of the Alexandrian school, the professors of medicine, though scattered, were still received with honour by their Moslem conquerors. What they could teach was eagerly gathered, except when their instruction clashed with any tenet of the Mahommedan

[1] The employment of a porte caustique had been previously mentioned by Oribasius. Describing the application of caustics, he adds: "Uteri autem vesicæque exulcerationes iisdem remediis curantur sed opus est instrumentis quibus intromittantur."

[2] Wierus (1657) gives the first accurate description of an instrument exclusively used for uterine exploration.

creed. The Arabian school which then arose comprised equally industrious workers and equally accurate observers. But the study of diseases of women was not cultivated among them; for there was an insuperable bar to the attainment of practical experience on the subject. It was against the Mahommedan creed that women, even in their suffering, should undergo personal examination except by one of their own sex. Their degraded social condition prevented their attaining any such position as that to which the women of Greece had vindicated their claims. Even an Hypatia or Agnodice could not have withstood the blighting influence of Moslem sensuality. In the Arabian writings there is only very general mention of diseases of women, the matter being principally copied from the Greek books, whilst the local treatment was left in the hands of the midwives. The works of Avicenna, Serapion, and Haly Abbas show how far the Arabian physicians permitted the subject to drop out of notice. It is true that Albucasis, one of the latest writers of the school, refers to these diseases at greater length, but he appears from his writings to have been a Jew. It is he who first mentions herpes of the uterus, and the use of an air pessary for the vagina.[1] Then, as to this day in the East, the midwives undertook the work. One of them, Trotula (thirteenth century), published a treatise on uterine disorders, in which she expressly mentions that many Saracenic women practised at Salerno.

Reverting to the speculum, it is doubtful if the history of any single instrument has been so well preserved. We find it figured in Scultetus, and his description is as follows (the engraving is accurately copied on opposite page): "Fig. 2 is an instrument which they call 'speculum ani et vaginæ uteri,' in that by its help ulcers of the rectum and of the vagina and uterus may be seen, to be carefully observed according to their extent and kind. The part of the speculum, *a*, drawn open and called male, is applied for men; but the closed part, *b*, is applied to women, whence it is called female." This is a modification for general purposes, but "Fig. 4 is the large speculum matricis, and is only used for women, when a dead fœtus has to be cut away or an ulceration of the womb to be inspected." To illustrate the method of using this speculum, he gives a representation of a woman with the instrument introduced and dilated; he describes it as that which Paulus Ægineta mentions, whose words he correctly quotes as follows:

"The person using the speculum should measure with a probe the depth of the woman's vagina, lest the tube of the speculum being too long it should happen that the uterus be pressed upon. . . . The tube is to be introduced having the screw at the upper part, and the speculum is to be held by the operator, but the screw turned by the assistant; so that the laminæ of the tube being separated, the vagina may be dilated."[2]

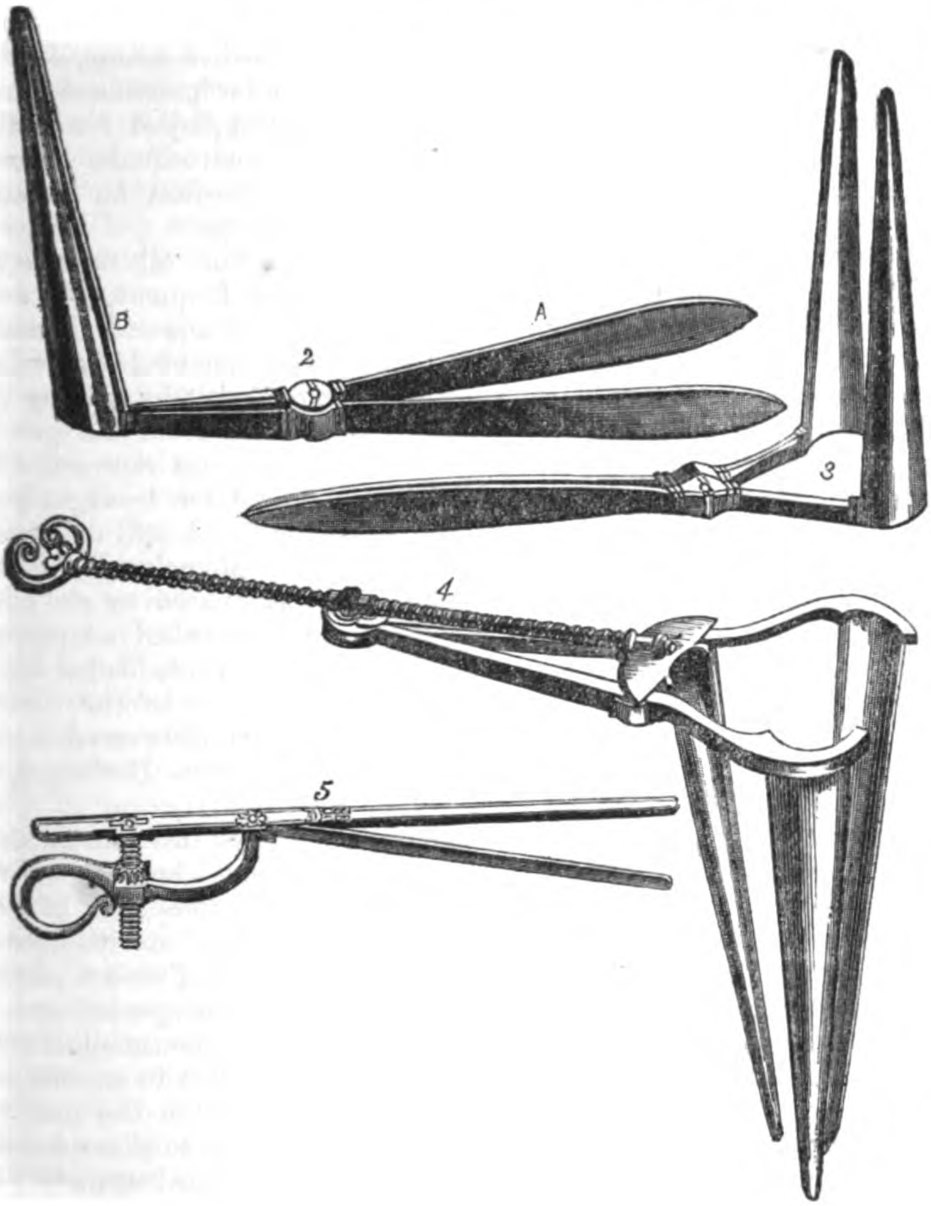
Now Paul of Ægina lived upwards of a century after the time of

[1] In fracture of the os pubis. He says: "Accipe vesicam ovis et stringe super foramen ejus canulam arundinis et intromitte vesicam totam in vulvam ejus. Deinde suffla in canulam cum virtute donec infletur vesica intra vulvam, fractura enim redit." The process is identical with that recently proposed in cases of mollities ossium.

[2] Lib. vi. cap. lxxiii.

Aëtius; and this very description is an almost verbatim copy from that author, but without the conscientious acknowledgment which I have mentioned as characterizing the book of Aëtius, whose description runs thus:

"Per specillum sinus muliebris profunditatem dimetiatur ut ne major dioptræ tibia uterum comprimat . . . . oportet autem tibiam



immittere, cochleâ ad supernam partem vergente, et dioptram quidem a chirurgo teneri cochleam vero per ministrum circumverti ut diductis tibiæ plicis sinus distendatur."[1]

The same description, with very slight difference, is to be found in Albucasis (fourteenth century). And it may be conjectured that

[1] Lib. xvi. cap. lxxxvi.

Scultetus was acquainted with the instrument, but not with its correct use, since in the plate he represents it as introduced with the handle downwards.[1] It is because of this historical reference that I first mention the illustrations of John Schultz (or Scultetus, as he styled himself in the fashion of those days). He was a pupil of Hieronymus Fabricius (1620), who also delineates a three-bladed speculum, whilst others still more complicated are represented by Galbelchouer (1627) and Ambrose Paré (1640). There can be no doubt of the purpose of the speculum as depicted by them; but a still earlier writer, Jacobus Rueffus[2] (1587), has a drawing of a somewhat similar instrument, which he calls the speculum matricis, and describes as employed for dilating the os uteri in difficult parturition, "expedienta instrumenta et præces piæ ad Deum fundendæ." He figures also an apertorium for the same purpose, and the first smooth-bladed obstetric forceps.

From the time of the revival of medicine we find allusions to the use of the speculum becoming more distinct and frequent. In some works it is figured, in many its use is mentioned as a matter of course for investigating uterine diseases. Usually the three-bladed speculum was employed. Wierus (1657) somewhat modified it by making the blades flat; and its frequent use may be inferred from the general description which Garengeot appends to his elaborate representation of it: "l'usage de speculum matricis est de dilater le vagin pour y apercevoir quelques maladies et pour y opérer."[3] A still more complicated instrument is figured by Arnaud in his 'Mémoires de Chirurgerie' (London, 1798). In this the vagina was dilated by six wires, opening to any extent by a most ingenious mechanical adaptation. Thus there is a tolerably continuous history of the three-bladed speculum, whilst the evidence of the ancient employment of the bivalve speculum is still more conclusive, as one has been discovered among the excavations of Pompeii: it is now in the Museo Borbonico, at Naples.

I have dwelt at some length on the history of the instrument, since there exists a general belief among the profession—how engendered and fostered it is needless to inquire—that the employment of local remedies and the use of the speculum for elucidation of uterine diseases is quite a triumph of modern special research. But if we are content to credit the practitioners of past times with an unexpected amount of knowledge about uterine diseases and their local treatment, it must not be forgotten that their writings are sadly deficient in another and perhaps even more important department. I refer to the constitutional treatment of uterine disorders, and especially to those correlative influences which so frequently determine the local malady. In

[1] Armamenta Chirurgica, 1650, engraved from the folio edition. The plates in the smaller copies are very inferior, and frequently altered. The engraving in the original comprises several other uterine instruments, but I have only here represented that marked fig. 5, on account of its identity in principle with the modern hysterotome.

[2] His work, 'De Conceptu et Generatione,' has a quaint allegorical woodcut representing the temptation. The tree of knowledge of good and evil has a human skeleton for its stem and trunk, the arms spreading out into fruit-bearing branches with the serpent coiled among them.

[3] Nouvelle Traité des Instrumens de Chirurgerie les plus utile (1727).

all such cases exclusive local treatment can afford but temporary relief; and this is neither a satisfactory nor a scientific result to aim at. To disentangle all the ravelled threads of inter-causation and accurately weigh the value of every symptom would avail us little, had we not the means of combating successfully the recognised morbid conditions. But for the aid afforded by chemistry in providing us with remedies, our most elaborate pathological researches would only illustrate the shrewd observation which Asclepiades made in reference to the Hippocratic doctrine, that it was "a meditation on death."

The Arabian physicians laboured in the laboratory and laid the foundations of that great science which has supplied so many valuable remedies for the cure of disease. Alchemy was the plaything of chemistry's childhood, but the time spent in its pursuit was not all wasted. They sought the elixir of life to cure disease and renovate decay, believing that the discovery of the philosopher's stone would reveal this also. The first principles of physiology and of commercial exchange were ignored by men who aspired to absolute immortality and boundless wealth; just as the search for an universal solvent was prosecuted without ever considering what should contain it when discovered.

In the writings of the early European physicians on uterine disorders the influence of the Arabian school is clearly traceable. They allude but vaguely to causation or to local treatment, but the use of empirical remedies, and of an uncouth polypharmacy, especially marks the period. Thus, for example, Rueffus advises for the cure of sterility a mixture containing thirty-eight ingredients, and a bath comprising thirty-three. The great reaction which occurred at the time of the revival of European literature was especially noticeable in works on uterine diseases. It was not enough that Wolphius should gather into a single work various short treatises on the subject, chiefly by ancient authors, but the book was in such demand that Schenckius and Spatius subsequently published similar reprints. In addition to those works of reference and editions of classic authors produced by Aldus and other publishers, there appeared in the seventeenth and eighteenth centuries a number of books, more or less original, treating exclusively of diseases of women. From these I select one as representing the available knowledge of the period, and illustrating my opinion as to the importance and originality of the views on uterine pathology advocated by the English school. The work to which I refer is, I believe, the earliest treatise on diseases of women by a graduate and practitioner of this country, as it is certainly the most complete, sensible, and practical of all the works on the subject published at that time. Jacobus Primerose was a Scotchman by extraction, studied in Paris, graduated at Oxford, and practised at Hull. His work, 'De Morbis Mulierum,' is published at Rotterdam, and dated 1665. He was evidently a man of decided opinions and original thought, with a thorough knowledge of classical professional literature. Hippocrates, Galen, and Aëtius are his principal authorities, though he alludes to the views of modern authors, and does not scruple to condemn, in no measured terms, those whose views do not square with his own. His book includes sixty-one chapters, giving evidence throughout of keen and original observation. He mentions the use of the speculum, as a matter of course, wherever the condition of the cervix uteri has to be investigated. Other appliances, pessaries, injections (both vaginal and intra-uterine), fumigations, medicated poultices, plasters, and instruments, receive due notice. But the distinguishing characteristic of the book of Primerose is the careful attention paid to those points of treatment which were most disregarded by the writers of his time. The air to be breathed, the food to be eaten, the clothing to be worn, and the baths to be used, are indicated with peculiar care, the natural mineral waters being advised in appropriate cases. The third book is chiefly devoted to the general influence of uterine disorders; taking notes of cases of epilepsy, of affections of the heart, the spleen, the liver, the stomach, and the head, depending on uterine disease, and describing uterine pains which occur independent of any local disease. The mental influences originating from depraved uterine action are dwelt on at length in a chapter on melancholia. Hysteria, its history and diagnosis, is described with a practical shrewdness and accuracy which acquires especial interest from a comparison with the well-known and contemporary contribution of Sydenham on the subject. Primerose wrote from a mind largely stored with the lore of those who had studied uterine pathology. His hysteria was that which took its derivation from ὑστέρα—the womb. Sydenham wrote as a general observer of the phenomena of disease; and the notable errors of each are to be traced to the point of view from which the subject was exclusively regarded.[1] That the work of Primerose has lain unnoticed for two centuries is probably owing to the circumstance that he, being, as I have said, an opinionated man, committed himself by a vehement opposition to the doctrines about the circulation of the blood which Harvey introduced into this country.

It is scarcely necessary to point out that a recognised speciality in medicine, which is only so segregated because its results are attributed to modern research and discovery, has its foundations seriously disturbed so soon as we recognise that the greater part of the claims to originality can be proved untenable. Limits of space compel me to omit much corroborative evidence, but my purpose will be sufficiently served if any of the time and talent now being wasted in exploring an already over-worked mine be diverted to more worthy investigations and more healthy methods of research. It is by the exclusive

[1] Whilst investigating the special literature of this subject, I had occasion to refer to a pedantic 'Encyclopædia Medicinæ,' by J. Dolæus, 1684, which contains a book on uterine diseases. It has some præfatorial laudatory lines by Sydenham, not mentioned in the biographies of the father of English medicine, commencing thus:

"Sic documenta damus doctrinæ sacra probatæ
Quid valeant humeri judicet ut sapiens
Gratulor ex animo Deus isthæc cæpta secundet
Sit nomen magnum clare Dolæe tuum
Cum voto exoptatissimæ felicitatis scripsit.
"Londini, 1683. THOM. SYDENHAM, M.D."

focussing of professional attention to one point, which hence acquires an exaggerated importance, that the great character of medicine as a cumulative science is distorted in its development. I fully believe that if English practitioners had followed the teachings of their own school, and availed themselves judiciously of the knowledge garnered by generations of observant men, we should have been spared many unseemly professional discussions, the enunciation of certain preposterous theories, and denunciations which assuredly prove that either the accuser or the accused must be very much in the wrong.

ART. III.

An Inquiry into the Causation, Diagnosis, and Treatment of Fracture of the Internal Table of the Skull. By WILLIAM FREDERIC TEEVAN, F.R.C.S., B.A., Surgeon to the West London Hospital, &c.

IT is, firstly, necessary to establish the existence of fracture of the internal table only, resulting from violence applied to the exterior of the skull, inasmuch as it is denied by some, doubted by many, and admitted by but few, English surgeons. I will, therefore, adduce not only many well-recorded cases, but also refer to such pathological specimens, illustrative of this particular injury, as I have been able to discover during a personal examination of all the pathological museums in London, the Museum at Netley, and the Musée Dupuytren in Paris.

It has, by some, been supposed that this variety of fracture was known to Hippocrates; this, however, is incorrect, as a careful examination of his works will show. One of the earliest writers who was aware of this lesion was Jacobus Berengarius Carpinensis, who stated, at page 6, of his work, 'De Fractura Cranii,' published in Bologna, in 1535: "Est alia species in qua os frangitur tantum inferius versus panniculum, et dicitur Marusis ab Haly, in Pantægni vero Monesis vel Marusis. Hanc speciem credo ego esse plicaturam ossis, quando os plicatur, et intra tantum rumpitur et non extra." However, the earliest recorded case I have been able to find is that by Ambrose Paré, at page 225 of the tenth volume of his works, published in 1652: "Ce que j'ay veu aduenir à vn gentilhomme de la compagnie de monsieur d'Estapes, lequel fut blessé sur la brêche du chasteau de Hedin, d'un coup d'arquebuse qu'il receut sur l'os pariétal, ayant vn habillement de teste, lequel la balle enfonça sans estre rompu, ny pareillement le cuir, ny le crâne exterieurement, et le sixième jour mourut apoplectique. Donc aduint que pour l'enuie que j'auois de cognoistre la cause de sa mort, je lui ouuris le crâne auquel trouuai la seconde table rompue, avec esquilles d'os qui estoient insérez dans la substance du cerueau, encore que la première fust entière. Ce que pareillement atteste auoir veu et monstré à messieurs Chapelain, premier médecin du roy, et Chastelan, premier de la reyne, à vn gentilhomme qui fust blessé à l'assaut de Roüe." Saucerotte, in his essay on 'Contre-coups,' at page 415 of the fourth volume of the 'Memoirs of the Subjects proposed for the Prize of the Royal Academy of

Surgery,' mentioned instances of this fracture which occurred to Tulpius, Mery, Le Dran, and Soulier. Pott, at page 273 of the second edition, of his work 'On the Injuries of the Head,' related two cases which fell under his own notice. In Velpeau's well-known work, 'De l'Opération du Trepan,' at page 29 of the edition of 1834, two examples are recorded which happened to Bilguer. In the 'Handbuch der Praktischen Chirurgie,' by V. Bruns, page 297, vol. i., references are given to twenty cases; and in the 'Archiv für Pathologische Anatomie,' vol. xxii. page 84, two instances are given. Mr. Guthrie, at page 329 of the fifth edition of his 'Surgical Commentaries,' gave an account of an interesting case which occurred to Mr. Dease. In the 'Archiv für Klinische Chirurgie,' page 547 of the second volume, for 1862, there is an article entitled "Ueber isolirten Bruch der Glastafel," by Dr. B. Beck, who brings forward an instance which fell under his care at the battle of Vicenza, in 1848, but it is not a strictly correct specimen of the fracture, as there was a fissure in the outer table. I shall, however, allude to his explanation of the cause of the fracture at another page. A very interesting case, which has been referred to by many Continental surgical writers, occurred to Mr. S. Cooper at the battle of Waterloo, and was narrated by him at page 1270 of the seventh edition of his 'Dictionary of Practical Surgery.' Very recently, an instance in which fracture of the internal table only, produced laceration of the middle meningeal artery, and fatal extravasation, happened to Mr. Edwards, and is recorded at page 191 of the eighth volume of the 'Edinburgh Medical Journal.' But, perhaps, the most interesting examples, inasmuch as the crania are preserved, occurred respectively to M. Denonvilliers in Paris, and Dr. Cowan in the Crimea. In the first instance a young man was struck on the head by a bullet, which wounded the scalp, but not the bone. He remained well for a fortnight, when symptoms of encephalitis came on, and M. Denonvilliers trephined him, on the twenty-fifth day, at the spot struck. The disc of the external table came away in the trephine, and a piece of the internal table was then seen lying on the dura mater. The detached portion had to be broken in pieces before it could be withdrawn through the trephine hole. Temporary relief only, followed the operation, for the man died a week after its performance. Dr. Cowan's case is thus related in 'Holmes's System of Surgery,' vol. ii. page 47: "Fissured fracture of the inner table may also occur from the action of a ball without external evidence of the fracture. Such a case occurred in the 55th Regiment, in the Crimea. The soldier had a wound of the scalp along the upper edge of the right parietal bone. The ball in passing had denuded the bone, but there was no depression. The man walked to the camp from the trenches without assistance, and there were no cerebral symptoms on his arrival at the hospital; but five days afterwards there was general œdema of the scalp and right side of face, the wound became unhealthy, and slight paralysis appeared on the left side. The next day hemiplegia was more marked, convulsion and coma followed, and he died on the thirteenth day after the injury. Pressure from a large clot of coagulum, and extensive inflammatory action, were the immediate causes of death; but a fissure confined to the inner table, running in line with the course of the ball, was also discovered. A preparation of the calvarium in this case was presented by Dr. Cowan, 55th Regiment, to the Museum at Fort Pitt." I could refer to many other undoubted cases of fracture of the internal table only, but it would be superfluous to do so.

I have only been able to find two pathological specimens illustrative of this variety of fracture of the skull. The first specimen, numbered 29 A in the Musée Dupuytren at Paris, is the calvarium taken from the man who was trephined by M. Denonvilliers, and is a very well-marked case of a detachment of the internal table only. The second specimen, which is in the Museum at Netley, is the skull-cap taken from the soldier who was under Dr. Cowan's care, and it shows a straight fracture, a few inches long, with slight separation of its edges, affecting the internal table only, of the right parietal bone. In each instance there was no fracture nor fissure of the external table, and in each the condition of the bones was quite normal. I have purposely excluded all references to those specimens of fracture of the internal table in which there were any fissures in the external, as being imperfect illustrations; for if the case be one of fracture of the internal plate with a fissure in the outer, it is, in reality, a complete fracture of both laminæ. It will often be found, in complete fracture of both tables, that there are certain fissures or fractures in one table without any corresponding ones in the other, but they have no bearing whatever on the present subject.

Thus it will be seen that the occurrence of fracture of the internal table only, without the slightest injury whatsoever to the outer table, from violence applied to the exterior of the skull, is placed beyond all doubt.

It is here necessary to make some remarks regarding the physical properties of the skull. It may be temporarily depressed at a spot without any fracture being produced, as is well seen when a dry skull-cap, being allowed to fall on a stone floor, rebounds without any fracture taking place. Now, this can only result from the elasticity of the bone, which implies that there was a certain amount of depression, or flattening, of the part struck, at the moment of impact—it is the act of the depressed bone in recovering its former position which causes the rebound. It is imagined that, on account of the arched form of the skull, the effects of violence on the inside of the cranium must be very dissimilar to those on the outside. Now, this is certainly true regarding those bodies which act over a large portion of the head, but small bodies, such as bullets, which only strike a very limited part of the skull, produce exactly similar effects, whether they act on the inner or outer surface of the calvarium, supposing always the amount of force similar, inasmuch as every point on the inside or outside of the skull is virtually a flat surface. It must also be premised that, with the exception of those places where there are sinuses, there is, physically speaking, no such thing as a distinct and separate inner or outer table.

The two laminæ and intervening diploë are inseparably blended together, and are one and indivisible.

It is asserted, in most surgical works, that because the inner table of the skull is more dense than the outer it is necessarily more brittle. Now, it is a fact, in physics, that if a given body is more dense than another, it does not consequently follow that it is more brittle; and I have already shown, and will still further show, in this inquiry, that the inner surface of the skull is not more brittle than the outer—the fact implied in the term "lamina vitrea" is founded on an assumption which cannot be supported.

Now, what is the causation of this fracture?

Most of the French surgeons regard this fracture as an example of contre-coup, resulting from the greater brittleness of the inner table, as will be seen by the following quotations :—" Premier cas. La table externe percutée, peut résister, tandisque la table interne se fracture immédiatement au-dessous, parcequ'elle est plus cassante, aussi l'a-t-on appelée vitrée."[1] Velpeau assigns a similar reason: " Plus mince, moins étendue en surface, plus irrégulière, plus dense que la table externe, la couche vitrée éclate et se fendille sous un effort manifestement moindre que la précédente."[2] It would, indeed, seem as if most of the French writers had adopted the views of Saucerotte, who regarded the fracture as a variety of fracture by contre-coup, and in the following words gave his explanation of it : " Qu'un instrument contondant soit appliqué, avec violence, sur un os de la tête où les deux tables soient distinctes l'endroit frappé, de convexe qu'il étoit, deviendra concave; par conséquent il y aura un grand déplacement dans ses parties intégrantes : car une voûte menace de la plus prochaine destruction, lorsqu'un corps quelconque, qui, par sa masse ou sa vitesse surpasse sa résistance, tend à l'enfoncer. Or, il n'est plus étonnant que la table vitrée se rompe, parcequ'elle est mince, sèche, et fragile, quoique l'externe, par sa souplesse et son élasticité, prête à l'effort du coup."[3] Legouest, who is one of the most recent writers on military surgery, considers it an instance of a direct fracture; at the same time he ascribes its occurrence to the greater brittleness of the inner table : " Lorsque l'os frappé est épais, résistant et à diploë solide, la table interne, plus mince et plus friable que l'externe, se rompt quelquefois, cette dernière restant intacte."[4]

The German surgeons are of opinion that fracture of the internal table occurs from its greater brittleness; and Dr. Bernhard Beck, in the article I have already alluded to, assigns an additional reason—the shortness of the inner table. He states that the outer table has a much larger superficies than the inner, and, therefore, a greater faculty of extension from the shorter and more brittle tabula vitrea, and consequently, when a projectile hits the outer table obliquely, and

[1] Vidal, de Cassis, Pathologie Externe, tome ii. p. 545.

[2] De l'Opération du Trepan, p. 29.

[3] Mém. sur les sujets proposés pour le Prix de l'Acad. Royale de Chir., tome iv. p. 374.

[4] Traité de Chir. d'Armée, p. 283.

sets it in vibration, it suffers a stretching and displacement of its tissue; the shorter brittle table follows the process in like manner, but not quickly enough, and is therefore broken. It is the shortness and brittleness of the inner, not any depression of the external, table which cause it to break. He also tried many experiments on the dead body, striking the head with bullets, and often produced fracture of the inner table, when the outer was neither depressed nor fractured. According to his experiments, the outer table can be depressed from half a line to one line without breaking.

Those English surgeons who have admitted the existence of this fracture state that it occurs from the greater brittleness of the inner table. Sir B. Brodie's words express the English belief: "The greater elasticity of the outer table of the skull, and the greater brittleness of the inner table, seem to afford the only reasonable solution ot these phenomena."[1]

It will thus be seen that all surgeons assign, as the cause of this fracture, the greater brittleness of the inner table, and Dr. B. Beck gives an additional explanation—its shortness.

I will now show that the cause of this fracture is not to be sought for in any of the reasons given, but that it occurs in obedience to a well-known physical law—that fracture commences in the line of extension, not that of compression.

If it were true that the lesser superficies and brittleness of the inner table were the cause of its fracturing, then it would follow, that, if violence were applied to the inner surface of the skull, it would be impossible to produce fracture of the external table only, without any injury whatsoever to the inner. Now, what are the results of my experiments on this point? Why, they show that, if the inside of the skull be struck, the external table can be fractured without any injury whatsoever to the internal table,—thus proving that the alleged lesser superficies and brittleness can have nothing to do with the causation of this fracture. I give the following details of an experiment which any one can, with a little practice, perform. A skull-cap, stripped of all its soft parts, with a wet cloth inside it, is to be laid with its convexity in the palm of the left hand, which is to be protected with several layers of a moist cloth, to obviate an inconvenient amount of pain. If the inside of the skull be now struck by the hammer with a slight degree of force, fracture of the external table will be produced without any fracturing or fissuring of the inner. I have performed this experiment several times, and exhibited some of the specimens at the Pathological Society. I would here refer to a specimen, which is quite unique, of a certain fracture of the skull, which has never been described by any surgical writer. In Guy's Hospital Museum, No. 1082^{70}, there is the calvarium of a man who committed suicide by shooting himself. The bullet entered the skull in the right temporal region, traversed the brain and its membranes, struck the inside of the left part of the frontal bone, and remained imprisoned in the cranial cavity. At the spot, on the inner surface of the left frontal bone, where the

[1] Med.-Chir. Trans., vol. xiv. p. 331.

bullet struck there was a black mark, but no fissure nor fracture, but, at the corresponding point outside, there was a starred fissured fracture of the external table only. Here, then, was produced accidentally a similar kind of fracture to that which I had caused experimentally.

Thus, therefore, whether the inside or outside of the skull be struck, fracture of the distal table only, without any injury to the proximal table, can be produced in either case.

I will now show the causation of the above facts:—If a stick be bent across the knee until it commences to break, it will be found that the fracture begins, not at the spot where the knee is applied, but at a point exactly opposite on the other side, and the fracture commences there in obedience to a well-known physical law, that when pressure is applied to a body till it breaks, the fracture commences in the line of extension, not that of compression. Now, when a stick is bent, the atoms along the proximal curve at which the pressure is applied are brought nearer together or compressed, and the atoms along the distal curve are separated or extended. Therefore, if the pressure be continued till the stick breaks, it follows that the rent or fracture must commence at that spot in the distal curve where the greatest extension is going on, which point will be found exactly opposite to where the pressure is applied.

The annexed diagrams show the rationale of *fracture of the internal table only, produced by a blow on the outside of the skull.*

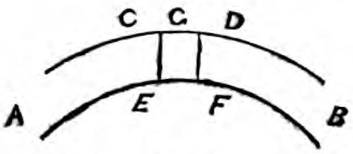


Fig. 1.

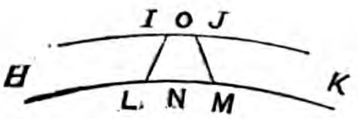


Fig. 2.

Let A B, Fig. 1, be a section of the skull. Draw two vertical lines, C E and D F, parallel to one another. Now, if pressure be applied at G, temporary depression takes place, and the bone assumes the shape of H K, Fig. 2, and the lines C E, D F, are no longer parallel to each other, but converge towards each other at the upper surface, I L, J M, so that the distance from I to J is less than that from C to D, but the distance from L to M is greater than that from E to F, signifying that the atoms of bone in the upper surface from I to J have been brought nearer to each other, or compressed, whilst the atoms of bone in the lower surface, from L to M, have been extended or separated from each other; therefore, if any fracture take place, it is clear it must do so in the line of extension L M, and at that point in the line where the greatest extension is going on, which is at N, exactly opposite the spot O, where the pressure was applied.

Proof.—Take a cane slightly bent, say A B, Fig. 1, and insert two pins or wires, C E, D F, vertically, and parallel to each other: the more the pins project at each surface the more manifest will be the result. Exert pressure at G till the cane is made flatter, H K. It will now be found that the wires are no longer parallel to each other, but converge along the upper surface, so that the distance between them from I to J is less than that from C to D, but the distance from L to M is greater than that from E to F, showing clearly that the atoms along the line I J have been compressed and brought nearer to each other, whilst those along the line L M have been extended; consequently, if any fracture take place, it must commence at N. If the pressure on the cane be continued till it breaks, it will be found that it commences to break at the point N.

A familiar instance of a fracture accidentally occurring in nature, similar to fracture of the internal table only, is when the ice cracks under pressure. It will often be seen that there are cracks in the under surface of the ice and none in the upper, and it will always be found that when a crack takes place it commences in the under surface, thus illustrating the fact that the fracture commences in the distal side, which is the line of extension.

The next diagrams show the rationale of *fracture of the external table only, by a blow from within the skull.*

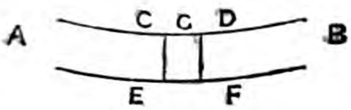


Fig. 3.

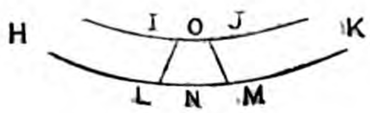


Fig. 4.

Let A B, Fig. 3, be a section of the skull. Draw two vertical lines parallel to one another, C E, D F. When pressure is applied at a point, G, on the inside of the skull, the bone is temporarily depressed very slightly, and assumes the shape H K, Fig. 4, and the lines C E, D F, are now no longer parallel to each other, but converge at O, so that the distance from I to J is less than that from C to D, but the distance from L to M is greater than that from E to F. Therefore the atoms of bone from I to J have been brought nearer to each other by being compressed, whilst those from L to M have been extended. If any fracture should take place, it must do so in the line of extension L M, and at the point in the line where the greatest amount of extension is taking place, N, which is in the outside of the skull.

Proof.—Take a cane and bend it slightly, A B, Fig. 3. Insert two pins or wires, C E, D F, vertically, so that they may be parallel to each other: the longer the pins the more manifest will be the result. Exert pressure on the concavity at the point G, so that the cane assumes the shape H K, Fig. 4. It will now be found that the wires are no longer parallel, but converge towards each other at O in the upper surface, and that the distance from I to J is less than that from C to D, but that the distance from L to M is greater than that from E to F, showing that the atoms along the line I J have been brought nearer to each other by being compressed, whilst those along L M have been extended. Therefore, if any fracture take place, it is clear that it will commence along the line of extension L M, and at that point, N, in the line where the greatest extension is going on. Consequently, if the pressure at O be continued till the stick begins to break, it will be found that the fracture commences at N.

It is stated by Dr. B. Beck, that fracture of the internal table only occurs in those parts where there is but little diploë. I, on the contrary, could only produce the fracture where the diploë was abundant; and certainly nearly all the cases recorded, and also the pathological specimens, show that, hitherto, the fracture has nearly always taken place on the inside of one of the parietal bones, which, as is well known, contain a thick diploë. It is very difficult to produce an incomplete fracture of a thin body, for if the pressure be sufficient to cause fracture, that fracture will not be limited to one surface, but will affect both; whereas, if the material be thicker, it will be found, although a much greater pressure will be required to effect fracture than in the former case, that fracture, limited to the distal surface, may be brought about. Hence, fracture of the internal table only, is, in reality, an incomplete fracture of the skull, for as fracture always commences in the distal table first, whether the violence be applied to the inside or outside of the skull, it follows that, if the force exerted be not sufficient to cause a complete fracture of both tables, the effects of the violence are spent on the distal table.

Legouest states:[1] "Ces fractures de la table interne, mises hors de doute aujourd'hui, ne peuvent être produites que par l'action obliquement dirigée d'un projectile, ou par le choc médiocre d'un corps à surface étendue, plane et régulière;" and Dr. B. Beck also states, that, when the fracture takes place, it is produced by a body striking obliquely. It is manifest, however, that it is not necessary that a bullet should hit obliquely in order to fracture the internal table only. What is necessary is, that the bullet should not strike with much force. Now, a bullet striking at right angles, when at full speed, does not bend the part it hits, but carries away bodily all that bone which is immediately in front of its path; whereas, when it hits slantingly, it acts with but little force on the point of impact, and very slightly depresses, temporarily, the bone; consequently, if a spent bullet strike at right angles, it may cause this fracture. In every case in which I produced it, it was by hitting the skull at right angles with but little force. Hence the kind of violence likely to cause fracture of the internal table only, is that resulting from a small stone, spent bullet, stick, or some body acting with a slight amount of force on a limited part of the skull—merely temporarily depressing or bending the part struck.

I now proceed to the diagnosis and treatment of the fracture in question. This lesion is not necessarily followed by any bad consequences, but should it cause damage to the cranial contents it would be in one of the following ways:

1. The spiculæ, or jagged edges of the fracture, may irritate or lacerate the brain and its membranes, and thus cause acute or chronic

[1] Legouest, op. cit. p. 284.

encephalitis. This is the most likely result to follow, inasmuch as the edges of the bone are very thin and sharp, and an entire piece of the internal plate is sometimes detached and may thus irritate, but not compress. It will be observed that the symptoms of this fracture are more likely to resemble those following the *punctured fracture* than any other.

2. The line of fracture may cross the course of the middle meningeal artery, lacerate it, and so allow extravasation of blood to take place. The sinuses may also be torn in the same way.

3. Part of the inner table may be depressed in such a manner as to cause compression of the brain. Thus, this injury may cause inflammation or compression of the brain, and the symptoms may therefore vary in different persons. Now, as this fracture can never be seen during life, it is obvious that its diagnosis must often be doubtful, and sometimes impossible; for it is only by the occurrence of certain symptoms, after a certain injury, that its existence can even be suspected. It is, in the first place, requisite to pay attention to the kind of instrument which may have struck a person in a given case; for, as I have already pointed out, this fracture has hitherto been caused by a small body, such as a stick, stone, or bullet, striking with but slight force; and it must be remembered that there is, generally, no injury whatsoever to the part of the external table which is struck, and that the fracture always occurs at a point in the internal table corresponding to the spot hit externally. Concerning this last statement, I may mention that all evidence is conclusively confirmatory, and notwithstanding Saucerotte's assertion that the fracture in the internal table may occur at some distance from the point struck. Now, as every fact shows that should fracture of the internal table happen it will be found at a point corresponding to the spot struck externally, it follows that should the trephine be required it must always be applied to the spot which was hit.

I will enumerate those symptoms which are sometimes diagnostic of the occurrence of fracture of the internal table only; but it is very rarely indeed that its existence can be absolutely determined.

If a person, after receiving a blow of the description I have already mentioned, should, in the course of some days or weeks, begin to complain of a fixed pain at the spot struck, and be finally attacked with encephalitis, we may conclude, if on examination no injury can be detected to the bone struck, that some spiculæ of the inner table, or the ragged edges of the fracture, are scratching the membranes and giving rise to an amount of mischief which will very probably terminate in intra-cranial suppuration. No acute symptoms may perhaps arise in a given case, but it may degenerate into chronic cerebral irritation. In those cases where the symptoms of the formation of pus are well marked, with paralysis of the side opposite to that struck, the diagnosis would be very probable.

If a person should show the symptoms of compression, with paralysis of the side opposite to the injury, a few hours after receiving a blow in the neighbourhood of the middle meningeal artery, and on examining the bone struck we can detect no injury to it, although there may or may not be a scalp-wound, we may infer that the vessel has been torn by a fracture of the internal table running across the direction of the artery, and that extravasation of blood is going on.

When compression of the brain is caused by a depression of the internal table alone, the patient may become insensible on the receipt of the blow, and remain so. There would be paralysis, more or less, of the side opposite to that struck; but, generally, the symptoms of compression are not well marked. There might or might not be a scalp-wound, but there would be no injury whatsoever to the external table; if there were a fissure, the case would be one of complete fracture of both tables, with depression of the inner one only. Now, if the patient were insensible from the first, it is evident that the above symptoms might result from an intra-cerebral extravasation of blood on the side on which the blow was received, and hence a diagnosis would be impossible. But it must be recollected that the compression produced by depressed bone is rarely so complete as that caused by an extravasation of blood; and that, when the internal table only is depressed, the symptoms of compression will not be nearly so strongly marked as when both tables are driven into the brain. Hence the less definite the symptoms of compression, the greater the reason to believe that they are caused by the internal table only.

There are two cases in which the diagnosis may be made with almost certainty. Firstly, when a person recovers immediately after the blow, but finds there is paralysis of some part of the body opposite to the side struck, and examination fails to detect any injury to the bone. Secondly, when, after the blow, no evil consequences arise at first, but in the course of time the patient begins to complain of fixed pain in the part struck, and all the symptoms of chronic cerebral irritation show themselves, although the surgeon cannot find any injury to the external table.

Inasmuch, therefore, as fracture of the internal table only, can never be seen during life, and can only be diagnosed by the occurrence of certain symptoms after a certain injury, it is evident that its treatment can never be preventive.

There can be no doubt that there is, both at home and abroad, a yearly increasing dislike to resort to the use of the trephine, resulting not only from the very great mortality which attaches to every violence, whether surgical or accidental, to the head, but also from the fact that the patient will often die, although the trephine may have effected the end proposed; and it is very certain that, in the present day, lives are saved which in time past would have been lost. But, inasmuch as the treatment now pursued is chiefly one of expectancy, it is necessarily fraught with much danger in certain cases. Surgeons of the present time are unanimous in stating that no such success follows the use of the trephine in their hands as attached to its employment by surgeons of the past; and they explain the discrepancy by alleging, what is no doubt perfectly true, that the operation was often unnecessarily performed on persons who had nothing the matter with them. If, therefore, that were so, it would clearly prove that the use of the trephine on a healthy subject is not, *per se*, the very dangerous operation it is stated to be. All surgical experience shows that the mortality which will attach to an operation performed on parts before they are in a state of inflammation, must be very much less than that which will follow interference with parts acutely inflamed; consequently, the use of the trephine as a preventive means is widely different from the employment of the same instrument as a *dernier ressort*. In the present day surgeons rarely apply the trephine at once except in cases of punctured fracture. Now, I have already stated that the effects produced by a fracture of the internal table only, are most likely to be similar to those caused by the punctured fracture; but we cannot therefore follow the treatment adopted in the latter case, inasmuch as fracture of the internal table only, can never be seen on its immediate occurrence, but only suspected, at a later period, by the advent of certain symptoms. Hence the urgency, or persistency, of the symptoms can alone justify the use of the trephine in suspected instances of fracture of the internal table only. Consequently, a surgeon would be warranted in trephining on the spot struck if all the symptoms of intra-cranial suppuration were well marked, and there was paralysis of the side opposite to the injury; so also if the violence had been applied to the course of the middle meningeal artery, and the symptoms of compression were urgent and persistent, together with paralysis of the opposite side; and likewise if the patient had been insensible from the first, with obstinate symptoms of compression, and paralysis of the side opposite. It happens sometimes that a patient is never rendered insensible from the blow, but finds that he has a paralysis of some part of the side of the body opposite to that struck. Now if, in the course of some weeks, the paralysis does not disappear, the use of the trephine to the part struck would be indicated.

A man occasionally receives a blow on the head, from a stick or stone, which causes no inconvenience at first, but, in the course of some days or weeks, he begins to complain of pain in the part struck, and is finally attacked with chronic cerebral irritation. On examination no injury can be detected to the part hit; and if, in the event of there being no scalp-wound, an exploratory incision be made down to the spot, no fissure nor fracture be found in the external table, but the symptoms persist, and the patient continue to suffer from fixed pain in the part struck, we may suspect that there is a fissure or fracture implicating the internal table only. Now if, after a persevering use of those means fitted for such case, the symptoms above described do not abate or disappear, the use of the trephine to the part struck will become necessary. A labouring man suffering from chronic cerebral irritation must be considered virtually dead; for not only is he completely incapacitated for supporting himself and family, but he is unable to enjoy life, and becomes a burden to himself and others. The question ought to be, not whether in a solitary case the trephine can effect a cure, but whether, out of one hundred cases, it can restore some. No answer can be given to the first proposition, but the second can be answered, and that too affirmatively.

Art. IV.

Cases illustrating the Formation of Morbid Growths, Deposits, Tumours, Cysts, &c., in connexion with the Brain and Spinal Cord, and their Investing Membranes. With Observations. By John W. Ogle, M.D. Oxon., F.R.C.P., Assistant-Physician and Lecturer on Medical Pathology, St. George's Hospital.

(*Continued from No.* 70, *p.* 520.)

A.—The Brain and its Membranes, continued.

VI. Morbid Growths of the Brain and its Membranes, of an Uncertain or Peculiar Nature.

Case CLXXXIV. *Growths of a Peculiar Nature connected with the Outer Surface of the Dura Mater.*—John P., aged forty-five, admitted March 10th, 1858, a bricklayer, who, having caught cold a few weeks before, was the subject of bronchitis. He died of this disease March 24th.

Post-mortem Examination.—Thorax and Abdomen : Excepting some congestion of the spleen and old peritoneal adhesions, these organs were natural. *Cranium :* The cranial bones were natural. The brain was natural, but connected with the outer surface of the dura mater, near the middle line, two or three spaces existed, where this membrane was cicatrix-like, the fibrous elements of the tissue being disunited, and, as it were, unwoven. Thus the appearance of separation between the two component layers of the membrane was produced, and where this was the case there existed a soft, yellowish-red mass or growth, exposed to view on dividing the outermost layer of the membrane. This growth had the same general appearance as another growth which was distinctly lobulated, and projected from the membrane through a round hole formed by the absence of the outer layer of the membrane. These bodies had, on a large scale, much the same appearance as those called Pacchionian bodies projecting into the superior longitudinal sinus.

Microscopical Examination.—Under a low power they appeared to be of a yellowish colour, to be lobulated and cauliflower-like on their surface, which was here and there marked by curved fibrous lines, the lobules containing closely packed oval and round nuclei, and numbers of firm and small oat-shaped nuclei at their margins. In places small oval and rounded nuclear forms were arranged in contact, so as to form rounded tube or cylinder-like projections, as indicated in the woodcut (No. 12). Under a high power the whole was seen to consist of round and oval cell-bodies rather larger than pus-globules, and here and there very pale cell-forms three times their size, but these were very rare. The delicate outer nuclei were arranged parallel with the circumference of the rounded lobules, and appeared to be nuclei investing a delicate membrane. On pressure being exerted on these forms, the cell-contents escaped along with a granular and homogeneous basis. On examining some of the smaller Pacchionian bodies projecting into the sinus, similar appearances were met with, but these bodies were coarser, more opaque, and contained much more fibrous tissue. (68.)

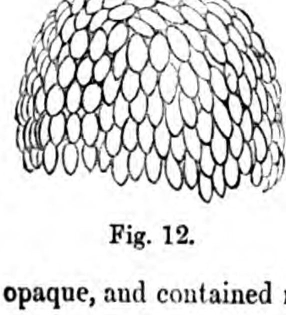


Fig. 12.

Fig. 1
See case CXLII

Fig. 2
See case CXLVIII

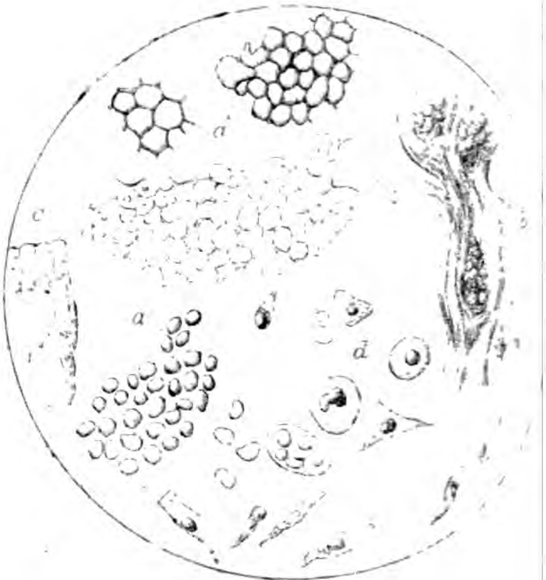


Fig. 3
See case CLXXXII

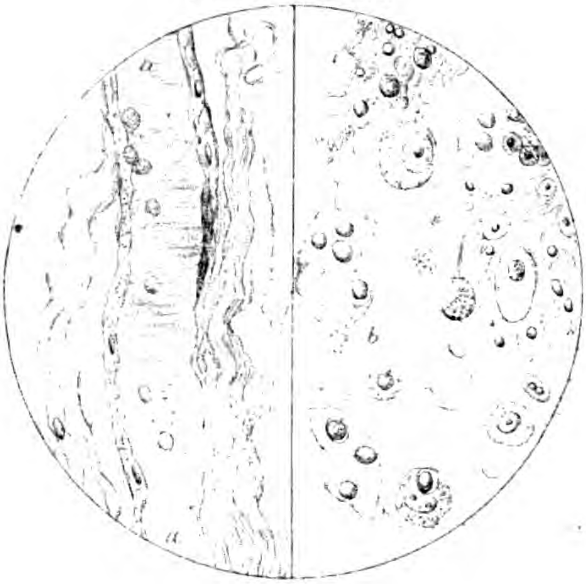


Fig. 4
See case CXLIV

Fig. 5
See case CLXXXVI

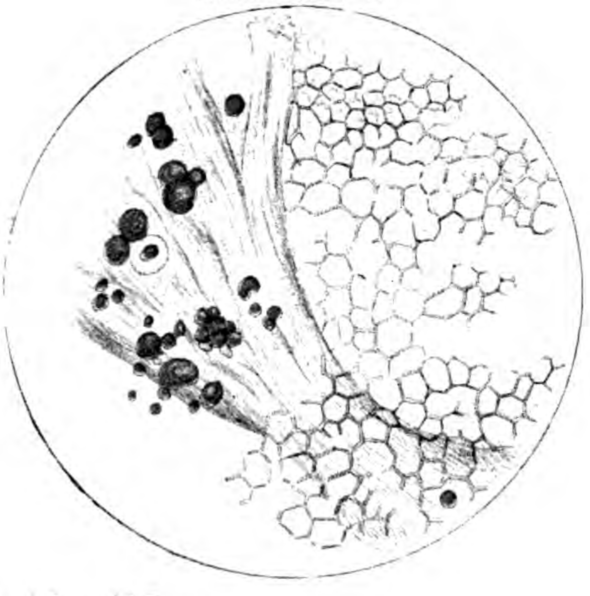


Fig. 6
See case CLXXXVI

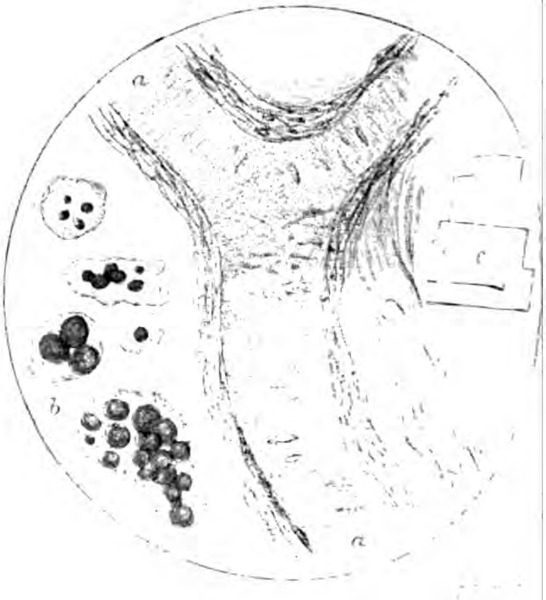


Fig: 1

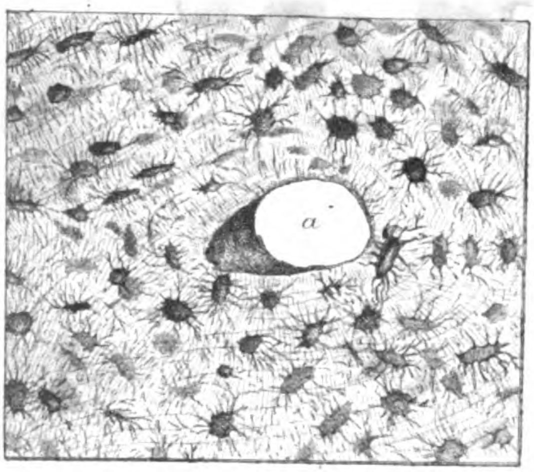


Fig: 2
See Foot Note to case CXLIX.

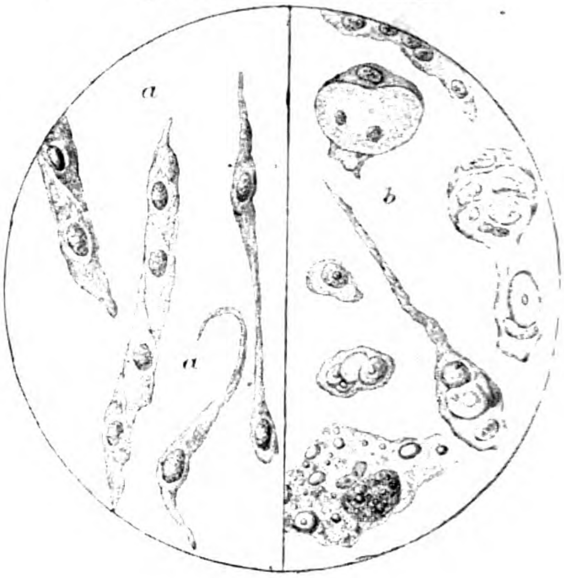


Fig. 3.
See case CLIV.

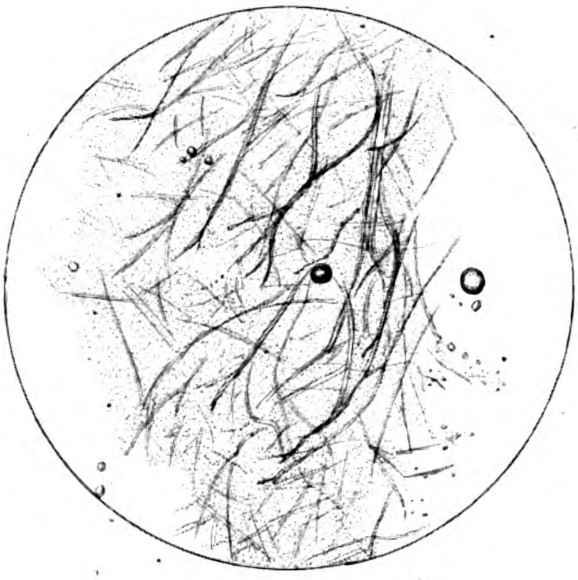


Fig. 4
See case CL.

Fig: 5.
See case CLXVI.

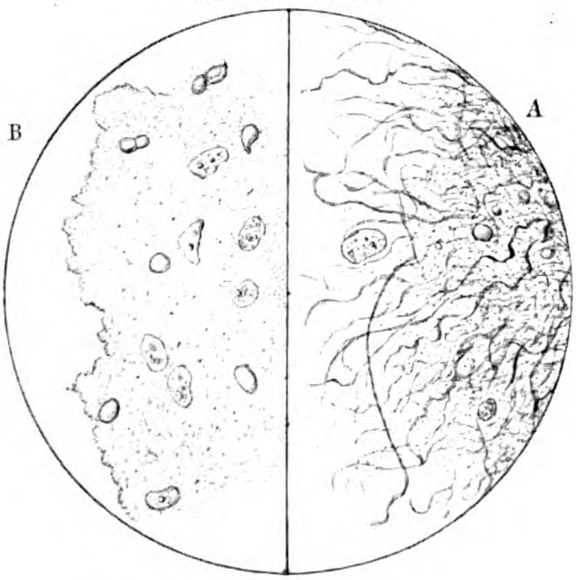


Fig: 6.
See case CLXVI.

H. V. Carter, del. T. West, sc. W. West, sc.

Illustrations of Dr. Ogle's cases of Tumours, growths &c.

Description of Plates illustrating Dr. Ogle's Cases of Tumours, Morbid Growths, &c., in connexion with the Brain and Spinal Cord.

PLATE II.

Fig. 1.—Fibrous tumour of the tentorium cerebelli. Fibrous tissue and numbers of elongated fusiform cells, showing in some cases delicate nuclei.—Case CXLII.

Fig. 2.—Fibro-cystic growth of the dura mater and skull. *a*. Rounded and angular bodies, apparently the remains of former blood-globules. *b*. Nests of nuclei embedded in fibres. *c*. Cells arranged in a regular order. *d*. Round and oval and angular cells containing granular matter and one or two nuclei.—Case CXLVIII.

Fig. 3.—Growth connected with the dura mater. *a*. Large blood-vessels. *b*. Flattened, irregularly-shaped, plaque-like bodies, mixed with round and oval nucleated cells and nucleus-like bodies.—Case CLXXXVII.

Fig. 4.—Cystic tumour connected with the choroïd plexus. Tubular structures of about the size of those of the kidney, in some cases coated with fat; also nuclear bodies and small cyst-like bodies.—Case CXLIV.

Fig. 5.—Deposit of uncertain nature from the substance of the brain; fibres and a material beautifully reticulated, the meshes having double walls, chiefly polygonal and tolerably uniform in size.—CLXXXVI.

Fig. 6.—Portion of the capsule covering the deposit alluded to in previous Fig. (No. 5). *a*. Large thick blood-vessels. *b*. Large rounded and oval cells, of irregular outline, and containing bright red and rounded bodies like nuclei. *c*. Plates of cholestearine.

PLATE III.

Fig. 1.—Microscopical appearances of a portion of ossific deposit formed between the layers of the falx cerebri. (See description of woodcut No. 11 of the series, following Case CLXXXIII.)

Fig. 2.—Portion of tumour of the dura mater. *a*. Nucleated fibres. *b*. Peculiar nucleated cells, some having a nested character. (See the microscopical appearances of a tumour described by Dr. Part at foot-note to Case CXLIX.)

Fig. 3.—Fibro-nuclear growth from the dura mater.—Case CLIV.

Fig. 4.—Fibrous tumour attached to the dura mater.—Case CL.

Fig. 6.—Shows (*a*) a fibrous tumour connected with the base of the fourth ventricle of the brain.—Case CLXVI.

Fig. 5.—Shows the minute structure of the above tumour (Fig. 6). *A*. The delicate fibrous elements, with a few nuclear corpuscles. *B*. The granular fibroïd matrix, with a few corpuscles intermixed.

CASE CLXXXV. *Peculiar Villous Pedunculated Growth from the Arachnoïd Membrane. Layer of Fibrin lining the Dura Mater. Scrofulous and Carcinomatous Deposits in various parts of the Body.*—Augustus D., aged thirty-eight, was admitted May 28th, 1856, and died July 12th with carcinoma of several of the abdominal organs and scrofulous deposit in the lungs. He had not suffered from head-ache or interference with the mental faculties.

Post-mortem Examination.—In addition to the condition of the various viscera before alluded to, a layer of recent but firmish fibrin was found lining the dura mater covering both cerebral hemispheres.[1] Moreover, about two inches from the longitudinal fissure, springing from the arachnoïd investing the convolutions, was a pedunculated villous growth of a glistening whitish colour, and about a quarter of an inch long, which was found to consist of two or three finger-like projections rising from a common base, the arachnoïd around being thickened and opaque, as was also this membrane covering the other cerebral hemisphere.

Microscopical Examination showed the growth to be composed of papillary projections with prolongations having an arborescent character, and possessed with rounded extremities, the larger ones being beset with or containing granular bodies. The smaller ones were semi-transparent and pale. These bodies were found to be very tough, and to consist, in addition to small nucleated cells, of free oval nuclei and granular matter, plentiful connective-tissue, fine as well as coarse, and tapering at their ends, mostly having a wavy and jagged outline, and also a very large number of fibres or tubes branching out in various directions, peculiarly and regularly indented in a transverse direction, and having the appearance of being surrounded by delicate circular bands or rings by which they were constricted.[2] (161.)

CASE CLXXXVI. *Deposits of Uncertain Character, but partly consisting of Ancient Extravasation of Blood in the substance of the Cerebral Hemisphere.*—Of the patient from whose body the specimen to be described was removed, no history of any kind exists. The whole mass occupies almost the entire thickness of the part of the brain in which it is situated (see woodcut No. 13), and is surrounded by a covering or membrane (*a*), as it were, which is with great difficulty separable from the contained deposit, but easily so from the surrounding brain; and this membrane has the appearance in one part of splitting, so as to enclose, besides the large mass of deposit, two other and smaller ones (*b*). One of these smaller ones (like the largest one) is of a light yellowish colour (*c*), very like the white matter of the brain, but soft, and as it were rather œdematous. The other smaller one (*d*) is of a mixed dark brown and light colour, and streaked, but very firm and solid in consistence, a small portion being quite white and opalescent. This deposit, taken as a whole, is seen to extend as far as the grey matter at the opposite or uncut surface of the brain. A portion of the latter has been removed, and the former is seen coated with a yellowish red-coloured substance. The entire thickness of the deposit, as far as this surface, is of uniform colour and character; but the central portion proved softer, less firm than the other part, and, as it were, œdematous, being of an opalescent character. The convolutions immediately covering the deposit are firm, but the white brain-substance surrounding part of it, as seen on the sectional surface, is observed to be softened; and in the same substance near the deposit may be seen a small cavity equal in capacity to a pea, empty, and having a uniformly smooth lining (*e*).

[1] For this reason the case has been related, with special reference to this circumstance, in Beale's Archives, vol. i. p. 282, along with others of false membranes connected with the dura mater.

[2] This case and the peculiarities of the villous arachnoïd growth have been detailed (and illustrated by a lithographic representation) in the Trans. of Path. Soc., vol. ix. p. 14.

Microscopical Examination.—After maceration for many years in spirit, I found the following appearances:—The largest and the smallest deposits, which were of the same colour as the whitish-yellow brain-structure around, were seen to present the same minute characteristics which universally prevailed. They consisted entirely of a quantity of delicate semi-transparent and

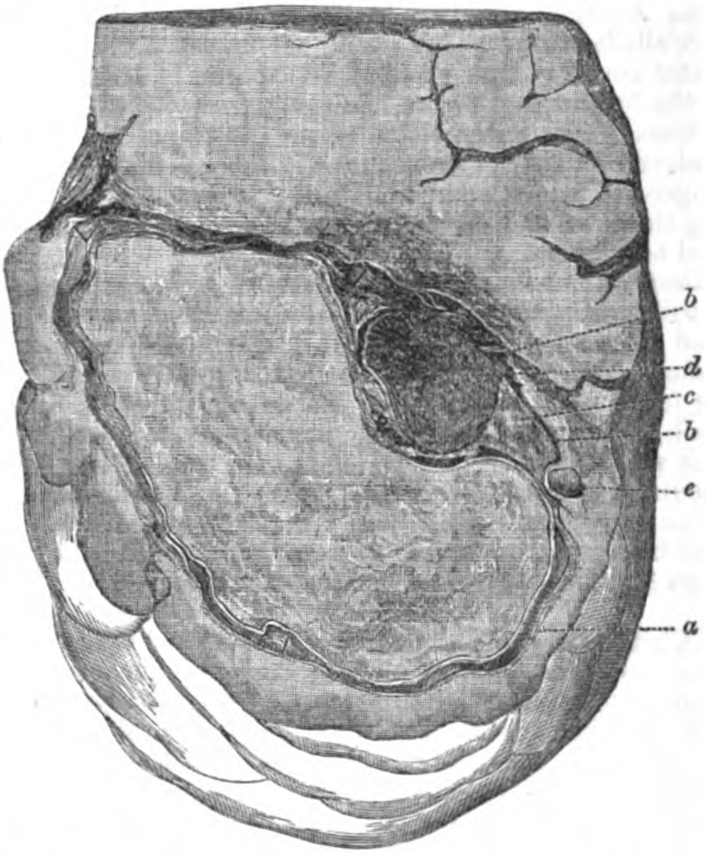


Fig. 13.—Portion of brain containing a large and two smaller (dark-coloured) deposits surrounded by a firmish membrane, *a* and *b*; *c* and *d* are the smaller bodies alluded to; *e*, a small empty cyst.

refracting granular matter, clustering around delicate and scanty fibrillated tissue. The mass of the dark, firm, streaked deposit, which was isolated from the other two, was found to contain a certain amount of granular and fibrillated matter like the other parts, cleared by addition of acetic acid, but contained also a very large amount of opaque amorphous dark substance, and in some places fibres existed, to which was added a considerable quantity of material having a beautiful reticulated appearance, the meshes having double walls, being about $\frac{1}{7000}$th of an inch in size, chiefly polygonal, and tolerably uniform in size. (See Plate II. Fig. 5.)[1] In the very firm, pearly, white-coloured part before alluded to, nothing but dense, firm fibres was met with. The investing capsule contained a large amount of fibrous tissue, as well as granular matter, having in places aggregations of opaque, blood-coloured

[1] Such appearances, though only to a slight degree comparable with the present instance, I have several times met with in the old-standing coagulum of aneurysms, and in the firm thrombus of veins (the darker and drier parts) I have found an approximation to this network and hexagonal character.

deposits amongst it. Part of the capsule, where thickest and of darkest colour, contained numbers of large, thick bloodvessels (see Lithog. Plate II. Fig. 6), many of which had numerous collections of fatty matter around or within them, and many irregularly shaped bodies of a bright reddish yellow colour. In one place, in addition to the above, numerous rounded and oval cells of large size and rather irregular outline, and containing bright red and rounded bodies like nuclei within them, were found (*b*), and one or two plates of cholestearine (*c*). Several small bodies, not to be distinguished from pus-globules, were also seen. Nothing like cell-formation of any kind was visible within the deposits themselves.

CASE CLXXXVII. *Growth of a Peculiar Kind connected with the Dura Mater on the* RIGHT *side of the Brain. Hemiplegia on the same side of the Body following Hooping Cough.*—The patient was a boy aged six years, who, during a severe attack of hooping cough, became affected with "fits," and lost the use of the *right* arm and leg. Subsequently his head became very large, and symptoms of so-termed inflammation of the brain set in, of which he died.

Post-mortem Examination.—Cranium: The dura mater, corresponding to the anterior inferior angle of the *right* parietal bone, was occupied by a morbid growth on both of its surfaces to the extent of about a shilling piece in area, that part of the growth on the outer surface of the membrane being less prominent and smoother than that on the opposite side. Much serous fluid was also found in the lateral ventricles, and a slight amount of purulent matter mixed with serous fluid in the general arachnoïd cavity.[1]

Microscopical Examination.—After maceration in spirit for many years, I found the growth to present a large amount of granular matter containing numbers of rounded, large and small, transparent, nuclear bodies: a few narrow, elongated, but short ones were also seen. A few nucleated bodies also existed of the size and form of pus-globules, and a few very large granular ones; moreover, some large-sized bloodvessels, though scanty in number, were visible. (See Lithograph Plate II. Fig. 3, *a*.) But the most remarkable constituents were the following: Commingled with small round and large oval nucleated cells and occasional fibres, existed numbers of plaque-like, flattened bodies (most likely portions of matrix) of irregular shapes (*b*), and containing, besides granular and apparently fatty matter, round and oval refracting nucleus-like bodies.

CASE CLXXXVIII. *Tumour connected with the Inner Surface of the Dura Mater, having a Peculiar Tubular Structure.*—This specimen was presented to our Hospital Museum by the late Sir Benjamin Brodie, but no history of the life-symptoms exists beyond the fact stated that none were manifested referrible to the brain. The growth had produced considerable indentation of the surface of the brain, but neither was the brain itself softened or otherwise diseased, nor was the visceral arachnoïd intervening between the brain and the morbid growth at all diseased.

Microscopical Examination.—After slight maceration in distilled water I found that much thick white fluid could be scraped off, which was found to consist of granular matter mixed with an abundance of single nuclei, and smallish cells of various sizes containing nuclei, some being oval and some round. The surface of the growth was flocculent, and its substance consisted mostly of tubes containing numbers of small nuclei, some oval and elongated, and others rounded. Some of these tubes were quite opaque, with yellowish contents, and nearly all were rendered very transparent by the addition of acetic acid. In some cases the tubes appeared to end in a cul-de-sac, and some which were filled with semi-opaque matter were so convoluted as at first

[1] See Hospital Pathological Catalogue, Series viii. No. 102.

sight to give the appearance of the formation of cysts or vesicles. Occasionally large masses of calcareous material were met with. The main basis of the growth contained a large number of firm and large blood-vessels.[1]

CASE CLXXXIX. *Doubtful Tumour (with or without Meningitis) within the Cranium. Head-ache, Strabismus, Paralysis of Facial Muscles, Hemiplegic Symptoms, &c. Exaltation of Special Senses.*—Ellen B., aged twenty-seven, a yellow-haired, light-complexioned girl, was admitted May 17th, 1859, having been ill two years. Her illness followed an attack of scarlet fever, and commenced with violent pain on both sides of the face, unconnected with any disease of the teeth. This pain went on for two months, and as it ceased pain at the vertex of the head came on. The head-ache got worse, and then the eyesight became dim, specially in the right eye, and she began to see things double. About two months before admission, numbness all down the *left* side of the body and face suddenly came on; and this part of the body was often painful, and generally of a lower temperature than the other side, and affected by a sensation of "pins and needles." Occasional "jumpings," also, of the left leg occurred, and she was subject to palpitations of the heart. At times there was deafness, but no dysphagia or loss of power of smelling, and she was often unable to bear a strong light; she often had stars or flashes in the eyes. For eight or ten months she had been unable to open the eyelids as wide as before, and when admitted she could not close either of the eyes very firmly; the pupils were natural. The tongue was reddish, and protruded in a straight line. The memory was very defective. She was very weak, and losing flesh; bowels active; catamenia irregular; sleep disturbed by pain in the face and head; pulse weak; head hot. She had never had a fit or spat blood, or been subject to a cough. Her father had died of phthisis, but not any brothers or sisters. After she had been two weeks in the hospital the pain increased, the pulse was small and weak, and the flashes in the eyes were worse. Before admission the gums had been made sore, and she had taken quinine and been blistered with temporary benefit. She was treated after admission by blisters to the neck, and strychnia 1-24th of a grain thrice a day. On the 4th of June the pain in the left eyeball was severe, and this eye was rather prominent, and had a slightly divergent squint. The conjunctiva was vascular, and there was less ability to open this eye fully. She said she was very "numby and weary," and that the hands and feet were cold. She had an attack lasting half an hour, in which she had numbness all down the *left* side, and down the right side for a short time. The head-ache became worse, and she scarcely got any sleep, owing to pain, in spite of treatment; and she returned to Essex (near Colchester) towards the end of June, being hardly able to see with the right eye. It appeared that after her return home she at first became worse: the pain increased, the loss of vision became greater, the sclerotic and conjunctivæ reddened, and what she could see appeared generally of a bright red colour (as it was stated). A general higher febrile state came on, and convulsive snatchings of the limbs, especially of the *right* hand and arm, and the head became incessantly drawn to the *right* side. These symptoms were not arrested by the use of aperients, ice to the head, &c.; but she became greatly relieved by quarter-grain doses of bimeconate of morphia and the continued use of aperients, and the improvement continued both as regards decrease of head-ache and decreased febrile condition and restlessness; but the twitchings continued much the same. In the autumn of 1861 she came under the care of Mr. Meadowcroft, of Great Bentley, near Colchester, complaining of distressing pain in the head and upper part of the spinal cord, and had constant convulsive twitchings of the right side of the body, great irritability of the

[1] St. George's Hospital Pathological Catalogue, Series viii. No. 101.

stomach, and but little sleep; but when this did occur the convulsions almost quite subsided. She suffered greatly, also, from dyspnœa; and the senses of hearing, smell, and touch were greatly exalted. She went to Colchester in 1862, where anasarca of the legs came on (according to the statement of Mr. Brough, of that town, who attended her and has kindly told me about her), and died at the end of the year.

Unfortunately post-mortem examination was not obtainable in this case, and therefore it is impossible to determine what was the exact nature of the disease; but from the character of the symptoms, and the long continuance of life after the disease first manifested itself, it may be judged that some morbid growth had taken place within the cranium. The uncertainty connected with the case gives it a place among the "uncertain" growths.

CASE CXC. *Large Cellular Growth of a Doubtful Nature in the* RIGHT *Cerebral Hemisphere. Hemiplegia on the* LEFT *Side. Facial Paralysis. Rigidity of Paralysed Muscles. Mind obscure.*—Sarah N., aged fifty-six, admitted January 27th, 1864, in a state of unconsciousness and hemiplegia on the *left* side, which had been the case since the day previously, when she was seized with vomiting. The muscles on the *left* side of the face were weaker than those on the right, and swallowing was difficult. On the day after admission she spoke vaguely, and frequently moved her right limbs. Under the use of aperients and counter-irritation she much recovered speech, but her mind was very sluggish. Pulse quiet. On the 1st of March the pupil of the *left* eye was smaller than its fellow, and the muscles of the left arm somewhat rigid, the facial paralysis on the left side being more marked. Slight power of moving the left arm was regained, and pain at the forehead complained of. She continued in the same state for a time, the mind remaining obtuse, and stimulants were given. Later on the features became drawn to the *left* side, and the muscles of the left arm contracted. Bed-sores began to form, the impulse of the heart became increased, and the pulse very much quickened. On the 7th of March she lay foaming at the mouth, the left arm being extended and quite relaxed, and she died quietly in the course of the day.

Post-mortem Examination.—Cranium: The vessels of skull and cerebral membranes were very vascular. The convolutions of both cerebral hemispheres (especially of the right one) were much flattened, and the left ventricle contained about one and a half ounce of clear fluid. The dura mater was found adherent to the lower part of the middle lobe of the *right* hemisphere of the brain, and this lobe was found very greatly occupied by a growth (appearing quite at the surface when the dura mater was adherent), which extended internally, so as to push the corpus striatum and optic thalamus inwardly, and thus close up the right ventricle. This growth was spongy, being white and friable, or yellow and translucent, and much resembled coagulated fibrin. In places it was blood-tinged. *Thorax and Abdomen:* Lungs congested. Other organs presented nothing worthy of remark. No morbid growths were found in them.[1] (75.)

Microscopical Examination.—This growth was found by Dr. Dickinson, where resembling fibrin, to contain much finely-divided oil and large globules which were aggregations of minute radiating crystals; whilst the more friable and opaque parts consisted of a great number of angular caudate, fusiform, and globular cells, mostly, but not all, without nuclei, and containing very small granules.

[1] This case has been published in the Lancet, October 22nd, 1864, p. 464.

VII. Cysts of the Brain or its Membranes.

These will be subdivided into (1) those which are connected with hydatid formations; (2) those which are congenital, containing hair and sebaceous or epithelial matter, or connected with the cranial sinuses; (3) those which are probably the result of ancient extravasation of blood;[1] and (4) those which appear to have been connected with exudations and accumulations of fluid, the result of inflammatory and other processes.[2]

I. THOSE CONNECTED WITH HYDATID FORMATIONS.

Case CXCI. *Numbers of Hydatid (so-called) Cysts in various parts of the Brain. Disease of the Kidneys and Vessels at Root of the Heart. Commencing Aortic Aneurysm. Epileptic Attacks.*—John W., aged forty-six, was admitted Dec. 7th, 1852. He was a drunkard who had fought hard, and been subject to epileptic attacks, but not for three years previously. He had also been in St. George's Hospital some months previously, owing to pain at the top of the sternum and dyspnœa (though without cough or expectoration), and was discharged relieved. At that time, on admission, he was very dropsical, the heart's impulse was increased, and præcordial dulness extended, and evident disease of the large vessels existed. During his absence from the hospital he had an epileptic attack, and when re-admitted, the cardiac symptoms were intensified. He was cupped between the shoulders; stimulating expectorants, and purgatives, and camphor were given, and decided diuretics subsequently. No albumen existed in the urine. On the 17th he was seized with convulsions and died.

Post-mortem Examination.—Cranium: The cranial bones were natural. Beneath the arachnoïd membrane covering the cerebral convolutions were two cysts, one as large as a walnut, at about the centre of the right cerebral hemisphere; and the other, of half this size, at the anterior part of the *left* cerebral hemisphere. These two cysts were lined by a distinct membrane, and each contained a substance having all the appearances of a so-called hydatid formation. The convolutions of the brain were much depressed by the cysts. In addition to the above, similar cysts were found in the substance of both cerebral hemispheres, there being as many as three or four on each side of the brain. One was at the base of the *left* side, close to the edge of the cerebellum, and one resting on the anterior and upper parts of the corpus callosum between the cerebral hemispheres. The lateral ventricles of the brain were natural. *Thorax and Abdomen:* The heart was hypertrophied (weighing twenty-six ounces), and the aorta was very dilated and atheromatous: a commencing aneurysm existed in the aortic "sinus." The valves were not diseased. There was very much recent fibrin in the left neural sac; and the kidneys were very granular and cysted, &c.

Microscopical Examination.—The material in the cysts in the cerebral ventricles was found to consist of clear fluid containing nothing more than sabulous matter and fine granules (243).

Case CXCII. *Hydatid Cysts in the* left *Fissure of Sylvius. Abscess of one Kidney. Delirium and partial Coma before Death.*—George E., aged fifty-seven, admitted August 24th, 1863, complaining of pain during and following mictu-

[1] An error exists in a foot-note to page 459 of the number for October, 1864, wherein it is stated that such cysts as result from former extravasations of blood will be excluded from this series;—the word should have been in-cluded.

[2] One or two cysts will also be found described in connexion with the carcinomatous growths, and are not introduced into this part of the series. Neither does this part include such empty cysts as form the walls of previous abscesses.

rition. No stone in the bladder was detected by sounding. On the 30th he was very low and inclined to drowsiness. On the 2nd of September he became delirious and very restless, trying to get out of bed, but was soon controlled. The pulse was frequent (108) and irritable, the tongue coated and dry. On the next day he was unconscious, the evacuations became passed involuntarily, and he sank and died on the 4th.

Post-mortem Examination.—Cranium: Old thickening of the arachnoïd at the upper parts of the brain existed, and the vessels of the pia mater were very distended. In the left fissure of Sylvius was a small collection of hydatid cysts lying loose, varying in size up to that of a chestnut, the larger ones being very shrivelled. There was no marked depression on the surface of the brain corresponding, and the pia mater was unbroken. Patches of fatty degeneration of the liver and enlargement of the prostate gland were found; as also abscesses of one kidney and constriction of the corresponding urethra. Nothing further was observable in the body. (210.)

CASE CXCIII. *Hydatid Cyst in the* RIGHT *Cerebral Hemisphere. Partial Loss of Vision. Vomiting and Convulsions before Death.*—A. B., aged twenty-six, had been quite well until three weeks before death, which occurred in March, 1862, when convulsive attacks came on. She preserved her mental faculties, and was free from paralysis of any kind, until the last two weeks of life, when she experienced considerable, but not complete, loss of vision. She also throughout suffered much from vomiting.

Post-mortem Examination.—The anterior lobe of the *right* cerebral hemisphere was found to contain a cyst of the size of a large orange, otherwise the brain and various organs were natural.

Microscopical Examination.—On examining the walls of the cysts, which were white and opaque, and in some places much thicker than in others, by the microscope, I found the membrane to consist of, for the most part, very fine

Fig. 14.

hyaline material, finely marked by parallel lines in most parts. In some portions distinctly curved parallel lines were seen, exactly representing what one finds in many, or most, of the so-called hydatid cyst-walls of the liver and other organs (see *a*, Fig. 14). The thicker and more opaque parts were found to be full of molecules and dotted material (see *b*, Fig. 14), and to be laminated at their edges.

For the details of this case, and for the opportunity of having a drawing made of the cyst, I am indebted to Walter Walford, Esq., of Hertford.[1]

[1] On examining the museums of most of our hospitals I have found illustrations of intra-cranial hydatids. For example: Preparations Nos. 1577 and 1577[39], in Guy's Hospital Museum, show acephalocyst hydatids of the brain; and in the same museum, No. 1590[14] shows the cysticerci found loose in the lateral ventricles; and No. 1590[75] shows a cyst, the size of a bean, in the pia mater, which

II. CONGENITAL CYSTS CONTAINING HAIR AND SEBACEOUS MATERIAL, OR COMMUNICATING WITH THE CRANIAL SINUSES.

CASE CXCIV. *Congenital Cyst within the Layers of the Dura Mater of the Brain, containing Epidermal Cells, Epithelial Scales, and Hair.*—A boy aged two and a half years, who had been out of health for six months, fell from a chair. The day following he squinted, and there was rolling of the eyes, and some convulsive

was occupied by a cysticercus. In St. Thomas's Hospital Museum, No. 101[1] shows the occupation of almost the entire posterior lobe of the left side of the brain by a hydatid cyst from a boy aged fourteen, and Nos. 101[3] and 101[4] show the cænurus cerebralis removed from the brain of staggered sheep. In the Pathological Museum of the Royal College of Surgeons are seven specimens illustrating the subject of hydatids from the brain; of these two were removed from the human subject, and connected with one of them an extract from Sir Everard Home's Lectures is made, in which he observes (in 1794–5) that he had never known but one instance of the formation of hydatids in the human brain, and that was in the case of a lady who was subject to periodic attacks of intense head-ache, which increased almost to madness. The hydatid cyst was of the size of a common orange. In the case of one of the specimens in the College Museum, the skull shows two large holes, which, it is said, were made by absorption consequent on the pressure of hydatids; the dura mater is in consequence adherent to the pericranium, and they together close the holes in the skull. Also in University College Path. Museum, Preparation Y 70 (2207) shows cysticercus of the brain; Y 87 (1696) shows a bony cyst removed from the brain of a sheep, which most likely was of an entozoic origin; and Y 86 (1111) shows a large cyst from the brain of a sheep which suffered from the staggers. In the same museum, Y 60 (1114) shows a cyst in the human brain, which may have been also entozoic in character. In the Westminster Hospital Museum is a curious specimen (D D 12), described as showing a larva imbedded in the vomer of a sheep. In St. Bartholomew's Hospital Museum, Nos. 60 and 61 show an acephalocyst hydatid in the right cerebral hemisphere, from a girl aged five, and two instances of hydatids in giddy sheep, in one of which (No. 69) the cyst occupies the greater part of one hemisphere. In the Pathological Museum at Oxford is a most interesting specimen of hydatid of the brain in a sheep (placed there by Dr. Rolleston), along with the cranium, showing how the skull had been pierced during life with a red-hot iron, and the cyst, which had been diagnosed, removed. Upon this method of removing so-called hydatids from within the cranium in the lower animals, my friend Dr. John Davy has kindly sent me the following communication. He writes:—"The disease is of common occurrence in the flocks in this district (Westmoreland); it is also met with in horned cattle, and in both it is operated on much in the same manner by the actual cautery. When advanced, its situation is known by a softening of the superincumbent bone; when not, the place of the hydatid is conjectured—at the side of the brain—by the condition of eye and the manner the animal turns in its gyrations; that being, if the hydatid is in the right hemisphere, from the left, the left eye, it is said, being destitute more or less of sight, and *vice versâ*. According to the information I have had from the master of a large flock, about three out of five operated on recover. I should mention that when the bone is burnt through, the hydatid protrudes, and is extracted by the point of a knife; sometimes a notched quill is used for the purpose. Sometimes, too, I am told that a long needle is thrust through the nostril into the brain, so as to puncture the hydatid, and with such relief, that the animal feeds and gets fat, so as to be fit for the shambles. On the cow, the extraction as described is said to be even more successful than on the sheep; but this conclusion, I apprehend, is derived from a very limited experience. The disease here is known by the name of 'sturdy.' Young sheep—hogs, as they are here called—are said to be alone subject to it. If the hydatid be not extracted, the animal dies. Occasionally there is a recurrence of it."

I have more recently read some observations by Dr. Boyd, of the Wells Lunatic Asylum (see Edinburgh Medical and Surgical Journal, No. 171, p. 468), in which he says: "In the brain of sheep with staggers, hydatids have been detected by the softness of the skull over the part. The graziers have attempted to cure the disease by puncturing and extracting the bag. Few have been saved by the operation."

movement of the arms, and the neck was tetanically drawn to the left side. There was neither paralysis nor loss of consciousness. After admission, the child improved for a time, but in a few days general convulsions of the limbs and body came on, and death followed.

Post-mortem Examination.—Cranium: On examining the bones of the skull a small foramen large enough to admit an ordinary probe was found in the mesial

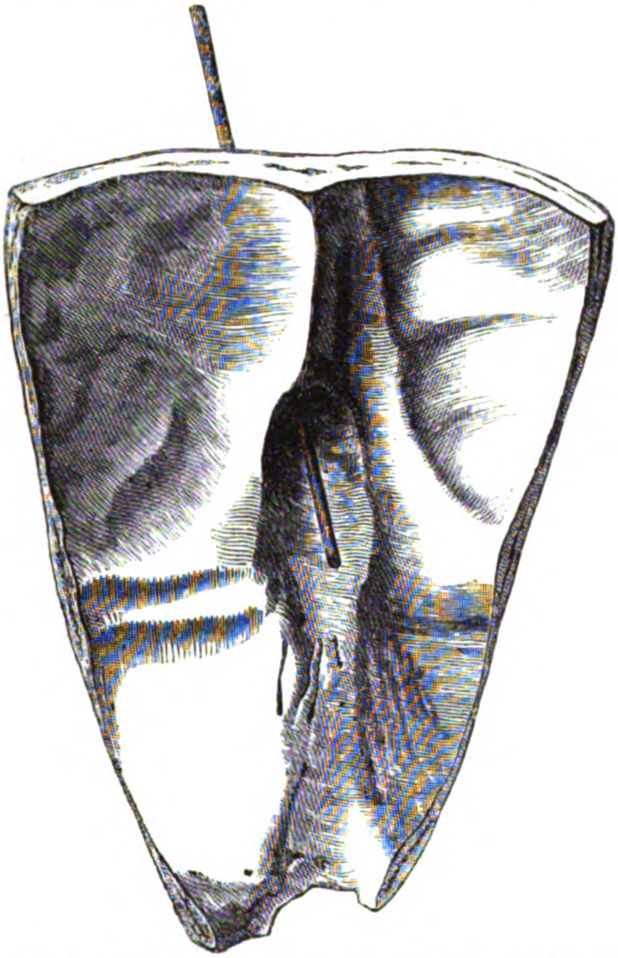


Fig. 15.—Shows the position of the depression (caused by the cyst) on the inner surface of the occiput, into which a probe is passed from the outer surface by means of the aperture through the bone.

line of the supra-spinous part of the occiput, passing in a direction from above downwards, and opening on the inner surface of the bone at the upper part of a depression which was caused by the presence of a cyst in the dura mater.[1] This depression was very shallow at its lower part, but very deep at its upper part, into which opened the aperture in the bone, having very abrupt margins (see woodcut, Fig. 15). It was situated vertically, so that the lower part of the groove for the superior longitudinal sinus was considerably deflected to the left side of the median line by it. The bone forming this portion was very thin. The cyst itself formed a projection about 1½ inch long and 1 inch broad, and originally encroached upon the posterior part of the brain, and was formed in that part of the dura mater which, being nearest the bone, was posterior to the sinuses terminating at the torcular, and was seen pierced by a hole through which one

[1] See Hospital Path. Catalogue, Series ii. No. 249.

or two hairs projected from its anterior, and which corresponded to the foramen before mentioned as existing in the thinned part of the occiput where was the depression. By means of the cyst, the lower part of the superior longitudinal sinus and the torcular were pushed much to the left side, and the termination of the right lateral sinus was greatly pushed forwards, and contained a projection inwards of a part of the dura mater, forming a small empty cavity of the size of a large mustard-seed. On minute examination no lining membrane or capsule was found between the dura mater forming the walls of the cyst and its contents; but on the outer surface of the cyst one or two flakes of soft fibrin were attached.

Microscopical Examination.—The contents of the cyst, which were composed of opaque white substance, were disposed in laminæ as regards the outermost portions, but were broken up in the central parts. In one or two places this material had a nacreous, glistening look, and in many places numbers of fine soft auburn-coloured hairs were mixed with it. These hairs, some of which had ill-formed bulbs or roots, were very abundant in the central parts, and were collected together into a lock, being curled up, and about an inch in length. They possessed no central canal, but were uniformly of a semi-transparent yellowish amber colour, darker at one edge than the other, apparently from increased thickness, and streaked by lines, which were not continuous, in a longitudinal direction, and which were in places thicker than in others. Parts of the hairs presented transverse, waving and irregular markings, like injuries or wrinkles, most obvious at the thinnest edges. The hairs were also decidedly imbricated at the edges. One or two of the hairs, however, had well developed roots. On examining the pearly contents, nothing like crystals of cholestearine or fatty matter was found, but large collections of epithelial cells. When seen singly, these cells were nearly all perfectly translucent, giving the appearance of transparent spaces enclosed by delicate lines; but when arranged in layers, had a yellowish, opaque character. A few contained rather granular, opaque material. The form of these cells was, towards the central parts of the cyst-contents, oval and rounded, and $\frac{1}{2000}$ to $\frac{1}{2500}$ of an inch in diameter, and they had more the character of compressed scales, being devoid of nuclei; these, however, in the greater parts were larger and more angular and tesselated, and contained small but very distinct nuclei, being rendered more evident by the addition of acetic acid. Besides the above-mentioned epithelial cells, in one or two places a quantity of very delicate fine fibrous tissue was contained in the cyst, but nothing more at all approaching any rudiments of skin tissue. Occasional accumulations of refracting fatty molecules were found. When examined, immediately after removal from the body, purulent matter was met with among the other contents of the cyst. The base of the brain, corresponding to the cornua of the lateral ventricles, was softened and infiltrated with purulent matter, and the ventricles contained much turbid and flaky pus. The arachnoïd cavity about the cyst and cerebellum and sella turcica contained purulent fluid and soft yellow fibrin; the various sinuses and veins were free from any fibrinous clot, &c.[1]

I have gone into more particulars regarding this case, for which I have to thank Mr. Cæsar Hawkins, in whose practice this case occurred (although I related it in the 'Transactions of the Pathological Society,' vol. vi. p. 12), inasmuch as I wished to illustrate the subject by the drawings, which were not given in the Transactions.[2]

[1] See Hospital Path. Catalogue, Series viii. No. 100.

[2] This case is mentioned in Mr. Paget's Lectures on Surgical Pathology, revised and edited by W. Turner, M.B. of the University of Edinburgh, 1864, p. 435. Without referring at the present time more at length to the pathology of this case, I may at least say that it appears most likely that before the completion of ossification of the skull, some part of the outer integument containing dermal tissue, &c., had become intimately united with some part of the cerebral membranes, which protruded

CASE CXCV. *Congenital Cyst, containing Sebaceous Matter and Hairs, in connexion with the Dura Mater. Arachnitis. Coma preceding Death.*—Henry C., aged twenty-two, a robust, well-made soldier, was admitted into Fort Pitt July 23rd, 1840, having been in good health until two or three days previously. When admitted, he had severe head-ache, pain in the back and limbs, hot skin, and dry tongue; the bowels were open. Subsequently, soreness of the throat came on, which externally was red and swollen, and to which leeches were applied. An early tendency to coma showed itself, and he became perfectly comatose, the pupils being quite inactive. He was bled, and treated with aperients and diaphoretics. Nine hours before death a profuse perspiration set in, which continued until death, July 26th.

Post-mortem Examination.—Cranium: A small encysted tumour, with semi-fluid, nearly transparent, contents, existed under the integuments covering the frontal sinus. The walls of this cyst consisted of a delicate but firm membrane, lined with delicate fibres like hair. The contents of the cyst, when examined *microscopically*, were found to consist of "oil-globules, and what appeared to be at first minute prismatic crystals," but which proved to be hairs. The arachnoïd cavity on both sides of the cranium contained a considerable amount of purulent fluid (pus globules $\frac{1}{3000}$th of an inch in diameter, and a few larger globules), and close to the longitudinal sinus, exactly in a line with the ear, was a cavity or depression in the surface of the brain (half the size of a boy's playing marble), full of sero-purulent fluid, lined with pia mater, and covered by the arachnoïd membrane. The pia mater throughout adhered, for the most part, to the cortex of the brain so much that its removal brought away portions of the grey cerebral substance; and the cortical parts of the brain, especially at the anterior portions, were softer and redder in colour than natural. Much sero-purulent fluid existed in the arachnoïd cavity, and also beneath the arachnoïd membrane at the base of the brain. Very little fluid existed in the ventricles, and that was transparent; and the central white parts of the brain were natural. Connected with the dura mater, and, as it were, enclosed between two layers of this membrane, was a tumour of the size of a walnut; this rested partly against the crista galli of the ethmoïd bone, and partly in a cavity in the bone-substance anterior to this projection. The tumour was found to be a mass of white material of the consistence of butter, surrounded by a delicate membrane of its own, not unlike the pia mater, and, when examined *microscopically*, was found to consist of fatty globules and long prismatic bodies, which proved to be of the nature of hairs, one being distinctly tubular;[1] several of these hairs were visible to the naked eye.

through the deficiency caused by absence of bony union, and had, on the filling up of the deficiency, been drawn within the cranial cavity, by which means the growth of the hair in the cavity had been permitted. As a point somewhat analogous to this, and illustrating its possibility, I may here mention the opinion which, as Mr. Paget and Dr. Sharpey inform me, has been held by some authorities, such as Rathke (see Müller's Archiv, 1838, p. 482), but denied or doubted by Reichert and Kölliker, that the pituitary body is originally connected with the pharynx, and becomes situated inside the cranium owing to ultimate inclusion, and that in some instances this gland may still be found not enclosed or included within the cranium, but preserving its original connexion with the pharynx.

I may here allude to an interesting case of steatoma of the cerebellum, of the size of a small orange, in the Museum of King's College, London, No. 781^4, removed from a paraplegic patient; and another in Guy's Hospital Museum, No. 1577^{10}, of the size of a pigeon's egg, and weighing ten drachms, at the base of the brain, compressing the pons Varolii and cerebellum, removed from a man aged twenty-six, who had general loss of power and finally general paralysis. He never had any fits. Also to a specimen in St. Bartholomew's Hospital Museum, Series vi., No. 56, showing a cyst containing fatty matter and hairs beneath the pia mater at the base of the cerebellum.

[1] In some hairs removed from the interior of sebaceous tumours, which I microscopically examined, a distinct canal, partly filled with black pigment, e-t-c

Thorax and Pharynx: The lungs were gorged, and in part consolidated; a small amount of scrofulous deposit existed in one lung and in the bronchial glands. The tonsils were very inflamed, and partly ulcerated; the pharynx was inflamed; and the glottis rather œdematous. *Abdomen:* Spleen bulky and soft.[1]

CASE CXCVI. *Blood-cyst beneath the Scalp, communicating with the Torcular Herophili.*[2]—The patient was a child aged three years, who died of chronic hydrocephalus.

Post-mortem Examination.—Cranium: At the posterior part of the cranium, beneath the integument, was a venous capsule communicating, as described below, with the cranial cavity. The brain was greatly enlarged, and the anterior horn of one of the lateral ventricles was distended with serum. The occipital tuberosity was perforated by a foramen, through which a tube of fibrous tissue passed from the Torcular Herophili, admitting the blood into the subcutaneous venous capsule mentioned as existing at the back part of the head.

For the description of this case I have to thank Dr. Acland, of Oxford.[3]

III. CYSTS APPARENTLY THE RESULT OF MORE OR LESS ANCIENT EXTRAVASATION OF BLOOD, INCLUDING CASES OF HÆMATOMA.[4]

CASE CXCVII. *Cyst in the Floor of the* LEFT *Lateral Ventricle of the Brain. Yellow Discoloration of the Brain. Phthisis Pulmonalis.*—D. D., aged twenty-one, suffered much in the middle of the year 1839, owing to a fall from a height of twelve feet on to his right side, when he was stunned. Profuse hæmoptysis followed, succeeded by dyspnœa and symptoms of phthisis. He was invalided from Barbadoes, and admitted into Fort Pitt in the beginning of September, 1860, with advanced phthisis. A drowsy state (but no delirium) preceded death, which occurred at the end of the month.

Post-mortem Examination.—Cranium: A tolerable amount of fluid was found in the arachnoïd cavity, sub-arachnoïd spaces, and the ventricles. The brain was natural, excepting that in the substance of the wall of the inferior part of the left lateral ventricle, contiguous anteriorly to the hippocampus major, was a cyst or cavity, capable of admitting the end of the little finger, covered with a very delicate membrane; the brain-tissue here was deeply discoloured, being of a yellow colour to the distance of two or three lines into its substance, which, however, was not at all softened in texture. *Thorax:* Scrofulous deposits and vomicæ existed in the lungs, and there was ulceration of the epiglottis and larynx. *Abdomen:* Numerous ulcers in the small intestines existed.[5]

1 I have to thank Dr. John Davy, F.R.S., for the details of this case.

2 The preparation of the enlarged brain and of the venous cyst communicating with the Torcular Herophili, is in the Pathological Department of the New Museum at Oxford.

3 For an interesting case of erectile tumour of the cranium communicating with the superior longitudinal sinus, see the Union Médicale, 1859, p. 254.

4 Not including the minute discoloured spaces and spots often found as traces of former ecchymosis.

5 In the King's College Museum is a specimen of cysts in connexion with the lateral and also the *fourth* cerebral ventricle, from a patient who suffered from amaurosis, possibly connected originally with extravasation of blood; also one of a thin-walled cyst in connexion with the *third* ventricle (No. 783), removed from the body of a girl aged seventeen, who had suffered from constant uneasiness in the head and from squinting for several months, and who had vertigo, then paralysis of the left side of the body, and who died in an apoplectic state following convulsions.

CASE CXCVIII. *Cyst formed around a mass of Extravasated Blood in the* RIGHT *Cerebral Ventricle. Adhesion of the Cyst to the Walls of the Ventricle. Softening of the Corpus Striatum and Optic Thalamus. Breaking down of the Left Optic Thalamus. Loss of Memory and occasional Incoherence. Coma and Convulsions before Death.*—Fanny N., aged forty-seven, was admitted May 15th, 1844, with some loss of power over the right side of the body. She was very weak, and the mental powers and memory very feeble; she was stated never to have had a fit, but for the previous twelve months her memory had been gradually failing, and her intellectual powers becoming impaired. Twice in that period she had been incoherent for a week's time, and then had recovered. The last attack was six months before admission. A few days after admission the motions and urine became passed involuntarily, and pain at the region of the heart was complained of, whose impulse was increased, and she exhibited occasional delirium. On the 31st, the other symptoms continuing, she complained of pain across the forehead, and the pupils were dilated and acted very sluggishly to light. On the 13th of June she became more delirious, and was constantly trying to get out of bed and strip herself. Coma and convulsions of the left side of the body came on before death, which occurred June 18th.

Post-mortem Examination.—*Cranium:* The skull was natural; Pacchionian bodies large and many; slight opaque sub-arachnoïd effusion existed; the white substance of the brain, forming the roof of the left ventricle, was of a marked saffron colour, that of the roof of the right ventricle being natural. The cavity of the right ventricle was slightly enlarged, and filled with blood-tinged fluid; the colour of its walls natural; a small blood-coagulum blocked up the foramen of Munro, and projected into the right ventricle, the cavity of the left ventricle being filled with blood. At the anterior part of this ventricle the blood formed a firm coagulum enveloped in a fine transparent cyst, which was adherent to the lining membrane of the ventricles, corresponding to the upper surface of the corpus striatum and to the anterior part of the thalamus; the adhesions were easily destroyed by the finger, and the corresponding portions of the corpus striatum and thalamus were softer than the other parts of the ventricle, but the softness did not extend beyond the superficial parts of these structures. After removal of the cyst its surface was observed to be covered with a delicate network of minute vessels, which were beautifully injected. The coagulum within the cyst was quite solid and of a variegated hue, being in some places of a fawn colour, and in some of the colour of yellow ochre, and in others of a deep red-brown colour. The posterior part of the left ventricle was filled with a coagulum of blood which had been recently effused; the source of the hæmorrhage was traced to the posterior part of the thalamus, which was broken up and mixed with blood. Puncta of effused blood were traced into the structures of the thalamus, at some distance from the part where the substance was completely broken up. This recently-formed coagulum had a natural appearance, and was traced into the third and fourth ventricles, which it completely filled up. The colour and structure of the walls of these last two ventricles were quite natural; but the colour of the walls of the left ventricle, specially towards the anterior part, was of a dark yellow ochre; the lining membrane of the ventricle was but slightly thickened. An old apoplectic cyst was also found in the substance of the left corpus striatum, at about its central part. The arteries at the base of the brain were thickened and atheromatous. *Thorax:* The left ventricle of the heart was thickened; slight atheroma existed at the root of the heart; lungs healthy. *Abdomen:* Organs natural. (23.)

CASE CXCIX. *Cyst containing the Remains of old Blood-clot in the Substance of a dense Fibrinous False Membrane attached to the Inner Surface of the*

Dura Mater on the RIGHT *Side. Hemiplegia on the* LEFT *Side following Convulsions. Coma before Death.*—Mary H., aged forty-two, was admitted into St. George's Hospital August 9th, 1850, with hemiplegia on the *left* side, having been subject to "fits" of some kind. She partially recovered from this state when she became a second time affected on the same side, after a severe attack of convulsions. Peculiar clonic spasms of the muscles of the back and legs came on; and coma set in before death, which occurred two days after admission.

Post-mortem Examination.—Cranium: The bones of the skull were natural; attached to the inner surface of the dura mater, corresponding to the right parietal eminence of the skull, was a dense laminated, yellowish-coloured material (evidently the remains of old blood-clot), of about the size of a crown-piece, having in its centre a cavity containing a quantity of material which had the appearance of silvery scales. The whole of this laminated material containing the cavity could be peeled off the dura mater, to which it was pretty firmly adherent. The cerebral convolutions were rather flattened, and there was much serum in the lateral ventricles; there was also softening of both corpora striata and optic thalami, as well as of a portion of the cerebral convolutions corresponding to the deposit on the inner surface of the dura mater above described. *Thorax and Abdomen:* The lungs and kidneys were congested; otherwise organs natural.[1] (144.)

CASE CC. *Large Cyst in the* RIGHT *Cerebral Hemisphere in immediate contiguity to the Lateral Ventricle, and also to the Surface of the Brain. Small Cysts in the Walls of the Lateral Ventricle.*—Sophia R., aged thirty-two, admitted March 6th, 1850, a married woman, and intemperate, who had only one child, which was seven years of age. The catamenia had been, as a rule, excessive and frequent, and for one month she had been subject to "fits," attended with pain and great heat in the head. The fits consisted of "shaking or trembling," in which she would sometimes fall down, but never quite lose her senses. At those times the urine would be passed involuntarily. The tongue was rather coated, and bowels confined. Ordered aperients and the compound infusion of roses. On the day after admission she fell into a soporose state, and soon was unable to be roused except with difficulty. A blister was applied to the neck, and stimulants given, followed by leeches to the head, and mercury. She became much less drowsy, and the pulse, which was 84, was not oppressed. She so far improved as to eat roast meat, but still the evacuations were passed involuntarily. She again became very drowsy, and had a "sort of a fit," in which, however, sensibility of the skin and power of motion were not affected. In spite of remedies she became gradually comatose, grinding the teeth and snoring much. She died March 29th.

Post-mortem Examination.—Cranium: Cerebral convolutions flattened and dry; the entire brain was "wet" and diminished in consistence, especially the fornix and septum lucidum; the lateral ventricles were filled with clear serum, and their lining membrane swollen, but translucent; the choroïd plexuses were pale. Above and to the outer part of the right lateral ventricle was a cyst of the size of a hen's egg, the upper wall of which nearly reached the surface of the cerebral hemisphere, and gave rise to discoloration at the surface of the convolutions and a sense of fluctuation. This large cyst was filled with clear yellow serum, and lined by a delicate translucent membrane containing several large tortuous vessels. A part of the inner wall of the cyst was in immediate contact with the lining of the ventricle. The pia mater lining the roof of the right lateral ventricle was in three or four places raised up in the form of vesicles by small cysts larger than peas between it and the brain-substance. *Thorax:* Lungs congested; heart soft and flabby. (56.)

[1] See Hospital Path. Catalogue, Series viii. No. 188.

CASE CCI. *Cyst on the Surface of the Middle Lobe of the* LEFT *Cerebral Hemisphere. Corresponding Depression of Brain. Atrophy of the Right Ventricle of the Heart.*—Ellen C., age unknown, was brought into the hospital dead December 16th, 1853, having been found in the street unconscious, and taken to the police-office; it was stated that she had often been so found when drunk. After some hours her breathing had become oppressed; the skin becoming cold shortly before death.

Post-mortem Examination.—Cranium: Skull and cerebral membranes natural. At the base of the brain, and at the back part of the anterior and the front portion of the middle lobe of the left hemisphere, a cyst was found, having very thin and fragile and dark, reddish-coloured walls. Its contents escaped during examination. The contiguous parts of the brain were depressed, but the other portions of this organ were natural. *Thorax:* Pleuritic adhesions existed, and a cavity having putty-like contents in the apex of one lung. The right side of the heart was much covered by fat, and the muscular walls of the right ventricle very thinned; large firm yellow coagulum existed in the right auricle. Other organs of body were natural. (260.)

CASE CCII. *Cysts (the remains of old extravasated blood) in the* LEFT *Corpus Striatum. Recently Extravasated Blood in the* LEFT *Cerebral Hemisphere. Epilepsy. Hemiplegia.*—Thomas M., aged fifty-four years, was admitted into the hospital January 31st, 1855, having had a fit on the previous day, Nothing more was known of him as to whether, for example, he had had previous fits. He was hemiplegic on the *right* side. After admission he had a long-continued "epileptic attack," during which the pupils were contracted. His speech was incoherent; and all evacuations were passed involuntarily. Stertor and stupor came on in spite of purgatives, cupping to the nape of the neck, and stimulants, and he died comatose February 15th.

Post-mortem Examination.—Cranium: The skull and cerebral membranes were natural. In the substance of the left cerebral hemisphere above and internal to the posterior part of the left ventricle was a quantity of recently extravasated blood; the brain-tissue around being somewhat of a chocolate colour, but firm. In the *left* corpus striatum, which was much discoloured, this ganglion, at points corresponding to these cysts, were two depressions. were two cysts bounded by yellowish-brown parietes; and on the surface of Other parts of the brain were natural. *Thorax:* The lungs were in a state of hepatization. *Abdomen:* The kidneys were much diseased.[1] (82.)

CASE CCIII. *Cyst in the* LEFT *Corpus Striatum, containing so-called Amyloïd Bodies. False Membrane in the Arachnoïd Cavity. Atrophy, Shortening, and partial Paralysis of the Right Arm. Partial Paralysis, without Atrophy, of the Right Leg. Imbecility of Mind.*—The patient, a man, aged sixty-two, was admitted into St. George's Hospital, December 20th, 1855, with retention of urine. He slightly dragged the *right* leg, and had to a degree lost power in moving the right arm, and also quite lost the power of moving the right wrist and right fingers. The right leg was of natural size and form, but the right arm was affected as follows:—The fingers, which were long and thin, were flexed on to the palm of the hand, and the wrist on to the fore-arm. (See woodcut, next page.) The fore-arm was generally flexed upon the arm, but could be straightened, though all movement was somewhat impaired, and that of the fingers and wrist, as before said, quite gone. (See woodcut, Fig. 16.) There was no want of common sensation in the skin

[1] See Hospital Path. Catalogue, Series viii. Nos. 18 and 19.

of this arm. On measuring the right arm, and comparing it with the opposite (the left) one, it was found that the circumference of the thickest part of the right arm, above the elbow, measured eight inches, whilst that of the left arm

Fig. 16.

was nine inches and a half. The length of the affected arm, from the acromion to the elbow, was twelve inches and a half; that of the opposite one being fourteen inches. The length of the affected fore-arm was seven inches and three-quarters; that of the left one being eight inches and five-eighths. The patient was said to have been partly paralysed on his right side ever since he was twenty-seven years of age. He was not known to have had convulsions or fits, but he was to a certain extent affected in his mind, having the delusion (apparently the result of his having been joked) that he was pregnant, and that he was frequently having valuable presents made to him by friends. He was not known to have been laid up with any bodily illness until the retention of urine came on. It was ascertained that he suffered from enlarged prostate gland. He went on well for some time, the catheter being daily passed. He died January 9th, 1856, about three weeks after admission, spasmodic stricture having come on, and the urine having become ammoniacal.

Post-mortem Examination.—The right fore-arm became rigidly flexed on the arm after death, at about rather less than a right angle. *Cranium:* The scalp and cranial bones were natural. The dura mater was in places much adherent to the skull, the arachnoïd covering the cerebral convolutions and thickened. At the upper part of the middle lobes of both cerebral hemispheres the visceral arachnoïd was adherent to the dura mater. Moreover, lining the dura mater, to a certain extent covering the upper part of the hemispheres, *was a thin layer of false membrane, here and there blood-stained, but otherwise almost discoloured.* On cutting down to the lateral ventricles, every part of the brain appeared to be natural, and the right lateral ventricle was natural in all respects. The *left* lateral ventricle presented the following characteristics. The outer as well as the posterior part of the left corpus striatum was so destroyed, that only about half of this ganglion remained (*a*, Fig. 17), and that was much altered in form,

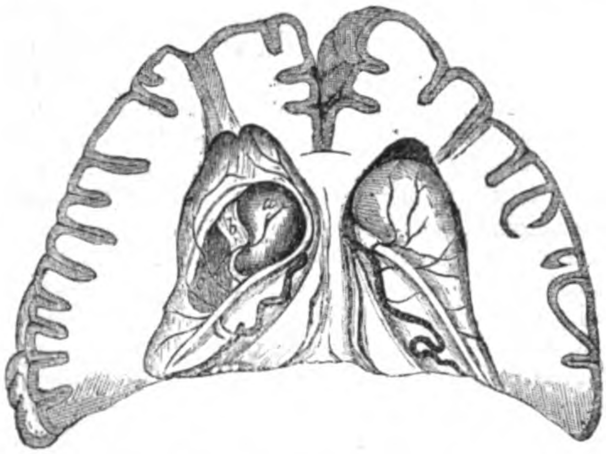


Fig. 17.—Section of brain, showing the floor of both lateral ventricles. *a.* Remaining portion of the left corpus striatum. *b.* White nervous fibres exposed by the destruction of part of the corpus striatum, covered by the lining of the ventricles. *c.* Left optic thalamus.

being lobulated on its surface. A small part of the outer wall of the ventricles was also involved, and to a very slight degree, likewise, a superficial portion of the contiguous optic thalamus. The parts destroyed were replaced by a deep cavity, of which the margins were, for the most part, gradually bevelled off from the surrounding surface, but in places were very abrupt and ragged. The lining membrane of the ventricles which was immensely thickened, in some parts more so than in others, and corrugated, was preserved over the cavity, but of course on a lower level than in surrounding parts, and assisted in smoothing its edges. The cavity was traversed by delicate fibrous processes in one or two places, and contained a clearish pale fluid. Moreover, where the outer part of the corpus striatum was wanting, the white nervous fibres which pass outwards and forwards beneath the ganglion (the so-called peduncular fibres) were plainly displayed, as if by artificial dissection (*b*, Fig. 17), the only covering they possessed being the translucent thickened lining of the ventricles. *Thorax:* Organs natural. *Abdomen:* The kidneys were granular. The urinary bladder was much thickened and inflamed, the prostate gland being greatly enlarged, and there was a false passage at the posterior part of the cavernous portion of the urethra, leading into a sloughy canal, and abscess between the bladder and the rectum. *Muscles of the Arm:* The muscular structure of the biceps muscle of the affected arm was natural; but in the muscles of the wrist the transverse striæ were in many places absent, and the fibres were granular.

Microscopical Examination.—The fluid in the ventricles contained a certain amount of granular albuminous material, and also a *number of amyloïd bodies,* but nothing more. The false membrane in the arachnoïd cavity showed great numbers of delicate fibres, with large distinct oat-shaped nuclei; also occasional round and oval bodies, with dark refracting contents, much granular matter, red corpuscles mixed with a large number of white ones, and distinct *capillary vessels* with regular nuclei in their walls.[1] (8.)

CASE CCIV. *Cysts (Remains of former Extravasations of Blood) in the Middle Lobes of both Cerebral Hemispheres. Head-ache and Vomiting.*—Henry Y., aged thirty-five, was admitted May 12th, 1855, having suffered from pain in the head for two years after having broken his arm in a fall. Frequently he had vomited. When admitted he was very tremulous, but gave tolerably rational answers, and had not the excited manner of delirium tremens. For one week he had had dysphagia and sore throat. He was restless at night, requiring restraint. On the evening of the day after admission he began to breathe hard, but was quiet, and died in an hour.

Post-mortem Examination.—The pupils were dilated, but equal. The glottis and epiglottis were œdematous, and tonsils ulcerated. *Thorax and Abdomen:* The heart was very hypertrophied, the liver large and fatty, and the kidneys cysted. *Cranium:* In the middle fossæ of the base of the skull the dura mater was puckered and thickened, and adherent to the middle lobes of the brain, and of a brick-red colour. On section of the middle lobes here at the base small cavities were found on both sides, crossed by bands of areolar tissue. On the left side the cavity was of considerable size; part of its walls, to some extent, consisted of a thin layer of the cortical part of the brain, and part consisted of a brown-coloured material continuous with a cicatrix-like mass, with which blended the brownish-yellow lining of the descending cornu of the left lateral ventricle. This discoloured lining of the cornu gradually deepened in colour in a downward direction.

Microscopical Examination.—I found the brown lining of the cyst to contain many nuclear, oval, and round bodies of small size, very many hæmatine crystals, a plentiful supply of blood-vessels. Where of a brick-red colour a quantity of colouring matter, and blood-crystals, and round globules existed. The contiguous brain-matter, which was rather softened, was full of granular and molecular material, with a very few cells and natural-looking vessels. The brown lining of the cornu of the ventricle contained a quantity of granular matter, numbers of largish, oval, and round nuclei, much curly fibrous tissue, many blood-vessels, granular fatty matter, and a few fine light-coloured crystals of indefinite shape.[2] (148.)

CASE CCV. *Cysts, the Remains of former Extravasations of Blood in the* LEFT *Corpus Striatum. Recent Extravasation in the Left Cerebral Hemisphere. Right Hemiplegia. Coma before Death.*—Thomas M., aged fifty-four, was admitted January 31st, 1855, with hemiplegia of the right side, which had followed a fit which he had on the day previously. Nothing further of his history was attainable. The bowels were confined, tongue coated, skin natural. Pulse quick and full. The arcus senilis was well marked. A strong aperient was given, and two hours afterwards a long-continuing epileptic attack occurred, during which the pupils were much contracted. He was cupped to ten ounces on the neck, and a purgative enema was given. On the following day he was incoherent, and had a vacant unintelligent stare. In spite of treatment, the breathing became slightly stertorous and very soperose, but he could be roused to speak and say he had no pain. After continuing forty-eight hours in the same state, he became very comatose, and died on the 15th of February.

Post-mortem Examination.—All the limbs were rigid, especially the lower

[1] See also Trans. of Path. Society, vol. vii. p. 8; and Hospital Path. Catalogue, Series vii. No. 49.

[2] See Path. Catalogue, Series viii. No. 185.

ones; the pupils were natural. *Cranium:* The dura mater was universally adherent to the skull. The arachnoïd membrane was generally thickened and pulpy as if œdematous, and much fluid existed beneath it. In the middle of the left cerebral hemisphere was a clot of extravasated blood, of the size of a walnut, the tissue around being of a chocolate colour, but firm. The left corpus striatum had a yellow spot on its surface, and also two depressions corresponding with two small cysts or cavities having brown-coloured parietes, evidently the remains of former blood-extravasations, and lined by distinct fibrous tissue. The blood-vessels of the brain were very atheromatous. *Thorax and Abdomen:* The heart was enlarged, the muscular fibre of its right ventricle in a fatty state, and the right lung hepatized; the kidneys were granular, with diminished cortex; the spleen very large. (52.)

CASE CCVI. *Cyst from former Extravasation of Blood in the* LEFT *Corpus Striatum. Recent Extravasation in the Right Corpus Striatum. Disease of the Heart and Kidneys.*—William D., aged fifty, was admitted into the hospital, April 11th, 1855, with disease of the heart (hypertrophy) and kidneys, of which he died on the 13th. Owing to his state, no history of cerebral symptoms having existed was obtainable, but his speech was very inarticulate.

Post-mortem Examination.—In addition to the disease of the organs abovementioned, on examining the brain a recent clot of black blood was found in the right corpus striatum, surrounded by a soft smoothish membrane as a containing cyst; and in the opposite (the left) corpus striatum was a cavity or cyst, evidently the result of former extravasation of blood, empty, and lined by a distinct membrane. The cerebral arteries were very atheromatous.

Microscopical Examination.—The soft cyst-like membrane around the recent extravasation of blood contained much fatty granular material, with a few blood-vessels, but very few fibres and nuclei. The brain-texture around contained a large quantity of fatty material and blood-vessels, having granular fatty deposit on them. The walls of the transparent empty cyst in the left corpus striatum were found to contain crystals of hæmatine and round globular and granular yellowish-red particles, also numbers of delicate nuclei passing into fibres, and much granular fatty material. (111.)

CASE CCVII. *Cyst in the* RIGHT *Corpus Striatum. Surrounding Brain indurated. Hemiplegia on the Left Side of Eight Years' standing. Disease of the Lungs and Heart.*—Thomas D., aged thirty, was admitted July 19th, 1855, having been hemiplegic for eight years. On admission, there was great anxiety of countenance, much dyspnœa, irregularity of the heart's action, attended by a systolic bruit, albuminous urine, and œdema of the limbs. There was also vomiting. General dulness of the chest on percussion existed, and râles were audible over the lungs. The dyspnœa increased, lividity became excessive, and he died July 26th.

Post-mortem Examination.—*Thorax:* Evidences existed of pleurisy, congestion of the lungs, and dilatation of the heart; and the tendinous chords of the valve-flaps were united and so tied together, as it were, by consolidated fibrin, that the orifice only admitted of the passage of one finger. *Cranium:* Much sub-arachnoïd fluid existed. In the right corpus striatum was an empty cyst, having yellowish opaline walls, with blood-vessels coursing along them, and continuous with the vessels in the fissure of Sylvius at the base of the brain. The brain around the cyst was decidedly thickened and indurated, and of a yellowish colour, the hue gradually becoming lighter in an outward direction.

Microscopical Examination.—The thickened and indurated part of the brain was full of fat granules, several being accumulated into round and oval bodies, and great numbers being arranged longitudinally, as if from the filling up of old blood-vessels, being, as it were, *casts of the margins or edges of vessels.* (191.)

CASE CCVIII. *Cyst, the Remains of former Extravasation of Blood into the* RIGHT *Corpus Striatum. Convulsions followed by Coma. Diseased Kidneys and Heart.*—John M., aged forty-nine, was admitted Dec. 21st, 1863, with dyspnœa, cough, anasarca, and crepitation in the bronchial tubes. The urine was albuminous. Pericardial friction sound came on, and he had a convulsive attack which left him partly comatose, and with paralysis as to motion of the *right* arm and leg, the pupils being rather dilated but equal. The alvine evacuations were all passed unconsciously, but he voided the urine naturally; he died comatose, Dec. 26th.

Post-mortem Examination.—Cranium: The brain generally presented more than ordinary puncta on section, and the ventricles contained rather a large amount of fluid. In the substance of the right corpus striatum was an empty cyst, of about the size, in circumference, of a threepenny-piece, evidently the remains of former extravasation of blood. The arteries at the base of the brain were atheromatous. *Abdomen:* The liver and the spleen were rounded and enlarged. In the lining of the stomach (posterior part) was a recent ulcer and the cicatrix of an old one. The kidneys were cysted and large, and in one several cysts were united to form a cavity containing a large mass of soft, pultaceous and fatty matter. *Thorax:* The heart was dilated; recent fibrin existed in the pericardial sac. (268.)

CASE CCIX. *Numerous Cysts, the Remains of former Blood Extravasations into both Corpora Striata. Numbness and Diminished Power in the Limbs and especially the Legs. Purulent Deposits about the Muscles of the Neck and in the Mediastina.*—Charles M., aged forty-seven, was admitted Sept. 18th, 1844. Ten months before he had had giddiness and uneasiness of head, which had increased since. He had never had a fit, but at times his limbs had been numb and weak, and his extremities cold, especially on the left side. On admission, there was hesitation of speech and unsteady gait, and he dragged sometimes *one* leg, sometimes the *other*. There was slight head-ache, with giddiness and numbness in the thighs and legs. The bowels very costive, and had been so for some time. The pulse was irregular, soft and full. Aperients and alkaline tonics were given, and as no relief occurred a blister was applied to the loins, and pil. hyd. gr. v. given every morning, with slight relief. Afterwards the hyd. bichl. gr. $\frac{1}{8}$th was given twice a day. Salivation was produced, but the weakness remained the same. Cantharides was added to his medicines, and on Nov. 12th a seton applied to the back of the neck. On the 14th he had full use of his arms, speech was better, and he could walk more steadily. On the 24th, the LEFT leg and arm becoming weaker, he was bled to ℥viii., with relief. These symptoms remained, and he was cupped to ℥x. between the shoulders, but did not get rid of his symptoms. The throat became sore, and a sense of constriction of the larynx came on, with dyspnœa. The pulse became sharp. He was bled to twelve ounces, and calomel and opium with James's powder brought relief to the breathing. Dysphagia returning, leeches were applied to the throat. After much struggling for breath, coma came on, and he died Jan. 22nd, 1845.

Post-mortem Examination.—Cranium: Slightly opaque sub-arachnoïd fluid existed to some extent. The brain was very wet and somewhat softer than usual; its puncta large and numerous. The ventricles were very distended by clear fluid. The central white parts of the brain were not very softened. In the centre of both corpora striata were several cysts containing clear fluid, and varying in size from a pin's head to that of a pea. The brain around these cysts, which were more in number on the RIGHT than the left side, was natural. The arteries at the base of brain were very atheromatous. *Neck:* Pus and fibrin were found about the hyoïd muscles and about the pharynx and œsophagus. *Thorax:* Purulent fluid existed in the mediastinum. The lungs were very lacerable; the heart softened and the pericardium adherent. *Abdomen:* The kidneys were much diseased. (22.)

CASE CCX. *Cyst in the Walls of the* LEFT *Cerebral Ventricle lined by a Smooth Membrane, the Remains of former Blood Extravasation. Recent Hæmorrhage into the* LEFT *Corpus Striatum and Optic Thalamus. Hemiplegia on the* RIGHT *Side.*—William W., aged thirty, was admitted in August, 1857, with hemiplegia of the *right* side, owing to an apoplectic seizure which he had experienced. He improved, and left the hospital. In October 17th another fit came on, and he was brought to the hospital unconscious and with well-marked hemiplegia of the right side. He had latterly indulged in intemperate habits. He was treated by aperients, cold applied to the head, but he remained in the same unconscious state until he died, October 21st.

Post-mortem Examination.—Cranium: The left ventricle was full of blood, and a large, recently-formed clot of blood existed in the left optic thalamus and posterior part of the corresponding corpus striatum. At the upper and outer portion of the ventricle, and at the edge of the clot, was a small cavity lined by a smooth, glistening membrane, being evidently the traces of former extravasation of blood. *Thorax:* The heart was hypertrophied; atheroma of the mitral valve-flaps existed. *Abdomen:* Kidneys granular. (250.)

CASE CCXI. *Cavity, the Remains of former Extravasation of Blood in the Centre of the* LEFT *Cerebral Hemisphere. Yellow Discoloration of the Cortex in the neighbourhood. Hemiplegia on the* RIGHT *Side.*—Matthew R., aged thirty-three, a soldier, admitted into Fort Pitt Hospital, July 21st, 1840, having been five years in India, and having suffered from rheumatism, syphilis, pneumonia, dysentery, &c. In June, 1838, he was first affected by paralysis of the limbs on the right side of the body, and some time before admission, when at sea, had bronchitis. He was greatly exhausted on admission; dyspnœa and anasarca came on, and he died two days afterwards.

Post-mortem Examination.—Thorax and Abdomen: The lower part of both lungs was indurated, and the inner surface of the colon was granular and presented several cicatrices; other organs were natural. *Cranium:* Much serous fluid was found at the base of the skull on removing the brain. The brain itself was firm throughout. The left corpus striatum on section proved to be irregularly yellow and in spots changed in colour, but firm. In the central portion of the anterior lobe of the left cerebral hemisphere was a cavity capable of holding a barley-corn, with smooth lining surface, as if scooped out with an instrument. A portion of the cortex of this hemisphere, equal in size to the nail of one's little finger, at the upper part of the fissure of Sylvius was of a yellow colour and somewhat altered in structure.[1]

CASE CCXII. *Cysts containing Serous Fluid on the Under Surface of both Cerebral Hemispheres. Abscesses of the Liver, &c. Injury of the Skull from a Scalp Wound, followed by Typhoïd Symptoms.*—William P., aged forty-five, was admitted Dec. 19th, 1857, with a scalp-wound at the back of the head attended by much hæmorrhage. For a short time he was insensible, but afterwards he went on well for some days, occasionally taking a few grains of calomel. On the 28th of the month, he was walking about his ward; but on the 7th of January typhoïd symptoms came on, and he died on the 9th, remaining sensible until just before death.

Post-mortem Examination.—Cranium: There had been injury to the surface of the skull, which was, however, undergoing reparation. At the under surface of the middle lobe of the RIGHT cerebral hemisphere, and also at the under surface of the anterior lobe on the LEFT side, were two cysts containing serous fluid, evidently formed at the expense of the brain-tissue by extravasation of blood; the grey brain-substance around these cysts was of a greyish tinge; otherwise, the brain was natural. *Abdomen:* Purulent fluid existed in

[1] I have to thank Dr. John Davy for this case.

the general cavity of the peritoneum, and several abscesses in the liver. The capsules of the kidneys were adherent. (10.)

CASE CCXIII. *Cyst, the Remains of former Extravasation of Blood in the* RIGHT *Cerebral Hemisphere. More Recent Cerebral Hæmorrhage in the same Hemisphere. Partial Hemiplegia on the* LEFT *Side.*—Elizabeth C., aged sixty-three, was admitted June 2nd, 1858, with weakness and numbness of the left side of the body. It was stated that she had been attacked, one month previously, by a seizure, in which her mouth was drawn, but that no fit had occurred. The tongue was foul and rather protruded to the right, and head-ache was complained of. The bowels were confined, the pulse quick and full, and albumen was found in the urine. She stated that she had for some time been troubled with what she called rheumatism, and that occasionally the whole body was attacked with "tremblings." On the day after admission there was sickness, and this, with the head-ache, continued. She gradually recovered the use of her left arm and leg. She was treated by aperients and diuretics. On the 19th stupor came on, from which she was somewhat roused by a blister to the nape of the neck; but she sank and died, July 2nd, no convulsions having supervened.

Post-mortem Examination.—Cranium: The vessels at the base of the brain were rather atheromatous. In the substance of the middle lobe of the right cerebral hemisphere a quantity of blood had been extravasated, forming a hard laminated mass of the size of a filbert, and another clot of blood quite discoloured, situated in the immediate neighbourhood; also a large cyst, containing about a dram of pale yellow serum, was found in the neighbourhood, the surrounding brain-tissue being broken down. *Thorax:* The heart's walls were very fat, and the valves slightly atheromatous. (180.)

CASE CCXIV. *Cyst, apparently the result of Extravasation of Blood in the Anterior Lobe of the* RIGHT *Cerebral Hemisphere, in connexion with ancient Fracture of the Skull. Phrenic Hernia.*—Sarah N., aged sixty, was admitted March 17th, 1858, suffering from hypertrophy of the heart, and pneumonia, with diseased kidneys, and died on the day following, no history having been obtainable. There was a cicatrix, evidently from a cut or a blow, at the right part of the forehead.

Post-mortem Examination.—Thorax and Abdomen: In addition to the diseased condition before alluded to, a phrenic hernia existed, the stomach, spleen, transverse colon, and part of the pancreas lying in the left pleural cavity, in direct apposition with the lung. *Cranium:* There was found a very ancient and healed fracture of the frontal bone into the right orbit and anterior cranial fossa,[1] with some degree of necrosis of the ethmoïd bone, which was denuded of dura mater. The base of the anterior lobe of the right cerebral hemisphere was flattened, and contained a cyst of about the size of a small bean, lined by yellowish-red gelatinous matter. This part of the brain, where in a cysted condition, was firmly adherent to the cerebral membranes, and was surrounded by fibrinous deposit of old standing, assuming a membranous character. (70.)

CASE CCXV. *Cyst in the* LEFT *Cerebral Hemisphere, with almost entire Destruction of the Left Corpus Striatum and Optic Thalamus. Patches of Induration of the Middle Lobe of the* RIGHT *Cerebral Hemisphere. Partial Idiocy, and* MISAPPLICATION OF WORDS. *Partial Hemiplegia on the* RIGHT *side.*—William S., aged thirty, admitted February 8th, 1860. Having been in good health previously, he fell down upon his head, out of a tree, about two years before admission, and gradually a state of imbecility, and inability to work followed. He also had four convulsive "fits." On admission he had a robust look, but a very silly manner. He could articulate, but

[1] See Series i. No. 37, in Hosp. Path. Cat.

had great difficulty in finding either words or ideas. Indeed for some time he was quite unable to mention his own surname, and would repeat the same word as an answer to all queries; laughing in a childish way when he could not reply. The muscles on the *right* side of the face were decidedly, but not to any great extent, wanting in power. The right arm was quite powerless, and the sensibility of the skin on its surface diminished; the limb was firmly flexed. The right leg was weaker than the left, and described as being "benumbed," and his gait was unsafe. There was no loss of power over the sphincters. The urine contained no albumen. Antispasmodics, with the use of the shower-bath, and a blister to the back of the neck were prescribed. The pulse became weaker. On the 22nd he fell down in the ward, and afterwards became faint, and bluish in the face, and almost pulseless, and he sank and died on the 23rd.

Post-mortem Examination.—Cranium: The skull and cerebral membranes were natural. External to the *left* lateral ventricle was a cyst containing clear fluid, bounded internally by the corpus striatum and optic thalamus, and outwardly by the pia mater and arachnoïd membranes matted together and containing large blood-vessels; the corpus striatum and optic thalamus were almost quite destroyed, one small portion alone remaining, and this was very indurated, and of the brightest yellow colour. At the inner part of the middle lobe of the right cerebral hemisphere was also a small patch of similarly altered brain-tissue.

Microscopical Examination.—The brain-tissue in the neighbourhood of the cyst, especially near the surface of the organ, was, here and there, of a yellowish colour, and was found to contain a large quantity of fat and refracting minute granules, as also large and oval and round dark clumps of granular and fatty material, and numbers of capillary vessels in a fatty condition. The same appearances were seen in the soft, reddish, semi-transparent parts forming the base of the cyst in places; but in addition, numbers of large, round, white blood-corpuscle-like bodies existed. No corpora amylacea were seen. *Thorax:* The heart was very hypertrophied, and the mitral valve-flaps very diseased, and occupied by calcareous matter. *Abdomen:* The organs were natural, except a cicatrix on the surface of one kidney. (50.)

CASE CCXVI. *Cyst containing Coagulated Blood found in "False Membranes" within the Arachnoïd Cavity.*—The above mentioned preparation is in our Pathological Museum, St. George's Hospital, but has no history attached to it.[1] The contained clot is almost but not entirely discoloured; and the membrane at one part forming the cyst is reddened by red puncta, owing clearly to small blood accumulations beneath it. In one or two places the opposite walls of the membranous bag are firmly adherent by means of dense fibrous tissue.

Microscopical Examination.—I found the thin laminæ forming the cyst-walls to be composed of delicate fibrous structures, the fibres being for the most part very wavy, and containing among them smallish oval and rounded cells. No blood-vessels were observed in it. The clot presented the ordinary appearances of coagulated blood.

We have in St. George's Hospital Pathological Museum certain other cases of cysts in the arachnoïd cavity, apparently formed from extravasated blood. Among them is one of those brought before the notice of the Royal Medico-Chirurgical Society, by Mr. Prescott Hewett, in 1845 (see 'Trans. of the Society,' vol. xxviii. p. 61); also the case, following an injury, brought before the Pathological Society by Dr. Quain, in April, 1855 (see 'Trans.,' vol. vi. p. 8), and reported upon

[1] See Series viii. No. 78.

by Mr. Hewett (p. 10); and also a case related by myself in the 'Journal of Mental Science,' for January, 1865, p. 525—one which I met with in a case of "general paralysis of the insane."[1] St. Bartholomew's Hospital Museum contains a specimen (No. 45, Series vi.) showing a newly-formed thin membrane forming two layers, containing, as in a sac, coagulated blood; and another (No. 52), in which the sac containing coagulum was formed of very thick and dense membrane; and in the St. Mary's Hospital Museum, No. 17 G.B. shows two serous cysts on the surface of both cerebral hemispheres contained in the sac of the arachnoïd, from a patient of Mr. Coulson's, aged fifty-five, who had been partially paralysed since an apoplectic fit four years previously, and in whom sensibility of skin and the power of motion had always varied. In University College Pathological Museum, Preparation Y. 13 (3664) shows a thick fibrous layer on the inner surface of the dura mater split into a pouch at the upper end; and in King's College Museum, No. 706 shows two layers of false membrane lining the dura mater.

Of the exact nature of the two following cases some doubt may exist; they would be considered by some, at any rate, as instances of cysts formed by the coagulation of blood effused into the so-called arachnoïd cavity. In deference to the eminent authority who has described these specimens, I cannot but insert them with the description which accompanied them when they arrived in England from Utrecht.[2]

[1] I may advert in this place to five cases of blood-cysts formed in the arachnoïd cavity, as found after death in cases of general paralysis of the insane, related by Calmeil.

[2] I would allude here in passing to specimens of a similar nature in the King's College Museum. Thus No. 782[3] shows an empty thin-walled cyst, evidently the remains of old blood-clot, in the brain. No. 747 shows a large empty cavity flattened, of about the size of a walnut, of a similar origin; and Nos. 750 and 751 show what are described as "apoplectic cells," cavities of a like nature. No. 785 shows the presence of a cavity, in the *right* cerebral hemisphere, containing three vesicles—removed from the body of a patient, aged thirty-one, who was epileptic, and had suffered from occasional head-ache and amaurosis. No. 782 shows a cyst of the size of an orange, in the right cerebral hemisphere—from the body of a patient who died suddenly in a state of convulsions, and who had suffered from deafness and head-ache; and No. 727 shows a cavity, in the anterior part of the right cerebral hemisphere, having vascular and pulpy walls, and containing one ounce of serum. In the Pathological Collection of St. Mary's Hospital exists an interesting specimen (No. 9 G.B.) of a cyst in the *right* cerebral hemisphere, which was originally full of yellowish serum, and was lined by a loose, flocculent, vascular membrane—removed from the body of a man, aged fifty, who had had hemiplegia for eight years. In the Guy's Hospital Museum, Preparation No. 1575 is described as an apoplectic cell lined by a thin, smooth membrane; and No. 1595[20] is described as a cyst of an old apoplectic clot from the brain, deeply tinged of an ochre-yellow colour. In the Middlesex Hospital, No. 6 in Series v. illustrates the formation of a cyst in the cerebellum (1 inch by 1½ in size) lined by a membrane, supposed to be the result of former extravasation of blood; and No. 22 in the same series is described as an apoplectic cyst in the brain. In the same museum, No. 1566[20] is a specimen showing a large cyst, of the size of a pigeon's egg, containing an ounce of limpid fluid, occupying the anterior third of the right cerebral hemisphere (and a smaller one near this)—from a man, aged forty, who suffered from head-ache, loss of memory, difficulty in speaking, convulsive fits, and eventually paralysis, and in whom disease of the cranium and dura mater was found.

CASE CCXVII. *Three Empty Cysts, Two in the Cerebellum and One in the Cerebrum, apparently the Remains of former Blood Extravasation. Congestion of the Brain. Facial Paralysis. Triple Sounds of the Heart. Coma before Death.*—George M., aged seventy-four, was admitted January 2nd, 1864, having fallen down suddenly in a state of unconsciousness. He had enjoyed good health excepting some attacks of severe vertigo which he had suffered from of late. Shortly after admission he regained his senses and sat up in an excited manner, speaking indistinctly. He could move all his limbs, but there was paralysis of the muscles on the *right* side of the face, with numbness of the skin. The right eyeball was drawn inwards, and its pupil was smaller than its fellow; the tongue was protruded to the right. There was very considerable dysphagia. The sounds of the heart were indistinct, but apparently triple. In spite of treatment the dysphagia increased, some vomiting came on, and coma before death, which occurred on the day after admission.

Post-mortem Examination.—Cranium: The vessels of the dura mater and surface of the brain were very distended, and the ventricles contained about two ounces of turbid fluid, the convolutions being flattened. On each side of the cerebellum, in the trunk of the so-called "arbor vitæ," as also in one spot under the pia mater of the cerebrum, were small, empty, rust-coloured cysts of about the size of a pea. The small vessels of the pia mater were natural. *Thorax:* Great congestion of the lungs and much atheromatous narrowing of the aortic and mitral valves of the heart existed. *Abdomen:* The kidneys were atrophied, granular; the liver was much contracted, with thickened capsule. (3.)

CASE CCXVIII. *Old Cyst in the* LEFT *Corpus Striatum, the Remains of Extravasated Blood. Hemiplegia for Twenty-two Years. Death from Obstruction of the Intestines.*—John T., aged sixty-five, admitted May 22nd, 1844, in consequence of peritonitis and partial obstruction of the intestine, of which he died five days afterwards. He had been hemiplegic for twenty-two years.

Post-mortem Examination.—Cranium: Turbid serum existed under the arachnoïd membrane, and the membranes were slightly thickened; the bloody puncta on section were large, and the grey cerebral matter dark; the ventricles contained much serum, and were enlarged. In the centre of the left corpus striatum was an old cyst, consisting of a small transparent membrane of a yellow colour, containing numbers of minutely injected vessels. The surrounding brain was of natural colour and consistency. *Thorax:* Organs natural. *Abdomen:* Signs of extensive peritonitis existed, and the intestine was considerably twisted. (118.)

CASE CCXIX. *Two Cysts apparently the result of former Extravasations of Blood, one in the Grey Part and the other in the White Substance of the Brain. Peculiar Porous Condition of the White Brain-substance. Diseased Kidney and*

also in the same museum, No. 1566[25] shows a cyst ($1\frac{1}{2}$ inch by $\frac{1}{2}$ an inch in size) in the medullary matter containing clear fluid—from a man, aged fifty-five, who died after a fall with extravasation of blood into the corpus striatum; and another, No. 1566[30], in which the entire right cerebellar lobe is occupied by a cyst separated into two or three chambers by its lining vascular membrane—from a man aged twenty-one, who, after having had a blow on the head, which rendered him insensible, became deaf and blind, and suffered from head-ache; the bones of the skull and membranes were implicated in an inflammatory process. In the St. Thomas's Hospital Museum is a preparation (No. 93) showing, in addition to the effects of chronic hydrocephalus, the formation of a thin serous cyst, about two inches long and one wide, forming part of the roof of the left lateral ventricle—from a boy of weak intellect, who died after a fracture of the skull with hæmorrhage into the right cerebral hemisphere. In St. Bartholomew's Hospital Museum are two specimens (Nos. 12 and 13, Series vi.) showing smooth-walled cysts formed by old extravasations of blood.

Heart, &c.—John S., aged sixty-four, was admitted February 18th, 1863, with debility, cough, œdema of the lungs, and general symptoms of hydrothorax and congestion of the lungs. The pulse was weak and irregular, and there was sickness and giddiness, and albumen in the urine. One month previously he had had a "fit," after which he suffered from weakness in the left hip and knee for some days. Dyspnœa became very extreme, and he died March 26th.

Post-mortem Examination.—Thorax: The heart was dilated and the pericardium adherent; the left pleural sac was full of fluid. An old-standing coagulum of blood existed in the appendix of the right auricle of the heart. The orifice of one coronary artery was missing, its course being obscured by pericardial adhesions; and the other was contracted, owing to atheroma. The small arterial ramifications of the pulmonary artery were plugged up by fibrinous coagula. *Abdomen:* Gall-stones were found in the gall-bladder, and the kidneys were very cysted. *Cranium:* A small cavity (of about the size of a pea), apparently the result of former extravasation of blood, was found in the cineritious part of the convolutions of the upper surface of the right cerebral hemisphere. This cavity was so superficial as merely to be covered by the transparent arachnoïd membrane. Another and similar, but rather smaller, cavity was found in the white substance of the left cerebral hemisphere above the lateral ventricle; and the white matter generally presented a remarkable condition, containing numbers of minute round holes or depressions, when cut into, and thus having obtained a porous character.[1] (82.)

CASE CCXX. *Cyst formed from Extravasated Blood in the Arachnoïd Sac, following Concussion of the Brain. Imbecility of Mind, and then Coma, preceded Death.*—Elizabeth S., aged seventy, admitted July 23rd, 1844. She had been run over by a cart, and there was a large wound of the hand, and a small one over the external angular process of the brow, and some ecchymosis of the eyelids. There was also bleeding from the nose, and vomiting of blood swallowed. Inflammation of the lymphatics from the wound of the hand came on, and afterwards constant drowsiness and apparent imbecility. Sloughs on the sacrum formed, and erysipelas set in; subsequently, also, disease of the wrist and carpus. Coma came on before death, which occurred September 20th.

Post-mortem Examination.—Thorax and Abdomen: Excepting much atheroma in the abdominal aorta, and a slight amount in the thoracic aorta, the organs of these cavities were natural. *Cranium:* Blood extravasated into the arachnoïd cavity was enveloped in a complete bag, adherent by one of its surfaces to the parietal layer of the arachnoïd, the other surface being perfectly smooth, and in all appearances like a serous membrane. It was in contact with the visceral arachnoïd, but not in the least adherent. The visceral arachnoïd, towards its free surface, presented its usual polished look, not thickened or discoloured. Extravasation of blood had taken place on the surface of both cerebral hemispheres, that on the right being the larger, occupying both lateral and inferior surfaces of the hemisphere (middle fossa). In the inferior fossa of the skull the blood was coagulated, retaining its colour, and of two lines in thickness. In the upper surface of the right side, the blood was collected into a pouch measuring three inches in length; the membrane forming the pouch gradually diminished in thickness, and was lost upon the parietal arachnoïd, with which it appeared at first sight as if perfectly continuous; but it was easily separated from it by the scalpel, and the whole might have been removed from the parietal arachnoïd slightly roughened. (205.)

CASE CCXXI. *Blood-cyst pressing on the* RIGHT *Cerebral Hemisphere.*—The history of this case is unknown. The preparation was described by Professor

[1] I have a drawing of a specimen showing remarkably a POROUS CONDITION of a large part of the white cerebral substance. This state is also to a certain degree illustrated by a Case related further on.

Schrœder van der Kolk as one of apoplexy of the dura mater, and is now among that part of his collection purchased by the University of Oxford.[1] Van der Kolk's words in description of this specimen are as follows: "A large quantity of blood has been poured out between the layers of the dura mater, and has there formed a great blood-sac or cyst, which has pressed very forcibly on the right cerebral hemisphere. The effects of the pressure are well seen on the upper and outer part of this hemisphere, where there is a depression, in which the convolutions are so flattened as to be almost obliterated. The concavity of this depression is exactly fitted by the convexity of the cyst. It is remarkable that the dura mater in other respects seems perfectly healthy, showing no traces of inflammation. This proves that the effusion must have occurred shortly before death, and have been, most likely, the cause of death. Another point in favour of this view is, that, when the cyst was laid open, the blood contained in it was found in greater part fluid."

CASE CCXXII. *Blood-cyst connected with the Dura Mater, pressing on the* LEFT *Cerebral Hemisphere.*—Of this case no life history remains. Like the former one (No. 222), it exists in Schrœder van der Kolk's collection, and was designated by him apoplexy of the dura mater. Comparing this case with the preceding, Van der Kolk, in his catalogue, observes that effusion is less in quantity than in the former one, but must have occurred a long time before death. The effusion is here, too, between the two layers of which the dura mater really consists (dura mater proper and periosteum); it is rather in the form of a diffused, tough, semi-fibrous clot, than like a cyst; it is seated over the middle meningeal artery, and must have caused some pressure on the left cerebral hemisphere.[2]

I have to thank my friend Dr. Tuckwell for kindly translating from the original catalogue in Latin, and forwarding to me the description of this and the other specimens in S. v. der Kolk's pathological collection, which I have quoted.

CASE CCXXIII. *Cyst among the Convolutions of the* RIGHT *Cerebral Hemisphere, the Remains of former Blood-clot. Recent Extravasation of Blood in the* LEFT *Optic Thalamus. Erysipelatous Eruption and Coma before Death.*—Elizabeth K., aged sixty, suddenly fell down, but was not quite insensible, being able to crawl to the door. She was admitted Dec. 19th, 1860, quite hemiplegic on the *left* side as to her limbs, and with some paralysis of the left side of the face. The tongue was protruded to the left; the speech was slow, and she was oblivious in mind, evacuations being passed involuntarily. The pupils were equal and natural. There was slight rigidity of the biceps muscle of the left arm. She had purgatives and a turpentine enema given, and she somewhat improved, but on the 2nd of January an erysipelatous eruption came on, and a half-comatose state, and she died on the 3rd.

Post-mortem Examination.—Cranium: The bones of the skull were very thin. Much fluid existed beneath the arachnoïd membrane, and bloody fluid in the ventricles; the vessels at the base were very atheromatous. In the *left* optic thalamus was a recently formed clot of blood, breaking up almost the entire texture, and trenching on the corpus striatum. In the other (the right) cerebral hemisphere, external to the middle horn of the ventricle, was a cyst or cavity among the cerebral convolutions, which was lined by a brownish-coloured membrane as large as a cob-nut, and occupied by serum, evidently the remains of former extravasation of blood. (2.)

CASE CCXXIV. *Cyst, the remains of Old Blood-clot in the* RIGHT *Corpus Striatum. Recent Extravasation in the* LEFT *Optic Thalamus.*—Abraham C. was admitted January 31st, 1861, insensible, with stertorous breathing, and unable to swallow; he was said to have had a fit an hour previously. He died in a few hours.

[1] Catalogued at present in V. d. Kolk's manuscript Catalogue as G 1. [2] Ibid. G 2.

Post-mortem Examination.—The pupils were dilated, but equal. *Cranium:* The *left* optic thalamus was quite broken down by a large clot, and the ventricles filled with clot and fluid. A large number of small recent extravasations of blood were found in both sides of the pons Varolii. An old cyst (size of half a filbert) containing yellow serum (remains of old clot) existed in the *right* corpus striatum. The arteries at the base of the brain were very atheromatous. *Thorax:* Old tubercles existed in the lungs. The mitral valve of the heart and the root of the aorta were atheromatous. *Abdomen:* The kidneys were granular and cysted. (34.)

CASE CCXXV. *Cavities in the Upper Surfaces of both Cerebral Hemispheres, the Remains, apparently, of former Extravasation of Blood. Destruction of Dura Mater and Superior Longitudinal Sinus, following Fracture of the Skull. Peculiar Supplemental Cornu of a Lateral Ventricle.*—Henry F., aged thirty-eight, was admitted into Fort Pitt Nov. 22nd, 1836, having served in India and New South Wales. In the year 1821 the skull had been fractured by the fall of a sentry-box in the wind, and in 1828 he experienced pain in the head, and became deaf. Vertigo came on, and a darting pain in the head, and subsequently a ringing sound in the ears, so that sleep was prevented. His general health remained pretty good, and he went on much the same until the 29th, when cough set in, aggravating the head-ache; and on the 27th muttering delirium came on, the breathing became difficult; after this he became unconscious, and died on the next day.

Post-mortem Examination.—Thorax and Abdomen: Portions of lung were in a hepatized state, and the bronchial mucous membrane was very vascular; other organs were natural. *Cranium:* On removing the calvaria a portion of the dura mater, to the extent of about a shilling-piece, was found wanting anteriorly, *including the corresponding part of the superior* longitudinal sinus and the falciform process beneath nearly to its free margin.[1] A similar deficiency, though not quite to the same extent, existed in the dura mater, over the anterior part of the left cerebral hemisphere. Beneath both deficiencies of dura mater there was a loss of brain-substance, and under the one last described was a cavity capable of holding a walnut, having walls of soft white brain-matter, and apparently the seat of former blood extravasation. Beneath the first described deficiency the loss of brain-substance was less. The anterior parts of the brain generally were rather softened. Some of the veins of the pia mater on the right side were unusually large, and much clear fluid existed in the ventricles, and at the base of the brain. On examining the lateral ventricles, in addition to the ordinary cornua, the right ventricle was provided *with an additional or supplementary one adjoining the posterior horn.* The other parts of the brain were natural.[2]

IV. CYSTS WHICH APPEAR TO HAVE BEEN CONNECTED WITH SEROUS EXUDATIONS, ETC., SEEMINGLY THE RESULT OF INFLAMMATORY AND OTHER PROCESSES (NOT HÆMORRHAGIC IN ORIGIN); INCLUDING CAVITIES ON THE SURFACE PRODUCED BY LOSS OF BRAIN-SUBSTANCE FROM INJURY.

CASE CCXXVI. *Cyst on the Surface of the Brain* (RIGHT *Cerebral Hemisphere*). *Phthisis Pulmonalis.*—William D., aged twenty-nine, was admitted Oct. 22nd, 1837, into Fort Pitt. He had had repeated attacks of dysentery, and for the

[1] In the museum of the Royal College of Surgeons, Preparation No. 2106 shows a contracted condition of the superior longitudinal sinus, the result of the operation of trephining. There is, however, no coagulum of any kind within the cavity of the sinus. Also in our own Path. Museum we have a specimen, No. 36, in Series i., removed from a man, James S., aged forty-six, illustrating almost complete obliteration of the left lateral sinus and entire obliteration of the right one by fracture of the skull.—P.M.B. 1856, 78; also Trans. of Path. Soc., vol. vii. p. 282.

[2] I have to thank Dr. J. Davy for the details of this case.

five or six months previously had suffered from tickling cough and pain in the chest and shoulders. When admitted, he had symptoms of phthisis, with diarrhœa. On the 23rd of November it was said that he had had a "fit," after which he had been troubled with hæmoptysis and strong epigastric pulsation. He retained his mental faculties, but his pulmonary symptoms became aggravated, and he died January 26th, 1838.

Post-mortem Examination.—Thorax: The lungs contained a number of vomicæ and much scrofulous deposit, and much fluid existed in the pleural sac. *Abdomen:* Considerable ulceration of the small intestines existed. *Cranium:* The skull and cerebral membranes were natural. The superficial and anterior part of the *right* cerebral hemisphere showed a hollow with an irregular outline, and about $1\frac{1}{2}$ by 1 inch in size, giving the idea that serous fluid had collected between the arachnoïd and the dura mater. The surface of this hollow was somewhat rough, and firmer than natural, the convolutions included being firmly adherent to each other, and the pia mater at the part being unusually thin and separable only in shreds. In the substance of the cerebrum below no apparent change existed. The lateral ventricles were considerably dilated, but did not contain much fluid. The Pineal gland was large and reddened, and adherent posteriorly. The cerebral arteries were natural.[1]

CASE CCXXVII. *Large Cyst occupying the* LEFT *Lobe of the Cerebellum.*—Jane N., aged thirty, the mother of five children, was admitted Sept. 22nd, 1841, having been ill about three years (ever since her last confinement), having had "fits," and having been treated for condylomata of the vagina. She complained of violent paroxysmal pain in the head and in the lower part of the abdomen, also of a "bearing down" at, and of bloody discharge from, the vagina. The tongue was dark and brown, and furred at the centre, but moist at the edges. The pupils were large; the pulse 84; skin cool. She was purged, and much fæculent matter passed; she was also cupped at the neck, took calomel every four hours, and had ice applied to the head with (for a time) very great relief to pain and the procurement of sleep. The gums were salivated, but the pain returned, and the motions and urine were passed involuntarily. The pulse also rose much. Salines and blisters to the neck used. Again the pain much diminished, the pupils became less dilated, and the evacuations were retained, but this was only for a time. Double vision, as regards distant objects, became complained of, and on the 9th of October there was a slight degree of drooping of the right eyelid. On the 14th, in addition to increased pain, strabismus existed; vomiting came on, and ptosis of the upper eyelids of both eyes, and also pain in the abdomen and back to a very considerable degree, alleviated to some extent by sinapisms and warm applications. Emaciation became decided. On the 28th of October, a return of the fits occurred, accompanied by general tremor, but without unconsciousness, the pain in the head and the vomiting continuing; about the middle of November they were attended by unconsciousness and struggling, and lasted about twenty minutes. The attacks were sometimes daily. Much relief was obtained to the head-ache from cupping on the neck. Cough and difficult expectoration came on. She continued to vary as respects the head-ache and vomiting, and for some days no fits recurred; but on the 16th of December she had a very severe fit in the night, and died on the following morning whilst apparently asleep.

Post-mortem Examination.—Abdomen: Liver congested. One kidney atrophied. *Thorax:* Organs natural. *Cranium:* Convolutions of brain flattened. Lateral ventricles much distended with clear fluid (4 oz.); septum lucidum softened. The interior of the left lobe of the cerebellum was entirely occupied by a cavity filled with straw-coloured fluid denser than water, circumscribed by a thin false membrane, which escaped when the tentorium was raised, so thin were the upper parietes of the cyst. (204.)

[1] I am indebted to Dr. John Davy, F.R.S., for the details of this case.

CASE CCXXVIII. *Large Cyst on the Surface of the* LEFT *Cerebral Hemisphere. Epileptic Attacks. Hysteria-like Symptoms. Coma before Death.*—Elizabeth S., aged thirty-four, a housemaid, was admitted December 21st, 1853. She had for several months been subject to "fits," during which she was quite unconscious, the last having occurred about two weeks before admission. The catamenia had been irregular, and only came on when she was twenty-

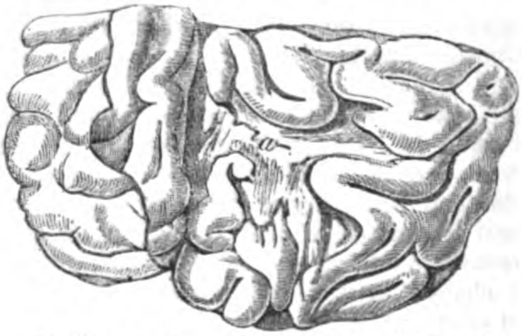


Fig. 18.—Portion of the surface of the brain, showing (*a*) a cavity formed at the expense of the convolutions, and lined by a tough membrane.

four years of age. They had been absent some months, and she was subject to leucorrhœa and to constipation. She had aloës and steel wine; the use of shower-baths was ordered, and a day or two afterwards she had an attack, which seemed to the nurse to be hysterical in nature. On the following day, after a shower-bath, a regular epileptic attack came on, lasting two hours and a half. To this succeeded stertor and coma, in which she soon died.

Post-mortem Examination.—Cranium: The skull was natural. The brain generally was somewhat vascular, but of natural consistency; the ventricles were rather large, but only contained two or three drachms of fluid. The arteries at the base were natural. The left cerebral hemisphere presented on its surface a cyst equal to a large walnut in size, containing limpid fluid, irregular in shape, and corresponding with absence of the cerebral convolutions. (See Fig. 18). The cavity was about one-fourth of an inch in depth, and was lined by a rather tough membrane, easily separated by the forceps from the walls to which it was adherent. The surrounding arachnoïd membrane was thickened, and also in many places more distant it was opaque and thickened, containing millet-shaped deposits of bright-coloured matter, with occasional portions of calcareous material. The brain subjacent to the cyst was softened to a considerable degree, though not to any great depth.[1] *Thorax:* The lungs were highly congested. The heart was natural, excepting a slight, old, and firm fibrous tuft projecting from the corpus Arantii of one of the mitral flap segments. The other parts of the body were natural.

Microscopical Examination.—The membrane forming the walls of the cyst was found to contain a large number of blood-vessels along with much fibrillated structure and granular material intermixed. The softened brain-tissue contained a large amount of granular matter, with numbers of oval and irregularly-shaped, nucleus-like bodies; also globules, the counterpart of pus-globules, wasted nerve-tubes, with here and there accumulations of star-shaped and caudate bodies, having dark margins.[2] (270.)

CASE CCXXIX. *Cysts on the Surface of the* LEFT *Hemisphere of the Brain, also one indenting the* LEFT *Lobe of the Cerebellum, and the* LEFT *Side of the*

[1] In the Museum of the Middlesex Hospital, Prep. No. 12 of Series v. shows a cavity on the anterior surface of the brain, filled with fibro-cellular tissue. In this case there was paralysis of the portio dura.

[2] See Hospital Path. Catalogue, Series viii. No. 99; also Trans. of Path. Soc., vol. v. p. 1.

Upper Part of the Spinal Cord. Recent Cerebral Hæmorrhage. Absence of Brain or Spinal Symptoms.—William B., aged thirty-two, admitted March 6th, 1854, with marked disease of the lungs, and died on the 16th, no symptoms referrible to the brain having shown themselves, and no history of his antecedents having been procurable.

Post-mortem Examination.—Cranium: The bones of the skull were exceedingly softened. The dura mater, at the vertex of the brain, was very closely adherent to the bone, and much sub-arachnoïd fluid existed generally. The septum lucidum and fornix were softened, and in the right cerebral hemisphere was a clot of extravasated blood, producing a soft and boggy condition of a portion of the brain's surface. At the base of the left cerebellar lobe, indenting very much its surface, as also the left side of the upper portion of the spinal cord, immediately below the medulla oblongata (which parts were, however not softened), was a cyst with white semi-transparent walls, apparently formed by thickened arachnoïd and sub-arachnoïd tissues, thus pushing forwards and rather upwards the various spinal nerves issuing from this part. When first examined, this cyst was adherent to the dura mater, where connected with the bony margin of the occipital foramen. Moreover, on the surface of the left cerebral hemisphere were two other cysts formed by the thickened membranes, both of them smaller than the one before described, and of these one contained a small amount of purulent fluid. The others had clear fluid contents. *Thorax:* The pericardial cavity was obliterated by adhesions, and a quantity of firm yellow material was deposited in the muscular walls of the heart. Large empty cavities were found in the upper parts of the lungs. (71.)[1]

CASE CCXXX. *Cyst at the Under Surface of the* RIGHT *Crus Cerebelli and the* RIGHT *Lobe of the Cerebellum. Great Absorption of the Crus Cerebelli. Softening of the Spinal Cord. Ulcerated Small Intestines.*—Elizabeth A., age unknown, was admitted July 8th, 1854, being in her fourth or fifth month of pregnancy. Three days only before admission she had had sickness, followed by general weakness all over the body, which increased until she had well-nigh lost all power in her limbs. She could move her arms about only when her elbows rested on the bed, and, moreover, was unable to stand, though no absolute paralysis of the legs as yet existed. There was a moderate degree of general feverishness. The bowels were well relieved by aperients, and she took the sp. ætheris, nitric, and nitrate of potash in solution. Pains down the back, shoulders, and hips came on, and she was placed under the influence of calomel, and a blister was applied to the neck. On the 13th the lower limbs were completely paralysed, and the hands were more powerless; the pains in the head and back were also greater. On the 13th, dysphagia and constipation came on, and a quick, weak pulse. The respiration became very hurried and quite thoracic. Vomiting ensued, and she died in the course of the day.

Post-mortem Examination.—Cranium: The skull and cerebral membranes were quite natural. At the base of the brain a cyst full of limpid fluid, of the size of a walnut, and formed of a thin and delicate membrane, was found at the under surface of the *right* crus cerebelli and the right lobe of the cerebellum, causing considerable absorption of the crus cerebelli. The other parts of the brain were healthy. *Spinal Cord:* The veins of the cord and membranes were very full of blood. The membranes themselves were healthy. In the lower part of the cervical region of the spinal cord, and about the middle part of its dorsal portion, the cord itself, throughout its entire thickness, was softened and pulpy, and its central parts in these situations almost diffluent. There was no vascularity of the parts. Other portions of the cord were natural. *Thorax:* The lungs were œdematous and congested. *Abdomen:* The kidneys were large and

[1] See also Trans. of Path. Soc., vol. vi. p. 20; and Hospital Path. Catalogue, Series viii. No. 98.

congested, and several ulcers existed in the small intestines, specially about the ileo-cæcal valve. The uterus contained a five months' fœtus. (180.)

CASE CCXXXI. *Large Cyst occupying the* FOURTH *Ventricle of the Brain, and pressing upon the Under Surface of the Cerebellum. Paralysis of all the Limbs, and Convulsions before Death.*—Mary L., aged eight, admitted December 14th, 1854, having a pallid, sickly look, and rather a large head. Three years previously she had had an attack of acute hydrocephalus, with convulsions, &c. Total blindness with stupor remained, and the latter continuing, she had become unable, two weeks before admission, to support the body erect, owing to weakness of the legs. On admission, in addition to the above-mentioned symptoms, strabismus, furred tongue, and quick pulse existed. Under treatment, by aperients and leeches to the head, she greatly amended, but after a time relapsed; sickness came on, and screaming at night, and the stupidity increased. Again she was relieved, and again relapsed. Partial convulsions came on, in which the head was dragged to one side, and the arms jerked unsteadily, but not violently. Pain in the head was also complained of. By degrees, she lost the use of all her limbs, and also all power over the sphincters. Severe vomiting came on, and she died in a state of general convulsions, March 15th.

Post-mortem Examination.—Cranium: The bones of the skull were thicker than usual, chiefly at the posterior part. The cerebral convolutions were much flattened. The lateral ventricles of the brain were very large and distended, containing not less than a pint of clear fluid. The fourth ventricle was converted into a large cyst, containing about six ounces of clear straw-coloured fluid, by means of which the under surface of the cerebellum was much expanded and hollowed out. The cerebellar boundary was lined by a somewhat shreddy layer of toughish material, which was obviously thickened arachnoïd membrane; whilst the opposite (the lower or medullary) boundary was only lined by the proper delicate membrane of the part. The lining membrane, when reflected upwards to the under surface of the cerebellum, had been torn through in the removal of the brain. *Thorax and Abdomen:* The lungs, liver, and kidneys were congested.

Microscopical Examination.—The membrane lining the cyst was found to consist of very delicate, clearly-outlined connective-tissue, having here and there granular matter, and a few small, indistinct corpuscular elements.[1] (77.)

CASE CCXXXII. *Cyst containing Clear Fluid on the Surface of the* RIGHT *Cerebral Hemisphere. Disease of the Lungs, Kidneys, and Ovaries. History unknown.*—Jane B., aged fifty-eight, admitted March 17th, 1858, in a dying state, and no opportunity existed of obtaining her history. She died on the day after admission.

Post-mortem Examination.—Thorax and Abdomen: The heart was large, having much fat about it. The lower part of one lung was solidified. The kidneys were much diseased, and the left ovary was formed into a tumour, consisting of carcinomatous disease and many cysts, and the lining of the uterus was much ulcerated. *Cranium:* On examining the brain, on the upper and posterior part of the *right* cerebral hemisphere was a depression or cavity, capable of accommodating half a walnut. This cavity was filled with limpid fluid, and had the appearance as if it had been formed merely by absence or

[1] See also Path. Soc. Trans., vol. vii. p. 34; and Hosp. Path. Cat., Series vii. No. 107. In connexion with this case of disease affecting the fourth cerebral ventricle, and others which I have already brought forward in this series, I may mention that we have the histories of several cases in which the floor as well as the upper boundary of this ventricle has been broken up by extravasation of blood; also of cases in which this ventricle has been distended by blood which had found its way thither from the third ventricle.

enlargement of the ordinary intervals between cerebral convolutions. The arachnoïd membrane in the neighbourhood presented several very remarkably long, blunted bony processes (portions of which I possess microscopical sections of), and the clinoïd and other processes at the base of the skull were unusually thickened with bony deposit. (69.)

CASE CCXXXIII. *Cyst in the* LEFT *Lobe of the Cerebellum. Partial Hemiplegia on the* RIGHT *Side. Ptosis of the Right Upper Eyelid. Coma before Death.*—George S., aged sixty, was admitted December 12th, 1860, having had good health until one month before admission, when vertigo came on. He was odd in manner, and did all sorts of out-of-the-way things; he frequently tried to make water on the floor: he also often asked to be killed. There was loss of power in the *left* arm and leg. Ordered iodine and mercury. The upper eyelid on the right side lost power, and there was difficulty also in closing the right eye. No sight in the right eye, and its conjunctiva was covered with adhesive mucus. He gradually became semi-comatose, and eventually quite so, the breathing being stertorous, and died January 9th.

Post-mortem Examination.—Cranium: Much clear fluid existed in the ventricles of the brain, and their septum was softened and thinned. In the left lobe of the cerebellum was a cavity (the size of a walnut) full of clear serum, having a shining smooth surface, containing several large vessels, and reaching almost to the fourth ventricle. The corpus dentatum on that side was absent. The other parts of the brain were quite natural. The thoracic and abdominal organs presented nothing unusual. (17.)

CASE CCXXXIV. *Cyst external to the Skull (Meningocele) communicating with the Arachnoïd Cavity by means of an Opening in the Occipital Bone.*—Of the history of this case, the symptoms of the patient, &c., unfortunately no record exists. The cyst was of large size, with thin walls, and possessed a smooth,

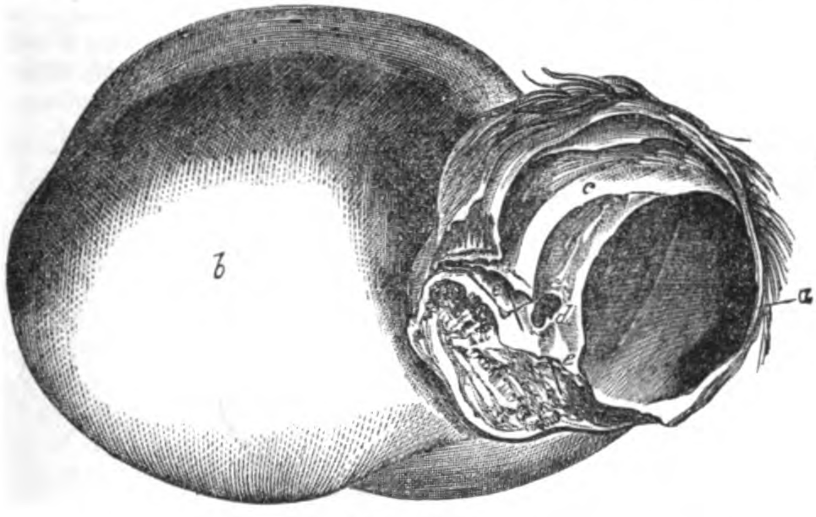


Fig. 19.

a. The posterior part of the skull. *b.* The sac.
c. The falx cerebri divided into two portions, each containing a sinus, *e e*, through which the bristles are passed.
d. The foramen of communication between the skull and the cyst.

shining, inner surface, continuous through an opening of about half an inch in diameter in the occipital bone with the arachnoïd cavity. The opening of communication in the bone was situated in the expanded portion of the occipital bone considerably below its centre (see Fig. 19), and was separated from the foramen magnum by a bridge of membrane, so that if the bones were denuded of soft parts, the occipital bone would be seen to present a large cleft, widening below into the foramen magnum. The falx cerebri bifurcated at the upper angle of the lambdoïdal suture, and in each of its branches, which appear to run into the jugular foramen on either side, a large sinus was visible. (*e e*, Fig. 19.) There was no trace of a falx cerebelli.[1]

CASE CCXXXV. *Pedunculated Cyst containing a Clear Fluid connected with the External Surface of the Skull, which most likely communicated originally with the Arachnoïd Cavity* (*Meningocele*).—The subject of this cyst was Elizabeth B., aged six weeks, who was admitted into the hospital June 8th, 1844, and died September 16th. Unfortunately no notes of this case during life remain.

Post-mortem Examination.—On the top of the head, at about the middle of the antero-posterior diameter of the bi-parietal suture, was a large pedunculated cyst, containing a quantity of clear fluid. Its walls were about two lines thick, and formed of skin, covered by hair, also a dense fibrous tissue, and a smooth membrane apparently serous. All these were adherent to each other. The inner surface of the cyst had several bands of a dense tissue projecting into its cavity, giving it the appearance somewhat of a fasciculated bladder. The pedicle of the cyst passed down between the parietal bones, the deficiency of which was made up by fibrous tissue; but no direct communication could be discerned leading into the cavity of the skull. The anterior and posterior fontanelles were all but closed, and the bones were natural, excepting the two parietal bones, which at their anterior and superior angles were very deficient, the deficiency being made up by a large intra-parietal bone, united to the other bones by a dense membrane. The anterior half of the skull and brain was natural, but in the posterior half was a large cavity containing clear fluid; the lower part of this cavity was bounded by the tentorium cerebelli, the lateral parts by the posterior lobes of the brain pushed outwards and expanded into a very thin delicate layer of substance. In the central part of its upper surface

Fig. 20.—Showing, *a*, the dried walls of a cyst projecting from the posterior part of the external surface of the skull. The base of the cyst is surrounded by locks of hair.

this cavity was found by the falx major, which at its posterior part was bifid, forming a kind of channel which terminated at the spot over which was lying the pedicle of the cyst on the outside. The lateral and the third ventricles were very dilated, especially at the posterior part, where they formed a thin stratum of cerebral substance, united in the centre by a thin layer of white

[1] This preparation was presented to St. George's Hospital by the late J. A. Stone, Esq.; see Hospital Path. Catalogue, Series viii. No. 82.

substance, which proved to be the corpus callosum and fornix thus expanded, and forming a portion of the walls of the cavity containing the fluid. The septum lucidum was very attenuated and gave way. The fourth ventricle presented nothing remarkable. The other parts of the brain, though soft, were of usual colour and shape. The membranes of the brain were firmly united to each other at the parts corresponding to the situation of the pedicle of the cyst. (199.)

Fig. 20 represents the preparation of the remains of the cyst in connexion with the cranium now in our Museum, No. 2 in Series xvii.

In the Guy's Hospital Catalogue are two preparations: one, 1563[20], termed Hydrencephalocele, showing a pyriform and translucent pouch of the size of a duck's egg, filled with serum, and communicating with the interior of the cranium, and probably with the lateral ventricles, removed from a child aged $3\frac{1}{2}$ weeks; and the other termed Encephalocele, consisting of a sac composed of the cerebral membranes, of the size of an egg, which appeared to have been formed at the back of the head.[1]

CASE CCXXXVI. *Two Cysts in the Pineal Gland. Absence of Symptoms referrible thereto. Phthisis Pulmonalis.*—A. W., aged twenty-eight, was admitted July 24th, 18—, into Fort Pitt, with cough, dyspnœa, night sweats, and other symptoms of phthisis. He died suddenly, August 15th, no symptoms referrible to the brain having shown themselves.

Post-mortem Examination.—Thorax: Vomicæ and scrofulous deposits existed in the lungs, also ulceration of the epiglottis. *Abdomen:* The ileum presented several ulcerations. *Cranium:* The brain and membranes were natural, excepting that the Pineal gland was exceedingly enlarged, and very adherent, posteriorly, and contained two cavities, each full of transparent fluid, situated immediately below its investing membrane.[2]

In the King's College Path. Collection is a specimen, also showing a cavity with an opening in an enlarged Pineal gland. And in St. Thomas' Hospital Museum is another, No. 100, showing the Pineal gland converted into a cyst filled with clear and amorphous granular matter, the walls of which contain much earthy matter.

CASE CCXXXVII. *Large Cyst in the* RIGHT *Cerebral Hemisphere. Cyst in the Pons Varolii. Numbness on the* RIGHT *Side of the Face and Head, and Left Arm. Head-ache and Vomiting. Loss of Power in the Left Arm. Dysphagia before Death.*—Agnes A., aged twenty-eight, was admitted Feb. 22nd, 1843, having had numbness and weakness of the *right* side of the face and head for three months, and having two weeks before been attacked by severe pain in the head, chiefly on the left side. The tongue was moist, pulse quiet, catamenia regular. She had been salivated and had taken aperients. On the day after admission she complained of numbness of the left hand; on the day following the numbness was worse, and the pupils dilated. In spite of aperients and the use of iodide of potassium, and cupping, the head-ache became worse, and vomiting came on. By the 6th of March all power of motion was lost. Effervescing salines and small doses of mercury had been exchanged for the iodide

[1] See also the report on a recent case of congenital deficiencies in the cranium, reported on as exhibited by Dr. Maclagen, in the Proceedings of the Medico-Chirurgical Society of Edinburgh (Edinburgh Medical Journal, May, 1865, p. 1040). The case was that of a woman who had had a cystic tumour over the occipital protuberance since childhood. This was removed by ligature; inflammation of the brain set up, and coma preceded death. After death three apertures were found in the upper part of the skull—two lateral and on a level, the third in the central line near the occiput; and it was with this latter that the cavity of the tumour was in communication. A more detailed description of this congenital deficiency of the skull will appear from the pen of W. Turner, Esq., of the University of Edinburgh, in the forthcoming part of the Proceedings of the Royal Society of Edinburgh.

[2] For this case I have to thank Dr. Davy.

of potassium, and ice had been applied to the head, which gave relief. By the 10th she had lost all power in the left hand, and the tongue was brownish; still she looked better; but on the 13th difficulty in swallowing came on, and on the 23rd she died.

Post-mortem Examination.—The mouth was noticed as being drawn down on the right side. The calvarium and dura mater were natural, but a quantity of dark blood existed between them. The arachnoïd membrane covering the upper surface of the middle lobe of the *right* cerebral hemisphere was adherent to the convolutions, and the removal of it occasioned the rupture of a large and well-formed cyst, occupying about the fourth part of the right hemisphere. The aperture gave exit to four ounces of dark-brown fluid; and the membrane of the cyst was of very considerable thickness and of a dark-brown colour. The cyst was situated directly over the right ventricle, being only separated from that cavity by a very thin layer of brain-substance. A small cyst also existed in the upper part of the pons Varolii. The left ventricle contained two ounces of clear fluid. *Thorax and Abdomen:* Lungs emphysematous; other organs natural. (28.)

CASE CCXXXVIII. *Cyst at the Base of the* RIGHT *Lobe of the Cerebellum. Interference with neighbouring Nerves.*—Thomas H., aged forty-two, was admitted into St. George's Hospital March 12th, 1862, having been ill with weakness and loss of appetite for eight days, his illness beginning with a chill. The tongue was red and furred, and inclined to be dry. The urine was very faintly albuminous. He died April 7th; but unfortunately we possess no particulars as to the course of the disease.

Post-mortem Examination.—Thorax: Old and slightly recent adhesions, and much fluid existed in the pleural sacs. Old patches of lymph on the heart. *Abdomen:* The spleen was soft and the kidneys congested. *Cranium:* The calvarium and cerebral membranes were natural. A large cyst of the size of a walnut was found at the base of the cerebellum, on the *right* side. This slightly encroached on the pons Varolii, and to some degree on the corresponding peduncle of the cerebellum, and was in contact with the upper part of the medulla oblongata. The cyst was lined by a thin membrane, which on its outer portion was inseparable from the arachnoïd membrane, and elsewhere was closely attached to the brain-substance. Beneath this membrane was an expansion of the arbor vitæ, forming a sort of outer wall to the cyst. The fifth nerve on the right side was much compressed and displaced; the sixth, seventh, and eighth nerves were elevated, but not flattened. The cyst broke in its removal from the brain, the contents being a clear and limpid fluid. (92.)

CASE CCXXXIX. *Cysts full of Serous Fluid in the Medullary part of the Brain. Peculiar Disintegration of the Cineritious parts, and Softening of the Cerebellum and other portions of the Brain. Epileptic Mania. General Paralysis of the Insane.*—James C., aged fifty-six, a married man, a painter, was a patient of mine at St. George's Hospital for a short time, for epileptic attacks. He became maniacal, suicidal, and dangerous to others; also incoherent, unreasonable, and prone to strike others. He would stumble, and then attack the object against which he struck his foot. He afterwards became an inmate of the Colney Hatch Asylum, July 1st, 1854, at which time he conversed incoherently, but could answer several continuous questions correctly. He continued in a tranquil, incoherent state until the beginning of September, when he had a severe attack of epilepsy. He remained much in the same way, having attacks of severe epilepsy, and having the ordinary signs of "general paralysis of the insane," but being usefully occupied until April in 1862, when he was described as gradually becoming more feeble in body and confused in mind. The bowels were subject to large fæcal accumulations, requiring removal by stimulating enemata. In May, œdema of the penis, scrotum, and testes came on; and on the 18th he died of exhaustion, associated with dementia.

Post-mortem Examination.—The body was thin; there was moderate rigidity of the limbs. *Cranium:* The dura mater was strongly adherent to the skull at the anterior part, and the calvaria was thin, with some deep pits on its inner surface, owing to Pacchionian bodies. There were several ounces of fluid in the arachnoïd cavity and in the sub-arachnoïd spaces, which in places was collected into pseudo-cysts between the superficial brain-convolutions. A very large amount of most remarkable degeneration of the brain, chiefly of the cineritious part, was found on the following various aspects—namely, on the vertex at the middle of the right side; on the left side, near the base; on the apex of each middle lobe in the middle fossæ; and on the apex of the right anterior lobe, resting on the ethmoïd cribriform plate. The description of what existed at one place will suffice for all: thus, on the surface of several adjoining convolutions the arachnoïd membrane and pia mater were opaque, thickened, and matted together, having a somewhat cicatrized appearance, and were depressed into a deep ulcer-like excavation of the cineritious matter.[1] On removal of the thickened membranes, a saucer-like cavity, of a bright rust colour, and penetrating through the entire depth of the cineritious layer, was exposed. Its border was irregular, sharp, smooth, and overlapping. The rust-coloured surface of the cavity was smooth, and covered by a distinct pellucid, fibrous membrane, which could be grasped by the forceps. Beneath was a very thin layer of softened disintegrated brain-substance, but neither the softening nor the rusty hue extended to the medullary substance. The destructive change near the left base was as extensive, and of the same kind as the above, but in the other parts before mentioned it was so to a much less extent. Several cavities, varying in size, containing clear serous fluid, without any surrounding softening or rustiness, were met with in the medullary substance in various parts: one, the largest, was equal in size to that of a small walnut, and was situated in the *middle* lobe of the *left* cerebral hemisphere. In addition to the above changes, one or two cerebral convolutions and a large part of one lobe of the cerebellum were so softened as to be in a pappy condition. The lateral and third ventricles were very dilated and occupied by clear fluid, their lining membranes being smooth; and beyond the termination of the posterior cornu of the right lateral ventricle was found one of the cells or cavities before described. The septum lucidum was very thin, and the soft commissure was absent. Eleven ounces of fluid were collected from the brain altogether. The blood-vessels at the base of the brain were natural.

For the details of this case I have to thank Dr. Sheppard, of the Colney Hatch Asylum.

CASE CCXL. *Cyst containing Clear Fluid, lying between Two Cerebral Convolutions on the* RIGHT *Side of the Brain. General Paralysis of the Insane. Disease of the Kidneys and Liver.*—J. L., of middle age, was an out-patient of mine at St. George's Hospital for a time. He was then transferred to the Peckham House Asylum in a state of "general paralysis," and with symptoms like those of Bright's disease of the kidney. For a time he went on in the same state, but at last sank rapidly and died.

Post-mortem Examination.—The dura mater was much adherent to the cranium, and the arachnoïd membrane was very thickened. The brain-substance, both grey and white, was very congested, but of natural consistency. The choroïd plexuses contained numerous small cysts having clear fluid contents. On the right side of the brain, lying between two cerebral convolutions and immediately beneath the descending cornu of the right lateral ventricle, was a cyst containing about a drachm of clear transparent fluid; and attached to its upper extremity (i.e., nearest to the floor of the ventricle) was a small mass of apparently nothing but fibrinous material. The blood-vessels of the

[1] **An ulcerated condition of the convolutions of both cerebral hemispheres is shown by a specimen in the Middlesex Hospital Museum, Series v. No. 16.**

brain were natural. *Thorax and Abdomen:* The heart and lungs were healthy; the liver was "nutmeggy" and fatty; and the kidneys were enlarged, and contained numbers of fat-globules among the cells of their cortical parts. The spinal column was not examined.

For the details of this post-mortem examination I have to thank Mr. Morris, surgeon to the asylum.

I would here allude to a specimen in University College Pathological Museum, Y. 45 (4068), showing a large cyst in the substance of the brain; to which, however, no history is attached.

CASE CCXLI. *Large Excavations or Cavities in the Surface of both Hemispheres of the Brain, the Result of a Blow on the Head Twenty Years previously.*—The patient was a man, aged forty-eight, who was admitted into the hospital twenty years before death, owing, along with other accidents, to an injury of the head, caused by the fall of scaffolding, attended by symptoms of so-called concussion of the brain; but there were no signs of fracture of the cranial bones. For some days he remained unconscious, and afterwards delirious, but in a few weeks became so well that he was able to leave the hospital, and in time he resumed his work, and for years remained an able workman, his intellect being clear; and he was from time to time seen by Mr. Hewett, and always stated that he had no head-ache. He eventually died of aneurysm of the subclavian artery.

Post-mortem Examination.—In addition to the disease of the artery above-named, it was found that the cerebral convolutions of the anterior part of both hemispheres of the brain were to a great extent wanting, so that on either side of the longitudinal fissure was a distinct cavity, or excavation, or depression, filled by loose areolar tissue and serum, and covered evenly over by the arachnoïd and dura mater. On the right side the excavation was nearly circular, about one and a half inch in diameter, and about one inch in depth; the convolutions around were natural in character. On the opposite (the left) side the excavation was only half the size of the former one. The brain-substance around both these excavations was apparently natural, and no traces of blood were found extravasated in the cavity of the arachnoïd. Moreover, no indication of fracture of any part of the skull was found.[1]

Sometimes a distinct cavity is formed in the surface of the brain-substance, owing to indentation of bone. Such a case lately occurred in our hospital, and was as follows :—

CASE CCXLII. *Cavity in the Surface of the Cerebellum, the Result of Indentation of a Fractured Occipital Bone. Coma before Death.*—Sydney C., aged fourteen, fell from a ladder, and was admitted May 20th, 1865, in a semi-comatose state: the pupils acted, and there was no paralysis. There was a large lump at the back of the head. He was constantly sick, and on the morning after admission more conscious. The pulse became quick and full, and he was bled. He again became unconscious, and died on the fourth day after admission.

Post-mortem Examination.—Cranium: The bones of the calvarium were natural. The vessels of the dura mater were congested, and a layer of blood existed in the arachnoïd cavity on both sides. On the inferior surface of the RIGHT lobe of the cerebellum a hole was made in the substance of the brain by laceration (about the size of a Spanish nut); and a stellate fracture of the occipital bone in the right cerebellar fossa was found, the rough edges of the bone sticking into the lacerated substance of the brain. There was fracture of the temporal bone across the track of the lateral sinus. (161.)

[1] Hosp. Path. Cat., Series viii. No. 180.

(To be continued.)

PART FOURTH.

Chronicle of Medical Science

(CHIEFLY FOREIGN AND CONTEMPORARY).

HALF-YEARLY REPORT ON MATERIA MEDICA AND THERAPEUTICS.

By ROBERT HUNTER SEMPLE, M.D.
Member of the Royal College of Physicians, Physician to the St. Pancras and Northern Dispensary, London.

I. *On the Successful Use of Bromide of Potassium in Epilepsy.* (Gazette des Hôpitaux, 1865.)

THE writer of this article admits that, although many cases of epilepsy have been improved by the bromide of potassium, in others no good effect has resulted. A case, however, under the care of M. Bazin, was distinctly benefited by this remedy. The patient was engaged in trade, forty years of age, of a sanguine temperament and robust constitution, but he had sunk into a melancholic condition; and one day he fell down in the public streets in an epileptic fit, which was succeeded by other attacks, recurring more and more frequently, until at last several occurred in the same day. In proportion as the attacks became more frequent the intellectual faculties were altered, as well as the functions of nutrition. Under these circumstances M. Bazin administered the bromide of potassium in progressive doses, and this treatment was immediately followed by a cessation of the fits; and in five months from the time when the treatment was commenced there had not been a single attack, and all the physical and intellectual functions were restored. In three other cases of epilepsy, in private practice, M. Bazin found the bromide of potassium equally successful, although the disease had previously resisted different kinds of treatment. The mode of administration adopted by M. Bazin was to form a solution of the bromide in the proportion of 20 grammes (a gramme is about 15 grains), to 300 grammes of distilled water; two tablespoonfuls of this solution, representing 30 grammes, contained 2 grammes of bromide. In the adult he commences at once with this quantity of two spoonfuls—one dose in the morning, and one in the evening, before meals. Every five days the dose is increased progressively by one spoonful, up to eight or ten spoonfuls a day. This last dose is continued more or less, according to the degree of resistance of the disease. When the attacks are evidently modified, the quantity of the medicine is diminished in an inverse progression to four spoonfuls a day, a quantity which is continued for several months, even after the cessation of the attacks. In children the medicine is given in the same manner, substituting a teaspoonful or less for the larger doses, according to the age of the patient.

II. *On the Internal Use of Alcohol in Large Doses in Inflammatory and Febrile Diseases.* By Professor BÉHIER. (Bulletin Général de Thérapeutique, Feb. 28th, 1865.)

After a brief review of the opinions of English authors, and especially those of the late Dr. Todd, upon the use of alcohol in inflammations and fevers, Professor Béhier proceeds to give his own experience on the subject. For several years, and even before the appearance of Dr. Stokes's views in 1839, Professor Béhier had been in the habit of employing wine in rather large doses in the treatment of typhoïd fever and other acute diseases, but for the last two years he has tried Dr. Todd's treatment in forty-five cases. Of this number thirty-four were attacked with pneumonia. Twenty-seven were cured, and of the seven who died, most were suffering under some serious or even fatal complication. Like Dr. Todd, Professor Béhier has found alcohol to calm the delirium, to lower the pulse, to reduce the number of respirations, and often to induce an abundant perspiration, notwithstanding which the strength was restored. He has never observed the least sign of intoxication. The mode of administration was to mix from 80 to 120 grammes (a gramme is about a quarter of a drachm) or more of brandy with an equal quantity of water, and to give a spoonful every two hours to the patients, who did not know what they were taking, as the liquid was called *Todd's Potion.* In eight of the cases, a solution of acetate of ammonia was administered every two hours alternately with the brandy; in the rest, the latter was given alone. No special indication existed in any of the cases to recommend or to contra-indicate this combined method of treatment; but, in adopting it, Professor Béhier endeavoured to vary the conditions of the experiments, and he observes that he found no remarkable influence exercised either by the addition or the absence of the acetate of ammonia, although on other occasions he has observed excellent results to follow from the use of this medicine in certain very severe cases of secondary pneumonia.

Professor Béhier states that he has no doubt, according to the facts he has collected, that brandy has materially contributed to save the lives of many of the patients for whom he has employed it. The dangerous character of pneumonia in patients of from sixty-six to seventy years of age is well known, when the disease is extensive, and when it is accompanied by great prostration and delirium. Many of his cases were almost in a hopeless condition, and he remarks that none of the severe ones occurred in habitual drunkards. He concludes, from his experience, that brandy, freely used, and assisted by chicken broth and other light aliments, is of undoubted efficacy, and that it raises the economy to the level of the work it has to perform. But the facts have not led him to accept the therapeutical plan recommended by Todd as the sole treatment of pneumonia. Many of the cases treated by Professor Béhier were of advanced age, which is a special condition; but some of them were only one-and-twenty to thirty-three years old. Five times he tried Todd's treatment in typhoïd fever, but never successfully, although he remarks that in these cases the fever was very severe, and the disease of long standing. But in four cases of erysipelas of the face, the treatment by brandy arrested almost instantaneously in three the delirium which opium had failed to relieve, and the patients were cured. He also tried the same treatment in four cases of articular rheumatism, but with various results; in one a cure was soon accomplished, in another the disease continued unabated, and the other two were complicated with heart affections, but were relieved.

From a review of all the results he has obtained, Professor Béhier draws for the present, the following conclusions—namely, that alcoholic preparations, methodically administered, are much more easily employed and are far less dangerous than is generally supposed in France, and that they constitute a valuable therapeutical resource to the practitioner, who can employ them in pretty large doses, provided that these doses are duly divided.

III. *On the Use of Bromide of Potassium in Tubercular Meningitis.* (Gazette des Hôpitaux, 1865.)

M. Gubler considers that the bromide of potassium exercises a contra-stimulant action on the nervous centres, at the same time that it moderates and retards the movements of the heart; and if this view be correct, the salt ought to prove serviceable in affections of an inflammatory nature occurring in the brain; and tubercular meningitis might by its use be removed from the category of incurable maladies. M. Bazin relates a case in which the bromide was successfully employed. The patient was a youth of nineteen years old, but who appeared younger, and had been subject to convulsions since infancy, and had had pulmonary symptoms indicating the commencement of tuberculosis of the lungs. While undergoing treatment for a skin affection he was seized with cerebral symptoms of an inflammatory character, and exactly resembling those of meningitis. Among the other marked symptoms there were insensibility, vomiting, and convulsions. M. Bazin determined to try the bromide of potassium, of which he gave one gramme in solution the first day (a gramme is about 15 grains). The next two days he gave two grammes a day. The day after there was a slight improvement, and the patient appeared to return somewhat to his senses, and the fits were less violent; the bromide was continued in the same dose, and a blister was applied to the nape of the neck. The two succeeding days the improvement was more marked, and the dose of the bromide was increased to three grammes, and afterwards to four grammes a day. Under this treatment the progress of the case became more and more satisfactory: the pulse fell, the fits ceased, there was tranquil sleep, and the digestive powers returned. But in proportion as this improvement took place in the cerebral symptoms, the abdominal and thoracic regions exhibited undoubted signs of advancing tuberculosis. The reporters of this case think that it ought to encourage practitioners to employ the bromide in similar circumstances.

IV. *On the Use of Tincture of Iodine in Saccharine Diabetes.* By Dr. Bérenger-Féraud, Surgeon in the French Navy. (Bulletin Général de Thérapeutique, April 15th, 1865.)

Dr. Bérenger-Féraud states that he has been induced to employ the tincture of iodine in the treatment of diabetes on the recommendation of Dr. Ricord; and although he has treated only two cases, the results appear to him sufficiently interesting to be recorded. In the two cases described, the treatment was renewed, twice in one, and three times in the other, and always with success. The author also observes that he has had the rare opportunity of observing the progress of diabetes in a monkey, and has in this instance also successfully tried the tincture of iodine. Dr. Bérenger-Féraud records in detail the results of his observations from day to day on the two cases of diabetes in the human subject, giving the density of the urine, the relative amount of glucose, and the quantity of tincture of iodine administered. The mode of giving the iodine is very simple, and consists solely in employing the tincture of iodine of the French Pharmacopœia, containing eight parts to a hundred of spirit. Five drops of this tincture were given at first, and the quantity was gradually increased up to twenty drops a day, administered in

100 grammes of water. At first, the smell of the drug produces a rather disagreeable effect, but at the third or fourth dose the repugnance to its use is very much diminished, and soon disappears entirely; as was proved not only in the two diabetic cases, but in many others, including Dr. Bérenger-Féraud himself. The physiological and therapeutical effects observed were, in the first place, those which are caused by the gentle action of iodine upon the system; and in relation to the diabetes, the proportions of glucose, which diminished during the first or second day, again increased in the urine. The improvement at first obtained remains stationary, and even retrogrades, unless the use of the iodine is discontinued; and the author remarks as a curious circumstance, that under the influence of this suppression of the medicine the proportions of glucose again begin to diminish, at the same time that the urine again becomes less abundant. The quantity of glucose in the urine then remains at its minimum for a certain number of days, to augment again, if the patient makes any deviation from his regimen, and neglects to follow carefully the hygienic precautions which the diabetic sufferer ought constantly to observe.

The author does not assert that a few drops of tincture of iodine have the power of curing diabetes, or that hygienic or dietetic measures are of inferior importance; but he thinks that the tincture of iodine is able to cause a rapid diminution in the quantity of the diabetic sugar; and this action is very valuable, although it may be of a secondary nature. Besides the facts recorded by Dr. Ricord, Dr. Debout, and by himself, Dr. Bérenger-Féraud thinks that the action of iodine in glucosuria is a subject of the deepest interest to pathologists, because on several occasions successful results have been recorded from the employment of substances resembling iodine in their nature—as, for instance, chlorine. Several French and English practitioners, in fact, have recommended hydrochloric acid in the treatment of diabetes, but this acid is, in the opinion of the author, entirely contra-indicated in that disease.

V. *On the Treatment of Croup by the Inhalation of Lime Water.*
(Bulletin Général de Thérapeutique, April 15th, 1865.)

M. Küchenmeister, of Dresden, has stated that diphtheritic membranes are rapidly dissolved in lime-water; and this statement has been confirmed by M. Biermer, the Professor of Clinical Medicine in the University of Berne, who has repeated the experiment before the students of his class. Some pseudo-membranous exudations, of considerable extent and thickness, were placed in a small glass of lime-water, and in the space of from ten to fifteen minutes, and before the eyes of the students, they disappeared, leaving only a very slight sediment at the bottom of the glass. M. Biermer was therefore induced to apply the lime-water locally in a living patient, and he has published the results, which were quite satisfactory. The patient was a girl, aged seventeen, admitted into the hospital of Berne for croup, which had lasted four days. When she was admitted she was nearly choked, cyanotic, and insensible, and she threw up portions of membrane only by means of the administration of some very strong irritant medicines. The symptoms of laryngeal constriction still continued, together with distressing dyspnœa; and pulverized water was employed to moisten the respiratory passages. The water employed, which was at first hot, and then boiling, produced considerable amelioration; and M. Biermer, having previously tried the experiment mentioned above with the false membrane and lime-water, supplied the pulverizer with lime-water. The improvement was evident as soon as the inhalations were commenced; the symptoms diminished in intensity; the expectoration changed its character, and became purulent; the cough gradually disappeared, and the fever abated; and only hoarseness and a slight cough remained during the convalescence, which terminated in a complete cure. M. Biermer, and all those who watched the progress of the case, were convinced that the inhalations had a solvent effect upon the false membranes; but the Professor does not recommend an exclusive adoption of this local treatment, which softens and detaches the exudations, but does not reach the cause of the disease, which must be combated by constitutional remedies, calomel being considered the chief. The plan of M. Biermer has been followed by other practitioners; and M. Küchenmeister has published a case of diphtheritic pharyngo-laryngitis in a child of three years and a half old, treated in the same manner with complete success. Dr. Brauser, of Ratisbon, has also lately published a case of croup in a child of four years and a-half old, treated in the same manner, and perfectly cured. M. Biermer insists particularly on the necessity of using the injections hot.

VI. *On Digitalis as a Febrifuge.* By M. COBLENTZ. (Bulletin Général de Thérapeutique, April 15th, 1865.)

M. Coblentz has published in an inaugural thesis the results of his observations on the employment of digitalis in some inflammatory diseases. He relates the particulars of twelve cases of acute disease (pneumonia, pleurisy, acute articular rheumatism) treated by digitalis; and they show that the drug acts first upon the fever, and afterwards modifies the local disease. The observations were made with great accuracy, the temperature of the body and the rapidity of the pulse being carefully noted in each case. A very common effect of digitalis is to produce bilious vomiting, and if this occurs the remedy should be discontinued; but this symptom ought to excite no apprehension. According to Dr. Coblentz, the action of digitalis on the inferior part of the digestive tube is to induce constipation, and in one case it seems to have stopped diarrhœa; no diuretic effects were observed by him, the urine being always less in quantity than in health, but he has found the drug produce diaphoresis. As digitalis is considered to be only really efficacious in any disease by removing the febrile element, M. Coblentz recommends its employment in all cases where there is a marked febrile disturbance, as in severe erysipelas, and in typhoïd fever *in an inflammatory form*, but in this form only.[1] The author relates one case of this kind, in which the employment of digitalis appears to have produced good effects; he also recommends it in eruptive diseases, where there is a predominance of fever; in puerperal fever, in which it has already been given with success; and lastly, it might perhaps, according to M. Coblentz, be given to avert the inflammatory affections succeeding great surgical operations. As to the mode of administration, the best preparation, according to MM. Traube and Hirtz, is the infusion of the leaves, the dose employed at the hospital of Strasbourg varying from half a gramme to a gramme (a gramme is about a quarter of a drachm); but the German physicians employ much larger doses of the infusion, the difference, perhaps, depending on the mode of preserving the leaves, the efficacy of digitalis being very much influenced by this circumstance.

VII. *On the Dietetic Use of the Organic Acids.* By Dr. DURAND-FARDEL. (Bulletin Général de Thérapeutique, April 15th, 1865.)

The organic acids which enter into common use as food, and principally in the form of fruit, vegetables, beverages, and condiments, are the malic, lactic,

[1] The italics are by M. Coblentz.—REPORTER.

tartaric, acetic, citric, and oxalic acids, combined with potash and soda: what are called *acids*, indeed, are in reality salts, including the vinegar of commerce, which must not be considered as pure acetic acid. Now, these organic acids first enter the stomach, then pass into the blood, undergo metamorphosis, and finally appear in the urine. When these acids have left the stomach, and passed into the blood, it is known that they undergo rapid oxidation, which converts them into carbonic acid, and they are found in the urine in the form of carbonates; so that the sufficient use of fruits containing acids, such as cherries, strawberries, and grapes, renders the urine alkaline. All these acids, however, are not reduced into carbonates with the same rapidity, as oxalic acid, for instance, which is often found in the urine in the form of oxalate of lime, part of which has been introduced with the food. Dr. Durand-Fardel does not deny that there may be exceptional cases, in which the use of organic acids, for instance of red fruits, may increase the acidity of the urine, but he maintains that this anomalous result is uncommon, and that it is not found to occur more frequently in gouty and calculous patients than in others. In reference to hydrological science, which the remarks of Dr. Durand-Fardel were originally intended to illustrate, the author observes, that at Carlsbad, and many of the other German watering-places, the vegetable acids are forbidden in the alimentation of the patients; but he attributes this practice to the circumstance that the waters of Carlsbad, Marienbad, Hombourg, Wiesbaden, &c. are more or less purgative, owing to their mineral constituents, while at Vichy the waters act differently, and the patients are usually constipated. In the latter case, the use of acid fruits is advantageous, so that the visitors to Vichy are benefited rather than otherwise by the use of the organic acids, unless their maladies present peculiar contra-indications.

VIII. *On the Use of Aconite in Scarlatinal Anasarca.* By Dr. Léon Marcq. (Bulletin Général de Thérapeutique, May 30th, 1865.)

The author of this paper advocates the use of aconite in scarlatinal anasarca on the ground that this drug has proved serviceable in infantile diseases accompanied by febrile irritation; and he argues that it ought to be administered in certain cases of anasarca attended with fever and dry heat, the more especially because it causes moisture on the surface of the body, or even induces critical perspiration. In cases where Dr. Marcq hoped only to mitigate the symptoms, he obtained a perfect cure; and in several instances where internal diaphoretics caused no effect, a small dose of aconite produced abundant perspiration. The local physiological action of aconite is that of an irritant, and when absorbed it determines to the skin a kind of tingling compared by Dr. Hirtz to that caused by a slight electric spark; and the same author places it, as to its therapeutical relationship, between veratrine and quinine. From a consideration of the effects of aconite upon the body, as compared with Dr. Marcq's views of the pathology of scarlatina and anasarca, the writer argues that its properties on the function of assimilation, on the circulation, and on the skin, are precisely such as should recommend its use in scarlatinal anasarca. But it should be employed only in cases where the organism presents some resistance which the aconite may act upon and modify. In all cases, therefore, where scarlatinal anasarca presents itself with a sufficient degree of acuteness, aconite ought to be prescribed, because it acts on the exciting cause of the disease, and not upon the symptoms. The writer also asks the question whether this drug might not be beneficially employed during the convalescence after scarlatina, with a prophylactic view, in order to prevent anasarca. He has given it with this intention in several cases, and anasarca has not supervened; but this result, as the writer admits, is not of much value.

IX. *On a New Method of Administering Sulphate of Quinia in Periodical Affections.* By Dr. S. AUGÉ. (Bulletin Général de Thérap., May 15th, 1865.)

The question as to the time of administering quinine in periodical affections has hitherto been, whether it should be given before, during, or after the paroxysm; but Dr. Augé thinks that the question ought to have been, how long after the ingestion of the drug does its maximum action manifest itself? In his opinion it is necessary to solve this problem, and to administer the quinine in such a manner that its action may be developed exactly at the moment when the paroxysm appears, and in this manner the complaint will be best attacked and relieved. Dr. Augé remembered that he heard it taught in the Medical School of Paris that the maximum of action was from eight to nine hours after the drug was taken, and he therefore determined to administer it so that this action should coincide with the commencement of the paroxysm. Some cases presented themselves in which the ordinary treatment had been tried and had failed, but Dr. Augé advised that the quinine should be administered in small doses ($1\frac{1}{3}$ grain in 15 powders) nine hours, seven hours, and five hours respectively, before the paroxysm, and this practice proved to be remarkably successful. In one case of quotidian fever, the patient had taken 23 grammes (a gramme is about 15 grains) of quinine in the ordinary way, without any good effect; but on administering the small doses in the manner just indicated, a cure was accomplished in two days. Dr. Augé proceeds to observe that this mode of giving the sulphate of quinia is evidently rational, and presents great advantages. In the first place it is economical, because the medicine is given in small doses, and it is better borne by the patient; and in the next place, a very common inconvenience is prevented, namely, poisoning by quinia (cinchonism), which often alarms patients. There is, however, one inconvenience attending this treatment, namely, that the hour of administering the medicine often happens to be in the night; but this circumstance is but trifling when our object is to cure an intermittent fever, or still more a severe attack of neuralgia.

X. *On the Therapeutical Value of Arnica Montana.* By Dr. GARROD. (Medical Times and Gazette, January 30th, 1864.)

Although the *arnica montana* has long been empirically employed, no accurate inquiries appear to have been made as to its real uses in medicine. It is said to act as a powerful irritant, exciting sneezing when applied to the nose, and producing emetic and purgative effects if given in large quantities. The composition of the plant has been shown to be the ordinary vegetable principles, a little volatile oil, a bitter matter, and an acrid resin. It has long been used as an external application, but Dr. Garrod has tested its powers in an experimental manner without any satisfactory results. He chose some patients who had been subjected to the operation of dry-cupping, by which, of course, ecchymoses, or bruises, were produced; and as the cupping glasses were applied symmetrically to the two sides of the body, it was easy to compare the results. In some of the experiments, bruises were made on each side of the sternum, and arnica lotion was applied on one side, and spirit and water on the other; the results were altogether negative, and were indeed almost exactly the same as when no treatment was employed. In other experiments it was found that although there was no perceptible difference between the results of cases treated with tincture of arnica and with rectified spirit, yet that there was a decided improvement in the treatment by either of these alcoholic preparations as compared with the cases left to themselves. Dr. Garrod is led to conclude that the application of spirit to a bruise is decidedly beneficial, and that therefore the popular use of brandy or other spirit and water in such cases is justified; but that the addition of arnica to the spirit is unattended with appreciable good effects. Of the internal use of arnica Dr. Garrod has very little experience, and in cases where he has employed it the results were by no means definite.

XI. *On some of the Ferruginous Preparations of the British Pharmacopœia.* By Dr. GARROD. (Medical Times and Gazette, February 27th, 1864.)

In the London Pharmacopœia, iron in its metallic form has never been introduced as a remedial agent; but in the British Pharmacopœia it appears as a medicine, under the name of Ferrum Redactum, which has been for some years employed on the Continent under the name of *Fer Réduit.* Reduced iron is so called because it is reduced to the metallic state from its oxide, the reducing agent being hydrogen gas. Dr. Garrod thinks very highly of the metal employed in this state, as it is the most powerful of the ferruginous preparations, is easily dissolved in the acids of the stomach with the evolution of hydrogen gas, and is not very astringent. One grain is a sufficient dose, and is equivalent to more than five grains of the citrate of iron and ammonia. The oxides of iron are not so efficacious; the magnetic oxide, however, is cheap, and the dose is from three to five grains or more. In some comparative trials made by Dr. Garrod with the reduced iron and the magnetic oxide, the results were decidedly in favour of the latter preparation. The hydrated peroxide of iron is used only as a supposed antidote to poisoning by arsenic. The phosphate of iron may perhaps be efficacious as combining the beneficial effects of the metal with those of phosphoric acid, and the more so as phosphate of iron exists in the human system. The arseniate of iron is isomorphous in its chemical composition with the phosphate, and might therefore be supposed to possess analogous therapeutical properties; but such does not appear to be the case, nor does it seem that this preparation possesses the peculiar specific properties of arsenic. The dose is about a twentieth of a grain upwards, and it has been administered internally in carcinomatous affections, and externally it has been used as an ointment.

XII. *On the Therapeutical Properties of the Salts of Lithia.* By Dr. GARROD. (Medical Times and Gazette, March 10th, 1864.)

The British Pharmacopœia contains two salts of lithia, namely, the carbonate and the citrate, which have been introduced into medical practice by Dr. Garrod. Lithiais analkali, being the oxide of the metal *lithium*, which is the lightest solid known, and has a very small atomic number, namely, seven on the hydrogen scale; and lithia has, therefore, a much greater saturating power than either soda or potash, the metallic bases of which have the atomic numbers respectively of twenty-three and thirty-nine. Another peculiarity of lithia is, that it forms a salt with lithic or uric acid, much more soluble than the salts of other bases; more soluble, in fact, than lithate of potash, and far more so than lithate of soda or ammonia. Hence it appears that the salts of lithia must be valuable remedies when the object is either to keep uric acid in solution during its transit through the urinary organs, or to prevent its deposition within the structures of the body. The carbonate and citrate of lithia may both be obtained in the crystalline form, the citrate being in large crystals; the carbonate is very sparingly soluble in water, but the citrate is freely soluble. Dr. Garrod thus sums up the therapeutical properties and applications of the salts of lithia:—1. Lithia salts are readily absorbed by the stomach, and pass through the kidneys, the carbonate remaining unchanged in its passage; the citrate and other salts with a vegetable acid undergo decomposition and appear in the urine in the form of the carbonate of the base. 2. Lithia combined with carbonic acid or a vegetable acid, given in the form of dilute solution, acts as a powerful diuretic, probably more so than the corresponding salts of potash or soda. 3. Lithia salts exert a much more powerful influence upon the condition of the urine, in rendering it neutral or alkaline, than the salts of the other alkaline metals; that is, when given in the same doses. 4. In certain states of the system, in which urate of soda is liable to be deposited in the tissues, leading to the production of gouty inflammation, the administration of lithia salts is attended with advantage; probably, both by aiding elimination, and by assisting the solution of the urate in the animal fluids. 5. Lithia is not foreign to the system; it has been found by means of spectrum-analysis in the ash of the blood and flesh, although its amount is extremely minute. When its administration is continued for a lengthened time, no injurious consequences ensue, although we should be guided by the same rules in suspending the use of lithia as in the case of other alkaline remedies. 6. The dose of the carbonate may range from three to six grains, of the citrate from five to ten grains; the carbonate may be given in aërated water, and free dilution aids its diuretic action.

XIII. *On the Therapeutical Properties of Hemlock.* By Dr. GARROD. (Medical Times and Gazette, Feb. 13th, 1864.)

Hemlock has long been employed in medical practice, but many complaints have been made as to the uncertainty of its operation. In the London Pharmacopœia the leaves were employed, and a tincture, an ointment, and an extract were made from them. But as the activity of hemlock depends upon the presence of a peculiar fluid alkaloid, named *Conia*, which readily undergoes decomposition when exposed to the air, the dried leaves must obviously lose their efficacy by keeping; and hence it appeared to the Committee who prepared the British Pharmacopœia that the fruit should be substituted for the leaves in the officinal preparations, as the former contains conia in a more concentrated state. A juice of the fresh leaves, the *Succus conii*, has also been introduced into the British Pharmacopœia, a little spirit being added to the liquid to prevent decomposition. The tincture of the British Pharmacopœia, termed Tinctura Fructûs Conii, is made in the proportion of two ounces of the fruit to a pint of spirit. Dr. Garrod has lately made a series of clinical experiments with hemlock, the result of which shows that it possesses far less energy than is generally supposed, but the tincture of the British Pharmacopœia (made with the fruit) is more efficacious than that of the London Pharmacopœia (made with the leaves). Of the latter Dr. Garrod administered doses of from one drachm to half an ounce three times a day in about twenty cases, and latterly he gave a fluid ounce at each dose without producing any discomfort to the patient, who, indeed, exhibited no symptoms at all from the employment of the drug. The tincture employed was supplied by the most respectable pharmaceutical establishments. The tincture of the British Pharmacopœia, however, is more active; for in the case of the patient who took a fluid ounce of the London tincture for a dose, it was found that when the tincture of the fruit was substituted, five drachms were sufficient to cause the development of some symptoms, but these were only slight. Dr. Garrod considers, therefore, that the new tincture possesses at least twice the strength of the old, but that it is not very potent.

Dr. Garrod doubts very much the efficacy of conium in any form in relieving the pain or altering the diseased action in carcinomatous affections; but he thinks that in large doses it may be advantageously administered in cases of severe spinal disease, both structural and functional. In paraplegia, when there exists a sub-inflammatory state of the spinal cord, as indicated by pain in the back and startings of the limbs, hemlock is of great service; and Dr. Garrod has often seen the incontinence of urine checked by the drug. Conium appears to be beneficial where strychnia is injurious; and Dr. Garrod suspects that in very many cases of paraplegia, even when the ordinary symptoms of irritation of the spinal cord cannot be detected, some lurking action may exist which is aggravated by the employment of strychnia, but is generally soothed by hemlock. Dr. Garrod relates a case in which strychnia had been administered with the effect of aggravating the symptoms, and more especially the incontinence of urine, but in which the employment of hemlock in gradually increasing doses was followed by positive alleviation and eventual convalescence. The dose of the tincture of the British Pharmacopœia may range from half a drachm upwards, according to the nature of the case and the urgency of the symptoms.

XIV. *On the Therapeutical Uses of the Mineral Waters of Barèges.* By Dr. HERMANN WEBER. (Medical Times and Gazette, June 17th, 1865.)

Barèges is situated in the Pyrennees, and elevated almost 4000 feet above the level of the sea, being situated in a valley surrounded by barren mountains. The French Government entertains such a high opinion of the efficacy of the waters of Barèges that they have erected there a military hospital, where every year 168 officers and 400 soldiers are admitted for two months each. The late Mr. Carmichael of Dublin bestowed warm approval on this spa, where he was cured of an obstinate attack of sciatica. The principal chemical constituent of the waters is sulphuret of sodium, and their temperature varies from 64° to 112° Fahr. These waters have the reputation of being more exciting in their influence on the nervous system and on the circulation, and therefore more energetic in their therapeutical action than any other sulphuretted waters; but in considering their effects, it should be borne in mind that the climate of Barèges is mountainous, and possesses all the stimulant qualities of an Alpine climate. The diseases principally treated at Barèges are old wounds, diseases of bones, scrofula, skin diseases, chronic rheumatism, and secondary syphilis. In the last-named disease the waters are said to act energetically as a "test," by causing rapidly and certainly the appearance of the characteristic symptoms when the constitution is still impregnated with syphilis. With regard to the mode of employing the waters, the external application in the shape of the douche and the bath predominates over the internal administration, although the latter is used in many cases. The amount of water given internally does not in general exceed about twelve ounces a day, which quantity is usually divided over the day, half being taken in the morning and half in the afternoon. The term of an invalid's visit to Barèges varies from three to six weeks and more, and the best season is from the beginning of July to the first or second week in September.

XV. *On the Chemical Composition, and on the Physiological Properties of the Scilla Maritima.* By Dr. C. D. SCHROFF. (Schmidt's Jahrbücher der In-und Ausländischen Gesammten Medicin, April, 1865.)

In a long and elaborate paper on the Scilla maritima, published in the 'Wiener Wochenblatt,' Dr. Schroff proposes a series of questions in reference to the medicinal characters of that plant. He first discusses the question whether the squill-bulbs of commerce are derived from one or two species, and he comes to the conclusion that although a red and a white bulb of the squill are known, yet that they belong to the same species, and that the colour depends upon the nature of the soil and the place of growth. The colour appears to be the chief distinction between the two bulbs, but the red bulb has a more strongly bitter taste in its external and middle layers; and the raphides occur in the red somewhat less abundantly, but rather larger in size, than in the white. Among other slight differences between the two, the coats or layers of the bulb are more closely and firmly adherent to one another in the red variety than in the white. Exposure to the sun, superficial position, a higher station, and greater distance from the sea, appear to produce the white colour; while a deeper position in the ground, the proximity of the sea, and a greater covering of earth, develop the red. Transitions from one variety to the other are often to be observed; and Dr. Schroff has had specimens of the white squill in which the greater part of the most external coats exhibited a more or less light-red colour. Among other investigations as to the relative activity of the two varieties of the squill, and of the different parts of the same bulb, Dr. Schroff observes that the most external coats, which are tasteless and without parenchyma, are admitted to possess no active properties, and therefore the middle coats, or those which are relatively external in position, are preferred for use, and that the red bulb (as was known to Pliny) is more active than the white.

In reference to the physiological action of squill, the experiments of Dr. Schroff confirm the opinion hitherto entertained, that this plant stands in a peculiar relation to the respiratory and urinary organs. In the animals employed for the experiments, the kidneys were congested with blood, and the urine was very much increased in quantity and mixed with blood. The more the acrid principle contained in squill prevailed in quantity in the preparations used, the more violent was the action on the lungs; while the *scillitin*, which had but little taste, occasioned more of the phenomena of narcotism. Squill ought therefore to be placed among the narcotico-acrids, near Hellebore and Colchicum. From aconite it is particularly distinguished, from the circumstance that it acts immediately on the kidneys and produces an increased determination of blood to those organs; while aconite, like digitalis, acts first of all by its effects on the cardiac movements by a change of the force of the circulation. Colchicum and squill, on the other hand, agree with one another in these respects, that their principal action is directed to the ganglionic system, and by its means to the organs of secretion and excretion; and that they both possess an acrid principle, together with their active bitter principles, *colchicin* and *scillitin*, and in addition to their narcotic property. Squill acts, however—and especially by its acrid principle—much more immediately on the kidneys than colchicum. The narcotic property of both plants is only of subordinate therapeutical value, and is chiefly important when the object is to act upon the ganglionic system, and to increase the process of excretion, as in rheumatism and gout. In this respect colchicum is to be preferred, but squill ought to be resorted to when, in especially suitable conditions, a powerful expectorant and diuretic is required. Compared with cantharides, squill appears a much milder diuretic; and, in order to develop hyperæmia of the kidneys, much larger doses of the latter are required than of cantharides.

XVI. *On the Action of Digitalis in Disease of the Heart.* By Dr. WILLIAM MURRAY. (Medical Times and Gazette, 1865.)

Dr. Murray having carefully observed from twenty to thirty cases of cardiac disease treated by digitalis, arrives, in reference to the action of this drug, at certain conclusions which are in accordance with the theory lately advanced by Dr. Anstie as to stimulants and narcotics, namely, that all true stimulants tend to bring tissue action to its normal standard; that when such action is in excess, a true stimulant will reduce it, and when below par will raise it to its proper level. Dr. Murray believes that the action of digitalis, when properly investigated, will confirm these views; and he proceeds to show, "1st, that digitalis will stimulate and strengthen a weak heart, and that the weaker the muscular tissue of the heart, the safer will be the administration of the medicine; 2nd, that in a hypertrophied heart it will fail to reduce the pulse either in frequency or strength, and in such cases will prove dangerous; and 3rd, that in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. To strengthen and quicken the action of a weak, slowly acting heart, and to reduce the number of the rapid strokes of a feeble heart, is, according to Anstie, to do the work of a true stimulant, bringing action up to the normal standard on the one hand, and reducing it to that level on the other."

In illustration of these views, Dr. Murray adduces the results of his experience, and he remarks that, in many cases, digitalis has removed irregularity and intermission of the pulse, has given power to the heart when exceedingly weak, and increased the rapidity of its action. In one case a lady, aged fifty, had suffered for nine years with disease of both aortic and mitral valves, and the circulation was so weak that there was no pulse at the wrist, while dropsy of the legs and abdomen was making fast progress. Under the use of digitalis in doses of ten drops and upwards, the heart began to beat more forcibly, and the pulse returned at the wrist, the dropsy began to disappear, and the patient returned to her usual state of health, which, though not strong, was comparatively good. But she died about a year after this improvement. Dr. Murray has alternated the use of digitalis with the strongest stimulants, and has been astonished at the superiority it possesses as a stimulant. He thinks that there is not a single disease or condition of the heart *attended by weakness* in which digitalis may not be given with safety and benefit. In hypertrophy of the heart, Dr. Murray admits that his experience is not large, but in one uncomplicated case of this condition of the left ventricle without valvular disease, in which the heart's action was rapid, and at the same time forcible, the digitalis failed to reduce this action, and even caused an increase of the symptoms, and the patient almost fainted after trying it for a week. Lastly, as a cardiac stimulant, digitalis reduces too great rapidity of action when this depends on weakness. Thus it appears that the physiological action of digitalis is that of a stimulant, in Dr. Anstie's sense of the term; and that in its therapeutic action it is especially useful in cardiac weakness, whether that weakness be accompanied by extremely slow or extremely rapid action. As a diuretic, Dr. Murray considers digitalis to be at once the safest and best that we possess.

XVII. *On the Internal Administration of Dilute Hydrochloric Acid in Chronic Forms of Gout.* By Dr. JAMES F. DUNCAN. (Dublin Quarterly Journal of Medical Science, May, 1865.)

The author, after remarking that examples of genuine gout are of rare occurrence in the Irish hospitals, owing to the peculiar diet of the labouring classes in Ireland, proceeds to offer some observations on the chronic form of gout which he has seen in Simpson's Hospital, an institution in Dublin, founded for the relief of reduced citizens afflicted with blindness or gout. As he was constantly disappointed in the effects of the usual remedies, he was induced to seek for some new therapeutic agent, which he thinks he has discovered in hydrochloric acid. Although this acid may, *à priori*, be considered unsuitable, Dr. Duncan argues that it forms a very important constituent of the gastric juice, that it increases the efficiency of the assimilative process, thus preventing the formation of lithic acid in excess, and so more effectually counteracting the morbid influences than can be done by remedies given after the acid is formed. The alkaline treatment of gout is founded upon the principle of neutralizing the acid and facilitating its elimination by the kidneys, but the acid treatment recommended by Dr. Duncan aims at reaching a higher point in the pathogeny of disease, and preventing the formation of lithic acid altogether. The mode of administration recommended is to give a mixture containing two drachms of dilute hydrochloric acid, two drachms of compound tincture of cardamoms, and seven ounces and a half of some bitter infusion, an ounce being taken every three hours. Dr. Duncan has tried this plan in several instances, and has found it very successful.

HALF-YEARLY REPORT ON PATHOLOGY AND PRINCIPLES AND PRACTICE OF MEDICINE.

By Francis C. Webb, M.D., F.L.S.,

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I. *Epidemic Meningitis.* By Prof. Hirsch. (Schmidt's Jahrb. Band cxxvi. p. 36, 1865.)

In the 'Berlin. Klin. Wchnschr.' l. 18, 1864, Prof. Hirsch gives a sketch of epidemic meningitis. It is characterized by the generally rather sudden onset, the intense headache, the contraction of the muscles of the nape of the neck, and, in the period of depression, by various exanthems, especially by herpes of the face. Its course does not differ materially from that of ordinary cerebro-spinal meningitis. Very generally, side by side with the well-marked cases, there occur many abortive cases, which exhibit only the symptoms of irritation. The death-rate is very various, according as one includes these latter cases or not; it varies from thirty to eighty per cent., showing an average of from fifty to sixty per cent. Omitting the cases which prove fatal in a few hours, the disease lasts from two to three weeks. Convalescence is generally very slow. The characteristic pathological change consists of inflammation of the pia mater, with great tendency towards rapid suppuration.

Prof. Hirsch then notes the various outbreaks of epidemic meningitis, from 1805 to the present time, in Geneva, Grenoble, the South of France, Algeria, North America, Denmark, Gibraltar, Sweden, &c.

As to the etiology of the disease, climate has no influence, though season apparently is of importance, inasmuch as almost all the epidemics have reigned in winter or spring. Differences of soil are without importance. Hygienic conditions alone are certainly influential. Out of fifty-seven epidemics in France, forty-six affected military communities exclusively, and only six civilians alone. Also in Arnheim only the Dutch soldiers suffered. And on the other hand, if only civilians were attacked, it prevailed in crowded, filthy dwellings, and narrow, badly ventilated streets: from this point of view also, its specially frequent appearance in winter is of importance.

Contagion has generally been denied, but this cannot be excluded in all instances, as French troops have carried the disease into several garrisons ere it died out. Age and sex have no influence.

The various methods of treatment had the same unfortunate results. Antiphlogistics and drastics were absolutely injurious. Opium in large doses did good only in isolated cases; in smaller doses it only soothed. Chloroform and quinine were tried without effect.

Notes are given of cases observed by Drs. Löwer, Frentzel, Hanuschke Salomon, Prof. Wunderlich, and Dr. Meyer, but they give no new information.

II. *On the Nature and Treatment of Uræmic Convulsions.* By Dr. RUTHERFORD HALDANE, Physician to the Royal Infirmary, Edinburgh. (Edinburgh Medical and Surgical Journal, April, 1865.)

Dr. Haldane does not hold Frerichs' doctrine, that uræmic convulsions depend on carbonate of ammonia in the blood. He quotes the conclusions of Drs. Kühne and Strauch, based on a series of experiments undertaken to determine whether the blood of healthy animals at the temperature of the body contain free ammonia, and whether the blood of animals suffering from urea contain any carbonate of ammonia. These observers answer both questions in the negative. In reference to the latter one, "they induced uræmia in seven dogs; in four of them they tied both ureters at the entrance into the bladder; in the case of the other three they extirpated both kidneys." By testing with Nessler's reagent they were able to detect one-millionth part of carbonate of ammonia had it been present. "On testing the blood of these animals after symptoms of uræmia had set in, they were unable to detect any free ammonia. The blood, in fact (in so far as its ammonia reactions were concerned), resembled that of healthy animals. It therefore follows, that if in uræmia the blood contains carbonate of ammonia, it must be in less quantity than one-millionth part." He also quotes the experiments of Hammond and Oppler, to the effect that the symptoms produced by the injection into the blood of carbonate of ammonia are different from those of uræmia or from those which may be induced by the introduction of urea. He therefore reverts to the older view, that uræmic convulsions are directly connected with the presence of urea in the blood. But he does not think that the presence of urea is the sole cause of the symptoms of uræmia. He does not attempt to define what the other causes at work may be. In some, he thinks, there may be a greater susceptibility to the action of the poison than in others. He also thinks that mal-nutrition of the brain from a thin, watery state of the blood, may make it less capable of resisting the action of the toxic agent. He thus accounts for the differences presented by cases of uræmic and puerperal convulsions.

"In some the symptoms are markedly apoplectic in character; the skin of the head is hot; the carotids pulsate strongly; the eyes are suffused; the pulse is full and strong. In others the skin is cool; there is no visible arterial pulsation; the pulse is rapid and small. In the former class of cases there seems to be an increased quantity of blood in the head, or an increased tension of the cerebral arterial system. I cannot help thinking that this may in some cases depend upon an increase in the entire mass of blood. When the urine becomes very scanty, there may be some other outlet for the water of the blood, such as the bowels; or the distended veins may relieve themselves by the escape of part of the serum giving rise to dropsy. But suppose that the urine be scanty, that there be no compensating discharge, and that the amount of serous effusion be insufficient to make up the balance, it seems clear that, for a time at least, the mass of blood must be increased. Frerichs has observed, that the disappearance of œdema specially increases the liability to coma; and he explains this on the supposition that the purification of the blood is prevented by the cessation of serous exudations, and that so much the greater quantity of urea will be retained in the blood. Without denying the truth of this explanation, I would supplement it by saying that there is another circumstance in operation tending to produce the same result. The disappearance and cessation of serous exudations determine an increased retention of water in the blood, by which its mass is increased, with the probable result of predisposing to cerebral pressure."

It is in such cases of cerebral hyperæmia that he regards bloodletting as a valuable remedy. He thinks that the best index to the state of circulation through the brain is the state of the pupil. "When the vessels of the head are full, the iris is broad and the pupil is small; on the contrary, when the cerebral vessels are emptied, the iris is narrow and the pupil large." The author thus sums up his conclusions—

1. In the present state of our knowledge we seem justified in believing that the retention of urea is the chief cause of uræmic convulsions; though the effect of this agent is probably aided by individual peculiarities, and by deficient nutrition and consequent irritability of the brain, the result of the hydræmic condition of the blood.

2. It seems probable that the mass of the blood may be increased when deficiency of the urine is not compensated for by the augmentation of other secretions, or by the occurrence of dropsy, and that this condition predisposes to apoplectic symptoms.

3. In cases where symptoms of cerebral congestion are present, especially where well-marked contraction of the pupil exists, bloodletting is likely to do good.

4. In cases where symptoms of cerebral congestion are absent or ill-marked, and where dilatation of the pupil exists, bloodletting is likely to be injurious.

5. Chloroform is valuable as a palliative, especially in cases of puerperal convulsions; but when symptoms of cerebral congestion are present, it should not alone be depended on.

III. *On Fetid Bronchitis and other Lung Diseases with Fetid Breath.* By THOS. LAYCOCK, M.D., Professor of Medicine in the University of Edinburgh. (Edinburgh Medical Journal, May, 1865.)

Professor Laycock believes there are three kinds of pulmonary affection in which there is fetor (*sui generis*) of the breath, and which is mistaken for that of pulmonary gangrene:—1. Affections in which there is no *cognisable* lung disease, and no fetid sputa. 2. Affections in which there is a fetid bronchitis, bronchorrhœa, or broncho-pneumonia, with or without dilated bronchi. 3. Affections resembling a consumption, in which there is a fetid cavity, abscess, or vomica, lined with a pyogenic membrane, and situated in a portion of lung which has undergone fibroïd degeneration or condensation. In the first class of cases, the breath fetor is of pulmonary origin, and is to be carefully distinguished from fetor arising from morbid conditions of the nostrils, mouth, teeth, tonsils, pharynx; it is a peculiar odour—*sui generis*—as compared with other pulmonary fetors. In the second class, the cause of the fetor and of the fetid sputa is in the bronchial exudations or excretions. In some of these cases there is only bronchorrhœa, or chronic bronchitis; in others, there is acute or subacute bronchitis or bronchorrhœa together with a localized affection of the lung-tissue—a broncho-pneumonia of a peculiar kind. The anatomical changes observed in the former cases of fetid exudation are those of chronic bronchitis—the mucous membrane is thickened, swollen, and of a dull red colour. Dilatations of the bronchi have also not unfrequently been found in cases of pulmonary fetor. The latter division of cases, in which the fetor depends on the expectoration, are those in which there is a localized broncho-pneumonia. The signs of consolidation are commonly limited to a single lobe, and that usually a lobe of the left lung, and are not unfrequently combined with the signs of a localized pleurisy in the same region. In these cases, hæmoptysis is sometimes as predominant a symptom as fetor.

The third class of cases in which there is pulmonary fetor with a pyogenic lung-cavity, Prof. Laycock believes to belong to a form of "rheumatic consumption," which he differentiates from the scrofulous and tubercular. This kind of lung disease with fetor is that described by Laennec as "partial gangrene" and "gangrenous eschar," and by Dr. Stokes as "local gangrenous disease;" by more recent writers as "circumscribed gangrene." The author observes, "It is remarkable that the disease should be so constantly described as 'gangrene' of the lung, but it is very obvious that the diagnosis of gangrene, even *post-mortem*, is often as vague as during life, for it is too often established solely from the presence of a fetid sanious fluid contained in a cavity in the lung. Now, as the expectoration of such a fluid is not only no proof of a gangrene, but not even of a cavity, so the fetid fluid, which is only a peculiar kind of pus that has undergone a fermentation proper to it, is no proof of gangrene. It is only when putrid *tissue* is found in the cavity or sputum, that we can certainly say that the morbid change is a gangrene."

It is generally believed that these cavities are the result of circumscribed gangrenous sloughing, and that the periodic attacks of febrile disturbance, pain in thorax, cough, and fetid expectoration, are due to the accumulation of gangrenous fluidwithin them. Professor Laycock, however, does not agree with the generally received opinion. He thinks that the fluid comes chiefly from the bronchi, as it is disproportionate in quantity to the size of the cavity. He looks upon the fetid cavity as consecutive to fibroïd degeneration, just as in ordinary phthisis a vomica is consecutive to tuberculization. He thinks that "when we find such cavities in a highly fibroïd lung, we may reasonably conclude that they are formed like the ulcerous solutions of continuity of tissues in the state of fibroïd degeneration, and are to be classed with rodent fibroïd ulcers in the skin and cervix uteri or elsewhere. Hence the cavity is the result of rodent fibroïd ulceration. In its lining pyogenic membrane there is a tissue analogous to that of the bronchial mucous membrane in cases of chronic bronchitis. Since the structural disease is constitutional, it is fair to conclude that the predisposing causes of the peculiar fetid excretion are constitutional, and are linked etiologically with the fibroïd change of tissue." It is a special characteristic of fibroïd and cartilaginous ulcerations to be fetid; this is shown in ozæna and fibroïd rodent ulcerations generally. The smell in ozæna is, in fact, very like that observed in fetid fibroïd vomicæ, and as M. Lasègue has remarked in fetid bronchitis. In these cases Dr. Laycock suggests that the smell should be termed an ozæna odour. The odour, however, is not that of ozæna in all cases, nor does the above explanation apply to the fetor of bronchitis, bronchorrhœa, or broncho-pneumonia, for in these cases there is no rodent ulcerous cavity. In these cases the odour is *sui generis*. 1. In its typical form, when it comes directly from the lung, it is fæcal. 2. After the sputa has been exposed to the air for a time, the smell changes to that of decayed apple. Both these odours differ from that of fetid abscess (ozæna-like odour) and from the horrible smell of true pulmonary gangrene. Dr. Laycock then goes on to show how the three distinct kinds of pulmonary fetor—that of fæces, that of ozæna, and that of gangrene—arise. The odour of pulmonary gangrene is obviously due to putrescent decomposition of dead pulmonary tissue. Dr. Low supposes that it may depend on the putrefaction of blood previously effused; but for this to take place it is necessary that it should receive a septic ferment from without, as effused blood *per se* rarely or never putrefies. Or it is possible that some of the infusorial organisms which seem to be associated with hospital gangrene and other kinds of infectious putrescence may take effect on the blood or pulmonary tissue. With regard to the ozæna odour, it is connected with fibrinous exudation and degeneration—chronic tissue changes of a rheumatic origin. Lactic acid, or some allied acid appears to play an important part in such changes. Brought into contact with the bronchial mucous membrane, it would act as an irritant, and set up bronchitis or bronchorrhœa, and in the capillary bronchi and air-cells lactic acid or acids or the lactates would be easily transformed by a suitable ferment, as at a temperature of 86° to 95° the lactic in contact with putrefying matter is changed into butyric acid. The fæcal odour, although it may occur where there is no cognizable disease, has also probably a rheumatic origin. Cases of "cabbage-stump" odour of the feet, are also referred by Dr. Laycock to the same cause. In the cases which have come under his observation, the rheumatic habit was distinctly marked. The fæcal odour may possibly be an excretion, but it does not depend on a metastasis, as no change is observed in the odour of the fæces. Sulphur is a predominant, albeit not exclusive constituent of these fetid volatile matters. They may exist in the blood, but Dr. Laycock thinks it more probable that they first become what we find them on exposure to air in the lungs at a blood heat, or on the surface of the body as in cases of fetid perspiration.

IV. *Case of Dystaxia or Pseudo-Paralysis Agitans.* By Wm. R. Sanders, M.D., F.R.C.P.E., Physician to the Royal Infirmary, Edinburgh. (Edin. Medical Journal, May, 1865.)

J. C., aged thirty-five, admitted to the Edinburgh Royal Infirmary, October 7th, 1864. Nothing remarkable in his external appearance. Fourteen years ago had ague; nine years ago, rheumatism; since then, up to the date of his present illness, has enjoyed good health. The nervous disorder under which he now labours is traceable to an accident which occurred a year previously. He fell from a height of twelve feet, and some planks and bricks falling upon him injured him severely, causing fracture of the right leg and wounds of the left knee, of the back near the fourth dorsal vertebræ, and of the head, attended with considerable loss of blood. Between four and five months elapsed before he recovered sufficiently to resume his employment. At this period no shaking movements had occurred; and on careful investigation it appeared evident that the injuries then sustained in the head and spine were superficial. After recovery he had returned to work for eleven days, when the planks slipped on which he was walking, and he fell down upon his back upon them. He received no injury by this fall, but states that he experienced a "great fright." He describes that, while lying on the planks, he suddenly commenced to shake; his right arm flew upward involuntarily, and began beating the top of his head, and all his limbs shook, so that the bystanders thought he was in a fit. He was perfectly conscious at the time and aware of his condition, but was unable to control the commotions of his limbs. The liability to these shaking movements has continued ever since. At present, "when the patient is sitting tranquil and at rest, nothing peculiar, or at most a little unsteadiness, is observed; but so soon as he becomes excited, or when he performs any muscular action, immediately violent shaking movements take place, occurring usually first in the limbs, and rapidly extending to the whole body, which is thrown into extraordinary commotion. The head keeps nodding rapidly, or shaking from side to side; the trunk is agitated, and the arms and legs are violently shaken to and fro. These rhythmical spasmodic movements are entirely beyond the patient's control; they disable him from walking or even standing; he cannot use his hands to feed himself, to wash his face, or put on his clothes; he is completely incapacitated for any employment. The shaking movements subside when he is at rest and disappear during sleep, but even turning in bed is sufficient to renew them."

Dr. Sanders remarks that the case differs entirely from ordinary chorea. The movements are shaking or oscillatory, to and fro, by the alternate action of antagonistic muscles; they repeat themselves rhythmically when once begun, and are usually symmetrical on the two sides of the body. They present nothing of the irregular and rapidly changing, unsymmetrical dancing and gesticulating character of the true choreic movements. The grimaces of the features observed in true chorea are entirely absent, and the age and appearance are different from those observed in St. Vitus's dance. The sensory functions and mental faculties are entirely unaffected. He has never worked with mercury, lead, arsenic, or other metals; is sober, and has not been addicted to venereal excesses. Dr. Sanders draws the following conclusions:—1st. The case is one of functional disease of the spinal cord, allied to chorea (spinal chorea?) It is not paralysis nor ataxia. 2nd. The disorder belongs to the class "tremores," and is of the kind sometimes called paralysis agitans (not the senile form—non-senilis); but from the absence of muscular paralysis, it cannot be so named correctly. It may be called dystaxia, or scelotyrbe agitans, or, perhaps better, pseudo-paralysis agitans. 3rd. In the form, and to the extent presented in this case, it is a rare affection, as existing independently of old age, mercurial poisoning, great debility, or organic disease of the cerebro-spinal axis. 4th. It probably depends on a weak and excitable condition of the motor centres in the spinal cord, due to anæmia of its grey substance. 5th. The predisposing cause of the disease was the accident which the patient met with by the first fall. The exciting cause was the fright occasioned by the second fall. It is not likely that the ague or rheumatism, which had been cured so many years before, had any share in its causation.

V. *On a Common Herpetic Epizootic Affection and its Alleged Frequent Transmission to the Human Subject.* By Dr. WILLIAM FRAZER. (The Dublin Quarterly Journal of Medical Sciences, May, 1865.)

The herpetic affection is herpes circinatus, or ordinary ringworm. Dr. Frazer having met with a case in which it was believed to have been contracted from playing with a calf, his interest was excited, and on making further inquiries he learned that contagious herpetic eruptions were common in calves, and that in the country they were generally believed to be transmissible to man. One gentleman, Mr. P. Brady, who had observed the disease in County Cavan, informed him that "ringworm chiefly occurs in calves and young cattle, but is not unfrequently seen in the cow. It is noticed most frequently during the spring months and in the early part of summer; it forms round, spreading patches, reaching from less than an inch to two or three inches across, smooth in the centre, and rougher round the border; they continue to extend for some time, then dry up, and finally the spot appears covered with a crust of scales, thickest outside; the hair covering the part attacked falls off, leaving the skin bare, and so produces much disfiguration. The favourite situation of the eruption is about the eyes, the roots of the ears, and on the neck, but it may also occur upon the body and over the limbs. There can be no doubt that it is highly infectious, as when a cow or a calf having the disease is brought amongst others that are not affected by it, the eruption speedily appears amongst them, perhaps in consequence of their rubbing themselves against the same post as the infected animal." Men are frequently infected. The disease is frequent amongst milkmaids and herds. According to Mr. Brady, when it is caught from the calf it is particularly difficult of cure. The fact of its transmission from the lower animals has not been overlooked by continental writers. It has been especially noticed by M. Gerlach, of the Royal Veterinary School at Berlin. He has identified the disease occurring in the calf with herpes circinatus, for he procured from its crust the same parasitic vegetative growth (tricophyton tonsurans) which is present in that disease. He has effected its transmission to oxen, horses, and dogs, but has failed to induce it in sheep or swine. He inoculated his own arm, and also some of his pupils, with the crusts taken from oxen, and in every instance a patch of herpes circinatus was developed, the crusts of which "contained the vegetable parasite observed in the *dartres* of the ox."

VI. *Pleurisy with Fetid Effusion, Simulating Gangrene.* By WILLIAM MOORE, M.D., Physician to Mercer's Hospital. (Dublin Quarterly Journal of Medical Science, May, 1865.)

Dr. Moore's first case is that of a plumber, aged twenty-five, who was admitted into the Mercer's Hospital, January 17th, complaining of troublesome cough, with fetid expectoration, frequent vomiting, and great prostration. Four years before he had had syphilis, and a year before rheumatic fever. This winter, in consequence of exposure to cold and wet, he had been seized with rigors and sharp pain in his side. The following was his condition on February 1st:—He was pallid and anxious, with a troublesome cough; the expectoration very profuse, of a greenish frothy character, and so fetid as to impregnate the whole ward, the fetor being of the wet mortar semifecal odour. Pulse weak—120; profuse night sweats; he was unable to lie on the affected side. There was visible enlargement of the left side, posteriorly and laterally, with dulness on percussion from the scapular ridge down to the base of the lung, and absence of vocal fremitus. Over the superior and posterior portion of the left lung respiration was audible, but feeble, and attended with a crepitus, whilst inferiorly, respiration could not be heard, and vocal sounds were absent. There was displacement of the heart to the right side. Percussion and respiration over the front of the left lung were clear, and the physical signs over the right side generally were normal. Seven days afterwards the expectoration had diminished, and its odour partook more of the "musty hay" than of the fecal character. The fetor was subsequently lost, and the patient ultimately recovered. The expectoration was examined by Professor Cameron. It had an alkaline reaction; 100 parts yielded on evaporation 1·97 of residuum. It contained peroxide of iron, mucus, pus, and a little blood. The microscope revealed a few muscular fibrillæ, and a number of irregularly shaped particles, believed to be tuberculous. The principal point of interest in the case was the removal of the profuse fetid expectoration, without any of the symptoms or physical signs of a fistulous communication having been established between the bronchial tubes and pleural cavity. "Can a perforation occur in such cases without allowing the entry of air into the pleural sac, or does exosmosis through the membrane take place?" Dr. Moore inclines to the latter view, and he relates two other cases which resembled the above in the facts of effusion into the pleural cavity and copious fetid expectoration, all physical signs of a communication being absent. He believes that the low vital resistance of the membrane permitted the transudation of the fluid and of the fetid intolerable gas.

VII. *Case of Abscess of the Spleen, Discharged into the Left Lung.* By A. A. MANTELL, M.D. (Indian Annals of Medical Science, Jan. 1865.)

Abscess of the spleen is rare, and a termination by communication with the lung still rarer. J. D., European, aged sixty-two, came under observation on

January 31st, 1865. He had been a free liver, but generally a healthy man; had not been subject to fever, but had had a slight attack of ague before his present illness set in. He became ill five months ago, with sore throat and difficulty in swallowing; he also had pain in the right side of his neck. He grew worse, and on January 1st he was unable to masticate food, and his speech became thick. On January 25th he coughed up some dark coloured blood and matter of a very offensive character; from this time his breathing became difficult, a hacking cough set in, and he daily expectorated small quantities of blood and matter. When seen on January 31st, he was sitting in a bent posture, his countenance was dusky, and his lips livid; he was at times delirious, and breathed with much noise and difficulty; he had a slight but frequent cough, and with it expectorated an offensive sanguino-purulent fluid, of a dark brick colour. He was free from fever; pulse strong, 84; tongue clean. He complained only of his throat, and pointed to it as the seat of pain; nothing abnormal, however, could be felt externally, or seen internally; there was partial paralysis of his tongue, which rendered his speech thick and difficult to be understood. His lungs gave no evidence of disease, resonance was good on percussion, and the only abnormal sound present was a mucous râle. No enlargement of the liver or spleen could be detected, and he did not complain of pain when his abdomen was examined by pressure and percussion. He died from hæmoptysis on February 1st. *Inspection* twenty-one hours after death :—On removing the trachea, pharynx, &c., the greater cornu of the hyoïd bone of the right side was found in a state of caries, and the diseased part was surrounded by a small abscess, which had apparently burst into the upper part of the pharynx. The apex of the right lung was slightly adherent, and the bases of both lungs were firmly adherent to the diaphragm, especially the left; their structure was healthy, but engorged with frothy blood and serum. Heart natural, with empty cavities. Liver smaller than usual; gall-bladder containing greenish bile, and one large black calculus. On endeavouring to remove the spleen it was found adherent to the diaphragm, and so soft and pulpy that it broke in pieces under very slight pressure; the cause of this was an abscess which occupied its structure, and was now nearly empty: the walls of it were thin, and what remained of the parenchyma was infiltrated with fetid matter, and blood of a brick-red colour, similar to that which had been expectorated during life. The abscess had burst into the left lung, a communication being established between it and the spleen. The fatal hæmorrhage was due to rupture of a branch of the left pulmonary artery. The left kidney was hypertrophied; the right contained an abscess the size of a hen's egg.

VIII. *On an Epidemic of Icteric Typhus.* By Dr. CARVILLE, Physician to the Maison centrale de Gaillon. (Archives Générales de Médecine and Gazette Médicale de Paris, May 13th, 1865.)

M. Carville observed amongst the prisoners in the Maison centrale de Gaillon an epidemic of jaundice, which lasted from May to October, 1859. It attacked forty-seven persons, of whom eleven died. Twelve other persons exhibited the symptoms of the malady, without the jaundice: of these two died. The persons chiefly affected by the epidemic were males who had passed the age of forty years, of vigorous constitutions and sanguine temperament. In his description M. Carville divides the disease into two periods, that of incubation, extending from the initiatory rigor to the appearance of jaundice, and the period of outbreak, from the manifestation of jaundice to the period of convalescence or termination in death. The mean duration of the two periods was nearly equal, and may be placed at six days, giving twelve days for the duration of the disease in its acute stage; but convalescence was extremely long, it generally lasted thirty-eight days. The following symptoms were observed:—First period: Initiatory rigor, varying in intensity; cephalalgia, sometimes frontal, more frequently general, and always acute; general enfeeblement; the pulse sometimes a little above, sometimes a little below the ordinary frequency; temperature ordinary, severe thirst supervening, however, on the second or third day; diminution or suppression of the urine preceded the appearance of jaundice in severe cases, and followed it in the lighter cases, accompanied always by an alteration in the colour of the urine from its containing biliary principles; the sensibility of the epigastric region a little exaggerated; nausea and vomiting; the tongue coated, dry, or viscid; difficulty of breathing observed ten times in the first period, marking generally the second, and always in relation with the gravity of the disease; insomnia almost constant; constipation more frequent than diarrhœa; angina observed in seven cases, of which four were severe. Second period:—A fresh rigor observed in twenty-two instances; aggravation of the head-ache; development of jaundice, the colour of which, generally deep, was in relation with the intensity of the attack; pulse a little slower, more feeble, irregular, sometimes intermittent; feebleness; watery or greenish vomiting; about the third day after the appearance of jaundice, epistaxis was observed in half the cases, being, besides two cases of hæmatemesis and three of purpura, the only hæmorrhage observed, and being noticed in slight rather than severe cases; increased difficulty of respiration, hiccough, somnolence, and delirium preceded death. In the eleven fatal cases, post-mortem examination did not present the same results; in two, yellow atrophy of the liver was observed; in a third, the lesion was less advanced, and the granular structure of the hepatic gland could still be recognised. In the eight other cases, the liver appeared unaltered in volume, colour, and texture. The kidneys were more often affected than the liver; but in five cases they presented no important modification. A more striking alteration was observed in the spleen; its structure was softened and sometimes almost diffluent in ten cases; the organ was hypertrophied in seven instances—twice, on the contrary, atrophied. The most important lesion in the intestinal tube was the existence in nine cases of an exaggerated condition of Peyer's patches near the ileo-cæcal valve, but without appreciable structural alteration. In one case, meningeal hæmorrhage was observed, and in two others, engorgement of the vessels of the pia mater. The consideration of the variations in the post-mortem appearances, and of the twelve cases in which jaundice was not observed, has led M. Carville to the conclusion that the icteric symptoms were not the most important in the group of cases; he is led to look upon the adynamia as the most important phenomenon, and to consider the epidemic as one of typhus of a peculiar character, presenting considerable analogy with the yellow fever of America.

IX. *Typhus Fever in the Medical College Hospital, Calcutta.* By Dr. S. Goodeve Chuckerbutty. (Indian Annals of Medical Science, January, 1865.)

Typhus fever has hitherto been supposed to be unknown in Bengal. Dr. Murchison, in his recent treatise 'On Continued Fevers,' states that there are no authentic records of typhus in Asia, Africa, or the tropical parts of America. Dr. Chuckerbutty gives an account of twelve cases which have been treated by him at the Medical College Hospital; of these the following may be taken as the type:—J. H., aged twenty-five, a Portuguese seaman, of good constitution, was admitted on July 5th, 1864, with a fever of eleven days' standing, and discharged cured on the 23rd August. He presented a maculated mulberry eruption on his trunk, and a dusky red hue of the face and neck and hands, both of which disappeared on pressure, and returned on the pressure being removed. When these faded, they were succeeded by desquamation of the cuticle, and a crop of sudamina on the abdomen. His bowels were relaxed for a day or two in the beginning, and then constipated. He had a frequent and weak pulse, difficulty of respiration, heat of skin, watchfulness, delirium succeeded by stupor and coma, along with involuntary evacuations, a furred dry brown tongue, muscular tremors, subsultus tendinum and scanty urine (which became deep brown and copious as he recovered), and great prostration of strength, head-ache and pain in the back, redness of the conjunctivæ, &c. Of the twelve cases, five died, five were discharged cured, one was convalescent, and one under treatment. Of the cases cured, the whole time from invasion to discharge was in two 30 days, one 27 days, one 18 days, one 17 days. In eleven of the cases the mulberry rash was observed. (Nothing, however, is said of petechiæ, and in no case was the urine albuminous.) Of the morbid appearances, congestions of the lungs, kidneys, and brain were the most frequent; occasionally also of portions of the intestines and stomach, sometimes of the liver and spleen; flabbiness of the heart, and blackness and fluidity of the blood in all cases; prominence of Brunner's glands in one, affection of Peyer's patches in none; the cerebral membranes were always congested and contained much serum. The question of contagion, Dr. Chuckerbutty observes, is difficult to answer, but he believes he could trace contagion in one instance.

X. *Hysterical Anæsthesia and Ataxia.* By M. CH. LASÈGUE. (Archives Générales de Médecine and Gaz. Méd. de Paris, April 29th, 1865.)

The subject of M. Lasègue's paper was a girl, aged eighteen, who has attracted considerable attention in the Necker Hospital. She was first taken with fits of hysterical crying, and afterwards became cataleptic. The attacks of catalepsy returned every two or three days at various hours, without any appreciable cause. They lasted on an average two or three hours. The cataleptic sleep was calm, and difficult to distinguish from physiological sleep. The phenomena presented during the cataleptic state were carefully studied by M. Lasègue; he had recourse to various modes of irritation, such as pricking, pinching, cold affusion, electrization, &c., without any effect; he varied in different ways the position of the limbs, the trunk, and the head, without the patient being conscious of the movements he produced; there was no symptom of fatigue, nor did she change her position; all the muscles appeared to be under the cataleptic influence, excepting those of the face; the teeth were set, the jaws immovable, but the eyelids and lips resumed their position when he ceased to separate them. In the cataleptic state the patient presented a cutaneous anæsthesia, such as is met with in a certain number of hysterical females; this anæsthesia was complete in the limbs and a part of the trunk, but the face, the head, and one part of the neck preserved a certain degree of sensibility. The skin was not only insensible, but anæsthesia extended to the deepest parts; needles were plunged deeply into the tissues without any sign of pain being elicited. M. Lasègue took the opportunity of studying the influence of the nervous disorder upon the muscular activity. When the eyes were bandaged she could move the muscles lying under the sensitive parts, but it was impossible for her to move the anæsthetic parts; thus she moved the head, the neck, the trunk, but the limbs remained immovable. And when the limbs were put into different positions by the bystanders, she had no perception of the movement, and kept the position in which they were placed without evincing the slightest fatigue. In a word, she exhibited a partial cataleptic state. This phenomenon was observed in the lower limbs as well as in the upper; nevertheless, she walked without looking at her feet, and with the eyes fixed on the ceiling. With her eyes closed she could not carry the hand to the head; but if her fingers were applied on a sensitive point of this region, she could, with some indecision, execute definite actions; touch seemed to replace sight in indicating that a movement had been performed in conformity with her will. With her eyes open, she accomplished, with a certain amount of address, very delicate movements, provided she did not raise her eyes. If she directed her eyes towards a distant object, her movements were restrained, but less so than when she closed her eyes. If obliged to look at an object within reach, she could not take hold of it unless she saw her arm; but it became possible if she could distinguish the movements of the arm through her dress. M. Lasègue closes his paper with some instructive deductions on the conditions of muscular activity. The sense of muscular activity, he says, is not so simple as we think; it is more complex than appears at first sight. It is composed of elements furnished by sight, by touch, and by the slow and progressive education of movements. Each movement represents a succession of phenomena, which a minute analysis only can separate, from the moment when the movement is decided on to that when it is accomplished; from this chain, apparently indivisible, one or more links may be wanting. In the hysterico-cataleptic the state of rigidity of the muscular implement, the disappearance of volition, the intervention of the sight and of touch, are so many elements, differently modified, which change the results according to circumstances. If we admit an independent muscular sense or consciousness sufficing to explain all, we simplify the study by sacrificing a part of the truth. "I have only wished," he adds, "to show by an example how many accessory and delicate questions intervene in the solution of the problem."

XI. *The History and Pathology of Pellagra.* (Gaz. Méd., Feb. 1865.)

The Academy of Medicine proposed this subject for one of its prizes in 1864, and MM. Claude Bernard, Velpeau, J. Cloquet, Serres, and Rayer having reported on the several works sent in, the prize of five thousand francs has been awarded to M. Roussel, and an accessit of two thousand to M. Costallat. The opinion supported by these writers is, that pellagra is a specific disease, caused by a fungous parasite developed in diseased maize. It has been abundantly proved that the cause of endemic pellagra is to be sought for in the food. An improved diet cures it—i.e., if not too far advanced. Peasants afflicted with it on entering good domestic service get well; conscripts suffering from it are cured by their soldier life, so that the Italian Government no longer considers pellagra as exempting the patient from military service. The change of regimen thus followed by the cure of pellagra was in all cases the abandonment of the continual and almost exclusive use of maize flour; and according to M. Roussel, history and geography confirm the connexion between the use of maize as a food and the existence of pellagra. It exists in certain parts of Italy, France, Spain, and Hungary, and in those parts maize constitutes the principal food of the peasantry; and till maize was introduced into those countries as a food, pellagra was unknown there.

In reply to the fact that pellagra is not common in Burgundy and La Franche-Comté, where maize is largely consumed, MM. Roussel and Costallat affirm that the inhabitants enjoy a better general diet in conjunction with maize, and that they dry the maize in furnaces, by which the development of the fungus is prevented. In years when the maize is good and sound, pellagra greatly diminishes; when the maize is bad—that is, much attacked by the fungus—pellagra rages; those attacked by pellagra recover on ceasing the use of maize, but it has not yet been distinctly proved that they will recover if they continue to eat maize, only taking care that it is sound and free from the fungus—the *verdet*, or sporisorium maïdis.

The pellagre sporadique of M. Landoury, and the pellagre des aliénés of MM. Billod and Brunet, are examined and judged to be not true pellagra. In Old Castile and Aragon, a disease very closely resembling pellagra, and called *flema salada*, is common, and maize is not eaten; M. Costallat visited the country, and is disposed to believe the disease is caused by a fungus that is commonly found in the bread of the country. The reporters appear to agree with M. Costallat, that only one thing is needed now to the absolute demonstration of the theory that the verdet is the essential cause of pellagra—viz., "change only one thing in the diet of the pellagrous—substitute sound maize for damaged maize; if the pellagra persists, the verdet is not its cause; if it gets well, the verdet is its cause."

XII. *Essay on the Etiology and the Course of the Typhus of the Anahuac.* By Dr. JOURDANET. (Gaz. Méd., April, 1865.)

Dr. Jourdanet considers that it is proved, by his researches, that Yucatan and Anahuac present two distinct influences, which impress two different characters on typhoïd affections—petechial fever in the elevated plateaus, dothinenterite at the level of the sea; and believes that further investigations will show that "typhus fevers are purely nervous or adynamique on the plateaus, and dothinenterique at the inferior or intermediary levels."

XIII. *A Case of Apoplexy of the Spinal Grey Substance, attended with Convulsions.* By Dr. GONZALEZ ECHEVERRIA. (New York Medical Journal, April, 1865.)

P. R., aged eighteen, had been in good health until January, 1863, when he was attacked with rheumatism. His parents were living. His father had had chorea when young, but had recovered completely. He was seized with slight twitchings about April 10th, 1864, one week before he was seen by Dr. Echeverria. Previously he had only complained of "pain in the neck, from too much hanging of the clothes on that part." Pressure on the back of the neck produced pain and spasmodic contractions of the upper limbs. There was no fever nor head-ache. The convulsive movements increased, and became so violent, that when he was visited by the author he was found strapped down in the bed. The movements were of choreic character, quite involuntary, instantaneous, and rapidly succeeding each other. He could execute movements of the limbs suddenly, but if he attempted to perform them slowly, the power of co-ordination failed, and convulsions occurred. There was no anæsthesia of the skin of the trunk and extremities; no enlargement or inflammation of the joints; no coldness or numbness of the limbs. Speech was impeded, apparently from incapacity of co-ordination in the movements of the muscles of the tongue. No trismus. The tongue could be protruded without difficulty; it was moist and clean. Deglutition was impossible. Noise seemed to exert no influence in the production of the convulsions. The eyes were normal; slight injection of the conjunctivæ, but no remarkable change in the size, shape, or colour of the pupil. No photophobia. Respiration was laboured; the abdomen contracted and tympanitic; the bowels constipated. There was no retention of urine. Urine acid, clear, free from albumen and sugar; it deposited crystals of basic phosphates. For seventy hours the patient had had no food nor rest. Chloroform was employed; it arrested the convulsions but they returned on its being discontinued. Nourishment and stimulants and a turpentine injection were also given. The patient died quietly, after a short period of rest; the mind was unaffected throughout. The following are the chief points of interest in the post-mortem examination. It was only allowed to examine the cervical portion of the spinal cord. The vertebræ appeared healthy; the theca vertebralis was firmly adherent to the canal and intensely congested, the adhesions being firmer on the upper than the lower part of the cervical region. The spinal arachnoïdes was not thickened nor opaque, and adhered to the cord. The spinal fluid was of a red colour, and not considerably increased. The size of the cord was normal; the white was firmer than the grey substance. On removing the cervical portion of the cord, the inferior surface of section showed that extravasation of blood had been limited in that part to the posterior cornua, and to both tractus intermedio-laterales, the anterior cornua appearing scarcely affected; the white substance was very slightly congested. At the upper surface of the section, the grey substance was not so much injured, exhibiting only a few spots of extravasation, occupying the posterior portions. On dividing the cord through the posterior median line, apoplectic effusions were found along the grey substance, most of them located nearer to the posterior than to the anterior cornua, and a few extending upon the whole width of the grey substance. The capillary vessels were increased around these extravasations. The white substance was congested in some spots near the posterior median fissure. Microscopical examination of the white fibres, both of the anterior and posterior columns, showed granular disintegration in the cylinder axis; the fibres were surrounded by a fine, granular, amorphous matter, and filaments of connective-tissue. The capillary vessels were varicose in the vicinity of the grey substance. The grey substance was composed of a connective-tissue filled with fine, granular, amorphous matter, containing a very few fatty globules and crystals of hæmatosine, also a few spherical nuclei, like the *myelocites* described by Ch. Robin, in the grey substance of the nervous centres. None of these were found with the white substance, and most of them were in a state of disintegration. In specimens from the posterior cornua, there were, besides a few broken nerve-fibres, two cells, one of them corresponding to the ganglionic or sympathetic cells described by Jacubowitsch, and surrounded by a sheath containing several small nuclei. Both cells were very granular, without any nuclei, and dark from infiltration of pigment-granules, and of the colouring matter of the blood. Large multipolar cells of similar aspect were found in the anterior cornua. The conical epithelium of the central canal was disintegrated. Similar alteration was observed in the nerve-fibres and cells in the ganglia of the posterior roots. The vascularity of the membranes was considerable. No inflammatory corpuscle was observed in any of the preparations. In his concluding observations, the author points out:

1. The unimportant derangement of the eye with such an extensive injury of the cilio-spinal region.

2. The case further proves that irritation of the grey substance does not always produce hyperæsthesia, nor does alteration in this part of the cord and anæsthesia, or paralysis of movement, always accompany each other, as advanced by Dr. Brown-Séquard.

3. It also contradicts the opinion of the same physiologist, that the transmission of sensitive impressions chiefly takes place through the central grey matter.

The following papers and memoirs are cited by title only, as want of space prevents a more extended notice of them:

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A Very Full Report of "the Latest Researches and Observations on Pigment Diseases, especially of Addison's Disease." By Dr. Meissner. (Schmidt's Jahrb., Band cxxvi. Nos. 4 and 5, 1865.)

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E.

I. *On Hernia in Children.* By M. Guersant. (Bull. de Thérapeutique, Feb. 28th, 1865.)

Hernia is met with almost as frequently in children (oftener in boys than in girls) as at other ages, and especially during the early months of life. Some facts lead M. Guersant to believe that it is sometimes hereditary; but however this may be, its production at this early period is favoured by the less tense and less closed condition of the apertures, and by the exaggerated character of the efforts made by infants, whether in uttering their cries or passing their evacuations.

The cries of the child, the neglect of the application of an abdominal bandage, or the infant's feeble or emaciated condition, may prove the cause of umbilical hernia soon after birth. It is easily recognised, and when only small, the aperture may become narrower, and the tumour promptly diminish in size, especially when the child becomes stronger and stouter. When the hernia increases in size, and the bandages that are usually resorted to slip and prove inefficient, M. Guersant rejects all spring trusses and those having a fixed pad in their centre, and prefers the employment of adhesive plaister. A pad is formed of a hemisphere of yellow wax or vulcanized caoutchouc, and is fixed by a band of diachylon plaister long enough to make a turn and a half round the body, and about four centimetres in breadth. It is an excellent bandage when carefully applied, adhering to the skin, and well supporting the hernia. The yellow wax should be softened by heat so as to form a ball, which is divided into two parts, varying in size according to the dimensions of the ring, which it must always exceed, so as not to pass within it. This ball, covered with fine linen, should be so applied as to have its convexity against the ring, and the flat part in contact with the plaister. The parts which will have to come into contact with the diachylon should first be powdered with rice or starch, for the prevention of erythema. The plaister, covered with a bandage, should be left on for three or four days, when it should be renewed, another ball of wax and plaister being in readiness, and the finger applied so as to prevent the hernia escaping until this can be put on. By the careful use of this bandage, the hernia is generally cured in six weeks, although two months or even more may be required. M. Guersant has never had recourse to the ligature or other means of radical cure; nor has he ever met with strangulated umbilical hernia, although he has seen it so swollen as to require poultices before it could be reduced.

Inguinal hernia is of common occurrence, especially in boys, being often double. It usually contains the small or large intestine, with or without omentum and in the case of a child seven or eight years of age, M. Guersant met with the ileo-cæcal appendix. In three female children he has seen hernia of the ovary; this, mistaken in the first case for an encysted tumour, was removed, the child dying of peritonitis. Inguinal hernia in children, left to itself, may acquire a large size, but it may sometimes exist without causing any notable accidents. Generally, however, there are colicky pains, especially when the hernia is not reduced, or is only imperfectly retained. The choking (*engouement*) of hernia, characterized by the presence of matters in the intestine, and especially seen in feeble aged persons in whom the bowel is not supported, is also met with in weak and delicate children. The tumour is increased in size and weight, and has a soft and pasty feel. The skin retains its normal colour, and the abdomen is distended without being painful; nausea, or even vomiting, being sometimes present. Local emollients and some enemata generally suffice for relief, which takes place by evacuations; but the taxis, or even a gentle aperient, may be indicated. Strangulation is more rarely met with in the child than in the adult, but M. Guersant has seen several cases, even in infants only a few weeks old. In general, however, he has found the hernia yield to the taxis. When this has to be applied, especially in the younger children, the patient should be placed upon an inclined plane, so as to bring the head and trunk lower, and the pelvis higher. The application is then made in the same way as in the adult, and for a short time without chloroform. When it proves of no avail, as is often the case, owing to the resistance which the efforts of the child make to the reduction, a cataplasm should be applied over the tumour, and a bath administered. Chloroform is then resorted to during the use of the taxis, and almost always reduction is accomplished. M. Guersant has only had recourse to an operation in three cases, and in only one of these was it successful.

However, occurrences of this kind are very rare in children, for when treated in good time their hernias can generally be cured by the constant and careful application of appropriate bandages, and that especially when the child, from having been thin, gains flesh. When treatment is commenced during the early months of life a cure may be effected in four or five months, while when the child is a year or more of age a twelvemonth will often suffice. For older children the bandage will have to be continued for some years, and it must at first only be discontinued during the night before leaving it off entirely. For young infants, Galante's caoutchouc bandages with air pads are to be preferred; but for children from six to twelve months old, spring trusses, very lightly made, and covered with jean and oiled silk, are required. It is indispensable, in the case of young children, to have two bandages at least, as, often getting wet, they require to be changed daily.

Whenever the testis is found to have passed the external orifice of the inguinal canal, and yet remains near the ring, endeavours must be made to prevent its re-entering the canal. When it is found that it cannot be kept external to the ring, without exerting too much compression, by a hernial pad constructed for the purpose, which at the same time prevents the hernia from descending, Marjolais' advice should be followed—to return both testis and hernia, and maintain both reduced, rather than expose the child to the double danger of compression of the testis and strangulation of the intestine.

II. *On Suppurating Bubo.* By Prof. PETTERS. (Prag. Vierteljahrschrift, Band ii.)

Professor Petters terminates a dissertation founded upon a consideration of 278 cases with the following conclusions:—1. Bubo occurs more frequently in men than in women. 2. It most frequently follows chancre of the prepuce and the frenulum in men, and chancre of the mouth of the urethra and of the commissure in women. 3. The abundance of lymphatic vessels in these regions is the cause of this greater frequency. 4. Bubo of the right inguinal region occurs more frequently than that of the left, but the bubo does not always occur on the side corresponding to the chancre. 5. Simple, sympathetic bubo may be a consequence of gonorrhœa; but active, virulent bubo always depends upon chancre. 6. Indolent bubos frequently exist on both sides, and are very often dependent upon syphilitic disease of the glands. 7. Indolent bubo does not exhibit the signs of virulence. 8. Double bubos generally follow chancre of the frenulum in men, and of the commissure in women. 9. The decision whether a bubo is sympathetic or virulent cannot be arrived at before it breaks, as its virulence can only be positively proved by inoculation. 10. Usually, a simple sympathetic bubo precedes a virulent one. 11. The virus of chancre appears to undergo a certain degree of concentration in the lymphatic glands, as chancres inoculated by the pus from a bubo are more obstinate than those inoculated from the pus of a chancre. 12. Every form of bubo may first appear at a considerable time after the healing of the chancre. 13. As a general rule, the duration of a virulent bubo is longer than the sympathetic, and shorter than the indolent. 14. The indolent bubo usually gives rise to deeper excavations. 15. A bubo caused by a syphilitic swelling of the glands will not become arrested in its development and course by an antisyphilitic treatment. 16. An exact prognosis concerning bubo is seldom possible. 17. The treatment of bubo should be symptomatic and not too active. 18. Before it breaks, the treatment of bubo is precisely the same, of whatever form it may be. 19. It is best opened by means of a knife, the incision being a small one. 20. After the opening, the sympathetic and the indolent bubo may be treated alike, while the treatment of the virulent bubo will depend upon the appearance of the chancre. 21. The detached skin, which cannot be preserved, should be removed by the scissors in preference to the caustic paste.

III. *The Amaurosis and Deafness of Smokers and Drinkers.* By MM. SICHEL and TRIQUET. (Annales d'Oculistique, Mars; and Gazette des Hôpitaux, No. 61.)

M. Sichel, in continuation of a former communication published in 1863, observes that among the forms of cerebral amaurosis there are two which, although little known, are not of infrequent occurrence, and are difficult of cure. One of these, produced by the abuse of alcoholic drinks, he described as long ago as 1837, under the designation of "amaurosis symptomatic of delirium tremens;" and the other, produced by the abuse of smoking, was first described by Mackenzie. Incredulous as to this last, when first announced, M. Sichel, in the course of twenty-eight years' practice, has frequently met with it, and he believes that there are few persons who can smoke for any long period more than five drachms of tobacco daily, without their vision, and often their memory, becoming affected. In both these forms of amaurosis there is wellnigh absence of all well-marked cerebral congestion, and there is a vagueness in their sthenic or asthenic characters, which may cause hesitation and perplexity on the part of the surgeon, if unaware of the cause in operation. The ophthalmoscopic appearances, as in most old cerebral amauroses, are negative or ill-marked. The optic papillæ, sometimes very white, especially in one of their halves, sometimes slightly injected, have their contours ill-circumscribed or in part effaced. The retina is but little injected, the central vessels being sometimes normal and sometimes enlarged, the central veins being especially so when the affection has reached its last stage. All the characters observed are, in fact, in common with those of other cerebral amauroses. As in many of these, too, the memory is often enfeebled; and in the amaurosis from alcohol there are frequently trembling of the hands in the morning, and at a later period morning vomiting. Both of these varieties are very slow in their progress towards cure, and very refractory to treatment. Usually observed separately, they may be seen together, and in such cases it is not easy to decide whether the tobacco or the alcohol plays the chief part. The treatment of these cases usually occupies a long time, and an essential point, of course, is the discontinuance of the practice that has given rise to the amblyopia or amaurosis. In the few cases in which there is any marked congestion present, this must be met by antiphlogistics; but when this is not very positive, bleeding must only be resorted to with the greatest care. As in all forms of passive or old cerebro-ocular congestion, liberal depletion, even by leeching or cupping, and still more even moderate bleeding, soon completes the loss of vision, and this is only slowly and incompletely restored. On the other hand, external and internal stimulants, such as liniments, flying blisters, camphor, strychnine, &c., resorted to before a moderate antiphlogistic and derivative treatment has been put into force, only aggravate the disease. When there is but little congestion, mild aperients are very useful, such as equal parts of cream of tartar and magnesia, alternating with pills of gum ammoniac, sulphate of potass, and aloes. In drinkers these means will not be borne, and minute doses of rhubarb and magnesia may be substituted. Cold water should be applied to the forehead and eyes, while the lower extremities are irritated by sinapisms, dry cupping, &c. At a later period are indicated stimulant liniments to the circumorbital region, flying blisters first to the nape, or behind the ears, and then to the temples; and in very obstinate cases, the various internal stimuli, as camphor, arnica, strychnine, &c., may be tried.

M. Triquet states that in smokers and drinkers an insidious and obstinate form of otitis frequently becomes developed. There is a kind of numbness or torpor of the ear, with a sense of cold, but rarely any pain. There is no cerumen in the meatus, the membrane and ossicula are in a normal state, and there is little or no vascularity. There is, however, extreme dryness with very minute granulations of the pharynx, nasal fossæ, tubes and middle ear. Frequently both ears are affected, but one has always commenced being so before, and is more deaf than the other. The deafness, without being very troublesome at first, rapidly increases. Noises in the ear almost always exist at an early period, and it is of importance to notice that they assume a hissing sound. The affection exhibits itself in three periods,—1, that of excitement, in which there is intolerance of noise, and a hissing noise in the ear; 2, that of depression, in which the hissing sound disappears, or only remains as a distant and feeble echo; and 3, that of a paralytic condition of the auditory nerve, in which the sense of hearing is more or less completely, and often permanently lost. In this period there are also often trembling of the tongue, embarrassment of speech, and disturbance of vision. The prognosis is very unfavourable, for those patients alone are susceptible of cure who will consent to leave off the bad habit which has produced the affection. For treatment, in the early stages cupping of the mastoïd processes and drastic purgatives, and then alteratives, as calomel, sulphur, and small doses of arsenic, are indicated. Locally stimulating fumigations, and weak injections of strychnine or veratrine have proved useful; electricity has always done harm.

IV. *On Urinary Fistulæ.* By M. Civiale. (Bull. de Thérap. Mars 15 et 30.)

M. Civiale, after relating some interesting examples of supra-pubic fistulæ, proceeds to notice the more common occurrence, perineal fistula.

1. *Urinary Fistulæ, following Lithotomy.*—This, one of the most serious accidents consecutive to lithotomy, is of frequent occurrence, and if it is little mentioned, this arises from the mischievous habit of publishing cases before their treatment is concluded. With Deschamps, M. Civiale believes that these fistulæ are to be attributed to the contusions and lacerations caused by the extraction of the stone. For some persons such a fistula is only an infirmity which the observance of cleanliness renders tolerable, and some patients may live for many years in this way; but such instances are only exceptional, and in most cases the presence of the urine in these abnormal passages gives rise to inflammation, abscess, and other disorders of the tissues. Their course may become obstructed with calculous deposit, and in their vicinity considerable tumours may be formed. The treatment of this form of fistula is notoriously difficult; and M. Civiale does little more than illustrate this fact.

2. *Perineal Fistulæ, resulting from Abscesses caused by Calculi arrested at the Deep Portion of the Urethra.*—Calculi so detained increase in size, and having induced the formation of abscess on the aperture which has served for their discharge, this sometimes persisting, and become fistulous.

3. *Urinary Fistulæ, the result of Wounds and Contusions, or Violence done to the Urethra.*—In this category may be placed the vesico-vaginal fistulæ.

4. *Urinary Fistulæ, resulting from Stricture.*—These are the most numerous, every day presenting us with opportunities of studying their varieties. The portion of the canal situated behind the stricture, distended and irritated by the expulsive efforts, and sometimes by the sojourn of a small quantity of urine, becomes the seat of a phlegmasia, under the influence of which the urine infiltrates. Tumours and abscesses form in the surrounding parts, and on these becoming opened, fistulæ are established. It is, however, especially during the surgical treatment of stricture that the greater number of these tumours and abscesses, which give rise to fistulæ, are formed. If in place of treating stricture with prudent slowness, and observing the necessary minute precautions, this is pursued with suddenness and violence, obstacles being forced without caution, tumours which give rise to abscess and fistula will, ere long, be observed in the course of the urethra, and in adjoining parts. Fistulæ so resulting will be more efficiently treated the earlier the abscess is opened. Such abscesses should be opened, indeed, as soon as fluctuation can be felt; or the tumour even may be opened without waiting for this sign. When the surgeon is consulted in an older case, accompanied by

more or less considerable lesions of the neighbouring tissues, the first essential point is for him to assure himself of the exact condition of the urethra at the orifice of the fistula, and especially a little in front of this. The urine usually passes by the fistula, because the natural passage has not regained its natural suppleness and dilatability; and M. Civiale has cured many fistulæ reputed incurable, and against which all the resources of art have been exhausted, by attending solely to this fact. It is not enough to merely dilate the stricture, with urethrotomy if required, so as to introduce a full-sized instrument, the essential point being the restoration of the suppleness and elasticity of the wall of the canal at this part; after which, the fistula will spontaneously close. After the internal incision of indurated stricture, M. Civiale passes down to the neck of the bladder a metallic instrument sufficiently large to fill the urethra without painfully distending it. On withdrawing this, he bears its extremity down towards the rectum, and brings it against the lower surface of the urethra, upon which the incision has been practised. Repeating this manœuvre on alternate days, he elongates and distends the rigid tissues which constituted the stricture, and which, after a while, recover their normal elasticity. There are exceptions to the success of this practice, and the cause of such is not always manifest. Certain fibrous indurated strictures with nodosities may resist all treatment, as do for the most part old branching fistulæ, which have traversed nearly all the perinæum, groins, &c; but even here such extraordinary cures have been met with as to encourage attempts to be made. The tumefaction and induration of the tissues are chiefly observed in the curves where the fistulæ branch out and have numerous external orifices. The tissues invaded by the urine form frequently enormous masses of great hardness, changing entirely the normal character of the parts; but these cases are usually more frightful than dangerous, especially when the infiltration is circumscribed. If a catheter be left permanently in the urethra, or the flow of urine be established by other means, the tumefaction softens and subsides. Some patients are not able to bear the presence of the catheter for a sufficiently long time, or the infiltration continues notwithstanding; and in such cases, long and deep internal incisions of the urethra are often attended with surprising success. M. Civiale points out how much more effective and rational this practice is than that of opening up the numerous fistulous tracks by large *débridements*. It is to be remarked, that while urinary fistulæ which result from cystotomy are very difficult to cure, the resources of art are very efficacious in fistulæ resulting from urinary infiltration, extensive abscesses and disorders so grave in appearance as to seem to defy all means of treatment.

Summary.

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Military Surgery.—Goffres, Hygienic and Military Condition of the Camp at Chalons. (Recueil de Méd. Mil. Jan.-Avril. An elaborate medical history of this celebrated camp from its establishment, in 1857, to 1864.—Squire, Transport of the Wounded from the Field of Battle. (Boston Journal, March 23.)

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viz., the extra-peritoneal ligature of the pedicle. The two cases in which the pedicle was left within the peritoneal cavity terminated fatally.)—Ikawitz, Extirpation of a Cyst from the Left Ovary. (Langenbeck's Archiv, b. vi. No. 3.)

Patella.—Schreiber, Hygroma Patellæ. (Henle and Pfeufer Zeitschrift, No. 3. Details the anatomy of the bursa patellæ.)—Ball, Spontaneous Inflammation of the Bursa Patellæ during the course of Acute Rheumatism. (Gaz. des Hôp., Nos. 61 and 66.)

Periosteum.—Ollier, The Periosteum in its Physiological and Surgical Relations. (Gazette Hebdom., Nos. 6, 8, 10, 13. In this series of papers Ollier recapitulates his researches upon the osteo-genetic power of the periosteum, and shows the great part to be played by sub-periosteal excision in conservative surgery.)

Polypus.—Rose, Two Cases of Operation for Naso-frontal Polypus. (Annalen des Charité Krankenh., vol. xii. No. 2.)

Purulent Infection.—Baudot on Purulent Infection. (L'Union Méd., No. 64. A critical examination of the various theories, Baudot coming to the conclusion that the disease is a specific fever, just as much as variola is so.)

Syphilis.—Hugenberger, Broad Condylomata, especially in Women. (Petersburg Med. Zeitschrift, No. 2.)

Tongue.—Macgillivray, Case of Amputation of the Tongue. (Australian Med. Journal, Dec. Performed with the ecraseur; the patient, notwithstanding violent hæmorrhage some hours afterwards, continuing to do well nine weeks after the operation.)—Burggraeve, Amputation of the Tongue by the Ecraseur. (Bulletin de l'Acad. de Méd. de Belgique, Feb. 15th.)

Trephine.—Fischer, Clinical Observations and Experiments in relation to the Trephine. (Langenbeck's Archiv, vol. vi. No. 3.)

Urethrotomy.—Perrin, Internal Urethrotomy. (Gaz. des Hôp., Nos. 65, 68, and 71.)—Schultz, Four Cases of Stricture treated by Urethrotomy. (Deutsche Klin., Nos. 10-19.)—Beyran, Indications and Contra-indications of Urethrotomy. (L'Union Méd., Nos. 47-65. Beyran highly approves of internal urethrotomy, regarding the external as quite an exceptional procedure.)

Uterus.—Emmert, Radical Operation for Procidentia Uteri. (New York Journal, April.)—Grenet, Surgical Treatment of Uterine Deviations. (Gaz. des Hôp., Nos. 54-58. Under the title "Hystero-cautomie," Grenet describes a mode of applying the actual cautery which he has found successful.)

Veins.—Maisonneuve, Case of Wound of the Left Brachio-cephalic Trunk. (L'Union Méd., No. 64. An interesting case, occurring in the person of the Secretary of the Russian Embassy, who was stabbed by an assassin. Profuse hæmorrhage followed, but was controlled by securing the tissues over the vein by means of the twisted suture, thus exercising pressure upon the vessel without implicating its coats.)

Vesico-vaginal Fistula.—Duboué, New Auto-plastic Operation for Vesico-vaginal Fistula. (Bulletin de la Soc. de Chir., tome v., p. 358.)

Vitiligo.—Levi, Researches on Vitiligo. (Recueil de Mém. Mil., Mars.) Besides reference to the published cases, Levi gives some original ones, with woodcuts.)

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D.,

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I. The Non-Pregnant State.

On Amenorrhœa from Psychical Causes, and especially from excessive Dread of becoming Pregnant, or from strong Desire to have Children. By Dr. A. Raciborski. (Arch. Gén. de Méd., May, 1865.)

In this paper Dr. R. cites cases tending to show that menstruation may be suspended under influence of strong mental emotions. He supports his proposition by citing Cl. Bernard's theory of the action of the great sympathetic nerve upon the vaso-motor nerves. The excitation of these nerves by the great sympathetic may arrest the physiological congestion of the ovaries preparing for ovulation. He regards this form of amenorrhœa as analogous to the diversion of blood from the vessels of several organs under mental emotion.

II. Pregnancy, Labour, and Childbed.

Clinical Report of the Royal School of Midwifery in Milan: Director, Professor Lazzati. By Dr. Casati, Second Assistant. (Milan, 1865.)

The publication of reports of the lying-in hospitals of Berlin and Milan affords an opportunity of exhibiting and comparing the obstetric practice of Germany and Italy. The report of Dr. Casati of a year's history of the lying-in hospital of Milan, as conducted by Professor Lazzati, is especially interesting: 554 labours took place during the year 1864; of these, 6 were abortive, 63 premature, and 485 mature; 503 were natural, 51 preternatural or instrumental. In 410 cases the head presented in the first position; in 110 in the second; 30 cases of breech; 9 of shoulder; 3 of face; and 1 undetermined; 307 were primiparæ. The women are received some little time before labour; hence there is information as to the diseases of pregnancy. 167 women suffered variously before labour. The most frequent diseases were: intermittent fever, 6 cases; uterine plethora, 12; cerebral congestion, 24; bronchitis, 15; phthisis, 9; gastritis, 10; syphilitic diseases, 14; eclampsia, 7; various forms of ascites and œdema, 16; osteomalacia, 6.

Case—Cerebral apoplexy; death; autopsy.—A primipara, aged twenty-three, in the beginning of the eighth month, was suddenly seized with severe frontal and occipital cephalalgia; unconsciousness quickly followed; pupils not contractile; coma; pulse vibratile, sustained, but slow; respiration stertorous; inferior extremities cold; the whole body rigid as a statue. Veins in both arms were opened; little blood flowed at first, then more. The bleeding was repeated, and premature labour was induced. She died next day.

Autopsy.—An extravasation of blood was found in the centre of the pons Varolii. There was hypertrophy of the thyroïd gland; the heart was half as large again as normal, empty; concentric hypertrophy of the left ventricle.

Osteomalacia.—In the six cases, the usual symptoms of pains and impossibility of standing erect were present. The only circumstance Dr. C. calls attention to is, that all the patients came from the flat district of Milan, where misery prevails. Nearly all were weavers in cotton, were badly fed, and with a little of maize-bread. Not one came from the higher parts of the city, or from the Lago Maggiore. These observations correspond with the history of former years.

There was a remarkable case of *softening of pelvic symphyses*. The patient was obliged to keep her bed during the end of gestation; but very soon recovered after labour.

A case of *albuminuric amaurosis* was observed. *Phthisis* held a mild, if not stationary course in pregnant women.

Convulsions.—A case (1) of eclampsia at the beginning of the eighth month in a primipara, without albuminuria, was observed. She had suffered from epileptic fits four years before. She was bled; leeches were applied to the mastoïd processes, ice to the head. Fits and delirium returned; second bleeding to 300 grammes; violent delirium; no sign of labour; third bleeding of 200 grammes. Next day, two more fits; blood drawn not buffed. Next day another violent fit and fierce delirium. She got better in a few days, and labour came on naturally eighteen days after the first fit. Child fully developed, alive. Mother recovered.

Case 2. A primipara, aged twenty-one, being in ninth month, *and having been twenty days in the hospital*, was seized with a fit and passing coma. Fit returned; bleeding; ice to head. Other fits. Labour set in; bleeding; another fit, and deep coma. Head in first position; child extracted by forceps; fully developed, alive. Unconsciousness continued awhile. Two leeches to the mastoïd processes. Next day she was better; she recovered. No albumen was ever found in her urine.

Case 3. A primipara, aged thirty-three, in eighth month, had an eclamptic fit. Bleeding; ice to head. Little relief. Four fits followed. Blood plastic, not buffed. Labour set in. Head in first position. Albumen in urine abundantly. Same day another fit; bleeding again. A ninth fit occurred on delivery, followed by deep coma. During this the fœtal heart ceased beating. Male child extracted by forceps, dead. Half an hour after delivery, tenth fit. Next day she was better, but febrile. Twelve leeches to the mastoïd processes; no more albumen in urine. Twelve more leeches. Delirium broke out. She was transferred to the Ospedale Maggiore, where she eventually recovered.

Case 4. Primipara, aged eighteen, at term had a first fit two months after entering hospital. Seven fits the same day; coma. Bleeding. Two fits followed; therefore a second bleeding. Fits, threatening asphyxia and apoplexy. Urine abundantly albuminous. Labour commencing; it was accelerated by puncturing membranes. Child presented in second breech. Twelve leeches to the mastoïd processes. The blood drawn was not buffed; it was soft; much serum. She was better next morning, but a thirteenth and fourteenth fit appeared later in the day. Coma returned. Child fully developed, male, recently dead, was extracted. A fifteenth fit after labour. The following day she was calm, complaining of head-ache. Urine less albuminous. Bleeding, ice to head. Next day no albumen. In three weeks she left, quite well.

Case 5. Primipara, twenty-six, at term, labour commencing, membranes had ruptured, head presenting, when pulse became vibratile, as if febrile, pains became irregular, and labour not advancing, Professor Lazzati regarding the symptoms as those of *uterine* and *cerebral plethora*, and fearing eclampsia, bled to 400 grammes with apparent advantage. But later eclampsia appeared, followed by coma, during which the patient "*placed herself on her right side,*" and she ever returned to this position when she was put upon her back, "*holding the legs bent upon the thighs, and these upon the abdomen.*" Another fit. Delivery of full-grown male child, alive, by forceps. It was apoplectic, but recovered under bleeding from umbilicus. The urine after the second fit was rich in albumen. A third fit followed labour immediately. In the succeeding days, symptoms of cerebral congestion. Quite recovered. The urine of the first and second puerperal days presented traces of albumen; on the third day, none.

Case 6. Primipara, eighteen, at term, labour appearing, proceeded slowly, contractions irregular. Bleeding. Contractions more regular. Head presented. Eclampsia; coma. Bleeding; another fit soon after. Fœtal pulsation ebbing. Forceps. Male child, well developed, apoplectic, but restored. Uterus relaxed after labour; some hæmorrhage; ice, secale, cold acidulated injections into uterine cavity, frictions on fundus uteri, compression of aorta. Recovered. The urine never showed any albumen.

Case 7. Second pregnancy, age twenty-seven. Uterus of immense size. During her sojourn in hospital feet swelled. Albumen in urine copious. Labour: Membranes ruptured spontaneously, but contractions then fell off; patient became restless. Bleeding to 300 grammes. A second fit; a second bleeding, but *a less generous one* (*meno generoso.*) Labour still lingering; patient comatose. Urine rich in albumen. Patient *would only lie on her right side.* Child delivered by forceps. A second child, presented by nates, was extracted. Both were alive; female, well developed. A fifth fit after delivery. The blood drawn first had a slight buffy coat, the second none. Another fit; twelve leeches. Afterwards six fits in succession. Bleeding to 300 grammes. Next day there had been no more fits. Copious albumen. Fourth day, still albumen. Diarrhœa persisted for several days. She left quite well; her two children were sent to the Foundling.

The author calls attention to the following facts:

(1.) That, notwithstanding the gravity of the cases (some amongst us may feel additional surprise, considering the very generous bleedings resorted to), there was no death.

(2.) The proportion of cases of eclampsia, 7 in 554, is very large.

(3.) All the cases occurred in women who had been for a longer or shorter time in the hospital.

(4.) Four cases, which occurred in the institution in 1863, also all recovered. Professor Lazzati attributes his success to the free and repeated bleedings.

(5.) In six of the seven cases the patients were primiparæ.

(6). The almost constant position on the right or left side, with the legs and thighs bent, taken by the patient between the fits.

(7.) Six living children; one only being extracted dead.

(8.) Delirium in two cases.

(9.) Albuminuria in four cases only.

(10.) Among the albuminuric cases only one was anasarcous, the one with twins.

Labour.—The cases of pelvic deformity were frequent. A wise rule, instituted by Professor Lazzati, requires that every woman shall, on admission, be subjected to complete examination. The state of the pelvis, and the capacity to go through labour at term, are thus ascertained early. All the measurements are entered. In fifty-two cases, the dimensions resulting from external measurement by Baudelocque's compasses, and those ascertained by the finger, are given. A valuable table is thus formed, enabling us to test the accuracy of the indications given by external measurement. This table cannot be given at length; but it shows that whenever the external sacro-pubic diameter was only from six inches to six and a half inches, the internal or true conjugate was three inches, or only slightly more. These observations thus confirm the value of the method. In all these fifty-two cases there was marked contraction of the pelvic brim from rickets—a very large proportion, which, placed in connexion with the six cases of osteomalacia, exhibits the influence of very unfavourable hygienic conditions over the poor of Milan. A similar remark applies largely to the practice of the lying-in hospitals of Germany. This circumstance, and also the very large proportion of primiparous and single women, go far to explain the great mortality of the continental lying-in hospitals. Certainly destitution and immorality do not operate in nearly so high a proportion in England, whether in hospital or domiciliary midwifery.

Prolapse of the Funis.—12 cases occurred. In 5, it happened in first cranial presentations, in 1 in second cranial, in 2 in breech, in 4 of shoulder. Turning or extraction was generally resorted to as early as possible. The greater number of children were saved.

Congestion of the Uterus.—The observations upon this condition as a cause of difficult labour are interesting. Irregularity of uterine contractions, their little or no expulsive power, the predominance of the circular over the longidudinal fibres, the resistance of the neck, appear to be due to this cause Such cases were generally treated by baths, general bleeding, oftentimes repeated. It is stated that the irregularity of contraction quickly ceased, and the labour went on favourably.

A case of face-presentation, with slight pelvic contraction, is given in detail. Labour lingering from uterine congestion. She was bled freely. A shivering fit occurred during labour. Child was born dead. Slight hæmorrhage. Soon after she suddenly collapsed, a slight convulsion appeared, and death took place. The heart was found hypertrophied, especially the left ventricle.

Operations.—In seventeen women *turning* was practised: in four cases on account of prolapsus of the funis; once for placenta prævia; once for rupture of the uterus; once the patient being apoplectic, and in one an arm came down, there being also contraction of the pelvis. In all the above the occiput presented. In nine cases turning was indicated by shoulder-presentation. In three of the cases there was marked narrowing of the brim—i.e., in one the conjugate diameter was 3·5 inches, living child, mother recovered; in one the conjugate was 2·9 inches child, died shortly after birth, mother recovered; in one the conjugate was 3·2 inches, child (of eight months) alive, mother did well.

Rupture of the Uterus.—*Case.* Head in first position; irregularity of uterine contractions. Bleeding. The dilatation of the uterus still incomplete; during a strong contraction, and violent bearing-down, the patient complained of acute pain in the left anterior side of the uterus, followed immediately by a sense of general prostration and arrest of labour. There was no escape of blood, but the pulse fell; countenance became anxious. On examination blood, fluid and in clots, escaped. The feet were found at the fundus of the uterus. The child was extracted dead; it was of full size. The mother did not rally; she died about twenty-four hours after the rupture.

Autopsy: A small quantity of blood was found in the iliac cavity; some plastico-puriform effusion on the intestinal peritonæum. The rent involved the anterior wall of the vagina; the neck of the uterus was torn longitudinally on the right side. The placenta was attached posteriorly at the fundus. The pelvis seemed well formed; the conjugate measured 3·7 inches. The factors concerned in the rupture were the thinness and resistance of the inferior segment of the uterus, the slight pelvic contraction, the large size of the fœtus, the irregularity of the contractions, and the violent wilful bearing-down.

The Forceps.—The Milan school follows the precepts of Lovati in the use of this instrument. He teaches that the forceps should always be applied to the sides of the head. To apply it differently—that is, to place the blades in the sides of the pelvis when the head is transverse or oblique—is contrary to the principles which govern the mechanism of parturition; the diameters, which ought to be lessened, are increased; there is more danger to the child's life. By applying blades to the sides of the head, the bi-parietal diameter is reduced, as it is naturally reducible, and is reduced in natural labours. The instrument was applied in a first series of nine cases, of which four were cases of pelvic contraction, three of convulsions, one of irregular uterine contraction maintaining the left transverse position of the head; one case of face, labour being protracted by resistance of the uterine neck, irregular uterine contraction, and general debility.

Case 1. Occiput in second position; pelvic contraction; conjugate diameter 2·8 inches; head arrested at brim, moveable; bled three times; delirium; forceps applied, a male child deeply apoplectic, but restored. Metro-peritonitis. Four bleedings, and leeches. Left hospital still ill.

Case 2. Occiput, second position; conjugate diameter 3·1 inches. Irregularity, slowness, deficient expulsive power of uterine action; bleeding. Forceps. Male child fully developed, which quickly recovered. Severe metro-peritonitis; puerperal fever, which, notwithstanding energetic antiphlogistic treatment (two bleedings, thirty leeches, blisters, ipecacuanha, &c.), carried off the patient in fourteen days. Autopsy revealed the usual results of plastic and sero-puriform effusion in the peritoneal cavity, and no lesion of the uterus.

Case 3. Occiput, first position. Conjugate diameter, 2·10 in. Irregular labour through resistance of the os uteri from plethora. Three bleedings and baths. Head free above the brim. Forceps. A moderately-sized female child, dead. On account of inertia of the uterus, the placenta was extracted; hæmorrhage was arrested by local application of cold and frictions on the fundus uteri. Next day, symptoms of metritis, bleeding, poultice to abdomen. Fever, a slight laceration of perinæum put on a gangrenous aspect. It was cauterized with fuming hydrochloric acid. Another bleeding, ten leeches to groins, two blisters to the abdomen, aconite. Next day she was worse, and died. *Autopsy.*—Gangrenous appearance of inner surface of uterus; suppuration and gangrenous process of the cellular tissue of the lesser pelvis, especially in front.

Case 4. Occiput, transverse position of head. Irregularity and deficient activity of pains from uterine plethora and predominance of the circular over the longitudinal fibres. Two bleedings, a bath. Head on brim. Forceps. Live child, well developed. Miliary eruption. Recovery.

Case 5. Occiput, first position. Conjugate diameter, 3·2 in. Irregular action of uterus, resistance of uterine neck. Bath, bleeding, forceps. Live male child. Laceration of perinæum, which on second day assumed a bad aspect, a fetid odour, and gangrenous colour; cauterization with hydrochloric acid; a healthy sore resulted, and in three weeks patient left quite well.

Case 6. Face, in first position. Irregularity of uterine contractions and resistance of orifice. Bleedings, baths, forceps. A live, developed child. Recovery.

The applications of the forceps in the cavity or at the outlet were less numerous and important.

Case 7. Occiput in second position. Arrest of head at outlet from impeded movement of rotation from deformity of the bi-ischiatic diameter. Forceps. Living child. Recovery.

Case 8. Occiput, second position. Conjugate diameter, 3 in. Head arrested at brim. *The blades of the forceps were applied, and the handles being grasped by an assistant, the head was perforated between the blades.* Head then delivered by traction on forceps. Next day, tympanitis; a slight laceration of the perinæum exhibited a gangrenous and fetid condition. Hydrochloric acid. Six leeches to groins, afterwards ten leeches to abdomen, and two blisters. Death in 72 hours after the operation.

Autopsy.—The portion of vagina attached to the neck of uterus, and the neck, was pulpy, black, with loss of substance from gangrene. Purulent transudation near right broad ligament.

Cephalotripsy.—Dr. Casati complains that in the interesting monograph of Lauth (Strasbourg, 1863), relating one hundred and eighty-five cases of cephalotripsy, there is no Italian name, it thus appearing that the operation is exclusively French and German. Dr. Casati, however, refers to several Italian reports, ex. gr. of Pastorelli, 1854; Chiara, 1862; Giordano, 1861; Piazzo, of Palermo, 1861; Esterle, 1861. In Milan, the rules of Lovati are observed: the instrument is used when the conjugate diameter is not less than twenty-one lines; craniotomy by Smellie's perforator must precede. The instrument used is that of Depaul modified by Charrière. The cephalotryptor must always be applied in the sides of the pelvis, and when cephalotripsy and craniotomy have been effected, the cephalotryptor must be turned, so that the pelvic curve is directed to the right or left according to the position of the head. The author says the instrument so applied failed only once. He condemns the repeated cephalotripsy recommended by Pajot.

Case 1. Occiput, first position. Great deformity and contraction from osteomalacia. Prolapsus of cord, cessation of pulsation. Craniotomy with Smellie's perforator; cephalotripsy; sharp crotchet; extraction of a male, fully-developed child. Suckled a foundling. Recovered.

Case 2. Breech, second position. Pelvic contraction. Conjugate, 2·1 in. Arrest of head at brim. Tedious labour; ineffectual attempts outside hospital to extract the head, which was left in utero, the body being separated. *Rupture of the uterus.* Craniotomy and cephalotripsy. Peritonitis; perforation of intestine by gangrene. Death.

Autopsy.—A rent of uterus in the lower left side, involving the peritonæum and the substance of the neck, opening a communication between the vagina and peritoneal cavity, through which a loop of intestine falls. In the lowest part of this loop are several holes, caused by destruction of the walls of the intestine; liquid fæcal matter issues. The edges of the uterine wound are gangrenous.

Case 3. Occiput, second position. Great pelvic contraction. Conjugate, 2·9 in. Labour tedious; irregular uterine action. Bleeding, bath. Attempt to extract with forceps. Craniotomy and cephalotripsy. Extraction of fully-developed child. Metro-peritonitis. Discharged convalescent.

Case 4. Occiput, first position. Contraction of pelvis from rickets. Conjugate diameter, 2·11 in. Head free above brim. Trial of forceps. Craniotomy and cephalotripsy. Extraction of female child, fully developed. Metritis and typhoïd; bleeding; death in fourteen days.

Autopsy.—Uterus quite involved; near the neck, the mucous membrane and muscular wall are so crushed that only the peritonæum remains.

Gastro-hysterotomy was performed twice on the living woman, and once post-mortem.

Case 1. Occiput, first position. Pelvic contraction of the third degree. Pelvis more inclined than normal. There was a concavity at the sacro-lumbal union; sacrum short, carried backwards; iliac crests very little expanded, the left less elevated than the right; approximation of the rami of the pubis; approach also of the tubera ischii. External measurement of conjugate diameter gives 7in.; the bi-ischiatic diameter is 2·6in. There was extreme projection of the promontory. Measure taken from the point of union of the descending rami of the pubis with the ascending rami of the ischia to the promontory, is 3·4in. Labour set in on 20th January, 1864, at 7 P.M. It was then further ascertained that the sacro-cotyloïd distance on either side was only 18 lines = 0·040 mm. The child being alive, it was determined to deliver by Cæsarian section. The placenta presented under the incision in the uterus. A live, well-developed girl was extracted. Ice was applied to abdomen after suture. Death thirty-nine hours after the operation.

Autopsy.—Uterus healthy; the wound was in the anterior median part, commencing near fundus. In peritoneal cavity was sanguinolent serum.

Case 2. Occiput, first position; pelvic contraction in third degree, from rickets; conjugate diameter 2in.; external conjugate by Baudelocque's compasses gives 5·6 in.; outlet of pelvis nearly normal; labour at term. Section being determined upon, the fœtus was baptised. The uterus contracted, and aided the expulsion of the child with great vehemence. Child well developed, female, alive. The placenta was expelled entire; wound in abdomen closed by sutures; ice applied. Hæmorrhage, however, appeared at the wound. This was repeated next day. Collapse set in, and death followed on the fifth day after the operation.

Autopsy.—The parietal peritonæum below the wound showed a plastico-puriform deposition; gangrene also affected the anterior surface of the uterus. The uterus was quite contracted; the two lower thirds of the wound gaped, and was gangrenous. The upper third of the abdominal wound had united by skin, whilst in the remaining part were two gangrenous points.

Induction of premature labour was carried out 17 times. In one case the motive was dyspnœa, threatening suffocation; in the remaining sixteen the cause was pelvic contraction from rickets. The cases are related in detail. The following is a general summary: In three cases the conjugate diameter measured 2·4 in.; in one, 2·9in.; in two, 2·10in.; in one, 2·11in.; in six, 3in.; in two, 3·1 in.; and one was a case of osteomalacia. Nine women were primiparæ (a remarkable circumstance, showing the value of the rule of the hospital, which enjoins a minute exploration of the pelvis on the admission of the patient). In six cases, the method employed was the elastic catheter, without stilet; in five cases, the catheter and the sponge, as preparatory; in two cases, vaginal injections preceded use of sponge and catheter; in one case the membranes were punctured; in three of the cases, the introduction of the catheter accidentally ruptured the membranes; fourteen times the occiput presented; twice the breech. In two cases, the induction was in the seventh month, eleven times in the eighth month, and five times at the beginning of the ninth. Seven labours proceeded normally; three were natural, but difficult, from resistance of the neck; once turning was resorted to on account of prolapse in the cord; in the two breech cases, extraction was resorted to, once the forceps, twice craniotomy, and in one case the Cæsarian section. Thirteen children survived; in eight puerpery was normal; in one there was softening and inflammation of the left sacro-iliac symphysis; in three metritis; in two metro-peritonitis; in one mastitis, which began during pregnancy; in one hæmorrhage and syncope; four died.

The Child.—521 were born alive, 42 dead, or 1 in 12. A case was observed of hydrocephalus complicated with spina bifida. Of 37 that died in hospital, the cause in 19 was prematurity; in 9, apoplexy or asphyxia, caused by labour; 4, scleriasis; 1, anencephalia; 1, hydrocephalus; 1, pneumonia; 4, cyanosis; 1, enteritis; 1, syphilitic pemphigus; 1, peritonitis; 1, stenosis of the small intestine.

The Puerperal State.—563 was the number of puerperal women under treatment during 1864; 358 left the hospital well; 159 passed into the Foundling as nurses; 27 died; and 19 remained on the 31st December. There was thus a mortality of 4·7 per cent. The greatest amount of sickness was in February, then in January. The year, indeed, opened with metritis, sometimes accompanied by peritonitis, which arising from rheumatic causes (cold), and not from epidemic influences, quickly got well under the use of antiphlogistic remedies—bleeding, leeches, blisters, calomel, &c. Towards the end of January appeared miliaria as the sole expression of a morbid puerperal process. In February this was complicated with localized puerperal fever, as metro-peritonitis, parametritis, endometritis, which assumed fatal influences in March, continued all April, declined in May, and was very rare in June, July, August, September, and October; the few cases of illness in these latter months being independent of epidemic influences.

192 persons, or more than one-third of the whole, suffered from some form of illness. The most frequent diseases were, metritis with miliaria, 22 cases; simple metritis, 20; metro-peritonitis, 10; metro-peritonitis with miliaria, 8; miliary fever, 30; puerperal fever, 10; metrorrhagia, 17.

Amongst the facts specially deserving notice is the experience of the hospital concerning the use of *sulphite* of magnesia in puerperal affections. This medicine was given in 22 cases, in doses of 20 grammes divided in ten powders, taken within twenty-four hours as a drink, excluding all acid substances. Amongst these 22 cases were some in which it was not possible to give more than a few powders, because the condition of the patient became so bad that it was rejected. Death occurred in 4; 2 suffering from puerperal fever, at the time epidemic; sixteen patients recovered under the use of the remedy. What is the action of it? This is perhaps best answered by a case. A primipara, aged twenty-three, entered in February, 1864; was delivered naturally at term on 25th April; on the 27th had a chill, which lasted the whole day; abdomen tender; uterus enlarged; not suckling, because she had paid for the admission of her child into the Foundling. 29th, slight fever; abdomen painful; sulphite of magnesia; 30th, sweats in the night; tongue foul; one stool; sulphite repeated. Towards the evening the lochia became fetid; three stools; little fever. 1st May, pulse frequent; nine stools; sulphite repeated; six more stools in the day. 2nd, three stools in the night; a fourth of the dose of sulphite; sweating having persisted, numerous miliary bullæ were observed under the breasts; the uterus was diminishing in size; sulphite discontinued; ipecacuanha (50 centigrammes in six powders). 3rd, decided fever; abdomen painful; slight metrorism; two stools; lochia regular; continued ipecacuanha; 4th, pains continued; the miliaria remained; one stool; fever continued. 5th and 6th, improving; no pain. In fifteen days after labour dismissed well. She took 70 grammes of sulphite in three days and a half.

Some women, after taking one or two doses, refused to take more, complaining of the nauseous taste; commonly frequent stools and even diarrhœa followed the use; the stools had a fetid odour like that of rotten eggs; and although the wards were airy and by no means crowded, the bad odour produced was so great as to become very offensive and even noxious to the nurses. This odour even seemed to contaminate the linen, and to adhere to them through washing and the processes of the laundry. Dr. Casati refers to the objection that the sulphite exposed to the air might be converted into sulphate, and thus the purging might be accounted for; also that diarrhœa is common in purpura. The latter objection does not avail, because prior to the use of the sulphite the patients were costive. Upon the whole, he is unable to affirm, from present observations, whether the medicine has any power of destroying or of modifying the miasmatic element or ferment, the special virus that produces or maintains the puerperal process, or miliary fever.

Peritonitis with thrombismus.—The author cites the writings of Barnes, Giordano, Esterle, Virchow, Gritti, Padovani, Oppolzer, and others, upon thrombosis and embolism, and relates one case observed in the hospital. A woman, pregnant for the third time, had suffered from intermittent fever. On admission she was anasarcous, with cough, dyspnœa, had sensation of indistinct vision, albuminuria. She was bled; blood buffed. Labour set in, and resulted in the birth of a boy, live, healthy, but premature. The dyspnœa was relieved; but the abdomen became painful, light meteorism; anasarca persisted and the albuminuria. Bleeding. Cream of tartar, nitre, and digitalis. Next day, dyspnœa and fever returning, another bleeding. On the fifth day she became agitated, lips and hands cold and blue, sense of suffocation, sub-delirium, loss of speech, orthopnœa, and rapidly death.

Autopsy.—In the pulmonary vessels, as far as the branches of the third and fourth degree, were fibrinous coagula, whitish, slightly adhering to the walls, filling the calibre of the vessels, and coming out entire when extracted. At the point of origin of the pulmonary artery the coagulum was more resisting, and contained in its interior a commencement of detritus. In the abdominal cavity were six quarts of yellow serum, puriform. Similar fibrinous clots were found in the vessels of the neck (jugular and carotid), in the upper part of the aorta, in the bronchial arteries and veins; but there was nothing of the sort in the vessels below the heart. On dissection of the eyes, it was found that the papilla of the optic nerve and a portion of the surrounding retina was spotted with points of white granules of inflammatory matter, and the retina beneath was turbid and thickened. In one of the eyes, in addition to these granules, were several hæmorrhagic spots.

In his summary the author remarks that no case of phlegmasia dolens occurred.

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On the Statistics of Puerperal Insanity as observed in the Royal Edinburgh Asylum, Morningside. By Dr. J. B. Tuke. (Edin. Med. Journ., May, 1865.)

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MEDICAL INTELLIGENCE.

Leprosy Committee of the College of Physicians.

SINCE our last notice, in the January number of this Review, of the proceedings of this Committee, and of the work which up to that time had been done, a large contribution of most valuable materials has been received, through the Secretary of State for India, from the Bengal Presidency. It forms a goodly printed volume of five hundred folio pages, containing the replies to the interrogatories of the College from medical men, of the civil and military departments, scattered over the wide domains which are under the administration of the Governor-General—viz., at stations in Bengal, the North-west Provinces, the Punjab, Central India, Rajpootana, British Burmah, and Singapore. They considerably exceed a hundred in number, and many of them have been very elaborately and carefully prepared. Altogether, the mass of information as to the history of the disease as it exists at the present time in the different provinces of India, and illustrative of the hygienic and social condition of the lower classes of the native population, thus brought to light, would alone have sufficed to have made the work, which the College has undertaken at the request of the Colonial Office, a matter of much public interest. The Committee had previously received valuable communications from the Madras and the Bombay Presidencies, and also from Ceylon. To deal with such an amount of documentary evidence from all parts of the world as has been now accumulated will be a task of no ordinary labour. The best wish we can express for the gentlemen engaged in the work is that the scientific and practical value of their report, when it appears, may be in proportion to the labour which must necessarily be expended upon its preparation.

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NOTICE TO READERS.

The Editor is particularly desirous of having all Reports of Hospitals, Asylums, Sanitary Boards, Scientific Societies, &c., forwarded to him; as also Inaugural Lectures, Dissertations for Theses, Medical and Scientific Addresses, &c.

THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL REVIEW.

OCTOBER, 1865.

PART FIRST.

Analytical and Critical Reviews.

Review I.

Clinical Observations on Diseases of the Heart and Thoracic Aorta. By Peyton Blakiston, M.D., F.R.S., &c.—*London*, 1865.

A retrospect of the progress of any science by a writer who has himself been a successful labourer for its advance; who, after decades of years spent in its service, sits down in the full possession of the necessary faculties for the task, to sum up its gains, to tell the story of how knowledge was acquired, how enigmas were explained, and how obstacles were successfully overcome, has no ordinary charm for those who are and have been his fellow-workers. It would be too much to expect that such a retrospect should be a perfect picture, that all portions of it should be sketched with an equally graphic and firm pencil, or should be treated with the same breadth and glow of colouring. Those parts will of course occupy most of the narrator's thoughts on which have been bestowed the labours of himself and others who have been most intimately his co-workers, and consequently they will assume a magnitude and importance to which perhaps, in strict justice, they were not entitled. Yet these portions of his story will in reality be the most valuable, for they will be given with a vividness and exactness which may be looked for in vain in the works of professional historians who draw their accounts from books, and for whom literary research must supply the place of personal recollection.

Such a picture of the progress of medicine during the past thirty years Dr. Blakiston has drawn for us in the Introduction to the work the title of which stands at the head of this article. We do not regard the Introduction as the most valuable portion of the work, but it is undoubtedly one of the most attractive. We admit that Dr. Blakiston is not inclined to under-estimate the value and importance of certain advances in diagnosis, pathology, and treatment, in the accomplishment of which he has played a prominent part; but we should no more feel inclined to criticise him on such a score than we should be to humble the honest pride of the veteran who

"Shoulders his crutch and shows how fields were won"

for our entertainment. If thirty years' close observation of disease, most of them spent in the wards of a large hospital—if considerable faculties of perception and reflection, sharpened by the highest general and professional education civilization can afford—if industry and tenacity of purpose, which for a third of a century go on collecting facts bearing upon a particular department of pathology—be qualifications commanding the attention and deference both of reader and reviewer, they may assuredly be allowed to deepen a man's reliance on himself and on the work he has accomplished, without exposing him to the charge of egoism.

Dr. Blakiston's picture is a triptich. He arranges his narration under the three heads of Pathology, Diagnosis, and Treatment. Under Pathology the history of the advance of knowledge as to the nature and causes of *dropsy* is the first subject of which he offers a sketch. Starting from "a deficient action of the absorbents" as the current doctrine thirty years ago, he shows that the harbinger of progress was the observation of Dr. Blackall that in certain cases of dropsy the urine was albuminous; then came the keen, sagacious generalization of Dr. Bright, that cases of dropsy with albuminous urine depended on disease of the kidneys. The microscope and chemistry then lent their aid. Different diseased conditions of the kidney were distinguished from each other; and it was also shown that in albuminuria the blood was deficient in albumen, whilst it retained an abnormal proportion of urea. An enumeration of the progressive steps by which congestion of the kidneys leads to escape of the serum of the blood into the uriniferous tubules, clogging, disintegration, and desquamation of the secreting cells, and as a result impoverishment of the blood—diminution of its red corpuscles and other solid constituents—and an increased property of transudation in the watery serum, completes the author's sketch of the history of advance in the pathology of renal dropsy.

The connexion between cirrhosis of the liver and ascites was readily traced as soon as some accurate knowledge was obtained of the structural changes which the liver undergoes in that disease; and a due weight was allowed to the great fact, originally proved by the experiments of Lower, that effusions of fluid may depend on venous congestion produced by a mechanical obstacle to the return of blood to the heart. The same great principle was further exemplified by the progress of knowledge of cardiac dropsy. The idea held by so distinguished an authority as Dr. Hope, that a dropsy might arise from the capillaries being congested by an unusually large supply of arterial blood propelled by an hypertrophied left ventricle, is now not believed to be tenable. Cardiac dropsy is the result of an obstruction in the heart itself, and this is either originally tricuspid insufficiency, permitting regurgitation into the right auricle and the venous system, or it is an obstruction at some one of the cardiac orifices, which produces in its turn dilatation of the right heart, with concomitant tricuspid insufficiency; so that the latter condition is, *par excellence*, the proximate cause of cardiac dropsy. It is well known that to Dr. Blakiston is due the merit of having isolated and substantiated this important fact. We would guard ourselves, however, against being misunderstood. We agree with Dr. Blakiston that tricuspid regurgitation is the common cause of cardiac dropsy as far as the heart is concerned, but we do not wish our readers to forget that other causes must be conjoined before dropsy *necessarily* occurs from tricuspid regurgitation. Dr. Walshe has maintained that the cause of dropsy is never in the heart alone, and he enumerates all the cardiac conditions which have been supposed to give rise to it, and triumphantly asserts that they may exist, one and all, without any œdema resulting. He therefore looks for another but concomitant cause in the condition of the blood—spanæmia or anæmia. We agree with him that the obstruction to the return of the blood may in some cases be required to be supplemented by a watery condition of the circulating fluid, although that this condition of blood in all cases of cardiac dropsy plays a conspicuous part in the *rôle* of causes, we deny; all we advance is, that cardiac dropsy, as far as the heart is concerned, is the result of an obstruction to venous return, arising from original or superinduced tricuspid regurgitation, or at least dilatation of the right side; and the latter, we know, tends directly to the production of the former condition. Of course, the condition of the right heart may be the result of obstruction or regurgitation at the pulmonary orifice, at the mitral orifice, or even at the aortic; but these are not the *proximate* cardiac causes of cardiac dropsy.

From dropsies Dr. Blakiston passes to the kindred subject of internal hæmorrhages, cerebral apoplexy, pulmonary apoplexy, and aneurysm. As great a change has taken place in our ideas of the pathology of internal hæmorrhages as in our notions of dropsy. When cerebral hæmorrhage was believed to be generally dependent upon the abnormally large and powerful stream of blood pumped into the cerebral capillaries by an hypertrophied left ventricle, it wonderfully simplified our ideas of treatment. We have, however, got beyond that, and we now know how important a part disease of the arteries enacts in its production, and that it is far more probable that if the heart has any prominent place in the causation of the attack, venous congestion arising from tricuspid regurgitation will be the true *origo mali*, rather than arterial congestion from an hypertrophied heart. So of pulmonary apoplexy. We now recognise mitral regurgitation, exaggerated in many cases by hypertrophied left ventricle, as its most important cause, and practically find that it has but little to do with hypertrophy of the right ventricle. The diseases of the arterial coats which are the first steps to the production of aneurysm have placed the forcing power of an hypertrophied heart in the position of a secondary and supplementary rather than of a primary cause of that affection.

The different forms of fatty degeneration, that which in the arteries constitutes atheroma, the existence of a materies morbi in rheumatism, the isolation of the acid poison of gout, and the high probability that the lactic acid plays the analogous part in the causation of rheumatism, and the light which Dr. Beale's microscopic researches have thrown upon nutrition, inflammation, and suppuration, fill in the picture which Dr. Blakiston gives us of the advances made in pathology during the past thirty years.

The second compartment of Dr. Blakiston's historical review is occupied by diagnosis. We have already said, that it would be unfair to expect anything like completeness in such a sketch as Dr. Blakiston offers us; but we think he might have been somewhat more comprehensive in his notice of the advance of diagnosis. His section on this subject does not refer solely to improvements in means of diagnosis, but includes symptomatology and semeiology; for the only addition which he allows to be of any practical importance in auscultation since the time of Laennec is Dr. Jackson's observation, that prolonged expiration is a sign of incipient phthisis. Now, we do not think this is true or fair to the present and past generation of auscultators. Take the condition singled out by Dr. Blakiston—the first stage of phthisis: Laennec's knowledge of the physical signs of the first stage of phthisis was limited to two items—diminished resonance on percussion, and diffuse bronchophony. It is true that it may be said that to look for such phenomena as diminished or divided or quasi-tubular inspiratory murmur, or systolic bruit in the subclavian arteries, as evidences of incipient phthisis, is not to restrict ourselves to *practical* improvements, but to diverge into unnecessary refinements. To this, all we can say is, that all advance in such an art as auscultation must be in the direction of refinement, and that these signs are of practical importance to persons who will look for them and study them, and that by others improvement of any kind would be unappreciated. Dr. Blakiston enumerates, under the head of Diagnosis, the arrival at what he believes to be a juster view of the production of the impulse and first sound of the heart than that promulgated by the committee of the British Association for the Advancement of Science, consisting, it will be remembered, of Drs. Williams, Todd, and Clendinning; and he quotes the experiments of Dr. Halford, as fully bearing out and confirming the demurrer which he had entered to the conclusion of the committee, that the systolic sound was produced by the muscular contraction of the ventricle. Allowing that, until some flaw is discovered in them, Dr. Halford's experiments must be accepted, and admitting that it is in the highest degree improbable that the closure of the mitral and tricuspid valves should be noiseless, we yet do not see how this falls under the head of diagnosis. A more correct knowledge of the causation of the first sound may, and doubtless does assist diagnosis, but it is of itself a matter of physiology rather than of the differentiation of disease. Dr. Hutchinson's spirometer, the laryngoscope, and the light which the test tube and the microscope throw on urinary and other constitutional diseases, complete what Dr. Blakiston has to say on the improvements in diagnosis since the appearance of his first work. We may be allowed to add, that as a matter of practical diagnosis we look on the attempt to differentiate the forms of continued fever as worth any one of the specific improvements he has mentioned. We do not say this in anything like an hypercritical spirit, but we should be chargeable with a *suppressio veri* if we did not express our opinion that the author has made his sketch of the progress of diagnosis, if the term is to include semeiology, too meagre and incomplete.

The third compartment of the triptich is devoted to treatment; and here Dr. Blakiston puts forth his full strength in a vigorous outline of the change which has taken place in the abandonment of the antiphlogistic, and the substitution of the stimulant treatment in acute diseases. He tells us that he believes the change "has resulted not so much from an increased knowledge of the nature of disease, and of the chemical changes that take place within the body, or from the researches of any one person, as from the careful study of the progress and termination of various diseases by many clinical observers." He apparently, therefore, does not recognise any great change in the type of disease, or in the constitution of the people as accounting for the change, and he is far too advanced and sagacious an observer of the current of medical thought to be hoodwinked by the theory which we have seen paraded in some recent works on medicine, that the revelations of the microscope as to the nature of inflammatory action have been the great force which has broken in on the routine of bleeding, purging, and starving. The fact is, that the change of treatment has been brought about by clinical experiments and clinical observation. In so far as it has done good it is another of the obligations of practical medicine to empirical work. Neither the microscope nor the scalpel, nor the retort suggested the expectant treatment of pneumonia to Continental physicians, but it was the fact that a large mortality was not prevented by bleeding and tartar emetic. In the same way in England, in the influenzas and cholera of thirty years ago, it was found empirically that patients who were lowered much were sure to die, whilst the contrary treatment was found to give a better chance of recovery. The knowledge thus obtained was naturally enough, after the epidemics had ceased, applied to other acute diseases, and people found that their patients did not necessarily succumb to every attack of inflammation, because they were not bled to syncope and their secretions loaded with mercury. But we most firmly believe that the change was empirical, and founded on clinical observation only. After the facts were established, there were plenty of observations and theories, chemical, physiological, and microscopical, brought forward to prove that they must be so; but the improvement in practice, so far as it is valid, was like every other therapeutical advance—essentially, in the first place, the result of experiment. Dr. Blakiston observes, that "the employment of stimulants in typhus and enteric fevers can hardly be styled a *change*, because it was practised a long time back, but had been over-ridden, to a certain extent, by the disciples of a school that flourished about fifty years ago." There is no doubt, however, that there has been a kind of oscillation in the treatment of fever, between the antiphlogistic and stimulant extremes. The first impulse towards the antiphlogistic pole was given very early. Amongst the ancients the rule was to bleed in putrid and synochous fevers. This practice was supported by the authority of Galen, Alexander, Aetius, Paulus Ægineta, Oribasius, and many more. We have no doubt that their authority is the root from which the practice descended, through the middle ages down to the eighteenth and nineteenth centuries. There could always be found theories to support it, however it militated against common sense and observation. How otherwise are we to account for the fact, that such men as Sydenham bled in the plague, or that Huxham, with his wonderful insight into the nature of petechial fever, allowed that bloodletting was a proper remedy in its onset? Dr. Matthew Baillie regretted that he had not bled more, both locally and generally, in typhus; and when the phlogistic theories of Clutterbuck and Armstrong revived the old practice, there was no lack of authority to which to appeal.

This, however, is a digression. For inflammations the rule of vigorous depletion was far more universally accepted than for fevers. We shall follow Dr. Blakiston in the graphic account he gives of the introduction of the treatment of inflammations by stimulants; at the same time we must assert our belief that the relative merits of the two methods have not even yet been ultimately decided; that, although experience has shown that in the epidemic constitution of the middle of the nineteenth century our lancets may safely be allowed to rust in their cases, and brandy, chloric æther, and champagne may now with the highest advantage be substituted for the drenching salines of our fathers, the end is not yet. The pendulum has, we think, already touched the extreme of the stimulating plan, and it will probably oscillate backwards and forwards a good many times before the fact becomes universally recognised that disease cannot be treated on any one plan alone, that morbid changes are only secondary to constitutional conditions, and that to treat a diseased condition because it is called inflammation of the lungs or pericarditis, either by stimulants or depletion, without reference to the constitution, age, character, and condition of the patient, the manner, country, and climate in which he has lived, and the epidemic constitution of the period, is to discard the teachings of nature and the evidence of our senses, and to give in our adhesion to the philosophy which alike lies at the foundation of the celebrated methods of Dr. Sangrado and the author of "the grand chrono-thairmal" theory.

Dr. Blakiston tells us that about thirty years ago attention, we presume his own, was arrested by a remark made by a surgeon of a large provincial hospital. A lad, pale and emaciated, had his leg amputated on account of strumous disease. After the operation, the surgeon's attention was directed to some hæmorrhage that was going on from the stump. "Let it bleed," said the surgeon, "it will prevent inflammation." The false philosophy, nay, absurdity of the surgeon's dictum, struck him as he observed the pale, wan, anxious face of the boy, who certainly looked as if he had no blood to spare.

"From that time," he tells us, "every patient in that hospital who had been the subject of a severe accident or operation was closely watched and examined; and a few years afterwards a paper was published, in which it was shown that inflammation occurring under these circumstances in the organs of the chest had more or less of an asthenic character, resembling those which appear after parturition; and that, consequently, it was the duty of the surgeon to prevent all unnecessary loss of blood during operations, and to sustain his patient by every possible means."

We feel grateful to the blundering surgeon whose wise saw suggested the necessity for such an addition to medical literature; but his unthinking dread of the bugbear inflammation might, we suspect, be matched in the present day by the superstitious fear of debility, which has shut the eyes of a whole school of physicians to the fact that Nature herself cures many a diseased condition by evacuation, and that in man and animals the first indication of cure as taught by herself is to cut off ingesta.

The influenza of 1836 was studied carefully by Dr. Blakiston, and he culled from it sufficient clinical facts to still further shake his faith in the prevailing antiphlogistic treatment. Writing an account of the epidemic in 1837, "it was found," he says, "necessary to have recourse to diffusible stimulants at the commencement, and to administer tonic medicines in the early stage of the disease." From this time he began to try the stimulating plan in the treatment of various acute diseases, and he gives us in the text several telling cases of scarlatina, enteric fever, and pneumonia treated by alcoholic stimuli. Our readers who have observed the present phase of disease will easily conceive that this portion of Dr. Blakiston's picture is most effective; but those who have studied the writings of a previous generation will know that there is no lack of telling cases in the pages of authors who looked on the lancet as the great instrument of health, and on mercury as the grand panacea. We say this without the least desire of detracting from the value of the alcoholic stimulant treatment, which we fully allow to be a most powerful engine for good in hands with a brain to guide them, but which sinks to the level of homœopathy, hydropathy, or any other quackery, if it is made a therapeutical circle to include the treatment of all the diversified forms of morbid conditions.

Dr. Blakiston gives the following summary of his experience of the stimulant treatment:—

"1. The administration of stimulants was found advantageous in the great majority of acute diseases.

"2. The earlier they were given, the less was the amount required in the course of the illness.

"3. When given in an early stage of the disease, they seemed to shorten its duration in some cases, and in all to induce a speedy convalescence.

"4. On the contrary, when the administration of stimulants was deferred, the course of the disease and the convalescence were more protracted, and much larger doses were required.

"5. When the slightest sign of intoxication appeared, it was taken to point to the necessity of an immediate and considerable reduction in the amount.

"6. No other symptoms seemed to call for their discontinuance.

"7. When suddenly and totally discontinued during the courses of the illness, serious, and in some cases fatal effects ensued.

"8. In no case was a habit of drinking known to be induced, and very rarely was any chronic disease seen to arise out of the acute attack." (p. 27.)

Dr. Blakiston is inclined to ascribe the modern treatment of apoplexy, both cerebral and pulmonary, to the labours of the pathologist, who has shown that cerebral apoplexy is often dependent on atheromatous disease of the arteries, and that in both cerebral and pulmonary apoplexy, when congestion exists, it is not arterial, but venous. Now, without in any degree detracting from the value of these pathological facts, we question whether the disuse of the lancet in all cases of apoplexy can be fairly attributed to the permeation of the professional mind by them. We believe that the alteration which has taken place in the treatment of apoplexies, like that which has taken place in the treatment of inflammations, has been the result of clinical observation, and is really empirical. We could mention living writers of high authority in the profession, who, whilst fully alive to the share which diseased arterial coats bear in the production of apoplexy, are by no means timid advocates of the lancet "when the state of the pulse seems to warrant it." We do not believe that practitioners have come to the conclusion that abstraction of blood might do harm from post-mortem appearances, or from reasoning upon the phenomena of tricuspid regurgitation, so much as from an observation of the effects of routine and indiscriminate depletion on cases at the bedside. We shall more readily allow that our improved knowledge of the pathology of cardiac dropsy has directed attention to the necessity of administering such medicines as may be presumed to have the effect of strengthening the walls of the heart, and that the comprehension of the mode in which kidney disease leads to dropsy has led to the avoidance of stimulating diuretics in cases where any chance of amelioration can be obtained by keeping the kidneys at rest.

Dr. Blakiston has singled out two amongst the many new remedies which the last thirty years have produced, as worthy a place in his retrospect. They are cod-liver oil and pig's pepsine. To the therapeutical effects of the former we think he does but scant justice, when he describes it as only a new form of the old farm-house remedy, suet and milk. We know well that the latter is capable of producing excellent effects in phthisis, but we doubt whether it is able to give such good results as invariably follow cod-liver oil in phthisis where it does not nauseate. Dr. Blakiston has obtained great success in the treatment of marasmus, spasmodic asthma, and other secondary affections arising from imperfect digestion, with pig's pepsine. We confess ourselves somewhat sceptical as to its alleged virtues, although we do not deny that in some instances it has appeared to us of use. As a preparation, the pepsina porci is doubtless superior to the mess of calves' or sheep's pepsine and starch which it has replaced. We now take leave of Dr. Blakiston's very interesting and suggestive Introduction, and turn to the book proper, on diseases of the heart and aorta.

The body of the work, like the Introduction, is divided into three parts—on pathology, diagnosis, and treatment. For the student this is undoubtedly a good arrangement, but it is not so happy a one for the practitioner who takes a book from his shelves to consult on a special disease, and wants to get at once a bird's-eye view of all that can be said of its nature, recognition, and treatment. In the present review our space obliges us to confine ourselves to the first portion of the work, which treats of pathology; not that the others are less valuable or less interesting, but we can only very earnestly commend them to the study of our readers.

Inflammation of the aorta is dismissed by Dr. Blakiston with the observation, that as it is doubtful if arteritis of the thoracic aorta ever occurs spontaneously, this condition possesses little interest in practice. Now as cases of inflammation of the aorta have been noticed by many writers, amongst whom are Bizot, Bright, Walshe, Parkes, and Corrigan, we do not feel inclined to question its existence. Its rarity and the difficulty of its diagnosis are undoubted, but we think that these very circumstances enhance its interest. As, however, Dr. Blakiston has not met with any instance, we are obliged for the silence which he observes on the subject, and we would commend his example in this respect to medical authors of the present generation. The more important diseases of the aortic coats noticed by Dr. Blakiston are horny deposits, atheromatous degeneration, and calcification. In connexion with the pathology of the first of these, he is inclined to agree with Bizot, that they are deposits on the inner surface of the lining membrane of the artery. Although these horny deposits are often described as cartilaginous, they differ in structure from true cartilage. Under the microscope they are found to consist of an amorphous mass, containing some granular and pale cells, but without nuclei. Bizot thinks that they are the result of inflammation of the inner coat of the artery; in fact, fibrinous deposits from the inflamed membrane. The fact that no redness or inflammatory appearance is found in their neighbourhood suggests the possibility of a deposition from the blood as it passes through the tube. With regard to atheroma, Dr. Blakiston is not disposed to allow that it is a mere fatty degeneration of the inner coat of the artery; for, as he observes, the atheromatous mass is often thicker than all the coats of the artery. He believes that, in addition to fatty degeneration, fibrous material is probably deposited amongst the altered tissue from the blood, as in the case of false membranes.

Dr. Blakiston simplifies the classification of aneurysms by separating them into two groups only—the dilated and sacculated. With regard to the dilated variety, in which there is dilatation without rupture of all the coats, he insists on the fact first brought to light by Mr. Gulliver, that dilatation neither results from paralysis nor from overaction of the ventricle, but in every case from disease of the coats themselves. Atheromatous degeneration, and consequent loss of elasticity, seems to be the *fons et origo* of dilatation of arteries. Sacculated aneurysm arises from ulceration or rupture of the internal and middle coats of the artery, escape of blood through the aperture, and expansion of the external coat into a sac. The first step in the process, as is well known, may be imitated by tightly ligaturing the vessel out of the body. It was doubted, however, by Hodgson, who is a great authority on diseases of the vessels, whether such a condition could be produced by any pressure from within or by any violence from without, that would not rupture the neighbouring parts. To show how dangerous it is to say what may or may not take place when violence happens to so delicate a machine as the human body, Dr. Blakiston relates two cases of accident, in one of which the endocardium and muscular fibres of the left auricle were ruptured, whilst the pericardium was uninjured, and another in which the inner and middle coats of the aorta were lacerated, whilst the external coat escaped. The observations on the production of mixed aneurysms—that is, sacculated aneurysm produced in a dilated vessel—need not detain us, as they do not contain anything very novel. With regard to the thin, delicate film which, apparently continuous with the lining membrane of the artery, is sometimes found lining the aneurysmal pouch for a considerable distance—a distance militating against the supposition that it was composed of the inextensible internal coat—Dr. Blakiston relates several cases in which it was observed, and one which completely proved that it was a structure produced in the course of the disease, and not a natural formation, for it not only lined a large portion of the sac of the aneurysm, but completely invested a large coagulum, proving that it had been formed after coagulation had taken place in the sac. The fact is, that this kind of membrane is no more than a fibrinous film. In answer to the proposition advanced by Hodgson, that as atheromatous and calcareous deposits are of not infrequent occurrence in the sacs of aneurysms, the fact must be taken to prove that such sacs are formed in part of the inner coat of the artery, as a community of disease proves community of structure, Dr. Blakiston points out that calcareous deposits are not infrequent in other pathological formations. He believes the same to be true of atheroma, and quotes a case from Bizot, in which a sac of an aneurysm was completely lined with a substance resembling atheroma, over which was spread a delicate false membrane, in which the middle coat terminated with short raised edges around the orifice.

In tracing the course and termination of disease of the arterial coats, Dr. Blakiston relates a case of ossification of the coronary arteries, which was not accompanied by symptoms of angina pectoris. In recounting the various modes in which the ordinary fatal termination of thoracic aneurysm may be brought about, he relates an interesting case, in which perforation of a sac actually filled with coagula and death from external hæmorrhage took place, the coagula not having become agglutinated to the aneurysmal walls, and the blood having insinuated itself between them — an exception to Mr. Hodgson's rule, that a sac filled with coagulum cannot prove fatal by rupture.

A very remarkable case, in which a mixed aneurysm of the aorta communicated with a cavity in the left lung, is related by the author. The patient died of hæmoptysis. We may remark in passing, that one of the most praiseworthy, as it is one of the most important, features in the book are the numerous faithfully described, carefully observed cases with which it is enriched. We have but few works of its size which can furnish an equal amount of carefully sifted, judiciously arranged clinical observation.

The causes of diseases of the thoracic aorta are discussed with considerable sagacity and acumen. A connexion between horny deposits and the rheumatic diathesis is traced on the ground that these deposits partake of the nature of those fibrous growths from the valves of the heart which are so constantly associated with rheumatism; and the observation of Bizot, that the younger the subject the more acute is the attack in which gelatinous matter, the earlier form of horny deposit, is thrown out, is quoted as offering an argument from analogy in support of this view, for in youth attacks of acute rheumatism are more common than in advanced age. Dr. Blakiston agrees with Andral and Lobstein in thinking that the production of atheromatous degeneration is more or less under the influence of the gouty diathesis. Although the fact that atheromatous degeneration is almost entirely confined to the arteries springing from the left side of the heart, except in cases where malformation permits a mixture of the two bloods, might be expected to throw much light on the cause of atheroma, it has hitherto failed to do so. Our chemistry is as yet not delicate enough to detect what are the real differences between the blood of the aorta and that of the vena cava, although differences have been detected in the blood entering and leaving the kidney and liver. But whatever are the normal chemical differences between the blood before and after it has completed the systemic circulation, it is highly probable that such differences are greatly increased, altered, or diminished in various diseased conditions. On this point Dr. Blakiston quotes Simon, who gives reason for believing that

"urea, uric acid, and bilin are formed as a consequence of the consumption of blood-corpuscles; that they must necessarily be formed as products of the changes which the constituents of the blood undergo in the circulation, and are not (as observations on starved and emaciated individuals show) a consequence of the changes which the circulating fluid undergoes during the nutrition of the tissues, but are dependent on the metamorphic action that is produced by the respiratory process."

Uric acid has been proved to exist in healthy blood by Dr. Garrod. If therefore, in the gouty diathesis, a much larger quantity of uric acid is thrown into the arterial blood "by the metamorphic action produced by the respiratory process," to be got rid of by the kidneys, we can easily see why atheromatous degeneration should be for the most part confined to the systemic arteries, if we assume that it is dependent on the presence of the materies morbi of gout.

The causation of aneurysm is due to such morbid alterations of the arterial tunics as are accompanied by diminution of elasticity and loss of substance. Horny deposits may in advanced stages impair or destroy the inner coat; but as they never invade the middle coat, this disease cannot be supposed by itself to diminish the elasticity of the vessel to any great extent, neither are these kind of deposits found constantly in aneurysm. Atheromatous degeneration is, then, the chief condition which gives rise to aneurysm. The progress of atheromatous degeneration will vary, Dr. Blakiston thinks, according to the quantity as well as the quality of the general nutrient fluid, and the consequent moisture or dryness of the exudation. Moisture would lead to softening and ulceration, and as a result aneurysm; whilst dryness would give rise to a cheesy condition and calcification. With this view Dr. Blakiston connects the influence of age in the production of aneurysm. Aneurysm especially prevails between the ages of forty and fifty, whilst atheroma is rare before forty, and increases as age advances. After fifty, aneurysm decreases, whilst atheromatous degeneration increases:

"Assuming atheromatous degeneration to be the constant proximate cause of aneurysm, its rarity under forty accounts for the rarity of aneurysm under that age. When, however, it has once commenced, the younger the subject the greater would be the tendency to the formation of aneurysm; for this depends not so much on the extent of atheromatous degeneration as on its tendency to soften. Now, the younger the subject the more active would be the circulation, the more moist the exudation, and the greater the tendency to softening and ulceration. In old age the reverse of this takes place; the circulation is retarded, the quantity of nutrient fluid is probably diminished, and the atheromatous patches are dry, or are soon invaded by calcareous deposition."

Of course, in addition, as secondary causes of the rarity of aneurysm above fifty are the greater excitability of the heart and nervous system in earlier life, giving rise to nervous palpitation, and the greater amount of violent exercise, and the greater liability to falls and shocks of different kinds. The great proof of the influence of muscular exertion in the production of aneurysm, as is well known, is that males are more liable to the disease than females, in the proportion of nine to one, although the amount of atheromatous degeneration varies but little in the two sexes; and farther, that the popliteal artery, as shown by Bizot, is less liable to atheroma than many other vessels, although it is the favourite seat of aneurysm. Dr. Blakiston observes that it would be desirable to obtain statistics of the relative frequency of aneurysm in the sexes in countries where females are engaged in laborious occupations. If, however, the gouty theory of atheromatous degeneration be correct, we think that but little information would be obtained. Gout is one of the attendant evils of civilization; and if aneurysm be really connected with gout through the link of atheroma, we shall look in vain for the whole group in societies where civilization has not as yet meted out the duties appropriate to each sex.

Dr. Blakiston's observations on the progress and terminations of inflammation of the pericardium are worthy of record, as bearing on the vexed question of the effects of adhesion, and, as we shall hereafter see, on the production of dilatation and hypertrophy. He first calls attention to the effects of pericarditis on the muscular structure of the heart. When both the pericardium and the endocardium are affected, it is more than probable that the muscular walls do not escape. Although the eye may fail to find traces of inflammation in the muscular structure, it is difficult to conceive that tone and contractile power are uninjured. The exalted irritability expressed by palpitations and irregularity of action terminates in impaired vitality; in fact, in partial paralysis analogous to that seen in the intercostals as a sequel of pleurisy, and in the muscular coat of the intestines in proximity to an inflamed peritoneum. This condition is naturally followed by dilatation of the heart's cavities, with its train of serious evils. The author inserts a case of this kind, in which pericarditis was followed by dilatation, regurgitation through the tricuspid orifice, and cardiac dropsy. The effects of adhesion have, it is well known, been very variously estimated. Whilst some maintain that the effects of adherent pericardium on health may be inappreciable, others believe that it always leads to hypertrophy and dilatation, and in the end to fatal results. To neither of these views does Dr. Blakiston give implicit assent. He writes:

"No cases have come under notice in which a post-mortem examination revealed the existence of adhesion of long standing, without their history having afforded a great probability that some disturbance of the health had resulted from it; but it by no means follows that because the health has been notably disturbed, a fatal issue should necessarily take place." (p. 84.)

With regard to the special effects of adherent pericardium, he details one remarkable case in which the pericardium was closely and universally adherent to the heart, and also to the chest at the seventh and eighth ribs, in which also there was extensive mitral obstructive disease, and yet the heart retained its natural size. The history of the case rendered it probable that the adherent condition of the pericardium had existed for twelve years. The patient during that time had suffered from palpitations, dyspnœa on exertion, and teasing cough, but these symptoms were doubtless partly due to the mitral obstruction. Her life was terminated by an acute attack of endocarditis. In almost every other case of adherent pericardium observed by the author considerable dilatation was found, but hypertrophy in very few. If hypertrophy be construed into meaning *hypertrophy by extent*, it was present, but any increase of thickness in the walls of the auricles or of the ventricles was exceptional. Of course, as in the dilatation succeeding simple pericarditis, grave results may in the same way follow, and it is in this manner that adherent pericardium leads to a fatal termination.

Dr. Blakiston states that he knows of no instance in which pure, uncomplicated attacks of pericarditis resulted in speedy death. The fact is that pure, uncomplicated pericarditis, as Dr. Blakiston himself elsewhere asserts, is one of the rarest of diseases, its very exceptional occurrence favouring the suspicion that it probably exists only in nosological systems. He, however, quotes a case from Dr. Beale's 'Archives,' which he believes was fairly entitled to be ranked as idiopathic pericarditis. But he allows that it may so result when it is a complication of acute rheumatism. We believe that the speedy fatal termination of pericarditis in the course of rheumatic fever is not of excessive rarity. We have lately witnessed a case in which a strong vigorous man, in the prime of life, suddenly succumbed to an attack of rheumatic pericarditis. The case we speak of was very similar to one mentioned by Andral and quoted by Dr. Blakiston. Death occurred in Andral's case only twenty-seven hours after the onset of the pericarditis, which appeared on the sudden cessation of articular pain. The pericardium was found lined with a whitish exudation, membraniform and reticulated; it contained about one ounce of greenish-coloured serum. Here Dr. Blakiston observes that death could not have resulted from the effects of pericarditis alone. The heart was not compressed by a large accumulation of fluid, nor was it bound down by lymph. He therefore regards the pericarditis merely as the finishing stroke in the attack of acute rheumatism. The post-mortem appearances in the case mentioned above closely resembled those detailed by Andral. There was, however, in addition, a considerable fibrinous clot in the right ventricle, extending into the pulmonary artery. Death took place from a condition of prolonged syncope, apparently brought on by a large alvine evacuation, and it appeared to us more than probable that pericarditis had led to the fatal issue by impairing the contractile power of the muscular structure of the ventricles.

In a short summary of the causes to which pericarditis has been assigned—simple inflammation, the rheumatic diathesis, pyæmia, renal degeneration—Dr. Blakiston has some remarks in reference to the production of the disease during attacks of acute rheumatism, which are certainly of practical importance, as they bear directly on the treatment of patients labouring under rheumatic fever. Pericarditis certainly occurs in a large proportion of cases of acute rheumatism in which little or no depletion has been used. But to state this fact is not to assert that there may not be some truth in the following reasoning:

"But are there no special causes at work tending to determine the inflammatory action to the heart? It will be presently seen that anything which, by lowering vitality, makes the heart weak and irritable, renders it prone to pericarditis; and as it is not long since most active depletory measures were employed in rheumatic fever, it is open to inquiry how far such treatment might have acted as a cause of pericarditis. Bouillaud and Hope, who both carried venesection and mercurialization to a great extent, have showed that pericarditis occurred in one half of their cases of rheumatic fever. Subsequently Drs. Latham, Taylor, and Budd, whose treatment was much less depletory, state the proportion to have been only one-eighth in their practice; and the proportion has been still less in the practice of Dr. Fuller, and in that on which these observations are grounded. These are facts of much significance." (p. 90.)

Dr. Blakiston arranges diseases of the walls of the heart under the heads of inflammation, degeneration, and increase and extension of substance. He describes three forms of degeneration—the fatty, the mottled, and the brown-stained. To the head "fatty," he restricts those cases in which the subserous tissue, especially on the right side, is loaded with fat, which dips between and divides the muscular fibres, but does not invade the texture of the muscle itself. This fat is ordinary adipose tissue. The mottled heart presents patches of a mottled yellow and brown colour, of impaired consistence. These patches are composed of muscle that has undergone the true fatty degeneration, the fat-globules lying in the interior of the fasciculi, like strings of beads separating the fibrillæ, or taking their place. Such fat is rich in cholestearine. The third form is termed by Dr. Blakiston the *brown-paper heart.* He intimates that, twenty years ago, he pointed out and described under this name this pathological condition. Its colour closely resembles brown paper. The condition frequently extends over the whole organ, is sometimes associated with hypertrophy, and when not general, is most frequent on the left side. As Dr. Blakiston often found this condition occurring together with appearances referrible to pericarditis and endocarditis, he considered that it was in all probability a result of inflammatory action. Afterwards, however, the same condition was described by Rokitansky, and shown by him to be due to fatty degeneration, an invasion of the fibrillæ by fat-globules. In fact, from the author's description of the two conditions, it is pretty clear that the brown heart is only a more advanced stage of the mottled heart. The observations of Ormerod and Beale on the chemical nature of fatty degeneration—the fact that oleates preponderate over the margarates in the diseased tissue, whilst healthy fat in normal tissue consists almost entirely of margarates—the existence of cholestearine in large proportion in heart-tissue which has undergone fatty degenerative change,—are all facts which, it is easy to foretell, will find an important place in the pathologico-chemical system of the future.

Dr. Blakiston's observations on hypertrophy and dilatation may be thus summed up: taking Bizot's tables of the weight and size of the heart, the thickness of its walls, and the width of its orifices as his standard, he finds that hypertrophy is always accompanied by dilatation, but the converse does not hold good. In one hundred and fifty-five cases of fatal heart-disease observed by himself, there was not one of simple hypertrophy of the left ventricle without coexistent dilatation, and only one of the right ventricle without it; and whenever both were hypertrophied, both were dilated. In a set of cases tabulated by him, the number of cases of hypertrophy with dilatation of the left ventricle, and the number of cases of dilatation of the left ventricle alone were about equal; whilst of the cases in which the right ventricle was affected, one-third were cases of dilatation with hypertrophy; but in the remaining two-thirds the right ventricle was simply dilated. Although the walls of a dilated heart are stretched and attenuated, he doubts whether they ever become atrophied in the proper sense of the term, the constant work of the heart negativing the possibility of such a change as is seen in paralysed or disused muscles. Neither does he think that any of the cavities of the heart ever become contracted or lessened by hypertrophy, because any increase on the inside would be opposed by the constant pressure of the blood. He therefore differs from Hope and others, who suppose that contraction sometimes takes place from increase of the columnæ carneæ and papillary muscles. The effect of dilatation of the heart on its orifices is not constant. The pulmonary and aortic orifices may partake of the dilatation, but this is not frequent. It is otherwise, however, with the auriculo-ventricular openings. The mitral foramen is less liable to dilatation than the tricuspid, on account of the greater resistance offered by its tendinous ring, although enlargement of this opening is not uncommon in connexion with dilatation of the left side. In every case, on the other hand, in which the right auricle and ventricle are dilated, he finds that a widening of the tricuspid orifice takes place, bringing with it all the evils arising from tricuspid dilatation.

We must pass over the sections on the pathological appearances of the endocardium and valves, and also those on vegetative growths and morbid products—the various kinds of coagula found in the heart. In reference, however, to adhesion of one or more valves to the adjoining walls, Dr. Blakiston relates that it was a case of cardiac dropsy, in which one of the tricuspid valves was so adherent, which first led him to reason on the effects of tricuspid regurgitation, and to execute careful measurements of the tricuspid opening and its valves in all fatal cases of heart-disease.

Of the causes of hypertrophy of the heart, some are within and some without the organ. Of the latter, pericarditis and adhesion have been supposed by Hope and others to be important members of the group. Dr. Blakiston is inclined to agree with Rokitansky that this is not the case. Hypertrophy was only observed in one out of nineteen cases in which the pericardium was found adherent. In more than half the cases, however, traces of endocarditis or pericarditis were discovered. The main cause of hypertrophy is, of course, obstacle to the onward progress of the blood. In his enumeration of the various obstacles and their effects in producing special hypertrophies, Dr. Blakiston writes: "Mitral obstruction and regurgitation tend, of course, to induce hypertrophy of the left auricle, but it is doubtful whether they act similarly on the ventricle."

It is, we believe, an open point whether simple hypertrophy of the left ventricle may be produced by mitral constriction. Dr. Walshe seems to think it possible, either indirectly from the extra work thrown on the ventricle by systemic capillary obstruction consequent on pulmonary obstruction, or by extra work of the ventricle, to make up by force of propulsion for smallness of supply. He enumerates conjoined mitral constriction and regurgitation as an undoubted cause of hypertrophy of the left ventricle. That tricuspid regurgitation does not produce simple hypertrophy of the right ventricle, is proved by Dr. Blakiston's one hundred and six cases, in only two of which simple hypertrophy of the right ventricle was found.

With regard to the various obstacles to the circulation both without and within the heart, Dr. Blakiston deduces from the cases he records that diseases of the valves have a much less direct influence in promoting dilatation than has been supposed. Thus, of 120 cases of dilatation of the left ventricle, in which that ventricle was dilated either alone or together with the right, he finds the dilatation was combined with mitral disease in 48; with tricuspid disease in 36; with aortic in 32; with the results of pericarditis or endocarditis in 60. Again, in 112 cases in which the right ventricle was, either singly or together with the left, dilated, mitral disease existed in 28; tricuspid disease in 44; and the results of endocarditis or pericarditis in 44.

Of 92 cases in which both ventricles were dilated, there was no disease of the valves present in 56; aortic disease in 28; mitral disease in 20; tricuspid in 32, and the remains of pericarditis or endocarditis in 36. From carefully comparing the results of his cases, he concludes that in one-half of all cases of dilatation of the *left* ventricle, inflammation may be considered the cause; in the remaining half, obstacles to the circulation without the heart, more especially capillary congestion, induced by tricuspid regurgitation from diseased valves; or, again, in impaired elasticity of the walls of the aorta, the result of atheromatous degeneration and calcification.

"Looking at the right side of the heart in the same manner, and from the same point of view, we recognise the influence of inflammatory action in about one-third of the cases of dilatation of the right ventricle, the remainder arising from pulmonary congestion, whether induced by disease of the lungs, or by impediments to the circulation existing at the mitral valves; such congestion, often amounting to pulmonary apoplexy, having been found in more than half of these cases." (p. 112.)

We have only room to add the conclusions to which the observation of a large number of cases, tabulated and related in the chapter on the progress and termination of heart diseases, has led the author. They are as follows:—

"1. Except in conjunction with regurgitation through the auriculo-ventricular orifices, hypertrophy of the ventricles rather assists the circulation than promotes arterial congestion, and, consequently, *hypertrophy of the left ventricle is not a frequent cause of cerebral or general congestion.*

"2. A considerable amount of disease, producing obstruction and regurgitation at the aorta and obstruction at the mitral orifice, may exist without seriously affecting the general health, in consequence of prolonged systolic action of the heart.

"3. Mitral regurgitation is one of the most direct and frequent causes of pulmonary venous congestion.

"4. Disease of the tricuspid valves, mostly of inflammatory origin, and impairing their efficiency, is found nearly as frequently as similar disease of the mitral valves in *fatal* cases of heart disease.

"5. Tricuspid regurgitation is the most direct and almost *constant* cause of that engorgement of the vessels of the brain and of the general circulation, with their consequences, which originate with the heart." (p. 163.)

These views will probably meet the assent of most of our readers. But it must be remembered that they are entirely opposed to the speculations and hypotheses of a school which has not even yet passed entirely away. Of course a certain margin must always be allowed for the detractions which time and observation most surely will make in any pathological doctrine which its advocates may now be inclined to believe of universal application; but let pathological science advance and even change as it may, we can safely assert that the sagacity and acumen which traced the connexion of tricuspid regurgitation with the production of cerebral apoplexy and cardiac dropsy then lighted on a discovery which, as long as British medicine shall be studied, will confer well-merited immortality on the name of the author of this book.

Review II.

The Principles and Practice of Obstetrics. By Hugh L. Hodge, M.D., Professor of Obstetrics and Diseases of Women and Children in the University of Pennsylvania.—*Philadelphia*, 1864. pp. 550.

"The science of obstetrics," says our author, "is of modern origin." Chiefly for many centuries in the hands of women, it has been practised, as a rule, upon empirical principles, and its practitioners have been guided chiefly by what may not inaptly be termed the "rule of thumb." Advancing civilization and improved scientific knowledge have, however, administered a salutary check to this state of things; and though, from the peculiar nature of the practice, the patient will always be forced to depend more or less upon the services of her own sex, the science of the profession must in future fall with ever increasing frequency into the hands of the male practitioner. Ignorance and prejudice have, however, long conspired to shut the well-instructed and scientific accoucheur away from the bedside of the patient of this class, and to retain in his stead the services of an ignorant and conceited race of midwives. More than this—obstacles to the employment of the male accoucheur have been interposed by the very practice of the medical societies themselves, which, until a comparatively recent date, have exhibited a strange unwillingness to admit him to that professional fellowship to which he is legitimately entitled. It was not until 1826 that this opposition was overcome in England. In that year Dr. Ramsbotham, Junr., succeeded, after a struggle of many years' duration, in company with some thirty teachers and practitioners of obstetrics, in obtaining fellowship with the College of Physicians, and in gaining also such a recognition of the value of their studies as is implied in the fact that a knowledge of their especial subject is obligatory on all candidates for medical honours. In this, as in many other matters, we must confess that our American brethren have been in advance of ourselves. Thirteen years before the recognition of the value and importance of obstetric studies by the English medical authorities, the University of Pennsylvania passed a resolution to the effect that the professor of midwifery should be a member of the medical faculty, and that attendance on his lectures was compulsory on all those who aspired to the degree of doctor of medicine. This admission was chiefly due to the exertions of Dr. Dewees, who, fully appreciating the neglected condition of obstetric science in America, devoted himself entirely to its improvement, and expended the best years of a long and useful life in the pursuit of that object. He was aided by Dr. James in carrying it out; and to these two physicians, who carried on the professional succession from 1810 to 1834, when the former retired from practice, obstetrics owe their regeneration. "Drs. James and Dewees," says Dr. Hodge, "should be regarded as the fathers of obstetric science in America; the former, erudite and polished, gave currency to the teachings of the British schools; the latter, more nervous and energetic, exemplifying theoretically and practically the doctrines of the French obstetricians." Since that time the scientific character of the profession of obstetrics has been maintained in America by a succession of physicians of great local reputation, amongst whom may be named Dr. Meigs, Dr. Henry Miller, and Dr. Gunning S. Bedford. The first of these published a small elementary work on the subject in 1838, for the use of students, and afterwards republished it in an enlarged and improved form in 1849, while a final edition, with corrections and additions, appeared in 1863. Dr. Miller, Professor of Obstetrics in the University of Louisville, Kentucky, published a work on the principles and practice of obstetrics, which is interesting, according to Dr. Hodge, on account of its containing his own opinions and teachings; while to Dr. Bedford, Professor of Midwifery in the University of New York, the profession owe a "system of obstetrics," which has been favourably noticed by the medical journals on both sides of the Atlantic. It thus appears that in the course of sixty years midwifery has developed from a practice in the hands of an ignorant and uneducated class of women, governed by empirical rules and misled by childish prejudices, to the position of a recognised science, co-equal with other branches of medicine. Its teachers have their full quota of respect, attention, and confidence, and its practitioners are numerous and highly educated. The women who practise it will, it is highly probable, always be engaged to a certain extent. In such rare and exceptional cases—as in those of the distinguished Mesdames Boivin and Leschapelles—where the advantage afforded by the sex of the practitioner is supplemented by great scientific knowledge and large practical experience, they must drive male practitioners from the field. As things at present are, however, the employment of women, though by no means abandoned, nor, indeed, as it seems to us, likely to be, has become greatly restricted, and is much more under the control of the qualified accoucheur than heretofore, while the women themselves are not only taken from a superior class, but exhibit a praiseworthy disposition to seek for instruction on those points on which of necessity their education has left them entirely ignorant. For the education of these, and as helps to the student generally, systems of obstetrics are absolutely necessary; and although nothing can by any possibility supply the want of oral instruction, illustrated and enforced by practical examples, such as the hospitals and dispensaries of this and neighbouring countries supply, yet, as a preparation for it, and as an aid in reducing practical teaching to scientific system, well-written and digested works are imperatively demanded.

Such a work is that of Dr. Hodge, now before us, and though we may sometimes find it necessary to differ from him in his conclusions as to points of practice, and sometimes even, perhaps, upon theoretical or scientific questions, we can have no doubt as to the value of his observations. He claims, further, the praise of not having been satisfied with the repetition of the teachings of others, but of having submitted all such opinions to the test of clinical experience, basing his system on the words of Baudelocque: "Though the reading of authors has been of much use to me, it will be found that nature has been of much more."

The first chapter of this work is occupied in a careful consideration of the pelvis, and all the points of interest of an obstetric nature are especially dwelt upon. To facilitate the accurate study of the pelvic canal, Dr. Hodge has had a "cast" taken, which represents with the greatest accuracy the form of the cavity of the pelvis, and the shape of its entrance and exit. He observes, at the commencement of this portion of his subject—

> "A knowledge of the basin or canal of the pelvis is a subject of the most essential importance to the accoucheur. The knowledge, notwithstanding all that has been written upon the subject, is still imperfect. Many difficulties necessarily exist, as is proved by the want of accuracy, as well as by the discrepancy, in the opinions of the best writers."

This chapter is profusely illustrated with beautiful lithographs, taken from photographs, some representing horizontal and vertical sections of the cast alluded to. We advise a careful perusal of this portion of the book to any who would be well grounded in the rudiments of obstetrics. Great care has been bestowed in the next chapter upon the study of the fœtal skeleton. Remembering that, after all, the cranium becomes, in the majority of cases, the *fons et origo* of difficult parturition, the author has justly drawn particular attention to its importance. We are glad to find that allusion is made to the occasional occurrence of a *quadrangular* posterior fontanel, due to the bi-parietal suture being prolonged through the occipital bone. This bifid condition of the os occipitis is, we believe, very rare, having only observed it in one case ourselves. It is, however, worth bearing in mind, because the posterior fontanel, under these circumstances, so much resembles the anterior, that the exact position of the fœtal head could not by these means be positively diagnosed, and in the application of forceps in such a case we should prefer trusting to the direction of the ear.

In the chapter on gestation, we notice that the author alludes to the existence sometimes of a lobe of the placenta being separated from the main body of the after-birth. This supplemental mass has been termed by some *placenta spuria*, or *placenta succenturiata ;* it is not generally noticed by systematic writers on obstetrics, although it certainly ought to be, as it sometimes gives rise to secondary hæmorrhage, and the practitioner is unjustly blamed for not having used caution in the extraction of the placenta. This subject has been recently alluded to by Dr. Eastlake, in a paper read before the Obstetrical Society of London.

The symptoms of pregnancy in the following chapter are very well described. We are decidedly of opinion that Dr. Hodges has underestimated both the frequency and severity of obstinate vomiting during pregnancy. Our own experience would lead us to believe that cases of this kind are not uncommonly accompanied with the greatest distress and often danger. The Spiritus Pyroxylicus Rectificatus of the new British Pharmacopœia, in five-minim doses, has, in our hands, proved almost magical, where prussic acid, bismuth, opium, creosote, &c. had failed to be of any benefit. No mention of this medicinal naphtha is made in the work before us.

The sections which treat of the phenomena and mechanism of labour are ably handled ; we do not, however, approve of Dr. Hodge's division of labour into eutocia and dystocia—Denman's classification of natural, difficult, preternatural, and complex, being to our mind a much more teaching and practical distribution of the varieties of parturition. We cannot refrain from expressing the opinion, that the author's description of the various vertex presentations is needlessly elaborate, and, in some parts, even confusing to the reader.

Dr. Hodge sums up the sources of difficulty in the occipito-posterior positions under the following heads :—

"First—From the loss of power caused by the peculiar position of the child ; and

"Second—From the increased resistance met with by the head during its descent.

"First—The diminution of power arises from : 1st—The direction given to the uterine forces in these posterior positions. When the occiput is anterior, the expulsive force, being directed through the spine upon the occiput, is toward the anterior part of the pelvis, and very soon acts directly upon the soft distensible perineum. In the posterior positions, on the contrary, this force through the spine on the occiput is directed toward the posterior part of the pelvis, so as to impinge the vertex almost at a right angle against the lower portion of the sacrum. This implies, necessarily, a great loss of power, or, perhaps more correctly, it demands a great increase of power to force the occiput forward to the coccyx, perineum, &c. 2nd—The force of these bearing-down efforts is impaired also by the greater flexion of the whole spine, especially of the cervical position, demanding therefore a great accession of power to drive forward the occiput; because the force operates not directly, as in occipito-anterior positions upon the occiput, but indirectly through the curved line of the spine, which becomes more and more curved as the occiput advances from the sacrum to the coccyx, and from the coccyx to the orifice of the vagina.

"Second—The resistances to the descent of the occiput in these posterior positions are comparatively very great, much greater than in the anterior portions. These arise,

"1st—From the unyielding character of the posterior portion of the pelvis, against which the head is first impelled.

"2nd—From the resistance of the posterior perineum, which, although capable of great distension, is, in ordinary cases, much indisposed to protrude directly backward in the direction in which the occiput is forced. This resistance of the perineum may be considered as continually increasing as the occiput advances towards the vulva, for the curvature of the vagina is constantly augmenting as the occiput has to ascend, as it were, from the bottom or coccygeal portion of the pelvis toward its anterior part at the arch of the pubis.

"3rd—The necessity of the greatest possible flexion of the head in these posterior positions very seriously retards the progress of delivery, for this great flexion can only be accomplished by an increase of force. The ordinary degree of flexion takes place when the head is at the os uteri; but, owing to the retention of the os frontis by the pubic bones, a greater degree of flexion is requisite, that the occiput may advance. This is resisted by the descent of the thorax into the cavity of the pelvis, so that the child's chin cannot be directed backward toward the sacrum, but impinges against the sternum. The facial extremity of the head and the upper extremity of the thorax are therefore simultaneously engaged between the pubis and the sacrum. This circumstance, of course, retards flexion; indeed, it necessitates great compression of the chest, and even of the face, in order that flexion may be sufficiently great. It would seem necessary, in some cases, that the neck should be elongated, so as to allow the chin of the child to pass from the sternum to the front part of the neck, in order that delivery may be accomplished; in which case, the fronto-mental diameter of the face will be engaged with the antero-posterior diameter of the neck, instead of the dorso-sternal diameter of the chest. Much power is demanded to effect these changes.

"4th—The occiput must travel the whole of the posterior part of the pelvis, and that of the distended vagina, before it can be liberated at the vulva, a distance of some eight or nine inches, instead of two and a half or three inches, as in cases of anterior positions. This course of the occiput is not only much longer, but is more difficult, on account of the increasing resistance of the perineum, from the coccyx to the orifice of the vagina.

"5th—The adaptation of the form of the head to the passages of the pelvis is not so accurate as in the anterior positions. This fact is specially to be observed at the inferior strait; the great breadth of the os frontis, when applied to the arch of the pubis, prevents the close approximation of the top of the head to the pubic ligament. Hence, some space is lost under the arch of the pubis, rendering still greater extension of the coccyx and of the perineum requisite for delivery. In the anterior positions, the sub-occipital region, being more narrow, is closely approximated to the sub-pubic ligament." (p. 163.)

We are certainly surprised to find the following sentence, under the head of "Preparatory Treatment of Labour" (page 184): "It is a good rule in most instances to avoid animal food six or eight weeks prior to delivery, or, if it be demanded, to allow it in small quantities, and seldom more frequently than once in the twenty-four hours." We are decidedly of opinion that such a line of treatment would be most injudicious in this country; and a daily increasing experience has convinced us that at any rate a liberal diet should as a rule be permitted. Again, we are told at page 208, in allusion to treatment *after* labour, that "the diet of the woman should always be low;" and this, if anything, is still more imprudent.

We are glad to find that the author advocates external pressure in the management of the third stage of labour. By this means alone we are in the habit of extruding the placenta almost invariably within ten minutes of the birth of the child.

In Chapter XII., under the section of version by the feet, we are advised, in bringing down the arms, to operate first on the sacral one, and in this admonition our American writer is certainly supported by several British authors. We have, however, always found that the arm nearest the pubis is the one most easily extracted first; and bearing in mind the great amount of room gained by the arch of the pubis, it must be admitted that the manipulation at this segment of the pelvis would be easier than at the posterior portion. The pubic arm being once extracted, enables the operator to carry the body of the child well forwards, and the sacral arm will then offer no difficulty in being withdrawn.

Dr. Hodge has entered into long and almost tedious description of various kinds of forceps. He gives a decided preference to the long French forceps, and objects more or less to every English and German arrangement of this instrument. He has himself constructed one which he tells us will be found to "embrace all the advantages without the defects of the Baudelocque forceps." We must admit to having had no practical experience of the value of Dr. Hodge's instrument, and from its description and representation we probably never shall, being thoroughly satisfied with the utility of Beattie's straight forceps, and disapproving of the pelvic curve of the blades, and the peculiar arrangement of the lock which characterizes the forceps of the author. We entirely concur in the disapproval of the writer to the administration of anæsthetics in forceps operations, and also in the view he takes that the dangers of the forceps "have been greatly overestimated, and that they are comparatively slight, if the instrument be suitably constructed, and in the hands of a well-instructed, prudent, and judicious operator." (p. 260.) Dr. Hodge again well remarks:

> "We have always thought that it is a great injustice to this valuable instrument, to parade in statistical tables deaths of the child, and deaths of the mother, as arising from the forceps, when such unfortunate terminations were evidently the result of the complications of labour—the deformities, the rigidities, the convulsions, the hæmorrhages, &c.—and not of the forceps, when they occurred in spite of this invaluable instrument, whose tendency was to diminish, not to aggravate the danger."

On the question of the signs of death of the child *in utero*, the author writes:

"By auscultation it can readily be discovered whether the pulsations of the fœtal heart, and in some instances also the placental murmur, have disappeared, although it is said this last may be perceived even after the death of the child." (p. 277.)

Dr. Eastlake, in the paper which we have before alluded to, goes much further than this, for he describes a peculiar modification of the uterine souffle when fœtal life is extinct; so characteristic, indeed, that he believes it will become a valuable diagnostic test of the death of the infant *in utero.*

We really think that the history and description of the Sigaultian operation contained in Chapter XV. might well have been omitted in a work on obstetrics bearing the date of 1864! An interesting case is related in this chapter, of a lady whose pelvis measured very little more than two inches in the short diameter of the superior strait, and who was delivered of two children by embryotomy, and on two occasions underwent the Cæsarian operation with success to the children and herself.

Another instructive case is described in the chapter on "The Induction of Premature Labour." A patient, whose pelvis was rather below the average size, had only given birth to one living child out of eight labours at full time. On the occasion of her ninth pregnancy, the propriety of inducing artificial labour was carefully discussed by some of the leading American accoucheurs. Three weeks before her full period had expired, labour came on after a fatiguing drive, but without any interference. It was a favourable labour to the mother and child.

We entirely agree with the author in thinking that—

"The principle of inducing premature labour, where there is disproportion between the size of the pelvis and head, should not be confined to cases where the fault is merely in the pelvis, but be extended to those cases where the head is in fault, where it is too large or unusually ossified, as determined by previous experience." (p. 297.)

We are glad to find that in the management of prolapsus of the umbilical cord Dr. Hodge mentions favourably the suggestion of Dr. Gaillard Thomas, of New York, that the woman should be placed on her knees and elbows, so as to make an inclined plane of the anterior surface of the uterus. The funis can then be carried down into the womb, and retained there until the next uterine contraction occurs, when, the hand of the operator being withdrawn, the head of the child will be forced down upon the os, and will act as a ball valve, preventing the descent of the cord. In our hands this plan has been successful, the child having been subsequently born alive.

On the subject of operative interference in cases of deformities of the pelvis, &c., where the narrowing is so great that it is impossible for a living child to be born, we observe with pleasure the following precepts, which quite coincide with our own views on this question:

"If there be a *caveat* which ought to be impressed upon the mind of the young practitioner, it should be, beware of delay where there is a disproportion between the size of the head and the canal of the pelvis."

And again:

"It has been so common for experienced physicians to wait for many hours for the death of the child before craniotomy is performed, that it is no wonder that so many deaths are ascribed to this operation. The result of statistics proves that twenty per cent. of the mothers perish. This great mortality must mainly result from delay, for the operation of craniotomy in itself is very simple, and has the effect of immediately diminishing and eventually removing the pressure from the mother's tissues. It is characterized as an operation 'for the mother;' for her welfare, not for her injury." (p. 398.)

The author enters at great length upon the much-vexed question as to the advisability of podalic version, or the application of forceps in cases of minor disproportion, giving a decided preference to the latter mode of delivery.

Regarding the treatment of placenta prævia, Dr. Hodge, it appears, is inclined to follow that plan which was recommended by Wigand thirty years ago, and which, as he tells us, consists in filling the whole vagina—

"With shreds of linen, or other soft materials, during the first stage of labour, and that this be secured by a compress and T bandage externally, as usually recommended; but instead of removing it when the os uteri is dilatable, he advises, when the presentation is favourable, that it should be continued during a portion of the second stage. The contractions of the uterus will usually be sufficient to rupture the membranes; or, if this does not occur, they may be perforated, and then the child's head will press firmly upon the placenta and the bleeding surface of the uterus; while the counteracting pressure against the vaginal surface of the uterus will be made by the *tampon*. The bleeding tissue will thus be compressed between the head of the child internally and the tampon externally, greatly contributing, and often successfully, to the arrest of the hæmorrhage. The bearing-down efforts are to be encouraged, and, if necessary, the ergot be exhibited. The tampon will soon be found distending the perineum and vulva, and portions of it may be gradually removed as the head descends into the pelvis. If, after its entire removal, the child be not immediately delivered, the labour can be rapidly completed by the forceps." (p. 486.)

We regret that we have not space to enter upon the arguments which Dr. Hodge brings forward in support of this mode of treatment. It is only fair to mention that Dr. Greenhalgh, of St. Bartholomew's Hospital, read a paper before the Obstetrical Society of London last year, strongly advocating this practice, being unaware of the method having been proposed so many years ago by Professor Wigand. Dr. Greenhalgh employs gum-elastic bags surrounded by sponge, which are introduced in a collapsed state, and are distended afterwards.

Having now glanced at all the principal points of interest in the work before us, we must hasten to the conclusion of our notice. It is, we think, a great pity that the book has been brought out in such an unwieldy form, and also that the numbers on the plates are not in accordance with those of the pages, which occasions a great deal of trouble, owing to the constant references which are made throughout the work. Dr. Hodge's treatise is, nevertheless, full of much valuable information, and although its price alone will prevent its ever becoming popular amongst students in this country, still we strongly recommend that it should have a place in the library of every obstetric physician.

Review III.

1. *On Diseases of the Throat and Windpipe, as Reflected by the Laryngoscope; a Complete Manual upon their Diagnosis and Treatment.* By G. Duncan Gibb, M.D., M.A., &c. Second Edition. Embellished with 116 Engravings.—*London*, 1864. pp. 481.
2. *The Laryngoscope: Illustrations of its Practical Application, and Description of its Mechanism.* By G. D. Gibb, M.D.—*London*, 1863. pp. 46.
3. *The Laryngoscope: Directions for its Use, and Practical Illustrations of its Value in the Diagnosis and Treatment of Diseases of the Throat and Nose. Two Lectures Delivered at the Royal College of Physicians.* By George Johnson, M.D., &c.—*London*, 1864. pp. 64.
4. *The Use of the Laryngoscope in Diseases of the Throat, with an Appendix on Rhinoscopy.* By Morell Mackenzie, M.D., &c.—*London*, 1865. pp. 154.
5. *The Treatment of Hoarseness and Loss of Voice by the Direct Application of Galvanism to the Vocal Cords.* By Morell Mackenzie, M.D.—*London*, 1863. pp. 24.
6. *Clinical Researches on Different Diseases of the Larynx, Trachea, and Pharynx, examined by the Laryngoscope.* By Lewis Türck, M.D.—*London*, 1862. pp. 72.

The invention of any instrument which may supplement either of our higher senses—sight or hearing, and enlarge its range of function, contributes, just in proportion to the extent and variety of its application, to the, so to speak, perfectibility of our organization as reasoning creatures in search of truth, as well as to our means of practical usefulness. But it seems the rule that important inventions are progressive in development, and have their value gradually discerned and turned to practical account. Another rule with reference to instruments contrived to aid our special senses, is, except in the case of the most simple arrangements, the need of education in their use and practicable applications, without which their purpose is indifferently attained.

The foregoing remarks apply to the invention of the laryngoscope, whereby the otherwise invisible portions of the larynx, trachea, and posterior nares are revealed to our sight. The utility of this instrument extends alike to physiology and pathology, enlarging on the one hand our knowledge of the marvellous mechanism of the voice, and on the other interpreting and revealing to us morbid changes, and, what is more, bringing these within the scope of treatment. In its history the rule of progressive development is well exemplified, and though its construction be sufficiently simple, the conditions of its application render education and practice in its use necessary to success. Hence, like all other "scopes," it begets a race of "scopists," and our ever-widening language has to make room for laryngoscope, laryngoscopy, and laryngoscopist, together with their possible adjective derivatives, and a nomenclature for newly-defined anomalies of structure and function that bids fair to perplex if not to instruct the student.

Considering its recent formation, the new '*corps*' of laryngoscopists includes a goodly array, some of whom, with the ardour of recruits, magnify their office, and would impress upon outsiders the unequalled or unsurpassed importance of their craft. Thus Dr. Gibb, in a short, popular description of the epiglottis (p. 51), asserts that the integrity of the epiglottis and of the glottis "is the key-stone in the respiratory arch, upon which, in great measure, the perfection of the general health depends." Again, in a short preface, abounding in grammatical errors and ambiguous remarks, the same writer astonishes us when speaking of the value of the laryngoscope, by saying that, "in the hands of those accustomed to its manipulation, its use effects what has been heretofore looked upon as marvellous, for it renders 'the dumb to speak and the deaf to hear'"!! Moreover, so far as its doubtful construction permits us to interpret it, the following paragraph lays claim to diseases of the throat and larynx as exclusively falling within the domain of the physician, on the assumption that surgeons cannot devote the same patient care and attention to their treatment; a disability of novel discovery, and we apprehend of limited recognition. The paragraph stands thus:—"A class of maladies which may be now claimed as coming especially within the province of the physician, who can devote that patient attention and care to their investigation and treatment which surgery does not permit of."

The laryngoscope needs not the idle vaunting of words to recommend its use to the conscientious and painstaking practitioner. The careful record of cases in which the utility of the instrument has been proved, and a plain, clear exposition or demonstration of the mode of using it, will suffice to secure its general adoption, provided its construction be kept as simple as possible, and complicated, cumbersome apparatus be avoided. Doubtless, some medical men will acquire greater expertness in its use than others; but it is a duty, as Dr. Johnson rightly recognises (op. cit. p. 9), "to combat the notion that the art of laryngoscopy is so difficult that it can be successfully practised only by a select few, who would make it a speciality." All specialities in medicine have a *tendency* to warp the judgment and to mislead the perception, by reason of the paramount importance they occupy in the minds of those engaged in them; a fact recognised by Dr. Johnson in his concluding observations (p. 64) on the aptness to overlook disease elsewhere, when the attention is fixed by special examination upon some one lesion, and on the temptation of being too meddlesome in local treatment when, as by means of the laryngoscope, an organ is brought so completely within reach.

The history of the laryngoscope resembles that of most other useful inventions in being a chapter of guesses at truth, and of faltering experiments, for some time prior to a clear conception of the means of attaining the end sought, culminating in success. Dr. Morell Mackenzie has presented the fullest and best history of the instrument we are acquainted with. The chapter devoted to it occupies, indeed, in his treatise, nearly one-fourth of the volume. The first definite attempt to obtain a reflected image of the larynx appears to have been made about 1743, by M. Levret, a distinguished French accoucheur. Others sought to effect the same object in various ways, but it was left for Dr. Babington to devise an instrument agreeing in all essential particulars with the laryngoscope now in use. The instrument so invented, and called by Dr. Babington a "glottiscope," was exhibited before the Hunterian Society of London, in March, 1829. The only difference between this instrument and the laryngoscope "now in general use is, that whilst in the latter the light is thrown into the larynx, or rather on to the laryngeal mirror, by a circular mirror attached to the head of the operator, in the former the illumination was effected by a mirror held in the operator's hand." At first, the "glottiscope" was united with a tongue depressor, but in 1835 Dr. Babington abandoned the combination, and had mirrors made which closely resemble those employed at the present time. Tried by the critérion of priority of invention, Dr. Babington must be regarded as the inventor of the laryngoscope. In this verdict, Drs. Johnson, Mackenzie, and Gibb coincide.

Türck appears to be ignorant of Dr. Babington's claim, and restricts his remarks on the history of the instrument almost entirely to the matter in dispute between himself and Professor Czermak, as to priority in its application to pathology. The value of the instrument in physiological observations on the voice had been demonstrated by Garcia's experiments with it on himself, before Türck commenced to work with it. It was in the summer of 1857 that the physician last named endeavoured to make the laryngoscope practically useful, and after many experiments on the dead subject, and on numerous patients in the General Hospital, Vienna, he "succeeded (as he tells us, op. cit., p. 2) in giving the laryngoscope so convenient a shape as suited it best for the purposes of examination, both of the larynx and adjoining parts." At a subsequent meeting of the Medical Society of Vienna, he exhibited the "laryngo-pharyngeal speculums, which have since undergone no material alterations." In June, 1858, he published a paper entitled, "The Laryngoscope, and mode of using it," in one of the German medical journals; but no further contribution relative to the subject appears in his own list of published essays until February, 1859.

In the winter of 1857 Türck discontinued his researches with his laryngoscopes, "owing to a want of proper solar light," and did not resume them until about April, 1858. In the interval, Czermak had borrowed Türck's instruments (as it would seem, in the first instance, to repeat Garcia's experiments), and undeterred by the absence of solar light, contrived, by employing a large ophthalmoscopic mirror, to concentrate artificial light upon the laryngeal reflector, and thereby succeeded in making laryngoscopy generally practicable. This proceeding was an important step in advance of Türck. At the same time, the wide applications of the laryngoscope, and the improvements possible in its construction, were at once discerned by the active mind of Czermak, and led him forthwith to devise instruments calculated to insure success and general adoption.

How soon Czermak appreciated the practical utility of the laryngoscope, appears from Türck's own account, viz., that on the 16th of March, 1858, Czermak obtained his permission to experiment with it on patients in the syphilitic wards, and that "eleven days had hardly elapsed when Dr. Czermak published an article in a medical journal, in which he tried to introduce, under his own name, and with the greatest self-confidence, the laryngoscope into common practice."

These rapid movements of Czermak quite disconcerted Dr. Türck, who had been several months engaged in determining on the particular figure and size the laryngeal mirror should assume, on the "number of degrees" of the angle at which it should invariably be fixed on the stem, and on the precise composition and figure of the stem itself; and who would possibly have occupied several months more with such details, before venturing to assert the advantages of the instrument in such a manner as to arouse attention.

From the date of his first paper on the laryngoscope, Czermak became the ardent promoter of its employment, and his name has greatly overshadowed that of Dr. Türck, who, to a certain extent, may be regarded as his master. However, "it would not be right (as Dr. Mackenzie remarks, op. cit., p. 32) to withhold from Dr. Türck the merit of having patiently and productively worked at the subject at a later period, ... prompted by the proofs which Czermak had given of the value of the laryngoscope."

The three English writers whose works are under notice concur in assigning the merit of *effectually* introducing the laryngoscope into practical medicine not less to the enthusiastic teaching and brilliant demonstrations of Czermak, than to the entire remodelling of the instrument as effected by him. Dr. Gibb, indeed, outvies the other laryngoscopists, by assigning to Czermak the title of the "father of laryngoscopy." Though this outburst of filial recognition may vanish with the appellation, yet it seems to us only fair to claim the paternity, if for any one, on behalf of our countryman, Dr. Babington, who certainly was the progenitor of the invention, and failed only in fully recognising the excellent qualities of his offspring until a German cousin expatiated on them and published them to the world.

Each of these three authors likewise gives a description of the laryngoscope and of the accessory instruments, with the methods of using them. The primary object of the treatises of Drs. Johnson and

Mackenzie is the fulfilment of these purposes, and very admirably is the end secured. Dr. Mackenzie enters the more fully into these matters, as the larger scope of his work justifies, and takes great pains in demonstrating the principles upon which the instruments are constructed and act. In Dr. Gibb's still more comprehensive work these subjects are left untouched until the concluding chapter, where they are sufficiently considered and illustrated. Dr. Türck's description of the laryngoscope is very brief and inadequate in the work now before us, and is unaccompanied by any instruction in the mode of employing it. It is but right, however, to remark that the treatise is essentially a clinical record of cases examined by the instrument in question, and that the method of its employment forms the subject of a special illustrated work, published separately.

A description of the laryngoscope is quite uncalled for in these pages. With respect to the best method of using it, the several authors are pretty nearly unanimous. Dr. Johnson believes "that the best possible position for the reflector is *above both eyes*, and not in front of one," and gives good reasons for the preference. Dr. Mackenzie, on the other hand, considers that the most perfect position on theoretical grounds for the mirror is in front of one of the eyes, the mirror having then necessarily a hole in its centre. Practically, however, he goes on to say, the position on the forehead is the easiest. Dr. Gibb writes (p. 447): "Each plan has its advocates, but that upon the forehead will perhaps be found the most convenient." It appears, nevertheless, not the plan followed by himself, as we might anticipate from the statement just quoted; for further on, in the same page, he states:

"I am in the habit of using the mirror before the eye, attached to a large spectacle-frame, as adopted by Semeleder, the handles of which go well round towards the back of the head. I prefer this to all others in examining patients . . . . . For minute and delicate operations on the larynx, nothing can be compared (in my mind, at least) to the position of the mirror before or in front of the eye."

Various devices for increasing the intensity of the light projected upon the pharynx have been invented by Tobold, Voltolini, Dr. Walker, and others. Dr. Mackenzie has proposed a very portable and efficient "light-concentrator," capable of being "employed either with an Argand gas-burner, a paraffine, moderator, or reading-lamp," or even with a common candle. Such means of concentrating the light may be sometimes necessary, but practically, in most cases, a laryngeal examination may, as Dr. Johnson teaches, be satisfactorily made without their aid.

Each of the three English writers on the laryngoscope gives ample instruction relative to the method of introducing the laryngeal mirror into the throat, and also with regard to the means of overcoming the several difficulties arising from a rebellious or large tongue, enlarged tonsils, an elongated uvula, or undue irritability of the fauces. However, no verbal teaching can supply the absence of experience, and the would-be laryngoscopist will do well to follow Dr.

Gibb's example, and make explorations on the throats of friends and acquaintances, as well as by what is termed auto-laryngoscopy upon his own. Of the several impediments to a laryngeal examination, excessive sensibility of the fauces is probably the most common. Ice held in the mouth for ten or fifteen minutes, or the inhalation of chloroform (some twenty drops being put on a handkerchief) for a minute prior to the exploration, are the two principal measures recommended for overcoming this difficulty. The former of these two means is preferred by Mackenzie, and the latter by Johnson. A third proceeding, more particularly recommended by Dr. Gibb, is the administration internally, and also locally by way of gargling, of the bromides of ammonium and potassium, but more especially the former. Neither Johnson, however, nor Mackenzie expresses any confidence in their use. It is a curious circumstance, as stated by Dr. Johnson, and corroborated by several of Dr. Gibb's cases, "that patients labouring under acute laryngitis and other organic diseases which are attended with much suffering, usually bear the examination well, and often better than others who have but trifling ailments or none at all."

Next in importance to laryngoscopy is rhinoscopy, or the examination, by reflection from a mirror, of the posterior nares and associated parts, such as the turbinated bones and the Eustachian tubes. Like its allied invention, rhinoscopy was imperfectly conceived and practised by some few physicians anteriorly to the time of Czermak; but we owe its position as a practical art to this distinguished man. "The art of rhinoscopy (says Dr. Mackenzie) dates from a paper published by him in August, 1859."

The reflector employed is essentially the same as that used in laryngoscopy, except that the "rhinal" mirror is smaller than its laryngeal counterpart, and rightly not more than five-eighths of an inch in diameter. Moreover, instead of being fixed to the stem at an obtuse, it is attached at a right angle. An accessory instrument in rhinoscopy is the palate-hook for raising the uvula and pulling it forward. This was proposed and used by Czermak, but Dr. Johnson avoids resorting to it, if possible; and Mackenzie observes (p. 144): "I can recall few instances where the procedure has facilitated my examination of the posterior nares." Lastly, a spatula is frequently required to depress the tongue; and this instrument should, according to Dr. Mackenzie's recommendation, "have the part which is introduced into the mouth an inch longer, and should form a more acute angle with the handle than the ordinary instrument."

The value of the art is well illustrated by the cases adduced in the several treatises before us. The following summary of its uses is presented by Mackenzie (p. 149):

"Though of comparatively limited and rather difficult application, the art of rhinoscopy proves useful in cases of obstruction of the nasal passages by polypi or thickened mucous membrane, in that most troublesome affection, ozæna, and in the various forms of ulceration of the hard and soft parts at the back of the nose. In cases of deafness dependent on obstruction of the Eustachian orifice, it not only enables the practitioner to diagnose the affection, but enables him to use the Eustachian catheter with safety and precision."

The case put on record by Dr. Johnson in illustration of the utility of rhinoscopy deserves notice on account of its singularity. The case was that of "a gentleman, twenty-four years of age, who had complete obstruction of the right nostril. It had commenced two years ago, after a severe cold; and it had steadily increased" until the nostril was rendered impervious to air. "Examination of the nostril in front discovered no obstruction, nor was any abnormal appearance visible on examination of the palate and pharynx in the ordinary way, through the open mouth." Rhinoscopy, however, exhibited the right nasal fossa completely obstructed by a globular-looking tumour, having a slightly granular surface and a yellowish green colour, and which proved, on an attempt at evulsion being made, to be a cyst containing a glairy fluid-like white of egg, and to have grown from the under surface of the middle turbinated bone.

Auto-laryngoscopy and the plan of demonstrating one's own larynx to others are among the subjects treated by Drs. Gibb, Mackenzie, and Johnson; the two former also describe and figure Dr. Smyly's ingenious apparatus to facilitate the demonstration of the larynx to several onlookers at the same time. The process of so doing has received the clumsy name of recipro-laryngoscopy, inasmuch as it is the art "in which (says Mackenzie, who, by the way, appears ashamed of the term,) a person's larynx is reciprocal to two or more people." We may well question whether this so-called art requires a special appellation; its end and aim are readily definable by ordinary English words, and the proceeding appears to us to require contorted derivatives from the Greek language to express it no more than does the very common act of beholding one's natural face in a glass, and having its image simultaneously gazed on by others.

The value of the laryngoscope in diagnosis is briefly but very appositely illustrated in the second of the two lectures by Dr. Johnson, and more largely so in Dr. Gibb's more bulky volume. The advantages of the instrument particularly appear, however, when we look at what it can effect in putting before our eyes the actual condition of parts otherwise concealed from view, concerning which only a crude notion could otherwise be formed; and, what is more, in rendering direct local treatment, under the guidance of the sight, practicable and comparatively simple.

The advantages of topical applications in throat maladies have long been recognised. MM. Trousseau and Belloc (in their treatise on 'Laryngeal Phthisis,' 1837) advocated topical treatment more largely, and surpassed their predecessors and colleagues in boldness, by recommending the application of solutions to the interior of the larynx itself—a proceeding still more vigorously and extensively carried out and popularized in the profession by Dr. Horace Green, of New York. But whereas formerly such topical remedies were used in the dark, and to a certain extent hap-hazardly, they are now, by the aid of the laryngoscope, applied with precision to the suffering part.

For topical treatment, a camel's-hair pencil for the application of caustic or other solutions is the instrument most in requisition. It has displaced the sponge probang, which was until lately thought preferable. The handle is bent at an obtuse angle, and may be made of whalebone or of aluminium or other metallic wire. Syringes specially constructed are used by some for injecting fluids into the larynx, but Dr. Mackenzie does not recommend them, as their use causes more spasm of the glottis than does that of brushes. Instead of applying liquids in an ordinary way by the brush, sponge, or syringe, a new plan has been invented—viz., that of dispersing them into a fine spray, which is directed through the mouth into the larynx. The liquid in the form of spray is said to be "pulverized," and the instruments constructed to produce the spray and drive it into the throat are called "pulverizers" (pulverizateurs).

Dr. Gibb has figured a very simple pulverizer (p. 386), and notes many cases in which he has used pulverization with advantage; he has not, however, stated in what particular lesions its employment is indicated. Dr. Mackenzie observes that this instrument is of most service where the patient is compelled to carry out the treatment himself, and that it cannot be recommended for the inhalation of caustic solutions. Now and then it is advisable to apply the solid caustic to the larynx and adjoining parts; to fulfil this object with more facility and security, an ingenious caustic-holder has been devised. "The solid nitrate will be found useful for touching ulcers, condylomata, and the base of growths after evulsion."[1] In the absence of the caustic-holder, a piece of aluminium wire suitably bent, roughened at its extremity, and then dipped into nitrate of silver in a state of fusion, forms a convenient laryngeal cauterizer.

It would occupy too much space in this article to describe the many ingenious instruments invented for the local treatment of various special lesions about the larynx, such as œdema and warty growths or polypi; but it is incumbent on us to notice the one contrived by Dr. Mackenzie for the direct application of galvanism to the vocal cords in cases of functional hoarseness and aphonia; a mode of treatment first suggested, it would seem, by Lewin of Berlin. The laryngeal galvanizer in question is as ingenious as simple, and has proved of great benefit in many instances, as recorded by its inventor, as well as by Drs. Johnson and Gibb. The cases in which galvanism of the vocal cords is likely to prove beneficial are, where

"1, Aphonia occurs as a symptom in conjunction with considerable disturbance of the nervous system; 2, in hysterical aphonia; 3, in aphonia associated with certain blood diseases, as chlorosis and anæmia; 4, in certain cases of blood-poisoning (arsenic, lead, and perhaps others); 5, in certain cases of purely local paralysis—*a*, in those analogous to the paralysis of the muscles supplied by the facial nerve; *b*, in diphtheritic paralysis of the vocal cords; 6, in certain cases of muscular strain, where, after due time has been allowed for the muscles to recover their perfect contractility, there still remains a want of power; 7, in certain cases of dysphonia, where there is congestion

[1] Mackenzie, p. 99.

of the mucous membrane of the larynx, and where local astringents have failed."[1]

To determine on which of these several morbid conditions aphonia depends, the laryngoscope alone can suffice; for the most careful analysis of the general pathological conditions is largely exposed to error, and at best uncertain. The principal indication for galvanizing the vocal cords is their non-closure when an attempt to speak is made by the patient, no mechanical impediment to their closing being traceable.

Perhaps, as Dr. Johnson justly observes (p. 59), "the greatest triumph of treatment by the aid of the laryngoscope has been the removal of tumours, polypi, and warty growths from the interior of the larynx. This feat has been accomplished now in numerous cases, and with the most satisfactory results." Dr. Mackenzie has had several successful cases, and Dr. Gibb has been no less fortunate in a larger number. The latter physician has paid especial attention to these morbid laryngeal growths, and inspected all the metropolitan and many provincial museums in search of specimens. The thirty-one specimens thus discovered are carefully tabulated, with such particulars as could be collected concerning them.

Dr. Walker, of Peterborough, was the first in England to remove a growth from within the larynx. This was in August, 1861. The tumour was of considerable size, overlying the glottis and threatening suffocation. "I followed (writes Dr. Gibb) in his wake (in November, 1862) . . . . and, without any disparagement to the claims of Dr. Walker, I may say that I was the first in England to remove a growth directly attached to the vocal cords."

Dr. Walker operated with an écraseur, acting by a loop of thin wire, and Dr. Gibb has continued to operate by an instrument acting on the same principle, but simplified, smaller, and made more convenient in practice. On the contrary, Mackenzie prefers "evulsion with forceps of suitable construction," such as he has himself invented and has figured in his book. The écraseur, he says, may be used for removing growths from the epiglottis, but is not at all adapted for operating on tumours in the interior of the larynx. He asserts this on the ground that in operating with the écraseur the tumour need be pedunculated and "the peduncle be firm and short (otherwise the tumour would hang down, and the wire could not be slipped over it). These conditions scarcely ever exist." Again, he adds, with the écraseur there is greater danger of the detached particles falling into the trachea.

There seems good reason, therefore, for the preference for his own instrument entertained by Dr. Mackenzie. To those practitioners who specially apply themselves to throat ailments, these comparative estimates of the value of various instruments will be interesting; whereas those who resort to the laryngoscope only in the course of ordinary general practice, will be the more interested to learn "that, with very few and very simple appliances, the most satisfactory results

[1] Mackenzie: Treatment of Hoarseness, &c., p. 6.

may be accomplished—not only in the diagnosis but in the treatment of laryngeal diseases." Even growths upon the larynx have been removed with forceps of the most simple description;—"a very large proportion of laryngeal diseases can be treated with the brush alone, and obstinate cases of functional aphonia cannot resist the internal application of galvanism."[1]

The general practitioner, indeed, need not provide himself with other special instruments for laryngoscopy than "a reflector, a couple of laryngeal mirrors, a light-concentrator (which can be used with different kinds of lamps), a few laryngeal brushes, and my laryngeal galvanizer."[2]

Some additional remarks are required respecting the intent, character, and merits of the several works enumerated at the head of this article. Two of them are simply pamphlets, and their contents reappear, in whole or in part, in the volumes prepared by their respective authors at a subsequent period. In Dr. Mackenzie's brochure, the indications for the application of galvanism to the vocal cords, and the cases illustrative of its value, are, however, much more largely given than in his subsequent volume on the use of the laryngoscope.

Dr. Türck's 'Clinical Researches' are comprised in a brief treatise of seventy-two pages. The subject-matter of the book is arranged on a pathological basis, the author treating in order of catarrhal inflammation of the larynx, of perichondritis, of syphilitic and tubercular affections, of new formations, of straitening (i.e. narrowing) of the larynx, and of tracheal tumours, &c. The remarks on these several topics are based on clinical observation, and therefore possess intrinsic value; but the whole treatise is so marred by Teutonic English, that few English readers will have patience to peruse many pages. The author tells us in his preface that the translation from the original in German has been made by Dr. Charles Dickin: if this gentleman be by birth an Englishman, he either has never acquired his mother tongue, or otherwise, in learning the German, has forgotten it. It is quite needless to extract particular examples of errors of idiom and grammar, and even also of orthography; for any one who will take up the book to examine it will find such errors prevailing from the first page to the last.

These grave defects are to be regretted, both on account of the reader of the treatise and of its author himself, inasmuch as Dr. Türck is a physician of eminence and of great experience and research, particularly in the matter of laryngoscopy, and as it would be therefore very desirable that the results of his labours should be fairly placed before English medical men.

Faults of the same kind blemish the pages of Dr. Gibb's extensive treatise, and though they may not be equal in number and degree, they are the more inexcusable in an English writer, particularly when he comes before us not only as the possessor of a degree in medicine, but also as a master of arts. It may be contended that a man might well deserve a medical degree by reason of his excellent professional

[1] Mackenzie, p. 138. [2] Ibid. p. 138.

attainments, even though an imperfect English scholar; but no one, we conceive, can be found to maintain the justice of conferring a degree in arts upon a person who cannot write his own native tongue grammatically; for assuredly one of the primary "arts" an educated man should acquire is the knowledge of grammar. An occasional "slip" may be overlooked, but the repetition of transgressions against the plainest laws of grammatical construction cannot be allowed to pass without censure. Yet, such sins against grammar abound in Dr. Gibb's volume; the simple rules of concord are at times forgotten; the relative very frequently loses sight of its antecedent; possessive pronouns stray from their possessors; and the construction is such, here and there, that the meaning of passages, though it may be guessed at, is not expressed.

To make good our assertions, a few examples may be adduced. Take for one the following paragraph from the preface, in which, among other things, the diagnosis of engravings is spoken of:—"A description of the diseases, with illustrative cases, would have been unintelligible without the aid of *engravings; they* have been therefore unsparingly introduced, regardless of expense, so as to render the work a complete manual and guide upon *their* diagnosis and treatment." The italics are our own. On the subject of the engravings introduced "regardless of expense," we may, in passing, remark that the engravings well serve the purpose of diagrams, but are very coarse and ought not to have been costly productions. The concord between the verb and its nominative is rudely disturbed in such sentences as the following:—"So *does* leucocythemia and chlorosis, and climacteric diseases in females" (p. 99); "œdema of the structures of the larynx . . . . *are* generally preceded by hoarseness" (p. 160); and "tumefaction of the follicles at the base of the tongue and in the tonsils *have* been observed in fatal cholera" (p. 103). Ungrammatical and ambiguous construction is exhibited in the following extracts, taken at random from various portions of the book:—"Occasionally large portions of the membrane are destroyed, which is replaced by a thick, indurated tissue" (p. 388). In "saccharine throat," "regulation of the diet is most important—meat once a day, and that mutton; it should be light, carefully abstaining from *all malt beverages*, which, in certain constitutions, *is* the great cause of fatty conversions, degenerations, and disintegrations of tissue. Instead of the latter, weak whisky or gin and water should be taken" (p. 308). "This fact (viz. the conversion of the cartilages of the larynx into true bone) has been most conclusively shown by Mr. Canton in his work on the 'Arcus Senilis,' wherein he has figured the larynx of the man 103 years old, already referred to, and which he has most kindly permitted me to introduce here." (p. 297.) "This patient (with lesion of the epiglottis, &c.) had been subject to fearful tertiary ravages, under the care of my colleagues Mr. Holt and Dr. Fincham" !! (p. 62). "Compression of the pneumogastrics or their branches, by tumours in the neck or in the chest, *give* (*sic*) rise to incurable aphonia, unless by some fortunate circumstance their removal *was* accomplished by the aid of the surgeon" (p. 101). "The topical treatment . . . . will have the effect of quieting or arresting the laryngeal disease, and even *to produce* cicatrization" (p. 82). "Under treatment she was perfectly cured in two months, to my own *surprise*, and *it* (?) has remained permanent" (p. 17). We have marked numerous other passages in the book, but it would be wearisome to the reader to make further quotations, for assuredly those already given are amply sufficient to justify the censure pronounced on the grammatical composition of the book in question.

Unfortunately, our animadversion cannot be restricted to the faults already pointed out, for there are others which cannot be passed over in an honest review of the work. In the first place, the arrangement of the subject-matter is very faulty. No plan based on definite principles is struck out. The arrangement of subjects is constructed in part on a pathological, and in part on a symptomatic basis, and the consequence is a constant repetition of the same facts and ideas. The first chapter is devoted to the consideration of the "General Diseases of the Upper Air-passages," and comprises sections on Follicular Disease of the Throat, on Chronic Disease of the Windpipe, on Diseases of the Cartilages and of the Epiglottis, on Consumption and Bronchitis in connexion with Diseases of the Windpipe and Throat, and on Weakness of the Voice and Chest. Of these several sections, that on Follicular Disease of the Throat constitutes the nearest approach to a definite, coherent account of a recognisable lesion possessing a sufficient pathological individuality. On the contrary, in the four sections next ensuing, the lesions treated of are such in character and in relation to the parts involved, that, as a result of the arrangement followed, they make their appearance again and again, as matters for consideration in subsequent chapters and sections.

For instance, Section II. is headed "Chronic Diseases of the Windpipe," a very wide and indefinite title, under which many other sections afterwards introduced might have with propriety taken their place. Dr. Gibb himself, indeed, has not entirely overlooked this, for he remarks: "Several cases introduced into other sections to illustrate special lesions, especially those on the epiglottis, aphonia and growths, might with propriety have been introduced here, for they were truly examples of chronic disease of the larynx." (p. 29.) Ulceration of the windpipe is, in fact, the subject of the second section; but the same topic re-appears in the sections on Consumption and Bronchitis, on Organic Aphonia, on Syphilitic Diseases of the Throat, and on Diseases of the Cartilages.

Other sections are equally reprehensible on account of the same fault of frequent repetitions; in fact, the work is throughout ill arranged. Its author has been ambitious of including in his volume every disease and deranged state in which the throat is primarily, or even secondarily, involved. To this desire there certainly could be no objection in a special treatise on throat maladies, had some satisfactory and pretty uniform scheme been devised in discussing their pathology and treatment; but, as above noticed, this has not been done.

The article on Diphtheria presents nothing original, nothing illustrative of the use of the laryngoscope; and the chapter on "Exanthematous Affections of the Throat" adds little to the stock of information to be gathered from general treatises on medicine, whilst in much of its details it contributes unnecessarily to expand the volume. Chapter VI. contains sections on "Saccharine Throat," on "The Sore Throat from Tobacco," and on "Dyspnœa." The section last mentioned is, as a whole, uncalled-for; the first class of causes of dyspnœa—viz., diseases of the lungs and heart, does not fall within the scope of the treatise; whilst the second class spoken of—viz., "the presence of tumours which, in some way, compress the windpipe and diminish the free entrance of air," is treated of in other portions of the book.

The "saccharine throat" is a malady which Dr. Gibb lays claim to as being first distinguished by himself. It is, in his opinion, a distinct disease of the throat, in the middle-aged characterized generally by a dry throat and a husky voice; occasionally, by preternatural secretion from the faucial mucous membrane, which is covered with a thin layer of gelatinous secretion containing such an excess of fatty matter as to make the mouth greasy. This greasy fluid appears to flow from the mucous follicles: "The patient's tongue is slightly furred, and he tells you that he has a sweet taste in his mouth. . . . . He frequently hems very loudly to clear his throat, and occasionally the noise is of a barking or cracked character," owing to calcareous degeneration of the laryngeal cartilages. In the three cases given in illustration, the only change alluded to as discoverable by the aid of the laryngoscope was some congestion of the mucous membrane, accompanied by a relaxed state and increased secretion from it.

The author prides himself on the recognition of this presumed special malady, which he would, it seems, elevate to the same rank in pathology as the lesions identified with the names of Bright and Addison, for he writes: "In these cases of saccharine throat, the disease is as readily and distinctly recognised as is Bright's or Addison's disease; the distinctive features in the diagnosis are three—namely, the atheromatous expression, the follicular affection, and the peculiar nature of the secretion, with the sweet taste invariably present." The perusal of this extract will immediately suggest to the reader the propriety of naming the affection "Gibb's disease," so that posterity may not lose sight of the physician who first detected and defined it—i.e., should posterity agree with the discoverer as to its distinctness and its importance pathologically.

The term "atheromatous expression" occurring in the quotation just made will be new to many of our readers, though we learn (at p. 303) that it was invented by Dr. Gibb so long since as May, 1860. It seems intended to portray an oily-skinned individual, with too much fat on his bones and too much carbon in his blood to be consonant with his healthy nutrition and well-being. In Dr. Gibb's words, the—

> "Atheromatous expression is a remarkable but very striking feature, characterized by indications in the countenance of certain changes going on in the system generally, but especially of the conversion of the saccharine element (now called hepatine or amyloïd substance) into fat and its compounds, which either becomes deposited in various parts of the body, producing polysarcia, or else causing (*sic*) a fatty disintegration of the tissues, associated with an atheromatous ulceration of the lining membrane of the cerebral and larger blood-vessels."

The composition of this paragraph and its pathological teachings are alike ambiguous. An expression which is a striking feature, characterized by indications in the countenance, is a definite entity hard of conception. Elsewhere in his book, the author speaks of a "calcareous expression," a term that might with propriety be applied to the begrimed features of an industrious whitewasher.

The sore throat from tobacco is marked by enlargement of the follicles of the throat, with increased secretion. It does not rank among Dr. Gibb's newly discovered diseases, Dr. Horace Green having referred to it in his writings. However, its description affords opportunity to the writer to make himself known as "a travelled man," and as a thinker on the popular question of the use and abuse of tobacco. "I have for many years," he writes, "noticed in various *parts of the world*, under different shades of temperature and of climate, *as well as in England*, that the mucous membrane of the fauces in all classes of smokers of tobacco is subject to a state of chronic irritation."

Another group of disorders called into being at the bidding of the author is comprised in the chapter on "Pathological Modifications of the Voice." Among such are "contendophonia," "acantophonia," "diplophonia," "ischophonia," and "psellismus." Of this array of terms, the three first named are especially claimed by Dr. Gibb as his own invention. He evidently possesses by nature a remarkable facility for coining, and also a love for, crooked words, calculated rather to astonish the unprofessional hearer than to enlighten the medical reader; for the terms quoted above are a few only, among many such, to be found in the volume.

Contendophonia means a straining of the voice, occurring in declamation and oratory. The hybrid character of the word apart, no good reason for its use appears; it represents no single and no distinct complex pathological change of the vocal apparatus; it expresses only a symptom of varying import, otherwise well enough expressed by common English phrases, such as lost voice or broken voice. Its definition is followed by the statement that "the signification of the term . . . is sufficiently expressive to denote its meaning;" of "the meaning of the signification" of which we must confess ourselves to be in doubt.

Acantophonia implies an impairment of the voice in singing, as shown in the failure of the higher, lower, or middle notes. Like contendophonia, it is no morbid entity, but simply a variety of aphonia, exhibited under particular conditions, and dependent upon various altered states of the vocal cords and adjoining parts. Dr. Gibb himself admits that contendophonia "often precedes, or is the forerunner of follicular disease," but he further asserts that it also occurs as a distinct affection. We presume he entertains the same opinion relative to acantophonia. However, he offers no evidence of either condition being a distinct affection; on the contrary, in three of the four so-called cases of contendophonia recorded, irritation, congestion with redness, and tumefaction of the larynx were present, whilst the remaining one "depended upon impaired nervous power of the muscles of the larynx, in a highly nervous temperament, ... (and) the fauces were studded with minute crimson points here and there." The cases detailed under the head of acantophonia likewise exhibited similar abnormal laryngeal conditions, and such as are elsewhere spoken of as causes of aphonia. For example, there was relaxation or flaccidity of the vocal cords, with or without inflammation and follicular disease of the throat. Neuralgia of the throat and "affections of the trachea" are other morbid conditions respecting which Dr. Gibb claims priority and originality of observation. He refers to Dr. Handfield Jones's papers on Neuralgia of the Throat ('Medical Times,' 1863), and to the statement there made, that it was a disease "not noticed, as far as he was aware, in standard works." To this remark of Dr. Jones, he subjoins, "although I drew attention to the subject in the first edition of this work, about four years ago, having been familiar with it myself for upwards of twenty years." The character of a standard work Dr. Gibb could scarcely lay claim for that first edition; but, apart from this, neuralgia of the throat is referred to in the 'Library of Medicine,' and in Copland's 'Medical Dictionary,' and is described, with a case in illustration, by Dr. Graves, in his 'Clinical Lectures,' (p. 432)—each and all these standard books being anterior in date to the brochure in question.

The chapter on "The Various Affections of the Trachea" is prefaced by the following paragraph:—"The literature of diseases of the trachea is so barren, that, with the exception of croup, which is not a disease of this tube especially, scarcely anything is to be found that would help in writing an article on the subject, unassisted by a large experience. In this latter view I hope to be borne out by other observers." What the latter view may be, we cannot guess; but the quotation, taken as a whole, seems to signify that the author could find in medical works scarcely any notice of the diseases which have the trachea as their seat. But if, on the one hand, the trachea, considered as a pathological region distinct from the larynx above and the bronchi below, has obtained little special consideration; it may, on the other, fairly be questioned whether it deserved much more than it has secured, inasmuch as very few morbid states are limited within its boundaries. Inflammation, ulceration, or congestion may, as an exceptional occurrence, be confined to the trachea, and alterations in form, dimension, and structure, may be present in it alone, but the most common affections of this tube, surgical injuries excepted, are such as originate in diseases of neighbouring parts, as tumours of the œsophagus, aneurysms, &c.

Nevertheless, morbid affections of the trachea have not so far escaped the notice of medical writers as is implied in the extract copied above. For instance, in Copland's 'Dictionary of Medicine,' particularly at p. 690, vol. ii., Dr. Gibb might have discovered most of the morbid conditions which figure in his own article on tracheal affections succinctly described.

If, on the one hand, the treatise before us sins in redundant, unnecessary matter, in verbose descriptions, and enigmatical, ungrammatical writing, it transgresses also in its defective information, particularly in reference to details of treatment. The following account of the "constitutional treatment" of follicular disease of the air-passages leaves the reader in doubt which of the medicines named the author deems best, either absolutely or in reference to the various indications that may exist:

"The most useful preparations will be found those of iodine. They will cure when other substances have been tried in vain. My favourite remedy is the ioduretted iodide of potassium, or a weak Lugol's solution, combined with some carminative and tonic, of which *hydrastin* . . . is one of the best . . . . occasionally the bromide of potassium has replaced the iodide in my hands with evident advantage, but I now give a preference to the ammonium base."

Again, at p. 11, the application of solid caustic to the larynx is seemingly approved of, and the solid "caustic-holder" described and figured; but at p. 123, Dr. Gibb writes, "while advocating solutions (i.e. of nitrate of silver) of a certain strength, I cannot too strongly deprecate the practice which prevails with some, of applying the solid nitrate or the strongest concentrated solutions to the mucous membrane of the throat in a state of ulceration or otherwise."

That the solution of the nitrate of silver should contain not less than forty grains to the ounce is largely insisted upon, again and again; and in the notice of the treatment of croup the strength of the caustic solution (thirty grains to the ounce of water), to be used in the form of spray directed within the larynx and trachea, is mentioned; but though solutions of other metallic salts, of tannin, &c., are constantly spoken of as employed in the cases recorded, and their use recommended in the form of spray, or simply by means of the brush, no instruction is given as to their proper strength. For example, credit is taken, and probably with reason, for the introduction into practice, as a topical remedy of considerable value, of the argento-nitrate of mercury;[1] and in several places this preparation is recommended, but nowhere are we told of what strength to employ it.

The like deficiency of information prevails throughout the book with respect to the doses of internal remedies advised; and the gravity of this defect is much enhanced, inasmuch as the drugs most in favour with Dr. Gibb are of an exceptional character, and unknown in the British Pharmacopœia. Thus, besides bromide and iodide of ammo-

[1] See p. 51.

nium, podophyllin and leptandrin, which have to a certain extent become established remedies, there are hydrastin, lozenges of Eucalyptus rostrata, iridin, sanguinaria, and pills of sanguinarin, iodide of sodium, nitrate of uranium, cherry-laurel water, cipripedin, and syrup of matico. Of the two last named we are fortunately apprised of the doses resorted to by the author (p. 308); but concerning the other novel drugs enumerated, as likewise those of a more common character, such information is almost invariably withheld—a circumstance to be the more regretted, since the results attained in Dr. Gibb's hands by the physic prescribed are noted several times as marvellous. Thus he employs "sanguinaria, as an emetic, in diphtheria; it acts with energy, and produces a *thrilling* effect upon the entire mucous membrane of the fauces and respiratory tract, with a feeling of warmth. It alone seems to impart vitality to the suffering throat." He treated a case of neuralgia of the throat with bromide of ammonium, used internally and locally, and "the pain was dispelled as if by magic."

In the notes of the cases detailed the particular treatment pursued is mostly dismissed in a few words, sometimes completely unnoticed. The only reference to it often is, that it was constitutional and local. A very large proportion of the cases, moreover, are barren of instruction, not only therapeutically, but also in all other respects. They would seem to be inserted merely for the purpose of showing how widely Dr. Gibb has been consulted, what distinguished characters have resorted to him for treatment, and how largely he has had patients referred to him by medical men. So numerous have been the cases sent him by various practitioners, that he is actually embarrassed in making a selection from his note-books, "with every desire, at the same time, to thank those by name who kindly sought" his opinion for their patients. (p. 108.) His medical patrons have especial cause to thank that physician for any satisfaction derivable from his laudation, an article of which he has been especially lavish. Indeed, some of his modest friends will, we fear, be put to the blush by being bespattered with so much praise; the precise terms in which this is conveyed we therefore, in consideration of their feelings, abstain from quoting. However, all his world-wide patrons need be penetrated with the most amiable sentiments by the following recognition of their past, and the humble solicitation for renewed favours:—"The author returns his most grateful acknowledgments to the large number of his professional brethren throughout the kingdom, and in other parts of the world, who have honoured him with their confidence in soliciting his opinion and advice. He humbly hopes he may always merit it."[1]

But whatever amount of gratification may be derived by his patrons from his encomiums, it is very clear that Dr. Gibb's own mind is in an admirable state of self-satisfaction. A hum of self-glorification pervades the entire volume, and ever and anon rises into higher and

[1] Preface, p. ix.

distinct notes of praise. No opportunity escapes him of recounting his good deeds, his long-continued and large experience, his excellent training, his learned and distinguished acquaintance, and the extent of his travels. He tells us that his lamented father was an officer in Her Majesty's Ordnance; that he himself was "at one time a pupil of the perhaps greatest anatomical school in the world," and had "the advantage of instruction from a not less renowned anatomist, the universally known Professor Jacob;" that he was residing in Paris "in the eventful year 1848," and was present at a meeting of the Parisian Medical Society; that in 1860 he became a disciple of Czermak, and instantly perceived the value of the laryngoscope "in the practice of a *branch of the profession* long familiar to" him. He has contrived or improved several, it must in justice be admitted, useful instruments, and has, as he informs his readers, "a *preferential liking* for his own inventions;" but this strong liking has led him to forget in his notice of approved instruments some of those suggested by others. For instance, in his account of the means of removing morbid growths, he makes no allusion to the objections that may be urged against the employment of the écraseur as invented by himself, nor to Dr. Mackenzie's method of extirpating such growths by forceps suitably constructed according to the plans of this operator. The principle of the écraseur, invented by Dr. Walker, of Peterborough, "was present in his mind long before" that gentleman published his paper. To recount other original and meritorious doings would be both unnecessary and tedious; but it remains to notice that there is a strong smack of something akin to quackish writing in the pages of this volume.

The loud sounding his own praise approximates to this; but stronger indications of the objectionable practice may be adduced. For instance, many passages go to show that the book is addressed to the public as well as to the profession. Else, for example, what need was there to explain in the 'Glossary' (p. 466), to the medical reader, the meaning of such words as aphonia, dysphagia, dyspnœa, and orthopnœa? Why the remark, "Many gentlemen may recognise their own cases by their initials. Clergymen are for the most part selected, because in them the complaint (i.e., follicular disease) is usually in a more aggravated form"? Why such quackish self-praise as in the following paragraphs:

"I cannot resist the opportunity of stating in this place that, aided by the kind co-operation of the fair patients themselves, I have been successful in restoring to their full power and compass, without the slightest break or irregularity in the notes, the singing voices of some of the first vocalists of Europe—some of them, too, who were brought over to London to be placed under my care, after being ineffectually treated by Continental physicians of the highest repute." (p. 181.)

"I may here observe, that the huskiness of singers and speakers I commonly remove at a single sitting with zinc showers, when the voice has to be used the same night." (p. 182.)

What does all this resemble so much as the advertisements of a charlatan bidding for practice? The individual possessed of such powers of healing as the above extracts imply would be well worth a heavy retaining fee at either of the opera-houses. Tuft-hunting, advertising twaddle, serves as a garnish to many cases, otherwise bald enough in medical facts. Witness:

"Signor B——, æt. forty-seven, with a fine tenor voice, consulted me .... recommended by Lord——, a popular singer, from the degree of feeling with which he sang, and the fine melody of a most excellent tenor voice." (p. 182.)

Again:

"Madame C—— was brought to me . . . . by two gentlemen, one a well-known barrister. She is a vocalist of European fame. She had been at various places for treatment, the last being France and Spain. At Paris she was under Trousseau without benefit; she then came to London, and was placed under my care." (p. 184.)

Recovery in due course followed.

At page 17 is a notice of a case that

"had been seen by many practitioners and hospital men; some pooh-poohed her complaint, and told her it was imaginary; yet, on examination, I diagnosed follicular disease of the mucous membrane . . . . Under treatment, she was perfectly cured in two months, to my own surprise, and it (? *what*) has remained permanent."

Case 13 (p. 20) records the cure of the Dean of ——, and the whole detail of Case 14, valuable or otherwise, is comprised in the following lines:

"*Incipient follicular disease.*—The Rev. G. J——, æt. twenty-six, who accompanied the Dean, had incipient follicular disease of the throat from excessive work; this had been present for three or four months, and was becoming inconvenient. In a month he was quite well from the treatment adopted." (p. 21.)

Notices of more wonderful cures may be culled from the handbills of Holloway and other pill-makers, and would prove equally instructive to the profession. The example last quoted is not, indeed, a solitary one of the sort of advertising cases, which can only be imagined to be addressed to the "many gentlemen" who may desire "to recognise their own cases by their initials." On the contrary, it is but one of a score or two.

We have been led to criticize Dr. Gibb's work at some length. The dimensions of the volume, its character as a complete treatise on diseases of the throat and windpipe, and the professional position and reputation of its author, have, we consider, justified us in so doing. We regret very much to have been compelled to animadvert so strongly upon the general character of the work, and on the many faults in its execution; for Dr. Gibb has undoubtedly been an arduous student and promoter of the art of laryngoscopy, and has done much to advance the knowledge of laryngeal disease. At the same time, our duty as reviewer left no other course open, excepting it was to ignore the existence of the book—a course we could not pursue. With no prejudice against the author, we took up the treatise with a desire to profit by it (and, with all its faults, it contains much instruction); but the perusal was disappointing, and criticism became inevitable. The quotations from the work justify the animadversions upon it.

The two other treatises on the list, by Drs. Johnson and Mackenzie, have already, in the earlier portion of this article, been noticed. Their primary aim is to instruct their readers in the use of the laryngoscope, and to illustrate the utility of that instrument. Dr. Mackenzie's book gives much more detail than does Dr. Johnson's respecting the mechanism of the laryngoscope itself, as well as of accessory instruments. It also contains more notes of cases, a much fuller history of the art, and is altogether a larger and more complete work. At the same time, it may be said of Dr. Johnson's two lectures, that he has contrived to compress such an amount of useful instruction in them as to render them a satisfactory guide in the practice of laryngoscopy.

REVIEW IV.

The Principles of Biology. By HERBERT SPENCER. Vol. I. *London,* 1864. pp. 475.

THIS volume, it may be premised, is the first of a "system of philosophy," in design of wide extent and of vast comprehension—indeed, so vast and comprehensive as, according to the author's prospectus appended, it is to include the "unknowable" as well as the "knowable;" i.e., the doctrine of the one, and the laws of the other, with the aim of reconciling science and religion; thence proceeding to 'The Principles of Biology,' begun in the present volume, to be followed by 'The Principles of Psychology,' 'The Principles of Sociology,' and to conclude with 'The Principles of Morality;' these to be comprised altogether in nine volumes. He informs us that, for several years, he has been preparing these several treatises, and that they are so far advanced as to allow him to promise his subscribers portions of them in quarterly consecutive numbers, or as nearly so as is found possible. The undertaking, it must be acknowledged, is a great one, and we heartily wish him well through it, not doubting, should his health be spared, judging from what he has already contributed to the philosophy of science, that the completion of his design will add to his reputation as an original thinker, and add, if not new facts to science, many new views and happy conjectures. Whether he will succeed in laying down principles and establishing laws which will bear a rigid scrutiny remains to be proved. When we consider the abstruse nature of the subjects, the mystery pervading nature, animate and inanimate, how little we know of either except the phenomena—these, indeed, orderly arranged and generalized, constituting science—we cannot be sanguine of his attaining any great amount of success. It is well, however, that an inquirer such as our author should come forward, courageous, indefatigable, and well prepared, ready to grapple with the great problems, and to attempt to solve them as best he can, irrespective of consequences. Those who are in the least acquainted with Mr. Herbert Spencer's writings must know what a free mind he brings to his researches, and how, in his lines of thought, he has emancipated himself from commonly received notions and popular beliefs.

An analysis of this volume we shall not attempt; it indeed hardly admits of analysis: the most we shall attempt will be to give our readers some idea, however imperfect, of its scope.

He first discusses the organic elements, and endeavours to show how from their very nature, being mainly composed of oxygen, hydrogen, carbon, and nitrogen, organic bodies are essentially unstable, the quality of instability characterizing them owing very much to the last-named substance. That he attaches too much importance to nitrogen as regards this quality, we cannot but entertain a doubt. According to his own principles, there are compounds which ought to be readily decomposable, or unstable, which are not so: for instance, sal-ammoniac, the hydrochlorate of ammonia, the carbonate of this alkali, and some other compounds which might be mentioned. Confining the attention even to substances of an organized kind, how great is the difference which they exhibit as regards stability—muscle, for instance, tendon, and cartilage, and these unstable, not *per se*, but only when brought under the influence of oxygen.

As a postulate, he lays it down that the primordial organic element—that is, one formed of carbon, hydrogen, oxygen, and nitrogen—is an homogeneous cell, and that from this cell, and the more advanced physiological cell—this latter heterogeneous—development, according to natural laws and incident forces, takes place; so that from it, in the course of time, all the variety of plants and animals which have been and are in existence have been and are derived, not excluding—allowing for "untold millions of years"—even the human race.

The forces to which he refers are astronomic, geologic, meteorologic, and organic agencies. Without their operation and co-operation, he holds, there could be no change—a postulate readily admissible; and that the changes which do take place in any organic body are conformable to the impulses which these forces impart to the primordial cell, or to the developed plant or animal, the proclivity to change or to disturbance of equilibrium varying in the latter at different periods of their existence. Many parts of his argument he illustrates by instances taken from common life and familiar arts; following his example in this, we would compare his elementary matter, his primordial cell, to plastic clay, which, by the skilful artist manipulating from without and from within, may be made to assume an infinity of forms, yielding to every touch applied, like the cell, to every force adequate to overcome the feeble resistance of the plastic matter in the one instance, or to disturb the equilibrium in the other, and varying in size according to the addition of formative substance or its withdrawal.

As regards development, philosophically viewed, we need hardly say, after this, that our author is a progressionist, opposed to the uniformitarian, following the natural method as opposed to the supernatural, and holding "a special formation" to be "merely a formula for ignorance." Granted that it be so: what shall we say of his primordial cell formula? Does not the same remark apply to it? Is not the origin of an organic cell—of a living entity—formed from dead matter, and endowed with properties permitting of development, according to his hypothesis, into an animated, reasoning being such as man, as mysterious and inexplicable? We are often reminded, in reading his pages, of sentiments such as Lucretius expresses in his philosophical poem, in his account of the Epicurean doctrine, starting with the principle—

"Nullam rem é nilo gigni divinitus umquam," &c.

And how many more passages might be mentioned—those in which atoms are described and brought into play—which might be referred to in the same manner!

We need hardly remark that Mr. Herbert Spencer is a follower of Mr. Darwin. No writings are so frequently referred to as his, and none are more deservedly commended. Yet he does not adopt all Mr. Darwin's views without modification. He attributes more than Mr. Darwin does to "functionally acquired modifications, transmitted and increased, and what are not explicable as the results of natural selection;" and in so doing, we think he is fully justified by the facts which he brings forward.

Of the volume as a whole we would say, and in its praise, that it requires to be studied, read, and re-read to excite the interest it deserves. It is rich in facts, acute in reasoning, ingenious in speculation, and most ingenious in explanation. The style is clear, always intelligible, but only intelligible in connexion with that which has preceded. But whether the doctrines it inculcates, the principles it lays down, the system which he endeavours to establish, are founded in truth, are sound inductions, there will be, of course, difference of opinion. When the work is completed, then will be the time to pass judgment on it. If in this its early stage we may offer an opinion, what which seems to us most open to question in it are the data he assumes for explaining groups, generalizations of facts—these data, as before mentioned, being cells, primordial and physiological, these themselves deductions after the manner of atomic units, with assigned properties inferred from certain resultants, and thus obtained, employed to account for phenomena.

With all respect to the author as an authority, it may be a satisfaction to those who study the work to know that in its execution he has had the aid of two distinguished men of science, Professor Huxley and Dr. Hooker, who have looked through the proof sheets for the correction of errors, but without, as he adds, taking any responsibility for "the enunciated doctrines that are not among the recognised truths of biology."

In this their revisal, we think they may have read carelessly what the author states of the generative powers of the salmon, and his reasoning thereon. We shall quote the passage, observing that it is introduced when insisting that the perfect sperm-cells and germ-cells do not appear until growth is declining. He says :

"There is, indeed, among fishes, at least one case which appears very anomalous. The male parr, or young of the male salmon, a fish of four or five inches in length, is said to produce milt. Having, at this early stage of its growth, not one-hundredth of the weight of a full-grown salmon, how does its production of milt consist with the alleged law? The answer must be in a great measure hypothetical. If the salmon is (as it appears in its young state) a species of fresh-water trout, that has contracted the habit of annually migrating to the sea, where it finds a food on which it thrives—if the original size of this species was not much greater than that of the parr (which is nearly as large as some varieties of lake-trout and river-trout)—and if the limit of growth in the trout tribe is very indefinite, as we know it to be, then we may reasonably infer that the parr has nearly the adult form and size of this species of trout before it acquired its migratory habit, and that this production of milt is in such case a concomitant of the incipient decline of growth naturally arising in the species when living under the conditions of its remote ancestors. If this be admitted, the immense subsequent growth of the parr into the salmon must be regarded as due to a suddenly increased facility in obtaining food—a facility which removes to a great distance the limit at which assimilation is balanced by expenditure, and which has the effect analogous to that produced in plants, of arresting the incipient reproductive process, and causing a resumption of growth. A confirmation of this view may be drawn from the fact, that when the parr, after its first migration to the sea, returns to fresh water, having increased in a few months from a couple of ounces to five or six pounds, it no longer shows any fitness for propagation; the grilse, or immature salmon, does not produce milt or spawn."

Now, we would observe, it is remarkable that the milt is developed in the parr before it has ceased its growth in fresh water, before it becomes a smolt preparatory to migrating seaward, and at a time when in the young female fish of the same age the ovaries are merely in a rudimentary state, so as to escape observation unless carefully sought for. Further, there is no proof that the male lake or river trout (unless in exceptional instances) has its generative organs developed so early, or, so far as our knowledge extends, and we have paid much attention to the subject, that the grilse is not fertile between its first return to fresh water and its second to the sea. Moreover, as regards the general proposition that the reproductive function is not exercised until there is a cessation of growth, we think he has expressed himself too absolutely. In the instance of the goat, the sheep, the bullock, the common fowl, this function is known to be exerted by the male with fruitful effect, and we may add, in the human race, before maturity of growth has been attained. What we have quoted is an example of hypothetical explanation, and we chiefly object to it as regards the data. The use of hypothesis in biological research is, perhaps, almost unavoidable; but it should be sparingly used, and only used, we think, when promising to lead to a theory.

We will mention another instance in which we think Mr. Spencer has received as an approved fact that which is in truth doubtful, and having adopted it as such, proceeds to explain it hypothetically. The presumed fact is, that marriages of consanguinity are proportionally barren, or productive of feeble offspring. For the explanation we must refer to the volume; it could hardly be done justice to in any words but his own, and it is too long for quotation; we would rather consider for a moment the assumed fact. The subject, as our readers are aware, has been long discussed, and is yet unsettled, some adopting the unfavourable view of such marriages, others that of their innocuity, provided the individuals concerned are healthy, free from taint, and in circumstances of life favourable to health.

This latter view receives support as well from observations on isolated societies of our own race as from instances among the *feræ naturæ*. In the February number of the 'Journal de Médecine et de Chirurgie Practiques,' we find two examples recorded such as we have adverted to, one by M. Voisin, the other by M. Revilbout, both striking instances of close intermarriages without degeneration. We quote part of M. Voisin's statement—the details are so precise, and his conclusion, as it appears to us, so just:

"Il existe en ce moment, dans la commune de Batz, 46 unions entre consanguins à un degré proche: 5 entre cousins germains, 31 entre cousins issus de germains, 10 entre cousins au quatrième degré; 5 mariages entre cousins germains ont produit 23 enfants, dont aucun n'est infirme de naissance. Il en est mort 2 de maladies accidentelles. 31 mariages entre cousins issus de germains ont produit 120 enfants, dont aucun n'est atteint d'affection congénitale ni d'infirmité, 24 ont succombé à des maladies. 10 mariages entre cousins au quatrième degré ont donné naissance à 29 enfants, tous bien portants, sauf 3 qui sont morts de maladies aiguës. La santé du père et de la mère de ces individus est ou était tres-bonne et exempte de toute diathèse. Celle aussi de ces individus aux-mêmes et de leurs enfants est excellente.

"Ces faits me semblent prouver, dit M. Voisin, que dans les conditions dites de bonne sélection, la consanguinité ne nuit en aucune façon au produit et à la race, mais au contraire, exalte les qualités comme elle ferait en sens inverse des défauts et des causes de dégénérescence."

The people in question are described as derived from a Saxon colony established in the fourth or fifth century, and as having retained to the present time the language and manners of their progenitors, with the habit of contracting marriages rarely with the inhabitants of the adjoining districts.

Mr. Herbert Spencer occasionally addresses his remarks and explanations to the general reader with familiar illustrations. These are always ingenious, and are strongly contrasted with his esoteric teaching. We give in the following extracts an example of each, and they are a good example of his style and reasoning. The passage relates to a term of progress, to a limit of growth:

"Since the function of any organ is dependent on the functions of the organs which supply it with materials and forces, and since the functions of these subsidiary organs are dependent on the functions of organs which supply them with materials and forces, it follows that, before any great extra power of discharging its function can be gained by a specially-exercised organ, a considerable extra power must be gained by a series of immediately-subservient organs, and some extra power by a secondary series of remotely-subservient organs. Thus, then, are required numerous and wide-spread modifications. Before the artery which feeds a hard-working muscle can permanently furnish a large additional quantity of blood, it must increase in diameter and contractile power; and that its increase of diameter and contractile power may be of use, the main artery from which it diverges must also be so far modified as to bring this additional quantity of blood to the branch artery. Similarly with the veins, similarly with the absorbents, similarly with the nerves. And when we ask what these subsidiary changes imply, we are forced to conclude that there must be an analogous group of more numerous changes, ramifying throughout the system. The growth of the arteries primarily and secondarily implicated cannot go to any extent, without the growth in minor blood-vessels on which their nutrition depends; while their greater contractile power involves enlargement of the nerves which excite them, and some modification of that part of the spinal chord whence these nerves proceed. Thus, without tracing the like remote alterations implied by extra growth of the veins, absorbents, and other agencies, it is manifest that a large amount of rebuilding must be done throughout the organism before any organ of importance can be permanently increased in size and power to a great extent. Hence, though such extra growth in any part as does not necessitate considerable changes throughout the rest of the organism may rapidly take place, a further growth in this part, requiring a remodelling of numerous parts remotely and slightly affected, must take place but slowly."

Now for his illustration:

"We have before found our conceptions of vital processes made clearer by studying analogous social processes. In societies there is a mutual dependence of functions, essentially like that which exists in organisms; and there is also an essentially like reaction of functions on structures. From the law of adaptative modification in societies we may therefore hope to get a clue to the laws of adaptative modification in organisms. Let us suppose, then, that a society has arrived at a state of equilibrium like that of a mature animal—a state not like our own, in which growth and structural development are rapidly going on, but a state of settled balance amongst the functional powers of the various classes and industrial bodies, and a consequent fixity in the relative sizes of such classes of bodies. Further, let us suppose that in a society thus balanced there occurs something which throws an unusual demand on some one industry—say an unusual demand for ships (which we will assume to be built of iron), in consequence of a competing mercantile nation having been prostrated by famine or pestilence. The immediate result of this additional demand for iron ships is the employment of more workmen, and the purchase of more iron, by the shipbuilders; and when, presently, the demand continuing, the builders find their premises and machinery insufficient, they enlarge them. If the extra requirement persists, the high interest and high wages bring such extra capital and labour into the business as are needed for new shipbuilding establishments. But such extra capital and labour do not come quickly; since, in a balanced community, not increasing in population and wealth, labour and capital have to be drawn from other industries, where they are already yielding the ordinary returns. Let us now go a step further. Suppose that this iron shipbuilding industry, having enlarged so much as the available capital and labour permit, is still unequal to the demand, what limits its immediate further growth? The lack of iron. By the hypothesis, the iron-producing industry, like all other industries throughout the community, yields only as much iron as is habitually required for all the purposes to which iron is applied; shipbuilding being only one. If, then, extra iron is required for shipbuilding, the first effect is to withdraw part of the iron habitually consumed for other purposes, and to raise the price of iron. Presently the iron-makers feel this change, and their stocks dwindle. As, however, the quantity of iron required for shipbuilding forms but a small part of the total quantity required for all purposes, the extra demand on the iron-makers can be nothing like so great in proportion as is the extra demand on the shipbuilders. Whence it follows, that there will be much less tendency to an immediate enlargement of the iron-producing industry—the extra quantity will for some time be obtained by working extra hours. Nevertheless, if, as fast as more iron can be thus supplied, the shipbuilding industry goes on growing—if, consequently, the iron-makers experience a permanently increased demand, and out of their great profits get higher interest on capital, as well as pay higher wages, there will eventually be an abstraction of capital and labour from other industries, to enlarge the iron-producing industry: new blast furnaces, new rolling-mills, new cottages for workmen, will be erected. But, obviously, the inertia of capital and labour to be overcome, before the iron-producing industry can grow by a decrease of some other industries, will prevent its growth from taking place until long after the increased shipbuilding industry has demanded it; and meanwhile, the growth of the shipbuilding industry must be limited by the deficiency of iron. A remoter restraint of the same nature meets us if we go a step farther—a restraint which can be overcome, only in a still longer time. For the manufacture of iron depends on the supply of coal. The production of coal being previously in equilibrium with the consumption, and the consumption of coal for the manufacture of iron being but a small part of the total consumption, it follows that a considerable extension of the iron manufacture, when it at length takes place, will cause but a comparatively small additional demand on the coal-owner and coal-miner—a demand which will not, for a long period, suffice to cause enlargement of the coal-trade, by drawing capital and labour from other investments and occupations. And until the permanent extra demand for coal has become great enough to draw from other investments and occupations sufficient capital and labour to sink new mines, the increasing production of iron must be restricted by the scarcity of coal; and the multiplication of shipyards and shipbuilders must be checked by the want of iron. Thus, in a community which has reached a state of moving equilibrium, though any one industry sensibly affected by an additional demand may rapidly undergo a small extra growth; yet a growth beyond this, requiring, as it does, the building-up of subservient industries, less directly and strongly affected, as well as the partial *un*building of other industries, can take place only with comparative slowness. And a still further growth, requiring structural modifications of industries still more distinctly affected, must take place still more slowly.

"Returning from this analogy, we realise more clearly the truth, that any considerable member of an animal organism cannot be greatly enlarged without some general reorganization. Besides a building-up of the primary, secondary, and tertiary groups of subservient parts, there must be an *un*building of sundry non-subservient parts; or at any rate, there must be permanently established a lower nutrition of such non-subservient parts. For it must be remembered that in a mature animal, or one which has reached a balance between assimilation and expenditure, there cannot be an increase in the nutrition of some organs without a decrease in the nutrition of others; and an organic establishment of the increase implies an organic establishment of the decrease —implies more or less change in the processes and structures throughout the entire system. And here, indeed, is disclosed one reason why growing animals undergo adaptations so much more readily than adult ones; for while there is surplus nutrition, it is possible for specially exercised parts to be specially enlarged, without any positive deduction from other parts. There is required only that a negative deduction be shown in the diminished growth of other parts."

Whether the work will attract to it many of the class of general readers, is questionable. We apprehend that its abstract, strictly scientific style, for most part, and the close dependence of its parts, as well as the preliminary knowledge required to read its pages intelligently and with profit, will prove repulsive to most of these readers. Yet, several of the chapters might be perused by them with advantage, and could hardly fail to excite interest, and might create a taste for the study of biology in all its profundities. The chapters we would name as most likely to have this charm are those on "Development," on "Adaptation," on the "Special Creation Hypothesis," the "Evolution Hypothesis," and those relating to the factors, external and internal, productive of those changes on which variations of plants and animals are implied to depend.

To the prepared reader who can give his mind to the great subject, the beginning of which is thus far discussed, we can promise much instruction and some delight, especially the latter, if he can adopt the sentiment of the author, that in the natural progress of development there is a constant tendency to improvement—from the simple to the complex, from the lower to the higher forms of existence, with enjoyment in a proportional grade, ascending from the merely sensuous and animal to the intellectual and human. Whether Mr. Herbert Spencer will accomplish the great desideratum, and solve the problem of the time, the reconciling of science and religion, we wait with some inquietude to see. Happy indeed will he be if he can effect this, and assign good grounds for some of our dearest and highest aspirations! —happy will he be if he can add force to the words of one of the most eloquent and able of his contemporaries—M. Auguste Laugelo:

"Dieu vit dans le temps, dans la création, dans l'histoire, dans l'homme. Ce qui en nous est divin ne peut périr; notre individualité seule, c'est-à-dire notre forme passagère doit s'évanouir. Le vase se brisera, mais le parfum qu'il recèle conservera toute sa force. Nous rêvons, nous desirons ardemment l'immortalité sous notre figure actuelle, parce que notre imagination, enchainée par les sens, est impuissante à la concevoir autrement. Cette soif de l'infini est le plus beau privilége de notre nature."

Review V.

Seventh Report of the Medical Officer of the Privy Council, with Appendix.—London, 1864. pp. 532.

This Report is not inferior to any which have preceded it in interest and importance. The subjects of it are Vaccination, the House Accommodation of the Labouring Classes in the Rural Districts, the Working of the Nuisances Removal Acts in England, Parasitic Diseases of Animals used for Food, and Miscellaneous Proceedings, chiefly with immediate reference to outbreaks of Contagious Diseases;

followed by an Appendix, containing elaborate reports on these several matters, drawn out by the Medical Officers acting under Mr. Simon, the able chief of the Medical Department of the Council Office.

In reading these documents, our first impression is that of a grateful feeling towards the Government for instituting such inquiries, the main intent of which is the improvement of the condition, and the preservation of the health and lives of the people, especially of the labouring class. Our lasting impression is a feeling of satisfaction and respect for the ability displayed in the conducting and carrying out the laborious inquiries to a practical issue.

As in the last two numbers of our Review, under the head of Sanitary Science and Legislation, most of the topics relating to the public health have been brought to the notice of our readers in considerable detail, we shall now be more brief, and confine ourselves to those subjects immediately before us, and which at the present time are especially deserving of attention. We shall follow the order observed by Mr. Simon in his summary report:—

1. *Vaccination.*—The exertions made during the last year in the cause of vaccination have been, it would appear, considerable, and in the right direction. 609 districts, comprising 129 different unions or parishes, have been inspected and reported upon, thus, as Mr. Simon states, presenting, in addition to those of the four preceding years, a complete account of the working of our present vaccination laws, and affording a basis, such as there never yet had been, for effective legislation against small-pox.

As in previous years, we learn that special means have been taken to ascertain that the quality of the lymph supplied was good, and also that the educational vaccination stations, increased by two, were in a satisfactory state.

By reference to the inspectors' reports, we are enabled to learn how far the working of the existing vaccination laws has been successful, or the contrary. It is with regret we have to state, that from them it would appear that the success has been partial, and their failure too frequent—this owing to a variety of causes, the chief of which, we gather, are the following:—on the part of parents, carelessness and indifference, and occasional prejudice, and this sometimes encouraged by farmers and clergymen; on the part of vaccinators, too often inattention to their duties, deputing often the performance of them to unqualified assistants, disregarding more or less the instructions for their guidance, consulting rather their own convenience than the good of the public service; and on the part of the officials, the registrars and boards of guardians, a more or less degree of inattention, owing to which the irregularities adverted to have not been checked as they ought to have been.

The proofs of the defective working of the laws are to be found in the frequent occurrence of small-pox throughout the country, in the proportionately small number of the vaccinated in infancy, and in the irregularity of that proportion in different and even in adjoining districts. Where there have been attention and zeal, the proportion has been high, and *vice-versâ.* Did our limited space permit, we might give from the inspectors' reports many instances, as detailed by them, of irregularities, to use the mildest term, in the performance of vaccination duties. One example must suffice. Dr. Sanderson, adverting to long-neglected vaccination, proceeds to remark:

"So long as a certain number of cases are annually returned, the neglect does not attract the attention of the guardians. If, however, small-pox occurs or vaccination ceases entirely, the contractor's attention will probably be called to the subject by a remonstrance, in which case he will, perhaps, secure the assistance of an 'efficient' assistant. This gentleman at once engages in a vaccination *battue.* He goes from parish to parish, well provided with 'points,' prepared to vaccinate or re-vaccinate all the children of whatever age he can find, whether in their parents' houses, at play in the village street, or at school. At the end of the quarter a large bill is sent to the guardians, and the annual return to the Poor Law Board shows that there has been an enormous 'extension of vaccination' in the district. But the result is most unsatisfactory, for not only has quantity been purchased at the expense of quality, but the goodwill of the people has been forfeited, or rather their antipathy has been intensified tenfold. In visiting schools in villages in which a *battue* had taken place, I have been astonished at the expression of terror which came over the children's faces as soon as they knew my object."

One circumstance is a little encouraging, viz., that the remissness and negligence so much to be deprecated have been greater and are decreasing; and it is no small satisfaction to learn from such high authority, that vaccination has lost little or nothing of its efficacy—the great majority of those who have had small-pox having been the unprotected by vaccination. It is stated in the instance of forty-two children who bore marks of small-pox, that forty were unvaccinated, that two only had been vaccinated; also, that small-pox after vaccination was of rare occurrence, and was commonly modified and mild, seldom leaving disfiguring marks.

In France, much alarm has arisen relating to the danger of using vitiated lymph, and of conveying syphilitic infection. It is a happiness to find that no terror of the kind is adverted to in any of the reports; indeed, judging from the silence of Mr. Simon and of the inspectors on the subject, we must conclude that even the suspicion of such infection as a public danger has not entered into their minds.

2. *House Accommodation of Rural Labourers.*—The inquiry into this subject has been conducted by Dr. Hunter, who, we are informed by Mr. Simon, examined in the different English counties as many as 5375 dwellings, paying attention to the local circumstances affecting their quality. His report is divided into two parts—one relating to the topic generally, affording information derived from extensive reading, the other confined to his special observations as reporter on the cottages he examined. Both are deserving of being read: the one, as might be expected, is confirmatory of the other, and must convey to the mind of the reader a very melancholy impression of the condition of the labouring class throughout the country with few excep-

tions. Whether or not, or to what extent, the dwellings of the poor have deteriorated of late years, we think it useless to stop to inquire; this is certain, that they have not in any way kept pace with the increasing wealth of the country, and the increase of comfort and luxury in the houses and habits of the middle and upper classes. Moreover, it is certain that the number of cottages has diminished with an increase of occupants: thus, during the last decennial period, it is authoritatively stated that in 821 parishes and townships the decrease of houses has been 3118, the increase of persons 16,497. Their deficiencies and defects, as we learn from the reports, are many and serious, tending to the degradation of our peasantry rather than to their social improvement; conducive to disease rather than health—to intellectual and moral debasement rather than to a better state of morals and any advance in useful knowledge. High rents, low wages, scanty room, over-crowding, the use of one bedroom by adults of both sexes,[1] are some of the evils more or less conspicuous; and there are many more, such as a too common want of privies, imperfect ventilation, bad construction, bad or neglected drainage, and other conditions of an unwholesome kind. Further, in a large number of instances the cots of the labourers are far apart from the land on which their labour is required—wasting, in going and returning, time and strength. To the readers of our pages, especially those engaged in country practice, these particulars can hardly be but familiar. They must know how few are the circumstances which favour the well-to-do of the peasant; how few comparatively of this class have a garden attached to their dwelling; how few a bit of land for cultivation at spare hours; how few a cow, or a pig, or even poultry;[2] in brief, there is an overwhelming preponderance of facts as to their condition which must be held to be a reproach to the civilization of England. These are not our words, but those of Mr. Simon. We have had in our wanderings some experience of the dwellings of the same class in countries which do not rank high in civilization and culture, and yet in none of them, not even in our West India colonies, is their condition so objectionable: there, even in times of slavery, a piece of garden-ground was attached to each, and there was leave granted to keep poultry.

Of the causes which have operated in producing this wretched condition some are less open to question than others; one main cause has been the law of rating and settlement, which, to keep down the poor-rate, has discouraged the building of dwellings in parishes and townships, and encouraged rather the pulling down, or the allowing to go to ruin, those already built, thus driving the labourers into villages open to them. Another cause, but secondary to the preceding, is the change in course of progress in the agriculture of the country, so much more land now being in pasture than under the plough, owing

[1] Of 5375 cottages reported on, 2195 contained only one bedroom. . . . "Though instances," says Dr. Hunter, "must not be recorded, sufficient data are remembered to warrant the remark that great depression, and sometimes death, are the lot of the female participator in the offence of incest."

[2] It is stated that from 60,000*l.* to 70,000*l.* a month is the amount paid for foreign eggs.

to the farmer finding it more for his interest to grow meat, feeding cattle, than to grow grain.[1] A third cause may be assigned, the greatly diminished number of small farms. It is noteworthy, that where these small independent holdings are most common—as in the northern counties compared with the midland—there the peasantry are least aggrieved, wages are higher, and their circumstances generally are less debasing.

We would fain hope that the evils of their condition, where worst, have reached their maximum, and that a change of a favourable kind is about to take place. Mr. Villiers' Union Chargeability Bill, lately carried in the House of Commons, and happily not thrown out in the House of Lords, should prove a great step in advance in favour of the freedom of the labourer, and the bettering of his condition. And it is to be hoped that as the science of political economy is better known and more widely diffused, with the conviction that the interests of all classes are inseparably connected, and that those of the lowest in the social scale, the most numerous and most useful, cannot be neglected with impunity, a disposition will be created to treat them more justly and more humanely. As regards their dwellings, the example has been set by some large landed proprietors —honourable exceptions—but too often their exertions have not been directed by the soundest judgment: the cottages erected by them, owing to their ornate style, being too expensive to ensure to the proprietors a moderate return in rent for the outlay. Those landlords who are desirous of improving the dwellings of their labourers would do well to consult this Report. Dr. Hunter has given in it a great deal of information which would be useful to them in carrying out their design with economy, not regardless of comfort and salubrity.

3. *Nuisances Removal Acts.*—The inefficiency of these Acts is well described by Mr. Simon; they are considered by him, in relation to the unsanitary state of the labourers' dwellings, as a mere dead letter; we need not, therefore, dwell on them at any length. He points out the many amendments which he thinks they need to be rendered practically useful. Those persons who have attempted to act under them, especially in villages, know too well the difficulties they have to contend with, and the impossibility at present of effecting any material hygienic reform—owing, amongst other impediments, to the impossibility of obtaining funds for the purpose by any legal measure, or allowed mode of rating. Were his fourth suggestion carried out—the forming of special *nuisances removal districts*—the measure might greatly facilitate proceedings.

4. *Parasitic Diseases in Animals used for Food.*—The occurrence which led to this special inquiry, we are informed by Mr. Simon, was the following very remarkable one: In 1863, in the little town of Hettstädt, in Prussian Saxony, the utilization of one trichinous pig (chiefly in celebration of the battle of Leipzig) had led to an epidemic

[1] A good authority—Mr. Disraeli—has stated that thirty cottages are required for the use of persons employed on 1000 acres of land—of course, not in pasture.

of human trichiniasis, wherein there were at least 158 sufferers, and no fewer than 28 deaths. The inquiry thus incited was intrusted to Dr. Thudichum, by whom it has been very ably and minutely carried out. His report is in the form of a monograph, comprising the physiology or natural history of each entozoon, especially the laws of their reproduction and migration, the circumstances under which man is liable to be infected, the symptoms produced by their presence, and the diseases most resembling their effects. His treatise occupies 162 pages; the parasites, the subjects of it, are those which occur in animal food sold in the London markets; of these five are of the order Cestoda:

1. *Cysticercus cellulosæ,* measle, bladder-worm of pork, in the flesh of pigs.

2. *Cysticercus teniæ mediocanellatæ seu saginatæ,* bladder-worm of beef, veal, in the flesh of calves, cows, oxen.

3. *Cysticercus tenuicollis,* the diving bladder-worm of cattle, in the abdomen of sheep, deer, calves, cows, pigs.

4. *Echinococcus veterinorum seu hominis,* in the lungs and liver, more rarely other organs, of sheep, cows, oxen, and pigs.

5. *Cœnurus cerebralis,* or water-brain of sheep, in the cranial cavity of sheep.

6. *Cysticercus pisiformis,* or the pea-shaped bladder-worm, in the abdominal cavity of rabbits.

Of the order of Trematoda there is one species:

1. *Distomum hepaticum,* or liver-fluke, in sheep and oxen.

Of the order of Nematoda there are two species:

1. *Strongylus filaria,* or round-worm of sheep, in sheep, pigs, and calves.

2. *Trichina spiralis,* or the spiral flesh-worm, in the flesh of pigs.

His descriptions of the several entozoa are accompanied by excellent woodcuts, illustrative of the forms and peculiarities of structure of the parasites. As a contribution to helminthology this monograph is deserving of all praise, and we strongly recommend it to the attention of our readers, especially that portion relating to the pathology of trichiniasis, its treatment and prevention. Our limited space does not admit of our attempting its analysis, and something more than an analysis would be required to do it justice; nor must we forget that the subject has been pretty amply noticed in the last number of our periodical, in the review of Dr. Cobbold's excellent work. One extract we think it advisable to give on account of its importance—that on the prevention of the diving bladder-worm (*cysticercus tenuicollis*), so fatal to sheep, and which are commonly infected through their guardians, the sheep-dogs. To free the latter from any margined tape-worms, the infecting media, the following treatment is prescribed:

"The dogs should be purged by a dose of jalap, one scruple in a pill being a good dose for a dog of from 17 to 30 lbs. A quantity of butter also acts as an easy purgative with many dogs, and has the advantage that the animals will eat it spontaneously; or any of the many purgatives known to dogdoctors may be obtained. Immediately after the action of the bowels has been obtained, half an ounce of the powder of the areca-nut should be given to the dog, either in pills or in milk, or mixed with some savoury food. With this drug should be united some of the pickings of sheep's head, the pieces with curly fine dense wool being preferred. These any dog will swallow when they are dipped in some grease or pasty substance. The purge removes the contents of the intestines, and sets up a strong peristaltic action. The areca kills the tape-worm when it comes sufficiently in contact with it, or at all events makes it obtuse or powerless; the curly wool entangles the worm in its meshes; and the entire ball, composed of worm, wool, and medicine, is speedily expelled by the energetic action of the bowels. The mass thus expelled must at once be destroyed, either by means of fire or by burying it sufficiently deep and in a secure place, so that pigs can under no circumstances reach it. This treatment applied to every dog once in every quarter of a year will act as a perfect curative and preventive of canine helminthiasis: it will liberate the dog from old and young teniæ; and supposing the dog to be again infected on the day after this treatment, then the repetition of the treatment after three months will remove parasites which have only just had time to become ripe, and not yet been in a position to do much mischief, by the launching into the world of ripe proglottids."

The same treatment is applicable to sporting and other dogs, and will conduce to their being clean, healthy, and vigorous.

5. *Miscellaneous Proceedings.*—Under this head are some interesting particulars relative to the state of health of several places where fever has broken out, or where the death-rate of the population has been unusually high, calling for inquiry. From the reports of the inspector in every instance, adequate causes appear to have been found in operation, comprised chiefly in the neglect of sanitary measures, the great majority of them of a remediable kind, and which might be corrected were the Nuisances Removal Act such as to be easily enforced and made compulsory.

We commenced this article with the expression of a grateful feeling for what Government has done to better the condition of the working class: now that we have gone through the details of this Blue Book, and seen how many are the physical evils oppressing the people, productive of disease, shortening life, and deteriorating morals, we are more disposed to cast reflections on the Government for supineness in not attempting their correction by appropriate legislative enactments. In one place, the silk-mills at Congleton, pulmonary consumption and complaints of the chest are prevalent amongst the women employed, the chief assignable causes of which are stated to be a want of proper ventilation and an excessively high temperature of the rooms, ranging often in some of the manufactories above 70°, and this though a few of the most intelligent of the mill-owners state that a temperature of 60°, or at most 62°, is adequate for carrying on the work to advantage. In another locality, Brynmawr, in the district of Crickhowell, with a population of 7000 depending for employment on the great iron-works there established, the death-rate of the inhabitants, and especially the death-rates of infants and children, are proportionally excessive, and as regards the latter, in great measure from neglect, the women, even mothers with infants at their breasts, working, we are informed, underground, and doing the work of navvies. Now, should it not be the part of the Executive to do more than have inquiry instituted as to causes?—these ascertained, should not active prevention follow? We select these two instances from the rest as striking examples; many of the others reported on are hardly less so; all tending to prove the evils arising from neglect, and the good that might accrue from the adoption of a judicious preventive system.

REVIEW VI.

Acupressure. A New Method of Arresting Surgical Hæmorrhage, and of Accelerating the Healing of Wounds. By JAMES Y. SIMPSON, M.D., &c. &c.—*Edinburgh*, 1864. pp. 580.

PROFESSOR SIMPSON'S proposal of a new method of securing the vessels in surgical operation has excited a great deal of notice in the profession from its intrinsic importance, and has attained perhaps an equal or greater notoriety from the violent quarrel which it has excited between himself and Professor Syme. The latter topic is too distasteful and too discreditable for us to enter upon. We regret that in Edinburgh what ought to be matters of scientific discussion merely have such a tendency to become subjects of personal squabbling, but with these squabblers we have nothing to do. Our present object is only to inquire whether Professor Simpson, in this bulky volume, has shown us enough reason for urging the surgeons of our great hospitals to give this method that thorough and patient trial which it certainly has not yet obtained in London, or elsewhere as far as we know, and without which any definite opinion on its value would be premature. Although, however, we must confess that we are not ourselves in a position to pronounce an opinion on the merits of acupressure in surgical operations, we shall endeavour to digest for our readers the evidence in its favour which Professor Simpson here tenders, and to estimate the probable value of the method.

1. In the first place, let us obtain a clear idea of the proposal itself. The essence of it is, that the wounded artery shall be compressed by means of a metallic body stretched across its open mouth, until the blood in its tube may be supposed to be coagulated, and then the compressing body shall be withdrawn from the wound. Thus, temporary compression, by means of a non-absorbing substance, is substituted for the prolonged compression of the silk ligature, which, as is well known, absorbs the discharges of the wound. Thus, as Professor Simpson hopes, no obstacle will be opposed to the primary and immediate union of the wound. The compressing agent must be either a long pin, the head and point of which shall project from the skin, or a needle carrying a wire thread, the thread projecting out of the wound in order to allow of the withdrawal of the needle; or either of these may be combined with a loop of wire, in the way which we shall speak of directly. The first method, by means of a long pin passed

through the skin, then across the artery, and then out of the skin on the other side (just as a flower-stalk is fixed into the coat), is now, we believe, antiquated. It is clear, that in order to compress a large artery (such as the femoral) with such an amount of force as would justify a prudent surgeon in leaving his patient under the care of a non-professional person, a very violent pressure must be exercised on the whole course of a long tract of tissue, and must be kept up for a considerable time; thus, no doubt, opposing a more effectual obstacle to union than a single silk ligature tied round the artery and brought out at the angle of the flaps. Indeed, there may be a doubt whether in a thick stump the thing could be done. Then again, if many arteries required compression, the plan would surely be very cumbrous. But we need not go minutely into the particulars of this method, since we gather, by what the author says on p. 57 of this volume, that he intends the various plans in which a common sewing-needle is used to supersede it. The needles which Professor Simpson uses are straight, of moderate thickness, and about two inches in length. They are threaded with a piece of twisted wire. He describes three methods of using them. In the first, "the needle is dipped down into the soft tissues a little to one side of the vessel, then raised up and bridged over the artery, and then finally dipped down again and thrust into the soft tissues on the other side of the vessel." (p. 58, fig. 10.[1]) 2. The second method is a modification of the first, devised independently of Dr. Simpson, by Dr. Knowles of Aberdeen, though previously employed also by Professor Simpson himself:

"Four movements are given to the needle—1. It is entered some lines on one side of the bleeding vessel or point, and driven on till it has passed some lines beyond it. 2. Its point is then, by another movement, made to emerge upon the surface of the wound. 3. A degree of rotation or torsion is next given to the needle, so as to twist the arterial tube or orifice and the included tissues till the vessel is closed. And 4. The occlusion being effected, the point of the needle is pushed onwards into the soft tissues beyond, to the extent of several lines, in order to fix and maintain the partial torsion of the artery and the tissues involved." (p. 355.)

3. The third method is the one which is characterized (and justly, as it seems to us) by the author as "the most certain, and which probably will be most frequently followed by practitioners:"

"The point of the needle is entered a few lines to one side of the vessel, then passed under or below it, and afterwards pushed on, so that the point emerges a few lines beyond the vessel. The noose, or duplicature of wire, is next thrown over the point of the needle; then, after being carried across the mouth or site of the vessel, and passed around the eye end of the needle, it is pulled sufficiently tight to close the vessel; and lastly, it is fixed by making it turn by a half-twist, or twist, around the stem of the needle. A slight half-twist usually fixes a rigid wire-thread quite perfectly. If the operator prefers, he may keep the two threads of the noose open after they bridge across the

[1] We must call the author's attention to the imperfections of his illustrations. Thus, the figure now in question merely shows the open mouth of an artery, and a needle lying in the tissues somewhere near it. It is impossible, either with or without the letter-press, to imagine how the needle is supposed to be exercising pressure on the vessel.

artery, and *tie* them below or behind the eye end of the needle in the form of a common single or double knot. A common silk thread may be used in the same way. But the tie, with any kind of thread, takes much longer time than the twist with metallic thread, and certainly is not more efficient." (p. 59.)

It is very easy to make trial of these methods on the dead subject by cutting the anterior flap of an amputation high up in the thigh, including the large and several small vessels, and pumping water through the arteries by a tube inserted into the external iliac. The results of such trials on the dead subject have not impressed us with a high idea of the efficacy of the first method; in fact, at present, we should be sorry to trust to it for any vessels large enough really to require ligature. The second is a more effectual method, but it must also be more painful, and we should think that, if the tissues are thickened and infiltrated, it would be difficult to carry it out in practice. Besides, it involves much more violence to the artery and surrounding tissues than any of the other methods. By the third plan, any necessary amount of pressure can be applied, and arteries of the largest size can thus be securely commanded. No precise directions are, or perhaps can, be given as to the length of time during which the compression should be kept up, since this must vary with the size of the artery, the force of the circulation, and the irregularity of the blood. Nor, in the absence of general rules, does it seem that Dr. Simpson can point us to any clear local indications by which the surgeon may be informed when it will be safe to remove the needles. Thus, in the cases which Professor Simpson has recorded, we find one in which, after excision of the breast, the needles were withdrawn in *two hours* (p. 81), but in most of them they were left about two days, those on the smaller arteries being withdrawn on the day after the operation. We will quote what our author says on this important point:

"As a general rule, even such a large artery as the femoral will be found closed in forty-eight or fifty hours. . . . . Two circumstances appear to contra-indicate the early removal of the needles: 1. If there is sickness and vomiting, consequent upon the operation, the acupressure apparatus should be left longer than usual, as the act of vomiting is sometimes attended by the recurrence of hæmorrhage. 2. Again, in any doubtful case, the appearance or feeling of the pulsation of the principal artery or arteries, up to the very edge of the wound, should make us cautious in withdrawing the needles. Till more practical knowledge is accumulated on the subject, it is at least better to err on the side of safety to the patient than to make too urgent efforts for complete primary union. Possibly even the retention of the needles for sixty, seventy, or more hours, may not be found incompatible with primary adhesion in some cases and constitutions. But perhaps, as I have oftened ventured to suggest, the time may come when, in minor operations and amputations, the surgeon will wait six or twelve hours before closing the lips of the wound with metallic sutures, and be able to withdraw most, if not all, of the acupressure needles which he has employed. If so, he would be able to close the sides of his wound without any foreign body whatever being left between them." (pp. 78-81.)

The author then relates the case of excision of the mamma above referred to, in which the vessels were temporarily secured with acupressure needles for two hours, during which the wound was left open. The needles were then removed, and the wound sewn up. The whole length of it (eleven inches) united completely and entirely by the first intention.

We cannot avoid being somewhat sceptical as to the occurrence of primary union in a wound which has contained a bundle of wires for more than two days, and we fear that the uncertainty as to the security against hæmorrhage after the withdrawal of the needles must for some time limit the application of the method ; but the suggestion last quoted seems feasible in some cases, and worthy of trial.

So much for the details of Dr. Simpson's proposal, and its feasibility. Let us now examine into its supposed advantages, the evidence which its author adduces of the reality of such advantages, and the objections which have been, or may be, urged against it, together with the author's answers to those objections.

The following is Dr. Simpson's own statement of the disadvantages of the ligature, and the contrasted advantages of metallic compression:

"COMPARISON OF THE LIGATURE AND ACUPRESSURE AS HÆMOSTATIC AGENTS:

Tabulated Contrast between them.

THE LIGATURE.	ACUPRESSURE.
1. Requires isolation, and consequently some detachment, of the end of the vessel from its vital organic connexions.	1. Requires none.
2. Produces direct mechanical injury, bruising, and laceration of the two internal coats of the artery.	2. Produces none.
3. Produces strangulation of the external coat.	3. Produces none.
4. Leads on, inevitably, to ulceration or molecular destruction of the external coat at the constricted part.	4. Produces none.
5. Causes mortification of the artery at the tied point, and usually also below it.	5. Produces none.
6. Produces, consequently, as many sites of ulceration and suppuration, and as many dead decomposing sloughs in each wound, as there are arteries ligatured in that wound.	6. Produces none.
7. If organic, as of silk or hemp, imbibes animal fluids, which speedily decompose, and irritate the surrounding living structures.	7. Requires only impervious metallic needles or threads, which are incapable of imbibing animal fluids.
8. Requires to produce the three highest stages of inflammation at each ligatured point—viz., ulceration, suppuration, and mortification.	8. Requires to produce inflammation up to the stage of adhesion only.

THE LIGATURE.	ACUPRESSURE.
9. Is not removable at the will of the operator, but, on the contrary, can only be slowly detached by the ulceration and sloughing of the ligatured vessel, and requires a period of from four or five to twenty days or more for its separation.	9. Is removable in an hour or two, or in one, two, or three days, and always at the will of the operator.
10. Stops only the artery tied.	10. Stops generally both artery and vein.
11. Stops only one artery.	11. May close two or more smaller arteries by means of a single needle.
12. Generally requires two persons for its application.	12. Requires only one person.
13. Is sometimes followed by secondary hæmorrhage, as an effect of ulceration and sloughing.	13. Is seldom followed by secondary hæmorrhage from ulceration or sloughing, as it produces none.
14. Sometimes fails altogether in cases of recurring secondary hæmorrhage.	14. Has succeeded under such circumstances where the ligature has failed.
15. Sometimes cannot be applied till the surgeon first exposes the bleeding vessel by dissection with the knife, as in vessels retracted in amputations, in wounds of the wrist, &c.	15. Does not necessarily require the exposure of the vessel, and therefore often prevents the necessity for antecedent dissection by the knife.
16. Prevents, as a foreign body, adhesion of the sides and lips of the wound by first intention, in the course of its track, as long as it remains.	16. Is early withdrawn, and is hence far less opposed to primary union.
17. Is apt, as an irritant body, to disturb and upset the process of primary adhesion in its vicinity.	17. Is early withdrawn, and has no irritant effect.
18. Unavoidably creates within the depths of the wound, pus, sloughs, and putrid materials, which are locked up and applied to the imbibing or absorbing cut surfaces of the wound.	18. Does not create nor apply any dangerous putrefying materials to the fresh absorbing surface of the wound.
19. Places the wound therefore in very dangerous local hygienic conditions.	19. Places the wound locally in far healthier hygienic conditions.
20. Is not unfrequently followed by surgical fever, from its leading to the formation and absorption of septic matters from the surface of the wound.	20. Is much less likely to be followed by surgical fever, because it does not lead to the formation of septic matter, and closes the veins as well as the arteries.
21. For these various reasons it makes primary union rarer—healing slower — and septic or surgical fever more frequent.	21. For these reasons it makes complete primary union more frequent—healing quicker—and septic or surgical fever less common." (pp. 447–450.)

This statement, like the whole of the rest of the work, labours under the defect of wordiness. The whole affair appears resolvable into the two very plain assertions, that the constricting action of the ligature being more severe than that of the acupressure, and more prolonged, is more liable to cause sloughing of the parts constricted, and that the silk ligatures, by imbibing the products of decomposition, act as irritants to the raw surface, which the metallic bodies, of course, do not, even during the short time of their application. The minor advantages which are claimed for acupressure, if real, are of no practical importance; and the supposed greater immunity from surgical complications is just the point in dispute. As to the reality of the obstacle afforded by ligatures to the primary union of a wound, there can be no doubt whatever. It is the unanimous confession of surgeons in every part of the world, that the primary union of the stump of an amputation is an event which they have never witnessed; if the words primary union are to be used in their proper sense—viz., as implying that *no* pus has been formed. If authorities were wanted on what is known to and admitted by everybody, our author gives us in chap. iv. the opinions of surgeons whose authority is unquestionable, to show that the small part of the artery below the situation of the ligature must die in almost every case, and be cast off as a slough, and that, at any rate, in every case the ligature itself must be loosened from the tissues embraced in it by a process of ulceration and suppuration. Therefore, with ligatures, primary union, in the strict logical sense of the term, is impossible. But when Professor Simpson wrote the following passage his discretion had been sadly laid asleep:

"Some time ago, when asked by an excellent provincial surgeon how his leading metropolitan brethren and former teachers were treating their surgical wounds, I answered, that they were placing some minute morsels of dead flesh into the raw cavities, or upon the raw sides of all their large wounds. My questioner looked greatly amazed, expressed his astonishment at such ideas being countenanced and adopted in high quarters; maintained rather stoutly that the practice must prevent primary union, and must be apt to give rise to pyæmia," &c.

And so Dr. Simpson goes on, ending by saying:

"Yet, in reality, all this—as we have seen in the last two chapters—is virtually and truly the practice and principle followed at the present hour by surgeons when they staunch the hæmorrhages which follow the use of their knife, by tying silken ligatures around the drawn-out and isolated ends of the bleeding arteries." (p. 45.)

It is really incredible that a pathologist of the extensive knowledge and experience of Dr. Simpson should not recognise the difference between inserting portions of dead tissue in a healthy wound—the effect of which would necessarily be to bring septic matter in contact with the open vessels—and strangulating portions of tissue, an operation in which the inflammation excited by the ligature acts as a bar to any such entrance of septic matter into the circulation. But as Dr. Simpson must have known this, it is unpardonable of him to have so misrepresented the case as to have insinuated that the two things are identical. What would he say to the man who should describe the ligature of a uterine polypus as "an operation in which a sloughing mass as large as an orange is thrust up the vagina?"

Such descriptions are out of place in scientific discussions. In rhetorical appeals to the passions, exaggeration has its proper use, and is often rewarded with striking success; in matters of art and science it only repels and disgusts, leading to the natural conclusion that an argument which requires the aid of misrepresentation must rest on a weak and narrow foundation.

Still, though the author has exaggerated this objection to the ligature out of all due proportion, it is a real objection. There can be no doubt that the presence of ligatures in the wound, though not the only, nor perhaps one of the chief, obstacles to union by the first intention, yet is a real impediment, and, in fact, as we have said before, renders the primary union of the *entire* surface an impossibility. We say, nevertheless, that the use of ligatures is not the main cause why most wounds do not unite by first intention. Surely on a little reflection this must be granted by anyone who will reflect, that in a great number of operations no ligatures are used, yet primary union never occurs, if the wounds are deep, and involve tissues of different powers for uniting. Thus, who ever saw, or who ever expects to see, the wound of a resection unite by the first intention? Yet in resection it is not often that vessels are tied. It may be answered, that in resection the parts are already in a state of inflammation, and sometimes suppuration. This, though frequently, is not by any means always the case. We have seen cases of resection of the knee for synovial disease, in which, as far as could be ascertained, all the parts left in the wound were healthy; but no one would venture to expect primary union in such a case, nor would recommend any treatment as likely to effect that end. So in strangulated hernia, primary union is not unknown, since in many cases the wound is but superficial, and the tissues involved are tolerably homogeneous; yet, as far as we see, primary union never occurs when the wound approaches at all either in depth or extent to the surface of even the smallest amputation wound. In fact, common sense teaches what experience abundantly confirms, that so violent and extensive an injury to all the various tissues of a whole limb as is caused by an amputation, cannot be repaired by primary union, unless in the most unexceptional cases. We do not mean that this ought to forbid any attempt to render union as rapid and secure as possible. But it is well to start with moderate and just estimates of the relative magnitude of the difficulties to be overcome.

With respect to the second of Professor Simpson's charges against the silk ligature—viz., that it is liable to swell out by imbibition of putrefying matter, and thus to act as a focus of unhealthy inflammation to the parts in the neighbourhood—as with his first accusation, we would admit its reality, while denying to it the importance which he attaches to the fact. If we are right in contending that suppuration is almost inevitable in these wounds, it is plain that the ligatures will be lying in contact with tissues which are already in a state of ulceration, and therefore not very ready to be reinfected by the products of their own decomposition. But in all such matters, practice is far more trustworthy than theory; and we would ask any surgeon, whether in examining after death a large wound, in which the ligatures have, as usual, been brought out in one or two bundles, he can tell by the appearance of the parts where these bundles have lain? Yet if Professor Simpson is right in saying that these threads act on the parts like setons, surely some trace of such action would be visible. So that while we do not deny that the porous material of the ligature may render it more irritative to the parts amongst which it lies than a metal string would be, we believe that the difference is, after all, trifling. On the whole, therefore, we believe, that if acupressure satisfies Dr. Simpson's expectation, in entirely superseding these inconveniences of the ligature, the gain will be a real one, and operation-wounds will unite more readily and kindly; but we believe also that the difference will be far less than is here represented as probable.

Let us now turn to the next branch of our subject—viz., the evidence which Dr. Simpson has here adduced of the reality of the advantages which he claims for acupressure—that is, that it can control hæmorrhage with as much certainty as the ligature, without opposing any bar to primary union, and that it is less exposed to the risk of unhealthy inflammation in consequence of the difference of the actions set up by the two agents.

First, that it can control hæmorrhage with as much certainty as the ligature, at least in appropriate cases, Dr. Simpson must, we think, be allowed to have proved by relating thirty-nine cases[1] in which compression has been thus applied to bleeding vessels in various operations, mainly amputations of the limbs. In none of these cases does it seem that the method failed to secure its immediate object—viz., the arrest of the bleeding. So that there can be no question of this, which indeed any one can prove to himself on the dead subject, that an artery may be closed, even against a pressure much more powerful than the normal circulation, by one or the other of Dr. Simpson's methods—more certainly by the third than any other. Next, with respect to its opposing no bar to primary union. We have extracted from these thirty-nine cases all those of amputation in which acupressure alone was used. The other fifteen are made up of cases in which both ligatures and acupressure were employed, and of miscellaneous cases, such as amputation of the breast, removal of tumours, wounds of arteries, and ovariotomy. Excluding these, we have twenty-four cases of amputation of the limbs, and we append a short summary of them:

[1] Perhaps the number should be a little less. In one or two cases, Mr. Dix's method was used.

Cases of Amputation of the Limbs in which the Method of Acupressure alone was employed.

No. of case.	Age.	Nature of amputation.	No. of vessels compressed.	Primary union.	Secondary hæmorrhage.	Death, and its causes.	Date of recovery, and remarks.
1. p. 71	50	Thigh, pathological	5	incomplete	...	...	Four weeks. It is said that primary union took place throughout except where the wires emerged, and at an old sinus.
2. p. 73	11	Leg, primary	1	Yes (?)	...	...	Date not given. It is said "the flaps adhered by first intention *from end to end*."
3. p. 74	14	Leg, pathological	3	Yes	...	...	Date not given. "The flaps united completely from end to end, without any formation of pus."
4. p. 75	...	Arm, pathological	...	?	...	...	Able to go out in 8 days. "The flaps adhered, and, except a little pouting at the skin-margins, the stump was healed in 5 days."
5. p. 76	...	Forearm, primary	...	Yes	...	...	Date not given. Dr. Grey says this is the first stump "he had ever seen really close by first intention."
6. p. 77	An old woman	Forearm primary	...	Yes	...	...	"The wound healed *completely* by the first intention."
7. p. 145	...	Thigh, secondary	4	Of edges	...	...	21 days. Suppuration from some swollen lymphatic glands & from 2 incisions made before the operation. The flaps healed in a great measure by first intention.
8. p. 159	5	Thigh, primary	2	No	Yes	...	The wound healed in 5 weeks. The needle was withdrawn too early from the popliteal artery—in 24 hours. It became necessary to tear asunder the flaps ("which were adherent from end to end") and compress the artery afresh for 69 hours.
9. p. 162	20	Thigh, primary	1	No	Yes	Pyæmia	The patient was phthisical. The needle was withdrawn from the femoral artery in 70 hours. The occurrence of hæmorrhage is referred to deficiency in power of coagulation of the blood, from his constitutional cachexia.
10. p. 247	41	Thigh, path.	...	No	...	...	2 months (?) The account is not clear on this point.
11. p. 255	Young man	Thigh, path.	2	...	...	...	4 weeks.
12. p. 256	...	Arm, pathological	8	Yes, except in the track of the needles	...	...	Not stated. "During the healing of the wound the whole amount of purulent discharge did not exceed ℥ij, and this came exclusively from the tracks of the retained needles. There never was any from the surfaces of the flaps."
13. p. 283	7	Thigh	6	...	...	...	Before the fourth week.
14. p. 285	...	Leg	3	"In great part"	...	...	Not stated.
15. p. 304	...	Leg, primary	4	No	...	Pyæmia	The arteries were ossified. Gangrene followed the operation and spread rapidly up the limb.
16. p. 306	An old woman	Thigh	?	...	...	...	Date not given. It is not clear whether in this case acupressure was used alone, or in combination with ligature.
17. p. 361	6	Thigh, pathological	...	No; but was at first incorrectly claimed	...	...	Date not given.
18. p. 361	13	Thigh, pathological	...	The same remark applies	...	...	Ditto.
19. p. 362	51	Thigh, pathological	...	No	...	Exhaustion	The stump refused to heal. The patient was exhausted by chronic bronchitis and bed-sores.
20. p. 362	18	Leg, pathological	...	No	Yes, from sloughing of the stump a fortnight after the operation	?	The result uncertain at date of report.
21. p. 363	12	Thigh, path.	3	"Very nearly"	...	...	The boy was walking on crutches on the 14th day after the amputation.
22. p. 364	...	Forearm primary	...	No	...	...	Date not given. "The stump healed kindly, though not entirely by the first intention."
23. p. 367	...	Leg, pathological	3	...	...	...	The case is incomplete. The report 4 days after the operation says merely that "the condition of the patient and the stump is most satisfactory."
24. p. 373	40	Thigh, secondary	6	No	...	...	6 weeks.

Note.—The reader will bear in mind that the Nos. prefixed to the cases in this table do not correspond with those in Prof. Simpson's work.

It would be hypercritical to complain of the imperfections of these reports, since most of the cases were not under Dr. Simpson's notice, and the surgeons who treated them furnished merely a general statement of the matter to him, without any systematic view of the points which required notes. The cases are also, at present, too few to form the basis of any decisive judgment; but we think that they must be held to prove one thing—viz., that union does take place in favourable cases under this method more rapidly than the average. Whether we can in all cases trust to the statement of "union by the first intention" as literally accurate, seems doubtful. The number of cases in which it is claimed appears to be four in all. We have excluded the cases marked 17 and 18 on our list, in which the enthusiasm of the gentleman who reported the cases to Dr. Simpson, and of the correspondent of the 'Lancet,' led them to proclaim these to have been cases of "complete success" of union by first intention, but where Professor Pirrie, who treated the cases, allows that pus was formed, though in no great quantity. This circumstance shows that such reports, even from persons whose good faith is above suspicion, are always to be taken with some slight reserve. We have omitted also the cases in which primary union is said to have followed, except in the track of the wires, since this occurs also in favourable cases with the ligature. Perhaps we should also have omitted Case 2, a primary amputation of the leg in a child, where only one vessel bled, and where the flaps are said to have adhered "from end to end" by first intention. If this one vessel had been tied, a few drops of pus would of course have followed; but, without very great care in the reporter (much greater than was exercised in the two cases above referred to), this fact might easily have been passed over, and the progress of the case described in terms identical with those here employed. In the remaining cases, where union by first intention is distinctly claimed, it will be noticed that the circumstances were somewhat favourable—the patient in the first being a child, and the amputation in the two others being performed in the forearm. But allowing this, and allowing also any deductions that may be necessary for that almost irresistible tendency to exaggeration which besets all of us in talking of novelties which have much struck our fancy, we cannot refuse to admit the testimony of such perfectly trustworthy and competent observers as proving conclusively that very kindly union, and perhaps even sometimes literally primary union, does occur in stumps of amputations treated by Professor Simpson's method. If so, however, the date of recovery ought to be very greatly accelerated; and here we cannot but regret that the notes are so very imperfect. In the cases in which primary union is claimed, no date of recovery is given, and in few of the other cases; nor in any, as far as we can see, does it really prove that the progress of the cure was more rapid than with the ligature, unless we are to except the case marked 4 in our list. Here the age of the patient is not given. From the extraordinary account appended to the report of the operation, we should suppose the patient was a child, since it is said that "the elbow was packed in large heavy poultices, the weight of which had, during some moments when the arm was left unsupported, broken the humerus about two inches above the joint." If, for politeness' sake, we allow that such an event is possible, it could surely only occur in a very young child; and in children we have seen very rapid recovery after amputation of the arm for chronic disease, even when constitutional cachexia has existed. Still, we must confess that eight days is a very early period to be walking about. The same observations will apply to Case 21. In Case 7, also, recovery seems to have been speedy from an amputation high up in the thigh. But, after all, we must say that no satisfactory evidence is here produced that the period of recovery is hastened by the new method.

One very encouraging circumstance is the rarity of secondary hæmorrhage in these recorded cases. It appears that in only two out of the twenty-four amputations did that occur which would at first sight seem the great danger—viz., that the needle was withdrawn too soon, and the artery remained unclosed. In a third case (20 in our list), the hæmorrhage occurred during the progress of sloughing, and might equally have taken place after ligature.

Again, the general result of this list is encouraging. Of course, we may assume that, for the trial of a new method like this, the best cases will at first be selected, and we are not to conclude that because only three patients died out of twenty-four amputations—and those, all of them, in a bad condition of general health—that therefore a similar rate of fatality or anything like it will be maintained. But still the success obtained has surely been sufficient to justify further trials. Even if Professor Simpson's own great authority were insufficient, the names of the surgeons under whom these cases occurred are of themselves sufficient guarantee that the operations were skilfully treated and well observed. The odious imputation that cases of bad success are wilfully kept back—an imputation which is so easy to make, and which was so long used to check the progress of ovariotomy—is one which cannot be believed without very distinct evidence in any case; and in a matter so remote from personal feeling, or even from personal advantage, as this question of acupressure is, it appears on the face of it incredible. The fact cannot but be admitted that twenty-four amputations are here reported by competent observers and distinguished surgeons in many different parts of the country, and that their success has been beyond the average. Surely this is a reason for trying the method which they recommend.

Having thus stated fully Dr. Simpson's views of the advantages of acupressure, and the evidence by which he tries to prove those views, let us now turn to the objections to which this method has been exposed, and the answers given by Dr. Simpson to such objections. In stating and answering these objections, our author seems to us too much disposed to complain of the opposition which his method has encountered. Such opposition is only due to the natural and very laudable caution which surgeons exercise in dealing with the lives of those entrusted to their care. We possess in the ligature a means of restraining hæmorrhage, with which we are familiar, and which has been proved to answer its purpose, in spite of some drawbacks, such as have as yet been found to attach to every invention hitherto introduced in operative surgery. If that of acupressure is really free from any such drawbacks, its author may be certain that it will speedily be appreciated as it deserves. The danger, in the present day, appears to us rather to be that each new proposal which emanates from any well-known quarter is puffed beyond its merits by periodicals eager to rival each other in novelty, till more cautious observers are deterred, by a feeling that these rose-coloured statements cannot be literally true, and by uncertainty how much of them they are to believe.

Some of the objections urged against Dr. Simpson's method appears to us to be weak enough, and with them he deals easily and satisfactorily. Others are not so easy to answer.

The first objection is that the needle may compress the vein and nerve as well as the artery. The author has no difficulty in showing that such compression of the nerve would produce no damage (though as far as we can see it might always be most easily avoided), while the compression of the vein would probably be advisable in many cases; and it is one of the advantages of the plan that it can be so easily effected.[1]

The second objection is that only small vessels can be safely compressed; but, as cases are given here in which the method has been successfully applied to the femoral near the groin in an adult, this objection falls to the ground.

The third, that acupressure is available *only* in amputation, is, no doubt, refuted by Dr. Simpson's cases, in which he gives several of removal of the mamma, ovariotomy, wounds of arteries near the wrist, &c., where the bleeding was restrained by needles; but he is very far from having shown that acupressure is so universal in its application as the ligature. In all such cases, the cut end of the vessel either lies on a surface completely and fairly exposed, or (as in wounds of the wrist) the needle is thrust under the known course of the artery and the parts compressed by the ligature, which passes over the needle, somewhat as in harelip. In such instances as these, the operation is completed before the vessels are tied; but there are many cases in daily practice where the vessel has to be tied in the course of the dissection; and in these even one needle (especially if the wire loop is also to be used), and still more several needles, would be too much in the way to be employed; and there seem to us many other cases in which the application of needles in deep and irregular wounds would be mechanically very difficult, if not impossible.

Nor is the next objection at all satisfactorily disposed of to our minds. It refers to the great number of needles and wires which might be necessary. Dr. Simpson replies that "usually in the largest amputations the number of arterial orifices that require to be secured does not exceed half-a-dozen;" but, with submission, this depends on

[1] Dr. Simpson curiously puts this as one of the superiorities of the needle over the silk ligature, as if it was impossible to include the vein and artery in the same string.

the nature of the case. In primary amputations the number is few, and in other amputations for injury is seldom great. In chronic diseases of the joints, also, the parts through which the amputation is done are frequently almost healthy, and this is notably the case in children. Dr. Simpson's list contains only one case in which the number of vessels secured is stated so high as eight, and only one other in which six are said to have been tied; but this is evidently because the surgeons had selected the easiest cases for the trial of the new method, so that primary amputations (especially of the forearm) and children's cases form far more than the average proportion. In adults who have been suffering long from extensive inflammation, or in cases of rapidly growing tumour, the number of vessels to be secured is often very much greater—sometimes enormous. We once witnessed an amputation at the shoulder for malignant tumour, where more than forty vessels were tied, and the man recovered very speedily. As to this, our author cries, "Twenty or more points in which the surgeon voluntarily sets up a process of local strangulation and sphacelation, of ulceration and suppuration in the stump; with twenty ligature or seton-threads tied to these points! What chances are there of such a wound going on prosperously and successfully?" We would reply that the very fact, known to all surgeons, that such wounds do go on prosperously and successfully, shows pretty conclusively that Dr. Simpson has much exaggerated both the extent of sphacelation caused by the ligatures, and the effects of this upon the progress of the wound; while the necessity (we should say, the rather frequent necessity) of securing a good number of arteries would certainly limit the application of acupressure. Any person may convince himself of this who will place a dozen acupressure needles, each furnished with the wire-loop to compress the vessels and with the wire-string to withdraw the needle, in an amputation on the dead subject, and consider whether he would like to fill the stump in the living body with this mass of metal, and whether, if he did, the patient would have a much better chance of primary union than with the silk ligatures. (See on this head what Dr. Gillespie says about a case in which eleven needles were used, in the postscript to this paper.)

Another of the objections, urged by Mr. Spence, appears to us to have been misconceived by Dr. Simpson. It is, that "the difference of textures in the stump is the principal cause of the suppuration; the end of the bone has to be rounded off; in this process portions die, and it often happens that, even after the ligatures have come away, discharge is kept up by the presence of little bits of dead bone." Dr. Simpson thinks it an answer to this objection to say that necrosis of the stump is now rarely met with. But what Mr. Spence intended to refer to was doubtless not necrosis, or the death of large portions, but ulceration, or the death of minute, almost invisible portions, by which the stump is rounded off. On this head we have said enough above (p. 349). The next two objections, viz., that the ligatures act as vents for the pus, and that a stump may be healed too rapidly (in fact, that primary union is not in itself desirable), will not appear of much weight to the profession, although they rest upon the high authority of Mr. Fergusson. Nor need we go minutely through the objections which Mr. Syme has urged and Dr. Simpson answered with so much acrimony on both sides. One of Mr. Syme's objections, viz., that torsion will do as well as acupressure, Dr. Simpson disposes of satisfactorily, showing by reference to the best surgical writers that torsion of an artery, if carried to the extent necessary to occlude any considerable vessel, is usually followed by sloughing of the part twisted. The rest of Mr. Syme's observations on acupressure are either misconceptions, as when he supposes that the plan can only be used on superficial arteries; or they are nearly identical with those which have been considered above, as when he says that "the ligature is useful as maintaining a connexion between the bottom and surface of the wounds," much as Mr. Fergusson regards the question when he teaches that they act as "vents for the pus." This objection to primary union of the superficial parts is a real one, and may often be verified in cases of strangulated hernia, where patients sometimes suffer very unpleasant symptoms from the confinement of matter in the deep parts of the wound, while the superficial parts have united over them; but it cannot be regarded as one of much weight by any person who reflects how easy it is for an experienced surgeon to recognise this condition and break down the soft union, so as to let out the matter.

Another objection, which Dr. Simpson notices in the course of the work, is that acupressure is more difficult than ligature. This seems not to be the fact, if we are to trust the account of surgeons who use acupressure, which is surely more rational than to follow the presumptions of those who have no practical experience of the new method. But Dr. Simpson does not dwell, as far as we have been able to see, on what seems to us likely to prove an obstacle to the use of the needles—viz., the great space which the apparatus occupies, and the unwieldiness of a stump, or wound, stuck about with a quantity of needles and loops of wire; though, from the answer which he gives to the objection previously noticed, as to the number of vessels which may require ligature, we suppose that he must have felt this inconvenience. If all that can be said in answer to the remark, that twenty vessels may require to be tied in an amputation, is, that the patient would have no chance of recovery if so many points of gangrene were established (which is quite a mistake), we may fairly conclude, that in such a case Dr. Simpson would not know very well what to do with his patient. We confess that, for our own parts, we should fear that any surgeon who would attempt to put needles under all these vessels would soon give up the attempt in despair, or in disgust at the clumsiness of the process.

We have thus tried to state, with perfect impartiality, the facts and opinions both in favour of Dr. Simpson's method and against it. The reader may easily collect from what we have said what is our opinion on the matter, if, indeed, an opinion which does not rest on personal experience is worth anything—viz., that acupressure will probably be found on trial to be limited in its application to the milder cases of operation, and will never supersede the ligature; but that in appropriate cases it may be found to be a real and valuable improvement on that method. At any rate, we hold that it ought to receive that fair and thorough trial which as yet it has not had. Dr. Simpson's facts, as far as they go, are favourable to the new method, but they go a very short distance towards proving its general utility; and it must not be forgotten that Mr. Syme has produced a miscellaneous collection of cases from the Edinburgh Infirmary, which tell a very different tale. Mr. Syme's colleagues protested against the discourtesy of publishing these cases without their sanction; but, as they have since made known the whole of their experience, we have referred to it in a postscript.

There are several other topics mentioned, though only cursorily, in this large book, which, indeed, is expanded to a size out of all proportion to the importance of its subject. For instance, Mr. Dix's method of restraining hæmorrhage by the wire-compress, and the analogous plans employed by Langenbeck and Neudörfer, are discussed, and the superiority of acupressure conclusively established. Then we have an Appendix of more than one hundred pages, containing various matters, having more or less connexion with the main subject of the book, and many of which, having no great interest or novelty, might have been omitted from so bulky a volume. For example, there is a chapter to prove that metallic substances may remain for a long time in the body without setting up irritation, which we surely knew before. Another chapter, on the history of the silver-wire suture, might suggest some reflections to Dr. Simpson as to the probable destiny of his own discovery. We all remember the exaggerated language in which Dr. Marion Sims's proposal for the universal use of the silver-wire suture was announced to the world. How it was the greatest surgical discovery of the age; how silk was never again to be used for the purpose, and other still more high-flown panegyrics of the great new invention; and we can see now what most surgeons of experience think of it—viz., that it is a useful, but trifling improvement, more convenient than the old suture in many cases, and less so in others, and which will never entirely supersede, or be superseded by the silk suture. So, if we are not deceived, will it be with the proposal of securing arteries by acupressure.

The attempts of various surgeons to substitute wire-ligatures for silk in the ordinary method of tying arteries are also detailed, with the result of leaving on the reader's mind a conviction that the difference of material makes very little difference in practice, and that the superior pliability of the silk far more than balances any trifling objection which may lie against it on account of its absorbent properties.

The other topics have no visible connexion whatever with the main subject of the book; and, as they really come to no conclusion, they should not have been used to swell this already swollen volume. They are: 1. Wound-lutes, or substances used to convert open wounds into closed ones; of which Professor Simpson allows that it is doubtful "if we are to expect much or any practical benefit from the employment of any artificial wound-lutes as yet known;" and of which we should say ourselves, that they always irritate and tend to keep open the wound which they seek to close. 2. The application of carbonic acid gas as a sedative to wounds. 3. Surgical fever, with a suggestion of the use of muriated tincture of iron, as a prophylactic against it. And, lastly, a "graphic" description, by the patient, of an amputation before the introduction of chloroform, in order to show that in addition to the other benefits of chloroform should be reckoned this, that it spares the patient the painful remembrance of the agony he once suffered.

In conclusion, we cannot but express our conviction that Dr. Simpson deserves the thanks of the profession of surgery for the persevering attempt he has made to increase the security and rapidity of the healing of wounds. We have little doubt that some measure of success will attend it, and we should, indeed, rejoice if it should prove as great as its gifted author anticipates, and add to the name of the discoverer of the use of chloroform a second title to the gratitude of the whole world.

Since the above was written, the surgeons referred to by Mr. Syme—viz., Drs. Watson and Gillespie—have published their experience of acupressure in the 'Edinburgh Medical Journal' for June and July. The report of the former gentleman is far more favourable to the new method than that of the latter. Dr. Watson speaks altogether favourably of what he has seen of acupressure, which, however, is as yet but little, since he has used it in only nine cases, none of them very formidable or extensive operations. He believes that the applicability of acupressure will be found as wide, if not wider, than that of the ligature, and that it is more favourable to rapid union. He says that in three of his cases, although he does not claim complete union by the first intention (a result, indeed, which, as Dr. Watson says, is very rare, in the strict sense of the term), yet the union was very rapid, and accompanied by the formation of merely a small quantity of seropurulent fluid. In Dr. Gillespie's report, we get more of the disadvantages which, as we have above conjectured, must be attached to the use of the method. Thus we have a case of amputation near the shoulder (Case IV.), in which eleven needles were required, and in which one of them got entangled with the others and locked them in; so that it was not till the seventh day that this offending needle could be liberated, and then only by seizing it by the point and dragging it out, wire and all, through the stump. The following are Dr. Gillespie's observations on the case:

"This case illustrated well some of the difficulties which may be met with by trusting exclusively to acupressure. Eleven needles crowded into such a small space, though great care was taken to keep their accompanying wires in the axis of their insertion, got wedged in, so as to cause much pain and trouble ere they were removed. You may also remark that suppuration showed itself at as early a period as usual, so no gain whatever, but rather the reverse, in this instance, seems to have followed the substitution of acupressure for the ligature."

Another case (Case III.) shows the needle slipping into the deep parts of the stump, so that it escaped removal, and secondary hæmorrhage occurred, which Dr. Gillespie attributes to the pressure of the needle on the femoral artery. In this case, also, suppuration was as early and as copious as is usual. The patient died of pyæmia, and Dr. Gillespie has not found pyæmia (unfortunately very prevalent at present in his wards) lessened by the use of the needles. He considers that acupressure may be used in the ordinary flap amputations, but that it is not apparently superior to the ligature, and that in primary amputations where the flaps have to be shaped irregularly, the plan is less satisfactory. It is especially useful in cases where the tissues are much softened by disease, or the arteries much retracted in situations where forceps can with difficulty reach them. (And we may add, that our own limited experience, since the above review was written, inclines us to the same conclusion.) Finally, Dr. Gillespie gives a case in which the needles having failed, the ligature had to be substituted. It was an amputation of the forearm:

"Forty-four hours after the operation the needles were removed, when a jet of blood, forcing out a clot, came from the radial, and it bled most fiercely. The stump was taken down and the artery tied. The ulnar was beating actively, and at the side of a clot at its mouth, a small oozing of arterial blood was perceptible, which made me think it more prudent to secure it by ligature."

Let not our readers think from these facts that Dr. Gillespie is an opponent of acupressure. Far from it; he uses it often, and with satisfaction. Both he and Dr. Watson state that the unfavourable results which occurred in the cases commented on by Mr. Syme, were entirely unconnected with the hæmostatic method employed. But Dr. Gillespie's experience has showed him the drawbacks to which the method is exposed, and although these may not be more than those of the ligature—nay, may even be far less—they are sufficient to show that more experience is necessary before we can go the length which Dr. Simpson would wish. It is eminently a case for practical investigation by hospital surgeons.

Review VII.

1. *Diseases of the Ovaries: their Diagnosis and Treatment.* By T. Spencer Wells, F.R.C.S. Vol. I.—1865.

2. *Die Ovariotomie in England, Deutschland, und Frankreich.* Von Dr. Eug. Dutoit.—*Würzburg*, 1864.
Ovariotomy in England, Germany, and France. By Dr. Eug. Dutoit.

Now that the fierce conflict of opinion is over, and that denunciation has given way to investigation and experiment, the profession can afford to look with calmness, if not with interest, at a review of the large experience by this time obtained in ovariotomy. This operation, which Liston, with more force than elegance of expression, designated as "belly ripping," and of which Scanzoni said it was "a proof of madness in the patient who should adopt, and of crime in the surgeon who should abet, such a mode of suicide," is one which has been established almost entirely by British surgeons, and we may be excused a not unnatural pride at such an honourable distinction. Whoever may lay claim to the credit of the first operation, and to whatever country its first advocates belonged, the fact remains that English surgeons have undertaken the large majority of cases, and to them is due the honour of having justified their attempts by success, and of having added another to the triumphs of legitimate surgery. Nor has this been an easy task, for it has been accomplished in the face of every opposition that talent, precedent, and prejudice could furnish, and with the deterring sense of the great risk the patient incurred. Foremost among the early supporters of this operation was Mr. Spencer Wells, who undertook to make public the results of all his cases, and thus give the profession the opportunity of fairly testing his experiences. His present volume is the record of his seven years' practice in ovariotomy, numbering in all 114 cases, and the results are such as to silence at once any doubts as to the propriety of undertaking the operation. In a question of such gravity there must be many things to weigh, and the fear rather is now that men may be tempted by the success which has attended so many cases to undertake the operation without sufficiently considering the dangers or indications of unsuitability; and so impressed is Mr. Wells with this risk that, in his preface, he warns us how "a discovery which has triumphed over opposition of all kinds—honest and scientific, prejudiced and ignorant—may still be ruined by the support of rash, inconsistent, and thoughtless partisans, whose failures do not reflect so much discredit on themselves as on the operation which they have badly performed in unsuitable cases."

Of the 114 cases, 76 recovered and 38 died—a result which would enable the operation to be favourably compared with any of equal danger. Apart from its surgical importance, there is some peculiar interest attached to recoveries from this operation more than others, for the victims do not save their lives at the cost of a limb, nor emerge with any appreciable risk of return of the disease, and they are not only rescued from a life of tedious suffering without any hope of spontaneous cure, but are restored at once and permanently to health and social position, and often afterwards have families. Speaking of the 76 recoveries, Mr. Wells says:

"Perusal of the cases will show that in very many of the patients the hope of recovery could be but slender, and that very few indeed have died where the conditions, general and local, before operation were at all favourable. Of those who recovered, 4 have died since—1 of hemiplegia, two years after operation, and 3 of abdominal cancer—1 ten months, 1 four months, and 1 six weeks after operation. *The other 72 patients have regained and maintained excellent health.* In 1 only has there been any suspicion of disease occurring on the opposite side. Five have borne children after the operation, mothers and children all having done well after easy and natural labours. As many of these 72 women who are now happy and healthy wives and mothers, or single women pursuing their avocations or fulfilling the duties of their station in comfort, would long since have died if they had not been rescued by ovariotomy, or would now be lingering as miserable invalids through a life of hopeless suffering to be terminated by a painful death, the conclusion is inevitable that ovariotomy is an operation which can no longer be regarded as it was generally seven years ago, and as it is regarded even now by some few, but that it is the clear duty of the surgeon to perform it in certain cases."

But while the lion's share of ovariotomy has fallen to the lot of English surgeons, our brethren on the Continent, and, indeed, in all parts of the world, have not been far behind, as may be seen by reference to the German work whose title we have given above. Since Dr. Clay's book appeared, we do not know of any *résumé* of the total number of cases operated on in England, still less of those occurring in foreign countries, and for this, if no better reason, Dr. Dutoit's book will be welcome. The author has, with much industry, collected all the published cases from England, France, Germany, Italy, America, and a few scattered points, down to October, 1863, and has given in some short tables, under various headings, an analysis of the chief features of each case, making in other tables a summary of the results. Such a compilation cannot fail to be valuable at the present time, and we have embodied in the following remarks some of the principal facts adduced by Dr. Dutoit.

Ovariotomy boasts an earlier origin than is generally supposed, and perhaps the fact that it was at first designed, as we are told, "to serve the degrading vices of royal monsters," may have had something to do with the odium in which it was held in later years. As in the case of many other benefits the world now enjoys, its early days were passed in obloquy, and an operation which is now welcomed by the majority of the profession, till the last few years was only mentioned in terms of the bitterest reproach. Such an operation is referred to by writers in the middle ages—Platter, Diemenbroek, &c.—but the first mention of extirpation of a diseased ovary is in the dissertation of Theod. Schorkopff, who, in 1685, wrote, "Majorem afferret medelam ipsius ovarii per sectionem extirpatio, nisi crudelis et majore cum periculo conjuncta videretur." Schlenker, in 1722, in a work bearing the title

'De Sing. Ovar. Sinistr. Morbo,' refers to it in a dubious way; and in 1731, Willius, who wrote 'De Structurâ Abdom. Tumor.," objects to it on these grounds—1st, that it is impossible in most cases to distinguish an ovarian tumour from pregnancy; 2ndly, that the woman suffers so little from the dropsy that she would never submit to so serious an operation, and that a prudent physician would never venture to propose it; 3rdly, that the tumour, in very many instances, adheres to the other organs; and 4thly, that it is better to let a patient die of the disease than to kill her by operation. A few years later (1751), Peyer Imhoff wrote against the operation; but not long after—viz., in 1774—its first apologist appeared in M. Delaporte, of Paris, who ventured to ask, "whether, in cases where puncture and injection had failed, extirpation might not be attempted?" Van Swieten also considered that under certain circumstances the operation might succeed.

About the year 1781, however, a new era commenced, when speculation gave way to action, and surgeons began to practise what their predecessors had never failed to vilify.

Laumonier, of Rouen, deserves the credit of being the first to have successfully extirpated (in 1781) a diseased ovary; but he had not many to follow his example, and France has up to the present time contributed but few cases even of attempted operations—indeed, the French surgeons seem, till quite recently, to have vied with one another in abusing it. According to Boyer, "the least reflection is enough to show the danger and impossibility of this operation, which has not been practised, and probably never will be." Cruveilhier, while admitting that the operation had been performed with success both in England and America, thought it too hazardous to be adopted in France, adding that "success does not always justify rash enterprises;" and Velpeau considered that "the extirpation of diseased ovaries was a frightful operation which ought to be proscribed, even if the cures which were announced were real." Such were the sentiments expressed even in 1856, but in 1861 M. Nélaton came to London, and after carefully observing the English methods, returned not only to advocate but also to practise the operation. His first case, however, did not recover, and how great was the antagonism even he had to encounter, may be guessed from the sarcasm appended to this case when published—"la malade de M. Nélaton *est morte guérie*"! Further successes have, however, greatly diminished the opposition, though we learn of but comparatively few operations.

In Germany, the profession did not evince the same horror of the operation as their French brethren, but the dangers incidental to it deterred many surgeons from the attempt, and from 1819 to 1856 only 64 cases were recorded, of which 18 recovered and 46 died. The first operation in that country was by Chrysmar, of Würtemberg, followed by Diffenbach and others; and later still, Langenbeck, between 1847 and 1855, had 7 cases, only 2 of which survived. In 1855, Martin[1] published a book specially on this subject, and this is

[1] Ed. Martin, Eierstockswassersucht, deren Erkenntniss und Heilung, nebst einem neuen Verf. für Ovariotomie nach eigenen Erfahrungen. Jena, 1852.

almost the only one to which we can refer for the German modes of operating. During the last few years the operation seems to have fallen into disuse, or at all events it has ceased to attract notice in the publications.

America is by no means willing to give up the glory of being first in ovariotomy as in everything else, and, while disputing the claims of Laumonier's case to be considered a genuine ovariotomy, puts forward a Mr. Eph. MacDowell as the first successful operator. In a country of such extent it is of course impossible to determine this not very important point, and we must be content to refer the curious to the works of Bradford, of Kentucky (1859), Lyman, of Boston, and various articles in the 'American Journal of Medical Sciences,' from 1855 to 1860.

In Great Britain, Lizars was the first successful operator (1825), but his example was soon followed in London, and in a few parts of the provinces. Up to 1849 only 55 recovered out of 120 cases operated on, but this result was greatly due to the insufficient care bestowed on diagnosis, and the rashness with which cases were undertaken. In proof of this it may be mentioned, that of the 120 cases just referred to, in not less than 37 the operation was left uncompleted, either by reason of mistaken diagnosis or of the extent of the adhesions. The following table gives a fair idea of English experience about the time selected for comparison with the Continental statistics—viz., October, 1863. The operators named are those among the foremost as ovariotomists, and the cases here specified are all those of completed extirpation :

	Operations.	Cures.	Deaths.
Tyler Smith	17	14	3
I. B. Brown	52	28	24
Spencer Wells . . .	76	53	23
Charles Clay	110	77	33
Lane	13	11	2
	268	183	85

The method of operating in various countries is essentially the same, but there are some slight differences. Bühring makes his incision diagonally from the false ribs to the crest of the ileum, a proceeding of which we fail to see the advantage. Kiwisch makes, at first, only a small opening into the peritoneum, and after convincing himself of the extent of the adhesions, enlarges it, introducing the hand so as to grasp the tumour in all directions, and when convinced of the feasibility of the operation, extends his incision so as to allow the withdrawal of the sac. The greatest divergence of opinion is on the point of the separation of the pedicle. Maisonneuve twists off the cyst by continued torsion, leaving the pedicle to fall back into the abdomen. The Americans use the écraseur, and fix the pedicle by means of ligatures brought out at the lower end of the wound. Baker Brown and Nélaton employ the clamp. While the English and Americans do not trouble much about the peritoneal covering of the pedicle, Martin and Langenbeck first make a circular incision of it, then cut off the tumour, tie each vessel separately, and fix the pedicle by means of a double ligature to the walls of the abdomen. The Germans avoid passing the sutures through the peritoneum, while English surgeons recommend the opposite, thinking that its edges may thus unite more readily. The after-treatment meets with comparatively little notice or consideration at the hands of German authors, but English writers dwell on this point with great emphasis.

The vast difference between the results of this operation in England and various parts of the Continent, naturally provokes inquiry as to the reason of the much greater success in this country, and the following considerations are put forward by Dr. Dutoit by way of explanation. In answer to the question, "Wherein lies the reason of this striking difference ?" he says :

"Whoever has visited the English hospitals, and has had occasion to notice the care bestowed on the after-treatment of those operated on, will surely ascribe the result to this circumstance. When we compare the wards and ventilation of the new buildings of Guy's or the London Hospital with the rooms in which Langenbeck's patients are treated in Berlin, we cease to wonder at the difference in the results. They seem on the Continent to have an especial dread of every breath of air a patient can encounter, while in England the first care is to have a continual current of air at all times of the year. The windows, placed opposite one another the whole length of the ward, are so constructed as to allow a free passage to the air above and below the bed, so that the air is continually changed around the patient. If a room is too cool, the temperature can be raised as much as is needed. The beds are so arranged that there are never more than five to three windows. Serious cases—in which is, of course, included ovariotomy—are placed in separate rooms where perfect quiet prevails, and the patient enjoys the greatest attention. These model arrangements, together with the precautions taken in preparation for the operation, and the energetic antiphlogistic (?) or stimulant after-treatment, are, in my opinion, the only reasons which can be adduced to explain the difference between the English and Continental results. Moreover, it is well known that other grave operations, such as resection of the knee-joint and amputation of the thigh, have a much less mortality in England than with us. When we adopt on the Continent the same care and energy in after-treatment—particularly when we allow our patients a sufficient quantity of pure air—then we shall, certainly, soon attain the same results as the English."

Following the same plan as that adopted by Dr. Clay, Dr. Dutoit has arranged his cases under five headings—viz., A, Total extirpations; B, Partial ditto; C, Abandoned ditto ; D, Extirpation of extra-ovarian tumours, such as of uterus, &c.; and E, Operations given up on account of false diagnosis.

These tables, which extend to the end of October, 1863, include, in all, 742 cases, which are thus distributed according to their nationality :

France	28
Germany	74
England	467
America	165
Other countries	8
Total	742

Dividing these 742 cases into the above categories, we find them in the following proportions :

CLASS A.—*Total Extirpations.*

	Recovered.		Died.
Germany	15	....	40
France	13	....	14
England	230	....	149
America	68	....	49
Other Countries	4	....	3
Total	330		255

CLASS B.—*Partial Extirpations.*

	Recovered.		Died.
Germany	1	....	8
England	7	....	6
America	3	....	2
Total	11		16

CLASS C.—*Operations abandoned on account of Adhesions.*

	Temporary recovery.		Died.
Germany	3	....	4
England	44	....	15
America	13	....	7
Other Countries	1	....	0
Total	61	....	26

CLASS D.—*Extirpation of Extra-ovarian Tumours.*

	Recovered.		Died.
Germany	0	....	1
France	1	....	0
England	3	....	6
America	3	....	6
Total	7	....	13

CLASS E.—*Operations abandoned because of Mistaken Diagnosis.*

	Recovered.		Died.
Germany	1	....	1
France	0	....	1
England	6	....	0
America	9	....	5
Total	16		7

Classified according to age, it appears that the operation was least fatal from 21 and 25 years, the proportion being 36·2 per cent.; while the greatest mortality was, as might be supposed, from 50 and over, at the rate of 42·8 per cent.

The following table shows the proportion of deaths to recoveries, in their relation to the age of the patients, in 432 cases of completed operation, arranged in quinquennial periods:

Age.	Recoveries.		Deaths.		Total.
From 15 to 20	20	...	16	=	36
" 20 " 25	44	...	25	=	69
" 25 " 30	42	...	39	=	81
" 30 " 35	35	...	30	=	65
" 35 " 40	34	...	26	=	60
" 40 " 45	21	...	18	=	39
" 45 " 50	22	...	16	=	38
" 50 " 55	10	...	7	=	17
" 55 " 60	11	...	8	=	19
Above 60	5	...	3	=	8
	244		188		432

In 251 instances of operation the tumour had been previously punctured in 206. Of 45 cases in which it had not been punctured, 31 recovered and 14 died; of 85 in which it had been punctured only once, 50 recovered and 35 died; of 43 in which it had been punctured twice, 24 recovered and 19 died; of 51 in which it had been punctured from three to nine times, 27 recovered and 24 died; and of 27 cases in which puncture had been employed ten or more times, only 12 recovered and 15 died.

The following items are worthy of notice:

Of 68 cases in which the tumour was *uni*-locular, 39 recovered and 29 died.

Of 256 cases in which it was *multi*-locular, 131 recovered and 125 died.

In 156 cases the weight of the tumour was found to be under 5 lbs. in 8 instances, between 5 and 15 lbs. in 42, and over 15 lbs. in 106—of which last 44 recovered and 62 died.

Of 218 deaths, the causes of which have been carefully stated, 41 are attributed to collapse, 31 to hæmorrhage, 91 to peritonitis, 2 to phlebitis, 4 to tetanus, and 11 to affections of the bowels.

As regards the time of death, dating from the operation, of the 218 cases 43 died within 24 hours, 31 from 24 to 36 hours, 23 from 36 to 48 hours, 29 on the third, 17 on the fourth, 18 on the fifth, and 11 on the sixth day.

Thus not less than 180 out of 218 deaths from operation occurred within the first seven days, and only 23 between the seventh and fifteenth.

As regards adhesions, the mortality in cases where the tumour was freely moveable was 38 out of 135, or 28·1 per cent.; in those with slight adhesions 60 out of 153, or 40· per cent.; and in those strongly adherent 99 out of 204, or 48·5 per cent.

As mistakes are supposed to be more instructive than successes, it may be well to enumerate the errors in diagnosis that have been recorded.

Of 23 such cases (6 of which occurred in England and 9 in America), 11 proved to be uterine tumours, 2 more connected with that organ, 1 was a case of chronic peritonitis, with thickening of the transverse colon, and ascites; another was a tumour of the spleen, another scirrhus of the omentum, and in 4 there was *no tumour at all*, the date of one of these latter being 1863.

With the present amount of knowledge on the subject, it is hardly likely, we take it, that such errors can be other than few and far between.

REVIEW VIII.

1. *Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine.* By WILLIAM ADAMS, F.R.C.S., Surgeon to the Royal Orthopædic and Great Northern Hospitals, &c. Delivered at the Grosvenor-place School of Medicine in the Session of 1860–61.—*London*, 1865. 8vo, pp. 334.

2. *Curvatures of the Spine: their Causes, Symptoms, Pathology, and Treatment.* By BERNARD BRODHURST, F.R.C.S., of St. George's Hospital, and the Royal Orthopædic Hospital, &c. Second Edition.—*London*, 1864. pp. 93.

A FEW years ago, in noticing works by Mr. Brodhurst, Mr. Adams, and others, we took occasion to review at some length the progress which has been made of late in orthopædic surgery. It will not be necessary, therefore, for us at the present time to do more than briefly notice the books which are named at the head of this article.

These volumes appeared about the same time—the one in the end of 1864, the other near the beginning of the present year. Both of the authors are connected with the Royal Orthopædic Hospital, both have laboured for some years at this special branch of surgical practice, and both have contributed towards the spread of sound views of the pathology and treatment of curvature of the spine and other allied diseases.

Let us first speak of Mr. Brodhurst's book, which has the priority in point of time, though it is the smallest of the two volumes before us. It is, in fact, a second edition of his work 'On Curvature of the Spine,' which has been known to the profession for some years, although it has now been entirely re-written and somewhat enlarged. As far as it goes, it gives a very clear and interesting sketch of the subject; but we could wish that the author had entered a little more into detail. It is not often that we have to complain that a book is too short, but here is one which might have been doubled in size with advantage. As it is, it extends only to ninety-three pages, and each page contains remarkably little letterpress; moreover, there are thirty-one illustrations, which occupy a good deal of space, so that the amount of reading is still further reduced.

The book opens with an introductory chapter on the normal or physiological curves of the spine. This is followed by three sections, which are devoted respectively to the anterior, posterior, and lateral curvatures. Of these the lateral curvature is treated much the most fully—nearly two-thirds of the whole volume being occupied with its consideration.

We have selected one or two passages which will serve to give the reader an idea of Mr. Brodhurst's style, and of the views which he advocates.

The first quotation that we shall offer recommends itself to us by the common sense which it embodies, and it is also interesting because it treats of a subject which has given rise to a good deal of discussion among orthopædic surgeons. The author is here speaking of lateral curvatures:

"A primary curve may be either lumbar, dorsal, or cervical, depending on the cause which gives rise to it. Thus, a lumbar curve will be produced through hip-joint disease, and a cervical curve through torticollis; while through excessive use of an upper extremity a dorsal curve will certainly be formed as the primary curve.

"No curve can remain single; but it is essential for equilibrium that, in every instance, secondary curves shall be formed, compensatory of the first; and thus a series of curves is formed—two, three, or more—according to the severity of the primary curve, and to the period during which it has existed.

"With regard to the formation of spinal curves, considerable errors exist. Thus, one author asserts that the lumbar curve is always the primary curve; while another, Pravaz, affirms with equal warmth that the dorsal must necessarily be first formed. Others (and it seems to be a prevailing opinion), teach that a spinal curve may remain single.

"I trust, in speaking of the causes of spinal curvature, that I may have shown in such a manner as to carry conviction that the primary curve may be cervical, dorsal, or lumbar; and that equilibrium can only be maintained when compensating curves have been formed. A single curve can only exist in the horizontal position. Nothing more is necessary to produce compensating curves than the erect position, and the muscular force which is necessary to maintain that position.

"The curves are constantly undergoing change, becoming more and more compressed and rigid, until the height of the trunk is considerably diminished. As a necessary consequence, also, of this restoration of the equilibrium of the body, the obliquity of the hips and shoulders is always diminishing, until they again assume almost, if not entirely, a horizontal direction." (p. 55.)

In the following passage Mr. Brodhurst speaks of the means of preventing lateral curvature by promoting the healthy action and development of the various parts of the body, and his remarks deserve to be widely diffused among all those who have to do with the education of youth:

"The *preventive treatment* of lateral curvature of the spine comprises all those measures of hygiène which tend to the development of the body, and which conduce to its perfection. It relates, consequently, to food, clothing, bathing, exercise (bodily and mental), sleep, rest, &c.—to every circumstance, in fact, which may affect nutrition.

"In youth, every care should be taken to strengthen the bones, to develop the muscles, and to promote activity of body—a system the reverse of that which prevails throughout England.

"The freedom of action which is permitted to boys prevents them from suffering from affections of this nature. Lateral curvature of the spine is very rare among boys; and when it does occur, it arises generally from some affection of the lower extremities. But debility is the most common cause of distortion in young girls—debility which, one might almost say, is purposely induced, so different is their mode of life to that which seems to have been intended.

"Exercise is essential to develop the muscular system; not only such regulated exercises as are comprised in a system of gymnastics, but freedom must be permitted in walking, running, playing, &c. This system has been introduced into some of the best schools in the neighbourhood of Paris, and with the happiest results. Nothing can exceed the appearance of health which prevails among the inmates. Widely different is it from that which may be observed in London schools, and, indeed, in schools throughout England. The use of forms and stays, and the want of adequate exercise, bathing, sleep, and rest, induce so much debility and consequent distortion, that it has been said, and with much truth, that it is difficult to find a young person so well developed as she ought to be, and that distortion is the rule rather than the exception in our female schools." (p. 77.)

The way in which Mr. Brodhurst's book is got up ought not to be passed over without notice. It reflects great credit on the publisher. The illustrations are excellent, and beautifully engraved; while the style in which the printing and binding have been executed is unusually good. Thanks to the remission of the paper duty, the paper on which our scientific works are printed has much improved of late—a matter of no small importance, especially where illustrations are freely used. Of this the volume before us affords a notable example.

Mr. Adams's work consists of lectures which were delivered some few years ago at the Grosvenor-place School of Medicine, and which are now published after careful revision, and with such additions as the author's experience has enabled him to make.

In his opening pages Mr. Adams speaks of the advantages which have accrued to surgical science from the establishment of special hospitals for the treatment of deformities. Until the attention of surgeons was closely directed to this particular field of study, the pathology of spinal curvatures and other allied diseases was but little understood, and, as a necessary consequence, their treatment was uncertain and unsatisfactory:

"A little consideration of these facts will at once explain to you why cases of lateral curvature of the spine always have been, and still continue to be, treated upon the most opposite and antagonistic principles. It will be equally obvious to you that a continuance of this state of things necessarily leaves open a very wide field to the pretensions of that irregular class of practitioners to whom I have before adverted. It cannot but be admitted, however, that the cause of the evil rests with the medical profession, and it is equally clear that we have the remedy in our hands; but so long as the pathology and principles of treatment of lateral curvature of the spine remain undetermined, we must cease to be surprised that the public, who are never slow to discover the defects and uncertainties in medical practice, should believe—as one of the most able and scientific English authorities on spinal deformity, Mr. John Shaw, has observed—that 'these unprincipled practitioners have secrets for the management of distortions, with which surgeons are not acquainted,' and that the occasional success of the empiric after failure under the direction of an eminent surgeon, by means diametrically opposite to those previously recommended, should 'confirm a parent's suspicion, that the knowledge of the *quack* is superior in such cases to that of the surgeon.'" (p. 5.)

Our author then goes on to speak of the spine in its normal condition—of the relation which it bears to the height of the body and the length of the limbs, of the ligaments and muscles by which it is sustained, and of the joints which enter into its composition. In dealing with these points he alludes to the comparative anatomy of the subject, and draws some instruction from it. In speaking of the normal lateral movements of the spine, he says:

"We all imagine the lateral flexibility of the spine to be much greater than it really is, but a more careful examination of the mechanism of motion of the spinal column will convince us that even in the lateral-flexion attitudes assumed by the gymnastic exhibitors, the appearance of lateral flexibility of the spinal column is chiefly dependent upon—1st, the obliquity given to the spinal column by tilting of the pelvis, and thus altering its base of support from the horizontal to an oblique direction—a movement permitted by the ball-and-socket form of articulation of the hip-joint; and, 2nd, upon the free mobility of the head in all directions, which is permitted by the movable ball-and-socket form of articulation between the occipital bone and the atlas." (p. 41.)

In his third lecture, Mr. Adams discusses the anterior and posterior curvatures. In speaking of the anterior curvature (*lordosis*), he draws attention to those rare and interesting cases of congenital dislocation of the hip-joint—of which two examples were mentioned by Mr. Hilton in his recent lectures at the College of Surgeons, the one as having occurred in his own practice, the other in that of Sir B. Brodie.

In speaking of the treatment of those cases of *lordosis* which are dependent upon a rachitic affection, Mr. Adams makes the following valuable remarks, which are applicable to the treatment of rickets generally:

"In connexion with the treatment of the diseases, such as rickets and caries, which sometimes produce this form of curvature, I would direct your attention to a few practical points. . . . . I recommend, as a general principle in cases of rickets, that the children be allowed to stand or sit as short a time as possible, and that reclining or complete lying down be encouraged. It is a very serious, though common, practical error to send children in whom rickety curvatures have commenced into the country, or to the sea-side, and encourage them to run about all day long; such children return with improved health, but the curvatures more confirmed. This is very good treatment for slight cases of knock-knees and bow-legs, which children certainly do grow out of when the general health and strength are improved, but a great mistake in cases of true rickety curvatures, which we know are immediately produced by mechanical causes acting upon imperfectly nourished bones." (p. 70.)

In the fourth lecture, Mr. Adams enters on the consideration of lateral curvature—a subject which occupies the whole of the remainder of the volume. The way in which, in severe cases, the bodies of the vertebræ may be rotated, while the tips of the spinous processes show hardly any deviation from the perpendicular line, is well explained and illustrated by means of a diagram and plates.

In speaking of lateral curvature in young subjects, Mr. Adams makes some useful observations :

"It has been too much the custom of writers on spinal curvature to assume that cases of severe lateral curvature occurring at an early age, and in which the bones necessarily become much altered in form, are essentially of a rachitic nature; but I believe a serious practical error is involved in this opinion, from an imperfect consideration of the evidence which should induce us to assign these cases to the rachitic classes of deformities. This question is worthy of our attentive consideration, and I believe the line between the rachitic and other classes of lateral curvature of the spine cannot be drawn too broadly for practical purposes, because the rachitic is the only form of lateral curvature associated with deformity of the pelvis, and, therefore, the only form in which any danger in child-bearing need be apprehended, or any obstacle to marriage assigned upon medical testimony.

"The most severe cases of lateral curvature of the spine occurring either in childhood or in youth, which have come under my observation, have certainly not been connected with rickets. The children in these cases have not presented the ordinary appearances of rickets either in their general conformation, such as dwarfishness of stature, principally depending upon the disproportionate shortness of the legs, giving an appearance of a long body and short legs; the peculiar conformation of skull, and aspect of features; or in the peculiarities affecting the bones, such as enlarged epiphyses and curvatures in different directions, all of which are constantly present in cases of rickets." (p. 130.)

We shall only offer our readers one more extract from Mr. Adams's book. It relates to a very interesting subject—the subcutaneous division of muscles, an operation which has been strongly advocated by M. Guérin, and which has been largely practised in France. In this country, however, it has met with but little favour; and it would appear, from the volumes before us, that at the Royal Orthopædic Hospital it is rarely or never employed :

"The theory of M. Guérin . . . . . at one time impressed me with its importance, and a desire to put it to the test of practical experience; I, therefore, in the year 1856, selected a case, in a girl under my care at the hospital, in whom there was an unusual degree of prominence and tension of the spinal muscles, in the lumbar region on the convexity of the curve; and in the dorsal region the muscles on the convexity of the curve were also tense and prominent. My late colleague, Mr. Lonsdale, concurred with me in the opinion that this was a fair case for testing M. Guérin's operation, and therefore I divided subcutaneously the muscles on the convexity of the lumbar curve, making a deep and free incision. Immediately after the operation, two or three fingers could easily be placed in the gap between the divided extremities of the muscles. No inflammation or ill effects followed. Mechanical treatment was afterwards adopted in the usual way, and the case proceeded favourably. However, Mr. Lonsdale and myself considered that the improvement was not greater than could have been effected by mechanical treatment alone; and as subsequent investigations led me to the opinion that the muscles usually found tense and prominent on the convexity of a curve are exerting their power beneficially to prevent increase of, rather than to produce a spinal curvature, I determined on physiological grounds to reject the operation, which therefore I have not again repeated." (p. 171.)

We have said that Mr. Brodhurst's book would be all the better if it were somewhat enlarged, but the advice we have to give Mr. Adams is just the opposite. There are some sections in his work which might be curtailed, and others which might be *omitted* altogether with advantage. Moreover, the style is not always so clear as one could wish. The writer is fond of long sentences, and long sentences are apt to become involved.

The volume is illustrated with some excellent lithograph plates and a number of engravings on wood.

Looking at these two books as a whole, it does not appear that they contain much that is new or original. But they show that the whole subject of spinal curvatures has been thoroughly investigated, and they furnish us with rational and successful methods of treatment, based upon sound observation and experience. We are glad to see that both Mr. Adams and Mr. Brodhurst speak in high terms of the system of gymnastic exercises, as a part of the treatment of spinal cases. There can be no doubt that a well-devised course of gymnastics, carried out under the direction of a surgeon, may be of the greatest benefit. The danger—and it is a real one—is lest they should be pushed too far, or applied to unsuitable cases.

To those who desire to make themselves thoroughly acquainted with the subject of spinal curvature, we cannot recommend two better books than those which are named at the head of this article.

Review IX.

The Works of Sir Benjamin Collins Brodie, Bart., D.C.L., Serjeant-Surgeon to the Queen, President of the Royal Society, &c. With an Autobiography. Collected and arranged by Charles Hawkins, Fellow of the Royal College of Surgeons of England. In 3 vols. pp. 657, 680, 697.—*London*, 1865.

An eminent man may establish a reputation in a twofold way. In the one he towers above his fellows, stands out in prominent relief from his contemporaries, sheds the influence of his personal abilities and character not only over those who come into immediate contact with him, but on the men and manners of the day. In this is seen the man of action and personality, of energy—the man of work, but of work of the highest kind. Perhaps he is a great lawyer; if so, he is great in the courthouse itself; or a *medicus*, but he is supreme at the bedside of the sick; or a priest, and he is "careful to maintain good works, for these things are good and profitable unto men." Or be he statesman, there are his eloquence and power of debate; or the Howard of his age, and he clothes the naked and hungry and visits the fatherless and sick. But let such a man die, and, unfortunately, his greatness has departed also. In a few years, and who will remember him—the voice that was music to the poor man's ear, the face that was sunshine to the lone man's heart? Time rolls on, and very shortly he is almost forgotten in everything but his name and a slight record of the personal character and beneficence of his works, for he was the "man of the hour." On the other hand, another, the "man of the future," lives not for his own day, but for when he is gone. Nature has not gifted him with that disposition and desire for energetic work which would force him daily into the forum, the senate, or the mart, there amidst the race of life to struggle and assert himself amongst the foremost runners. On the contrary, it is *thought* that he lives for, not action. In the quietude and seclusion of his study he elaborates those theories, works out those conclusions, establishes those doctrines which, though bearing little fruit at their birth, are destined to carry on his name in the records of humanity until again there shall be darkness over Egypt. The one man is all life and movement, the other all reflection and inquiry; the former pursues a profession with ardour, the latter chooses no profession at all. He prefers the gratification of his taste for study and speculation to all the temptation that a public career can produce. The one is quick and prompt, blessed with a native vigour and sense which teach, as it were, intuitively. He reflects little, reads less, and does much. The other, endowed with a cautious and philosophic mind, examines much, reads widely, but performs little in the way of immediate work. Their physical qualities may be even as strongly contrasted as their mental, though they may resemble each other in this: that they are alike free from all that is narrow and selfish in their notions, and alike exempt from that state of contentment which is the parent of mediocrity. But there are some men who come into the world so variously and richly endowed, that they become men of considerable mark in both these ways; Nature has so kindly treated them that their life of action is tempered by reflection, letting them live by deeds in the present, and in the future by words. They select a brilliant profession and practice it with ardour, and yet find time for philosophic or scientific research. By the former they make high their standing in the market-place, by the latter they are known in the school and the porch. They become of great repute in their own day, and will be looked upon as authorities in years which are to come. There is such a balance of action and of thought, and such an amount of either, that whether their possessor be more worker or thinker it is often difficult to say. Amongst this latter class Sir Benjamin Brodie has the privilege to be ranked. He obtained the highest reputation in his own day in the practice of the profession he had chosen, and left behind him works which, so long as medicine shall be cultivated as a science, will command attention and respect. We believe it to have been fortunate for himself and others that he was led so directly up to the healing art. Had he been lawyer, engineer, merchant, or otherwise, no doubt he would have become eminent for his acuteness of mind, precision, yet energy of work; but in medicine, the labour

> "It is thrice blessèd—
> It blesseth him that gives and him that takes,
> 'Tis blessèd in the giving."

If it be asked how it was that Sir Benjamin Brodie attained a success as a practical surgeon so far beyond that of most of his contemporaries, we would reply, with Dr. Babington, that he seems to have owed it not to personal appearance or manner, not to eccentricity, not to an unusual display of courtesy on the one hand or of bluntness on the other, but to the legitimate influence of a high order of intellect, thoroughly devoted to the practical application of the stores of professional knowledge acquired by his own assiduity and experience. The result of the practical sagacity of Brodie was that he became the surgeon of his day, that he was employed by the courts of three successive sovereigns, was consulted by the *élite* of the nobility and gentry of the land, and his judgment resorted to by the advisers of the Crown on certain important and debateable questions connected with the administration of justice. The union of sound judgment and probity of character with working power produced him such reputation as at length placed him at the head of the Council of Medical Education, elevated him to the presidency of the Royal Society, and led to a requisition of the graduates of the University of London that he would represent them in Parliament, at the time when there was a talk of such a representation being made. As a surgeon the fame of Brodie became so much the more increased above his fellows in proportion to the purely medical knowledge which he added to his surgical experience. It has been said that "he was more distinguished as a physician-surgeon than as an operating surgeon. His vocation was more to heal limbs than to remove them. His imagination had never been dazzled by the brilliancy of the knife to any great operative display." He certainly made no secret of the opinion that the manipulative part of surgery was not its highest part. Diagnosis and the due consideration of constitutional states had always been his points of greater strength, and his opinion was therefore always highly valued both by the profession and the public. The latter often insisted on regarding him in a purely medical capacity. "If I should be very ill and want anybody else, I should like Brodie," would say one to his usual medical attendant, totally regardless as to what might happen to be the matter. As an apt illustration, too, we offer the following anecdote, told us by a general practitioner. A patient of his own had—or supposed he had, we forget which—some disease of the heart, and requested to be taken to Sir Benjamin Brodie. It was pointed out to him that Sir Benjamin was a surgeon, and that the complaint he suffered from lay within the physician's province. Against the grain, he allowed himself to be taken to a well-known physician in Conduit-street. On their leaving the house of the latter the patient arrested his medical friend at the bottom of the steps, inquiring how far it was to Saville-row, for see Sir Benjamin Brodie he would. So they went at once to him. Sir Benjamin, on hearing an outline of the case, turned to Mr. M——, the medical attendant, and said, "This is not for me; you had better take him to my friend Bright, close by." "To tell you the truth, Sir Benjamin," said Mr. M——, "we have just this instant come from Dr. E——, and my patient will not be satisfied unless you examine him." Sir B. Brodie smiled, and made an examination.

From his careful consideration of constitutional states and his regarding a local malady as having a right, as it were, to be referred to some antecedent systemic condition—in his refusing to ignore the importance both of trifling complaints and obscure symptoms—the sagacious and cautious surgeon of St. George's not only was able to tread very often on breaking ice, but to save others from falling over head and ears into trouble. He has been aptly called the Sydenham of surgery. But though the knife was to Sir Benjamin a last resource, and used reluctantly, yet when employing it he was a steady and successful operator in spite of his own assertion—"I was naturally very clumsy in the use of my hands, and it was only by taking great pains that I became at all otherwise." He had caution without timidity, never-failing coolness, and fertility of resource. It has been stated ('Lancet,' 1862), that the first sub-cutaneous operation on record was performed by him. It occurred in an operation for the cure of varicose veins in the leg, an account of which is contained in the seventh volume of the 'Transactions of the Royal Medical and Chirurgical Society.' It is true that his name is unconnected with any other great advancement in operative surgery, but in association with minor improvements in the management of surgical manipulation, credit is due to him of very high degree. His name is said to be more familiar than that of any other surgeon to the surgical instrument maker and surgical mechanician, as associated with improvements over their branches generally. Another fact in the personal character of Sir Benjamin Brodie which obtained for him much respect in his own day, and particularly amongst the members of his own profession, was his own high personal probity, this being specially seen in the fearless way in which he opposed quackery, and stood forth an unhesitating witness in behalf of legitimate medicine. Well would it be if all in high places were his equal in this, and withstood, as he did, the Delilahs of Mammon, which are wont to try their charms over the pure surgeon and drag him within the sloughs of homœopathy, hydropathy, &c., under plea of his being consulted in a department and for a purpose having nothing to do with the medical aspect of the case. It may be replied, however, that Sir Benjamin disagreed with the desire once so prevalent, that Parliament should be urged to interfere for the purpose of suppressing quackery by the strong hand of the law. But why was he thus recusant? First, because "We are convinced that the thing is impossible." . . . Secondly, "Because, as matters now stand, would not such a proceeding be a very tyrannical interference with the right of private judgment?" In this we accord. And as he afterwards writes:

"In like manner, each individual has a right to manage his own health in his own way, and to consult whomsoever he prefers about his own complaints. But it is quite different when he has to provide for the health of others; and we conceive that the law ought to interfere to prevent any persons but those who are duly authorized to practise from holding appointments as physicians or surgeons of hospitals, schools, or ships, or as medical attendants of the poor; and the same rule should extend to the different branches of the public service. On the same principle, the certificates of none but licensed practitioners should be received in courts of justice, nor should any others be enabled to claim the usual exemption from serving on juries and in parish offices."

How these views, contained in an article in the 'Quarterly Review' of December, 1842, on "Quacks and Quackery," afterwards influenced legislative enactments, it is unnecessary to point out. In his article on "Homœopathy," in 'Fraser's Magazine' for September, 1861, he writes:

"With all the pains that I have been able to take, I have been unable to form any very distinct notion of the system which they profess to teach. . . . However, I do not hesitate to say that a very large number of persons have fallen victims to the faith which they reposed in it, and to the consequent delay in having recourse to the use of proper remedies. . . . . It would seem that there is nothing so absurd that it may not be believed by somebody, and it is not the smaller intellects alone that are thus credulous."

But,

"To join with homœopathists in attendance on cases either of medical or surgical disease would be neither wise nor honest. The object of a medical consultation is the good of the patient, and we cannot suppose that any such result can arise from the interchange of opinions where the views entertained, or professed to be entertained, by one of the parties as to the nature and treatment of disease are wholly unintelligible to the other."

Whilst Brodie was thus establishing his reputation amongst his contemporaries as a practical man of the highest character, he was at the same time stamping himself as one of scientific research. Seven papers were published between 1811 and 1814 on physiological subjects in the 'Philosophical Transactions.' Amongst these we may refer to his inquiries respecting the influence of the brain on the action of the heart and on the generation of animal heat, and the different modes in which death is produced by certain vegetable poisons, as being stock references in most physiological books. Again, in 1823, he appeared as a physiologist in the 'Quarterly Journal of Science,' with a memoir "On the Effects produced by the Bile in the process of Digestion." Thus his scientific repute obtained for him from the Royal Society the Copley medal, at a time when he was only twenty-eight years of age. This was followed by the friendship of Sir Joseph Banks and the *entrée* into Holland House. Again we see him as a scientific member of the profession of medicine developing his science into art in the publication of his work, 'Pathological and Surgical Observations on Diseases of the Joints,' and of his 'Lectures on Diseases of the Urinary Organs.' The first attained five editions, the last four—the latter work being translated into French by M. Patron of Montpellier, and reprinted in America. But, after all, he gained more credit for acumen perhaps from his 'Lectures on Local Nervous Affections' than from any other of his writings. Besides these there are his 'Clinical Teachings on Pathology and Surgery,' and the third volume of the present edition of his works contains numerous 'Pathological and Surgical Observations left in MS.' Towards the sunset of his life we find Sir Benjamin coming before the world as a philosophic thinker and agreeable writer on mental science, as witness the two series of 'Psychological Inquiries,' a series of essays illustrating the mutual relations of the physical organization with the mental faculties, and other questions in the physical and moral history of man. Of memoirs, addresses, and fugitive pieces, we need not say anything. That Sir Benjamin's philosophy may not be of the deepest kind, and that advances both in physiology and surgery would modify some of the opinions recorded in his works, we are willing to accede. Nevertheless, looking at this side of his character, we find on the whole high manifestations of the scientific thinker and writer striving to make his knowledge subservient always to the benefit of mankind. His purely professional works have indeed long since passed with honour the bar of criticism, and a majority of the opinions therein enunciated have become woven into the fabric composing the safest, and therefore soundest, medical knowledge of the day. As it has been well observed:

"The fact is, that, without our always remembering it, Sir Benjamin Brodie is one of the men whose great landmarks of judgment guide us in the formation of our own daily opinion. His actual observations and his general reflections have so impressed themselves on the teaching of the schools and the medical literature of the day, that they are sure to be long influential in the general practice of the country."[1]

But the character of Brodie, as Dr. Acland observes, can be only properly considered when regarded as a whole:

"Neither as scientific man, nor as surgeon, nor as author, was he so remarkable as he appears when viewed as he was—a complete man, necessarily engaged in various callings. It was impossible to see him acting in any capacity without instinctively feeling that there he would do his duty, and do it well; nor could he be imagined in a false position. A gentleman, according to his own definition of that word, 'he did to others that which he would desire to be done to him, respecting them as he respected himself' . . . . . . the public and the profession esteemed Brodie as the first in his art. . . . . . . but those who knew him only as a man of business would little suspect the playful humour which sparkled by his fireside—the fund of anecdote—the harmless wit—the simple pleasures of his country walk . . . . . . Some who knew these might not have imagined another and deeper current which flowed unheard, when neither the care of his patients, nor his literary pursuits or memories, engaged his mind."

It is scarcely to be wondered at that the death of the eminent surgeon—the referee in the case of Smethurst—the President of the Royal Society, and the author of the 'Psychological Inquiries,' should have caused such regret as it did amongst the public at large, nor that the latter should have been so much interested as it has been in such records of his progress through life as it has been able to procure. We are now presented, to some extent, with a systematic account of his course upward, contained in an autobiography he left behind him. This has been placed at the disposal of Mr. Charles Hawkins, who had undertaken to prepare an edition of his collected writings. It gives us much pleasure to bear testimony to the able and judicious manner

[1] Lancet, vol. i. 1865.

in which Mr. Hawkins has discharged his duty. He speaks so modestly of his own labours, and so reverently kind of his deceased friend, as to make us sure his task was not less a labour of love than it was of duty. Nor could we expect otherwise, for a friendship which extended over more than twenty years, during which an ever-continuing stream of affectionate kindness flowed, stopped only by death, would alone render the recipient unfit simply in a coldly judicial character. Hence Mr. Hawkins tells us he has "not presumed to write a life," nor "pretended to place myself in the position usually occupied by an editor:"

"Apart from my inability for undertaking such a duty, his works do not require 'editing;' that is, his language needs no explanations or elucidation. He was himself constantly employed in correcting and revising his own productions; and he has left each of them fully on a level with the present state of medical science. In the very last year of his life he occupied himself by having his early notes of cases read over to him (for, unhappily, the state of his sight did not permit him to read,) and he dictated many valuable observations, which have been incorporated in this edition of his works. The few notes which have been appended are mostly in reference to other writers .... Those who read his works attentively will see how he educated himself for the duties he was about to undertake, how he acquired the information necessary to make him what he lived to become—one of the most perfect masters of his art in this or in any other country, not only as a man of science, a surgeon of the greatest sagacity, and of never-failing resources, and a most impressive teacher (for it was impossible for the dullest to listen to his lessons without receiving instruction), but a most accomplished gentleman."[1]

His life is, indeed, written in his works; but the interesting autobiography which is prefixed to them will yet make us acquainted with such facts as they could never let us know. To it, then, we shall now pass, not refraining, at the same time, from applying to such other sources of information as may lie within our reach.

Benjamin Collins Brodie was born in the year 1783, at the Rectory of Winterslow, in the county of Wilts. His father had been presented to the living of Winterslow by the first Lord Holland. The Rev. Mr. Brodie was noted for his talents and general acquirements, as paying great attention to the duties of his parish, and as possessing considerable local influence beyond as a magistrate and deputy-lieutenant of the county. To have his children well educated was a paramount desire; and Sir Benjamin himself states, that he could not too strongly express his gratitude for the thought and labour which were bestowed by his father on the cultivation of his children's minds. His son Benjamin owed a great deal of his early education to his elder sister's care. She was seven years his senior, and superintended his first translations of 'Ovid,' and conducted him through Euclid's 'Elements.' From the home education he received, and the comparative privacy of the life at the Rectory, Benjamin and his brothers suffered, according to the former, some disadvantages, from which those boys who have passed through a public school are pretty generally exempt. In his own case, he experienced a shyness in general

[1] In Memoriam.

society which, for a long time, was very oppressive, and taking many years to overcome. Another result was, the tendency to overrate himself as regarded some things, and to underrate himself in respect to others, from not having sufficient opportunities for comparing himself with companions, and being thus unable to found a right estimate of his own character. From what we are afterwards told, it is clear, however, that such disadvantages were greatly counterbalanced by some benefits springing from the same source. One great advantage was, that he was for ever made very independent of others, whether for occupation or amusement:

"In the many years previous to my marriage, during which I was climbing up-hill in my profession, when I passed what is called the empty season in London with very few of my acquaintance left in the great city, time never hung heavy on my hands. Indeed, very few portions of my life have been much happier than those in which I had no other society than that of my books and writings, and little recreation beyond that of a solitary walk in the fields which now form the Regent's Park, or those which are now covered with houses and gardens in the district of St. John's Wood." (p. 8.)

In the year 1799 the elder son, Peter, left Winterslow to be entered at the Temple, and to reside as a law student in London. In the latter part of the year 1801 Benjamin followed his elder brother to the great metropolis. The interval between his brother's departure and his own from the Rectory, constituted "a very important portion of his life." He had become conscious, in fact, that he must depend on himself for making his way in the world, and that he might never have again the same opportunity for laying in a store of general knowledge. Hence he read much Greek and Latin, obtained an insight into geometry and algebra, as well as some information on chemistry, perused the poets of his country, and some amount of French and Italian literature, and scanned the pages of such philosophical works as those of Locke, Harris, Reid, Priestley, Godwin, Smith, and others:

"Looking back at these two years, the impression on my mind is that it would have been well if I had read less and digested more; nevertheless, I am satisfied that they have been to me of the greatest value, and that if they could have been blotted out of my existence, my position in society would at the present time have been very different from what it really is." (p. 10.)

The Rector of Winterslow led his sons to suppose that he left them free to choose a profession for themselves; but the fact was that, without their being aware of it, he himself directed their inclinations. The elder son became a lawyer, obtaining a high place as a conveyancing barrister; the second son went into commerce, and afterwards into the House of Commons. For Benjamin it was determined that he should embark in some branch of the medical profession. Dr. Denman had married one of his father's sisters. In the autobiographical fragment entitled "A Memoir of my own Life," appended to the later editions of Dr. Denman's work on Midwifery, occurs the following:

"I was now in the thirty-seventh year of my age, and I determined to marry, and becoming acquainted with the family of Mr. Brodie, a respectable army linendraper, I chose Elizabeth, his youngest daughter, then in the twenty-fourth year of her age."

This was in 1770. In 1779 Dr. Denman writes of the same lady:

" It is impossible to have chosen a wife more suitable to my disposition and circumstances: her manners are amiable, her disposition gentle, her understanding naturally good, improved by reading and the conversation of reasonable people; and she has that regard for truth and propriety that I am firmly persuaded no human consideration could induce her to depart from them."

The lady of whom this eulogium was written was the sister of the Rector of Winterslow, and, consequently, the aunt of Sir Benjamin. When written, Dr. Denman was living in a small house in Oxenden-street, Haymarket, and making about 300*l.* a year by practice. Dr. Baillie and Sir Richard Croft had married Benjamin's first cousins, and thus the great reputation these relatives had respectively obtained led the father to incline the child in a particular direction, and disposed the child to be easily guided according to his wishes. Persons often remarked to the successful baronet, that they supposed he must have had some particular taste or liking for the profession of medicine. But according to the latter, such was not the case, nor did his experience tell him that there was any faith to be placed in those special callings to certain ways of life which some young men are supposed to have. When the young surgeon first arrived in London, he knew as little as possible—he tells us—of the profession for which he was destined, and had to grope his way into it by himself as well as he could. That he managed to do so successfully speaks well for his youthful sagacity and caution. As he found that he could not be a physician without a University degree, he attended, during his first season in London, the lectures of Mr. Abernethy on Anatomy. So able were these, and such the repute and influence of the teacher, that like most of the pupils he was led to look up to Abernethy as a person of a superior order, and as being unable to conceive anything better than to follow his footsteps: hence Brodie was led to regard that department of the profession to which Abernethy belonged as the one to which he himself would become attached. He carried out his intention, and never had reason to repent his deed:

" After an experience of fifty years I am confirmed in the opinion, that the pursuit of what is called pure surgery, such as it is in large cities in connexion with a hospital and a medical school, is more replete with interest, and on the whole more satisfactory than any of the other branches into which the *ars medendi* is divided." (p. 15.)

During his first winter in London, he likewise worked in the dissecting-room, and attended Sir Alexander Crichton's lectures on Chemistry. He read, too, for his own general instruction, the philosophical treatises of Berkely and of Dugald Stewart. He had few associates besides Lawrence and Crawford amongst his fellow-students, but became acquainted with Maton, Bateman, Horner, Bowdler, Ellis, Campbell, and other eminent or rising men, through the "Academical Society," which he joined, and the medium of his legal brother of Lincoln's Inn. This "Academical Society" gradually declined, and died a natural death from pure exhaustion. Such a fate we have often thought hung over some of the societies of more modern times, so miserable has been the attendance at their evening meetings. According to Sir Benjamin, the altered habits of society have not been favourable to such *réunions :*

"In the beginning of the century lawyers dined at half-past four or five o'clock, and had long evenings. In like manner, the Royal Society Club dined at the Crown and Anchor at five o'clock, and made a full attendance at Somerset House afterwards. But now, when few persons of the best educated classes dine before seven o'clock, the meetings of the Royal Society are scantily attended, there being not unfrequently no more than twenty or thirty of the Fellows present, or, as the French say, *assisting* on these occasions." (p. 21.)

On the whole, the inauguration of the London life was agreeable enough, though it formed a strange contrast to the quietude of his father's dwelling, to which he returned in the spring of the following year. The ensuing autumn (1802) the young surgeon was again in London. In the winter he attended Mr. Wilson's lectures on anatomy, in Great Windmill-street, and worked hard in his dissecting-room. For learning anatomy this school offered much better opportunities than did any other; yet the junior, and also an inferior order of students preferred *Carpue's,* though the director was more of a private tutor or "grinder" than an anatomist. Wilson was the last of the great anatomists of the school of the Hunters, and it may be questioned if any man since his day has excelled him either as an anatomist or a teacher. In the schools of the beginning of the present century, what was called "surgical anatomy" was the absorbing subject, and many things now of importance in the medical *curriculum* had no place at that date in the "bill of fare" of the teachers. Besides attending closely to anatomy, young Brodie wisely followed Dr. Baillie's advice. This was, to gain some knowledge of materia medica and the compounding of medicines. To effect this, Brodie attended in the shop of Mr. Clifton, an apothecary of the old school, living at the corner of Little Newport-street. This worthy, though not having any science in the ordinary sense of the word, yet was thought by Sir Benjamin Brodie to have been a useful and successful practitioner. He came to this conclusion because—

"Although there was nothing prepossessing in either his manner or his appearance, his practice gradually increased, until at last he was able to give up his shop and live in a large house near Leicester-square, where he dispensed medicine only to his own patients. It is usual in these days to regard this class of practitioner with little respect, but the fact is that they were very useful persons, and having no very ambitious aspirations, they were within the reach of the poorer orders of society, which is not much the case with the better educated surgeon-apothecaries—or, as they are called, general practitioners—of the present day, who have expended a considerable sum of money in order to obtain a licence to practise. Mr. Clifton's treatment of disease seemed to be very simple. He had in his shop five large bottles, which were labelled *Mistura Salina, Mistura Cathartica, Mistura Astringens, Mistura Cinchonæ,* and another of which I forget the name, but it was some kind of white emulsion for coughs, and it seemed to me that out of these five bottles he prescribed for two-thirds of his patients. I do not, however, set this down to his discredit, for I have observed, that while young members of the medical profession generally deal in a great variety of remedies, they generally discard the greater number of them as they grow older, until at last their treatment of diseases becomes a work as simple as that of the Æsculapius of Little Newport-street. There are some, indeed, who form an exception to this general rule, who even to the last seem to think that they have, or ought to have, a specific for everything, and are always making experiments with new remedies. The consequence is that they do not cure their patients, which the patients at last find out, and then they have no patients left." (p. 24.)

In the spring of 1803 Benjamin Brodie first entered as a pupil, under Mr. (afterwards Sir) Everard Home, at St. George's Hospital, and who was the leading surgeon at the west end of London :

"He was looked up to with something like veneration by all the hospital pupils. He was punctual in his attendance, performed his duties with great ability, and was far above all his colleagues both in his diagnosis of disease and as an operating surgeon." (p. 27.)

He then left his old lodgings in Carey-street, and went to reside in the neighbourhood of the hospital, in order that he might be the better able to attend to his duties. Here the commencement of his studies formed a completely new era in his life. Hitherto he had worked, he says, rather as a matter of duty than from having any very great interest in what he was about. But now a marked change took place, from the peculiar influence which hospital work possesses :

"To those who really desire to learn, the wards of a hospital are soon found to be replete with interest. At first, all is confusion. The nice distinction of symptoms on which the diagnosis of disease depends, why the pulse in one case indicates immediate danger and in another none at all, why one patient recovers and another dies, why the same kind of treatment is successful in one instance and fails in another,—these and a multitude of other matters are quite inexplicable to the young student. Everything is seen, as it were, through a mist. After no long time, however, the mist begins to clear away, and whoever has advanced thus far finds no difficulty afterwards. Every case is an interesting subject of inquiry. A great game is being played, in which the stake is often neither more nor less than the life or death of a fellow-creature, and in which those among the students who devote themselves to their business perform a humble yet not unimportant part, without any painful feeling of responsibility. Not many months elapsed before I became sensible of the good effect of these new studies, and of the wisdom of Dr. Baillie's advice, that I should make myself a tolerably complete anatomist before I commenced my attendance at the hospital, as I found that I was able to comprehend many things that were passing under my observation, which I could never have properly comprehended otherwise, and in which those who were less prepared in this respect were little able to comprehend." (p. 28.)

In September, a return took place to his father's house at Winterslow. Here he had an attack of fever; went afterwards into Hampshire to recruit his health, and returned to London again in the October following (1803). Lodgings were now taken in May Fair, which, being situated between Hyde-park Corner and Great Windmill-street, he was enabled the more easily to divide his services between the hospital and the school of anatomy. At the school he had already obtained some credit with Mr. Wilson and his colleague, Mr. Thomas. The latter delivered a few only of the lectures, but it was understood that he was to superintend the dissections and give an anatomical demonstration daily for an hour in the dissecting rooms. But Mr. Thomas had become not very partial to his duties; he was getting into good practice, and he began to play the truant; when desiring to do so, he used to ask Mr. Brodie to demonstrate for him. This arrangement would appear not to have been attended with any difficulties, as both Mr. Wilson and the students seemed to be well satisfied with it. Of course Brodie himself felt sufficient reward for his trouble in the position which he was thus placed in above the ordinary students. In the following March he lost his father. About this time, too, he began to dabble in some literary pursuits. These were not of long continuance, for "I found that I could not well follow two trades at the same time, and thus my literary adventures soon came to an end." (p. 32.)

During the summer of 1804 a friend of Mr. Brodie's, of the name of Jeffreys, was house-surgeon at St. George's Hospital. This intimacy enabled the latter to pursue his studies at the hospital with great advantage. In the early portion of the day the two students were always together in the wards; nor were they apart in the evening. It was from Jeffreys, who had more knowledge of his profession than most young men of his own standing, that Brodie first learned the importance of keeping written notes of cases, a practice he afterwards continued until the latest times. These notes were carefully preserved from the first, and at length formed many thick quarto volumes of manuscript, to the earliest of which, we are told by Sir Benjamin, that he not unfrequently referred with advantage at the most advanced period of his professional career. Alluding to this subject, he observes:

> "My custom has been to take short notes at the bedside of the patients in the day, and to expand them with the aid of my memory in the evening. Thus they became an exercise of the memory; and, instead of weakening, tended to strengthen that important faculty. After an experience of nearly fifty years, I am satisfied that no one can be well acquainted with his profession, either as a physician or surgeon, who has not studied in that manner. It is only by these means that a case can be thoroughly and scientifically investigated, or that that minute and accurate knowledge of it can be obtained which is necessary to a right diagnosis. For one who is to occupy hereafter the situation of a consulting practitioner, to whom younger or less experienced persons will apply for assistance in cases of doubt or difficulty, it answers another purpose, as it enables him to express himself with greater facility, and especially to give written opinions with a degree of clearness and precision with which he could not give them otherwise. I have always, during the many years in which I was a teacher and a hospital surgeon, endeavoured to impress on the minds of my pupils the necessity of making and preserving such written records of their experience; and I have often been pained to observe how small a proportion have followed the advice which I gave them." (p. 35.)

Mr. Hawkins informs us, that during the winter previous to the death of Sir Benjamin, his volumes of notes were read over to him by Dr. Reginald Thompson, and that he dictated many observations on their contents, which were transcribed by Dr. Thompson, and have been appended to the present edition of his writings.

During the winter session of 1804–5, Mr. Brodie had come to have almost the exclusive superintendence of the dissecting-room, under Mr. Wilson. Mr. Home had also made an arrangement by which the young demonstrator was to become house-surgeon at St. George's in the Midsummer following. But, at the end of the session, a circumstance occurred which modified to some extent this arrangement. Mr. Thomas determined to retire from his office of teacher of anatomy. Mr. Wilson proposed to Brodie that he should occupy Mr. Thomas's place as recognised demonstrator in the school. This was agreed to, on the understanding that six months he might reside at the hospital and six months out, devoting his attention mainly to the school. Time went on; and when about to resign this office of house surgeon, Nicolson, Mr. Home's assistant, left England, to try his fortune in India. Mr. Home then proposed to Brodie that he should assume Nicolson's place, and assist him in his private operations. His connexion with Mr. Home not only improved the assistant's knowledge, but made some addition to his income, as young Brodie saw such of Home's patients as were disposed to accept the advice of the assistant when the master himself was taking a holiday. A few fees likewise came in on other occasions. It has been stated[1] that Mr. Brodie owed much of his early success to one of those lucky incidents in life which, taken advantage of, lead to fame and fortune. Sir Everard Home was sent for by Leech, the Master of the Rolls, who suffered severely from some disease of the urinary organs. The baronet had that evening made such libations to the rosy god as prevented him from attending to his lordship's call. Brodie went in lieu of him, and by his solicitude and attention to the patient made of the Master an attached and earnest friend. Home's intemperate habits and unprepossessing manners led many other of the patients to prefer the service of the assistant to that of the principal. For nearly two years and a half from ceasing to reside as house surgeon at the hospital, there was little change in pursuits and mode of life. He lived in lodgings in Sackville-street, at No. 24, nearly opposite to Sir Everard, who resided at No. 32. In the winter he demonstrated and studied at the hospital, and assisted Mr. Home both in his operations and his researches in comparative anatomy. In the latter occupation an acquaintanceship was formed with the late Mr. Clift, and he was introduced by Mr. Home to Sir Joseph Banks. By the latter he was invited to the assemblages which were held in Sir Joseph's library on the Sunday evenings intervening between the meetings of the Royal Society. Here Mr. Brodie saw such lights in the scientific firmament as Herschel, Davy, Wollaston, Young, Cavendish, Maskelyne, Blagden, Abernethy, Carlisle, and others; and from Sir Joseph he obtained, through Dr. Bancroft, who had travelled in Guiana, the supply of the Woorara poison, with which he performed his well-known experiments. In March, 1808, partly through the interest of Mr. Home, and partly

[1] Medical Times, 1844, vol. ix. p. 198.

through his own reputation as a teacher of anatomy, Mr. Brodie was elected assistant-surgeon to St. George's Hospital. This was an early honour, as he was barely twenty-five years of age, still at the lodgings in Sackville-street, and without his name on the door. From the day of his appointment Mr. Home left to him very much the management of his public patients; and those of the junior surgeon, Mr. Gunning, were also entirely under his direction for the space of four years, during which period Mr. Gunning was attached to Lord Wellington's army in the Peninsula. It may be thus seen how unusually early our young surgeon had opportunities for large experience in that unequalled field—hospital practice, and to which circumstance his early professional success unquestionably was mainly due, and not to any adventitious circumstances. As preachers are wont to say, too, "he improved the occasion:"

"The custom at St. George's, and indeed at all the other metropolitan hospitals, had hitherto been for the surgeons to go round the wards only on two days in the week, not attending otherwise, except when there were operations to perform, or severe accidents which made their assistance necessary, or on other special occasions. Mr. Robert Keate and myself were the first persons who adopted another mode of proceeding. We were at our posts in the hospital daily, and superintended everything; and there was never an urgent case which we did not visit in the evening, and not unfrequently at an early hour in the morning also. . . . After some time I appointed clinical clerks—one for the patients of Mr. Home (or, as he became soon afterwards, Sir Everard Home), and another for those who were under my care, as officiating for Mr. Gunning. I also began to deliver clinical lectures, and I believe that these were the first lectures of this kind which were ever delivered in a London hospital." (p. 49.)

In October, 1808, in association with Mr. Wilson, a short course of systematic lectures on surgery was likewise delivered. After the second year Mr. Wilson retired, leaving Mr. Brodie to carry on the surgical lectures by himself, and which duty he continued to perform for twenty years, until he himself resigned it to Mr. Babington and Mr. Hawkins. Though thus well occupied and known, yet Mr. Brodie had not anything as yet which deserved the name of practice. In the autumn of 1809 he removed from 24, Sackville-street, where he was paying 100*l.* a year, and had but very indifferent accommodation, to No. 22 in the same street, and taking the whole house. This enabled him to receive three indoor pupils, to place his name on the door, and to set about seriously thinking of private practice. In February, 1810, he was elected a Fellow of the Royal Society on the strength of some physiological papers he had communicated to it, and with the acquiescence of Sir Joseph Banks, the president. During the winter of 1811 he laid before the society his views "On the Action of the Heart," and "On the Generation of Animal Heat," and "On the Effects produced by certain Vegetable Poisons." So favourable an impression did he make by these communications, that the Council awarded their author the Copley medal in the following autumn. At this time Mr. Brodie was only twenty-eight years old; and, says he:

"I was told, that when the question as to my having the medal was discussed in the Council, the only objection made to it was by one of the councillors, who observed that it had never before been given to so young a man; on which Dr. Wollaston observed, that he thought if I deserved the medal that was only an additional reason for my having it." (p. 54.)

Few events gratified the recipient more than this, and the period generally seems to have been one of much happiness in Mr. Brodie's life. About this time he became member of a "Society for the Promotion of Animal Chemistry," but which gradually degenerated to a mere dining-club, of which, at length, Mr. Brande and himself were left as the only surviving members. He also belonged to a "Society for the Promotion of Medical and Chirurgical Knowledge," which had been founded in the year 1793 by John Hunter and Dr. Fordyce. Dr. Wells was secretary when Mr. Brodie joined it, and by whose advice the society was dissolved in June, 1818. As time progressed, private practice slowly increased at the rate of between 200*l.* and 300*l.* yearly. Mr. Brodie, however, continued to pursue his physiological investigations, though chiefly occupied with the business of the hospital, taking notes, and improving his course of lectures on surgery. By the year 1813 sufficient progress in certain inquiries had been made to enable Mr. Brodie to draw up a paper, which was communicated to the Medical and Chirurgical Society under the title of 'Pathological Researches respecting the Diseases of the Joints.' This paper was printed in the fifth volume of the Society's 'Transactions,' and formed the foundation of the volume afterwards published on the same subject. The work went through five editions, and may be said to have been the basis for all modern scientific consideration of a very important class of maladies. In the meantime, Mr. Brodie resigned his duties as teacher of anatomy, Sir Charles Bell having purchased Mr. Wilson's museum, and taken Mr. Brodie's place as lecturer. It had been open to the latter to have succeeded Mr. Wilson on his retirement, had he chosen; but the conditions would not do:

"Mr. Wilson," writes Sir Benjamin, "informed me that his increasing practice as a surgeon made it convenient for him to give up his occupation as a teacher of anatomy; and he proposed to me that I should take the anatomical school altogether off his hands, giving him 7000*l.* for his anatomical museum and buildings in Great Windmill-street, including the house attached to them, in which he resided, and which had formerly been the residence of William Hunter, and then of his nephew, Dr. Baillie; but I had no money of my own at my disposal, and even if my friends could, and would, have assisted me, I had little disposition to lay myself under such an obligation . . . . . Having consulted Dr. Baillie and Sir Everard Home on the subject, I found that their advice corresponded with my own inclinations; and I therefore communicated to Mr. Wilson *first*, that I must decline the offer which he had made me, and *secondly*, that I would not stand in the way of his making the arrangement that he was led to make with some other person, and that I would willingly retire, whenever he had done so." (p. 66.)

As we have stated, Sir Charles Bell occupied the position. During the two or three following years, Mr. Brodie's mode of life was very uniform, though scarcely monotonous: he was constant in attendance at the hospital, attending to what private practice he had obtained, seeing from time to time Sir Everard Home's patients, when the latter gentleman required assistance, or was not in the way, and assisting him in his investigations in comparative anatomy. Good society began to open its doors to him; by degrees, he became a frequent visitor at Holland House, and he formed some high legal acquaintanceships. In 1814, his health received a shock. He became dyspeptic, lost flesh, and altogether looked so ill, that he was told that at a medical dinner-party, where the question arose as to who would cause the next vacancy at St. George's, the guests all agreed that it would be done by Mr. Brodie. To put off so inauspicious an event, Mr. Brodie went off with his friend Mr. Brande to the seaside; and "it was remarkable how much and what immediate refreshment this change of air and freedom of labour afforded me. I returned to London quite an altered person, and had only an occasional recurrence of my former symptoms during the following winter." (p. 71.)

During the long war in which we had been engaged, we had little or no intercourse with the scientific or professional men of other countries. Its conclusion was now at hand, and hence such persons began to cross the Channel. Thus Mr. Brodie had opportunity of meeting with Roux, Orfila, Magendie, Ekstrom, Assalini, Blainville, Berzelius, and others. In 1816, having nearly completed his thirty-third year, he married the third daughter of Mr. Serjeant Sellon, then in her twentieth year of age, his professional income, derived from fees and lectures, amounting to 1530*l.* the same year, thus entitling him to assume such responsibility. His wife, if she brought no fortune, brought, likewise, no unnecessary expenses; and the couple were able to make both ends meet at Christmas, notwithstanding that a carriage and pair of horses had been started. An increase of professional employment was now more manifest than ever it had been before. In 1817, he became a father, having afterwards, altogether, three sons and one daughter:

"It was in the year 1817 or 1818 that I first formed a rather intimate acquaintance with the late Sir William Knighton. In the year 1815, Sir William was in attendance on the Duke of ——, in a very serious attack of illness, which terminated fatally. I was applied to for the purpose of examining the body after death. Some foolish or ill-disposed persons had persuaded the Duchess that Knighton had mistaken the nature of the Duke's complaint, and that he had treated him improperly. The examination which I made proved that this charge was altogether unfounded. After I had sent my written report, the Duchess asked me to call upon her; and she and her sister cross-examined me on the subject, being, as it appeared to me, very ready to attribute blame to the physician. I took his part—as it was my duty to do—and believed that I had satisfied them that the opinion which they had been led to form was erroneous. Not a word ever passed between Knighton and myself on the subject; but from this time he became one of my warmest and kindest friends." (p. 75.)

During the earlier years of his married life, Mr. Brodie continued to reside in the small house in Sackville-street. In the beginning of

1819 a house was taken in Saville-row. In this he remained until removal ensued to a larger residence in the same street, in which he resided as Sir Benjamin Brodie, Baronet. In the same year his professional income exceeded that of the previous year by more than 1000*l.* This augmentation was—

"In part attributed to the publication of the first edition of my work on 'Diseases of the Joints,' which had taken place in the previous year. Other circumstances, however, contributed to it. Although I was not more than thirty-six years of age, my name had been for several years before the public. Sir Astley Cooper, who had succeeded to the large practice of Mr. Cline, and the smaller one of Sir Everard Home, too confident of his position, had already begun to lose some of the vast reputation which he had previously enjoyed. Some one else was wanted, and I was ready to fill the vacant place. From this time my practice steadily increased, so that almost every year made considerable additions to it." (p. 80.)

In 1819, Mr. Brodie succeeded Mr. Lawrence as Professor of Comparative Anatomy and Physiology at the Royal College of Surgeons. In undertaking this office, he doubts as to his having acted wisely, since he already abounded in occupation, and could fit himself for the extra duty only by diminishing his hours of rest. In the year 1821, while he held this situation, he was first called on to attend the King (George IV.). His Majesty had one of the common encysted tumours which occur upon the scalp, which was large enough to be troublesome to him. It was shown to Sir Everard Home, who advised that it should be removed by operation. The King was willing, and expressed a wish to Sir William Knighton that Mr. Brodie should perform the operation in the presence of himself and Sir Everard. Sir William was commissioned to make known this determination to Mr. Brodie; who observes—

"I cannot say that I derived any particular satisfaction from it, as I found that I had already obtained the patronage of the public, and was quite contented with it. In the meanwhile, however, the subject of the proposed operation was mentioned to Lord Liverpool, who was then Prime Minister. Lord Liverpool represented to the King that it was a matter which might concern the public as well as himself; and urged that nothing should be done without Sir Astley (then Mr.) Cooper being first consulted, and that if an operation was determined on, that Sir Astley should perform it. Sir Astley being at that time the most conspicuous person in his profession, I cannot doubt that Lord Liverpool's judgment was quite correct. Accordingly, Sir Everard Home, Sir Astley Cooper, and myself were summoned to Windsor, when, after examining the tumour, we agreed that nothing but an operation could be of any service, and that it should be performed when the King returned to London. Mr. Cline was consulted afterwards, who confirmed the opinion which we had given. Eventually the operation was performed by Sir Astley Cooper, in the presence of Sir Everard Home, Sir William Knighton, the King's physician, Sir Henry Halford, Sir Matthew Tierney, and myself—making, indeed, a very large assemblage for so small a matter. . . . From this time, when any surgical operation was required, the King for some years was in the habit of applying to Cooper; but on some special occasions I was summoned to meet him in consultation, though I held no actual appointment in the Royal Household until the year 1820, when, on Sir Astley having been appointed Serjeant.Surgeon, I was gazetted as Surgeon to his Majesty's person in his place." (p. 82.)

In 1822, Mr. Griffith, one of the senior surgeons of St. George's Hospital, having resigned his office, Mr. Brodie was elected his successor without opposition. By the following year he had obtained a considerable private practice. His income from fees alone, independently of what was derived from pupils and the hospital, amounted to 6500*l.* It went on, too, steadily increasing, there being only one year—that following the financial crisis of 1825-26—in which there was any falling off, and then the diminution was inconsiderable. It was now Mr. Brodie's object to devote himself as much as possible to his profession, and to take advantage of the favourable opinion of the public, so that he might ensure a provision for himself and family. Accordingly, says he—

"I never absented myself from London for more than three weeks in the summer, and sometimes not at all. During the empty season I engaged, first, a ready-furnished house at Hampstead, and afterwards had a permanent residence there, at which my family remained, and where I dined and slept, coming to London every morning after an early breakfast. My receipts were such that I was able every year to lay by a considerable sum of money, so that I had no further anxiety as to the fate of my wife and children in regard to pecuniary matters, if I should be taken from them. But I had anxieties of other kinds. I had now a large share of operative surgery, far more than fell to the lot of any other individual in the metropolis. Sir Astley Cooper's practice was beginning to decline, and he finally quitted London for a considerable time in 1828, and the greater number of patients who would otherwise have applied to him now resorted to myself. I was never much attached to this department of my profession, which I considered as requiring far less of intellectual accomplishments than the diagnosis of disease, and the treatment of it in other ways. However, I could not venture to refuse what was offered to me, and I hope that I did justice to those who reposed confidence in me by sparing neither time nor trouble, and by neglecting nothing that could in any degree contribute to bring a case in which I was engaged to a successful termination. The only operation which gave me any real concern was lithotomy." (p. 39.)

Although Mr. Brodie had been already consulted by the King, it was but on rare occasions. In the spring of 1830, however, some symptoms under which his Majesty had long laboured, arising from disease of the aortic valves, became much aggravated, commencing, in fact, the illness which terminated in his death some months afterwards, and during which he was attended by his physicians, Sir Henry Halford and Sir Matthew Tierney:

"It was early in May that Sir William Knighton called on me one forenoon, and said, 'I have the King's commands that you should accompany me immediately to Windsor. They have got into a difficulty, and you must come and see if you can help them out of it.' On my arrival I found that the King's lower limbs were dropsical and enormously swollen, and that they had been scarified with a lancet, the consequence of which was that the swelling was not at all relieved, and that they were highly inflamed and in danger of gangrene; a further delay of twenty-four hours would probably have placed him beyond the hope of recovery from this local mischief. I at once made a good many punctures with a round needle, of the size of that which is known by the name of a worsted needle. This produced an immense discharge of fluid, and the success of the punctures, and of the other treatment which was continued with it, was complete. In the course of a fortnight, not only were the limbs free from inflammation and reduced to their natural size, but the state of his chest was so much improved, that instead of being scarcely able to breathe except he was in a sitting posture, he could throw himself on his bed and sleep in a horizontal posture with no other support than a pillow under his head. His Majesty was not only sensible of the relief which he thus obtained, but full of expressions of gratitude for what I had done for him. After the first three weeks, all that I had been specially required to do was accomplished. He would not, however, allow me to discontinue my attendance on him. My habit was to go to Windsor every evening after an early dinner, sleep in the Castle, and return to London, after a very early breakfast, in the morning. I generally went to the King's apartments about six o'clock in the morning, and sat by his bedside for one or two hours before my departure, during which he conversed on various subjects, not unfrequently speculating on his condition and prospects." (p. 93.)

In his more sanguine moments, the King would revert to the cottage which he had built at Windsor-park, expressing the pleasure which it would afford him to return to this his favourite retreat. He then seemed to imply that he had found the comparatively retired life which he had there led much more suited to his taste and disposition than were the splendour and publicity of Windsor Castle :

"The impression made on my mind by the very limited observations which I was able to make on these occasions was, that the King would have been a happier and a better man if it had been his lot to be nothing more than a simple country gentleman instead of being in the exalted situation which he inherited. If William IV. retained his simplicity of character and his freedom from selfishness, it was because he ascended the throne at a late period of life, having had no previous expectation that he would ever be thus elevated." (p. 95.)

On the death of Sir Everard Home, in 1832, Mr. Brodie was made serjeant-surgeon by King William IV., who, although he had never been attended professionally by him, yet had always been "kind and gracious" to him, in consequence of the report his Majesty had received of the sentiments which his brother George IV. had held towards Mr. Brodie. As the demands of private practice increased, retirement from the duties of systematic lecturing became necessary. In 1830, therefore, the lectures on surgery were resigned to Messrs. Hawkins and Babington, though clinical lectures were still delivered once in the week. In the year 1834 the King was pleased to elevate the serjeant-surgeon to the rank of a baronet. This elevation does not appear to have ever been any great object of ambition to him, as he considered that an hereditary rank, however small, without some independent fortune, would be really an incumbrance, and that it was a duty he owed to those who came after him not to leave them in so painful a position as to be forced to support it. However, fate decreed that Mr. Brodie should become Sir Benjamin Collins Brodie, Bart. :

"I have in my possession a letter from my friend General Sir Charles Thornton, who was one of his Majesty's equerries, stating that a person who was much in King William IV.'s confidence (I conclude it was Sir Herbert Taylor) had informed him that the King had said to him that it was his intention to make me a baronet, though not quite immediately. It was one or two years afterwards, when Lord Grey was quitting his office as prime minister, being succeeded by Lord Melbourne, that Lord Brougham said to me, 'You ought to be a baronet, and I know that Lord Grey intends to speak to the King on the subject, though it has escaped his memory to do so.' At that time my income, derived from my savings and independent of my practice, did not amount to more than about 2500*l.* or 2600*l.* per annum, and I thought that the being a baronet would not add very greatly to my own importance, while it might, in the event of my death, rather hamper my elder son. I expressed this to Lord Brougham, and said I should prefer to wait until I had acquired more landed property, and such as any one having anything in the shape of hereditary rank ought to be able to bequeath to his family. Being however, at the moment, pressed for time, I added that I would speak to him again on the subject. When I saw him on the following day I was about to repeat my former observations, when he interrupted me by saying, 'It is too late now to think about it; Lord Melbourne applied to the King yesterday, who immediately assented, and the thing is settled;' and so a baronet I became." (p. 103.)

For many years Sir Benjamin's practice, however, was such as to permit him to increase considerably his private income, though the public in this instance, as in others, much overrated the actual amount. Mr. Hawkins tells us in a note that Sir Benjamin's professional income never exceeded 12,000*l.* a year, though for several years he made about 10,000*l.* annually. During the later years of his life he declined important operations, and though this somewhat diminished his annual revenue, he never saw more patients, nor saw them more effectively, than for some years after declining to operate. According to the author of his biography in the 'Lancet,' the strength of Sir Benjamin's practice lay in the immense number of cases in which his opinion was taken. His patients came from all parts of the country, and were sent to him abundantly by medical men. He would often tell the pupils at St. George's that he owed very much of his success to the good opinion of his professional brethren, urging this as an incentive to them to strive after a high professional standard of excellence. Without the confidence of the profession no great practice can be held in this country for any length of time. Practices dependent on fashion, or on some particularity of treatment, may rule for awhile, but nothing save a solid reputation with the profession itself can ensure full and permanent work. The mass of the 10,000*l.* to 12,000*l.* a year of Sir Benjamin's income was taken, not in large fees, but in single or two guineas, in a home practice of plenty of patronage. It is the number of persons gathered in the waiting-rooms, morning after morning for a whole year, that goes to swell the income of our leading practitioners. Sir Astley Cooper ('Lancet,' *op. cit.*) once took a fee of 1000*l.*, but always laughed when he alluded to it, saying that great fees were no indications of a great practice. The men who do get great fees are those whose time admits of their paying immense attention to particular cases. This a leading physician or surgeon cannot do, unless the rank of the patient be sufficient to demand undivided services, and scarcely even then. Sir Benjamin Brodie always acted on the principle of associating another person with himself in all cases necessitating great care. On this account, again, he never received any very enormous fees—never, it is said, so large a fee as that received by Sir Astley. The latter was declared to have made in one year above 21,000*l.*—an enormous sum, and such as could only have been amassed by the performance of a large number of operations, when the rage for operative proceedings and the fashion for Sir Astley were both at their heights. As regards operative surgery, too, Sir Benjamin had, in his early years, the immensely popular reputation of Cooper to fight against, and in after years Liston came rapidly treading on his steps. Nevertheless, as Sir Benjamin himself says, he had his full share of this department, and the writer last quoted affirms that the "total earnings of Sir Benjamin Brodie undoubtedly exceeded those of Sir Astley Cooper."

In 1834 Sir Benjamin succeeded to the first vacancy that occurred, after his appointment of serjeant-surgeon, in the Court of Examiners at the College of Surgeons. This he did not by election, but under the provisions of the charter in virtue of his office as serjeant-surgeon. For several years at this period there is not much to recount as novel in the course and events of his life, being simply constantly engaged in professional engagements, and occupied in writing and preparing successive editions of his works. In 1837 he paid his first visit to Paris, remaining there for a month, having previously made a tour in Normandy with Lady Brodie and his daughter. He thus became personally acquainted with Cuvier, Dubois, Edwards, and others, whom he had not previously seen in London. During the more active period of his life Sir Benjamin was never absent from London for more than a few weeks in the year. He had engaged in 1828, as we have already mentioned, a house at Hampstead, whose heath at that time was a comparatively rural retreat. The lease of this having nearly expired in 1837, Broome-park, in the neighbourhood of Dorking, in Surrey, was purchased, possessing a larger and more convenient residence, and to which he determined to retire during a considerable part of the summer and autumn, and to extend the duration of his vacation annually. Landed property in the neighbourhood of Hadleigh, in Suffolk, was also procured.

In January, 1840, after having filled the place of assistant-surgeon for fourteen years, and that of surgeon for nearly eighteen years, to St. George's Hospital, he resigned his office. During these thirty-two years the hospital was, he tells us, the greatest object of interest, so far as his profession was concerned, that he possessed, and that he was indebted to the opportunities which it afforded him for the best part of the knowledge to which he had attained. He was, indeed, so attached to it, that he kept up in some degree a connexion with it after the resignation, by delivering annually a short course of lectures gratuitously to the students during the winter session, generally selecting for that purpose some one class of diseases, giving a more detailed history of his own experience than it was possible to give in an ordinary course of surgical lectures. Shortly after the resignation at St. George's, a medal was presented to him, a representation of which forms the frontispiece of the first volume. It formed the "Brodie Testimonial," copies of which were bestowed upon such eminent men as might be supposed to value his likeness. Amongst the latter was the late Lord Denman, who, in reply to thank the committee for the present, remarked, that the "beautiful memorial could not have been bestowed on any one who could prize it more highly." In 1854, the first part of the 'Psychological Inquiries' was published anonymously. In 1855 a second edition appeared, a third in 1856, and a fourth in 1862, just previous to their author's death. In this year, likewise, the second series was published; and the whole were very extensively perused by the public. In 1858, Sir Benjamin Brodie was elected President of the Royal Society—an honour which, Mr. Hawkins assures us, "he prized more highly than any that could have been offered to him." At this time, also, he was elected the first President of the General Medical Council, having previously been President of the Royal College of Surgeons, of the Royal Medical and Chirurgical Society, and various other bodies. When it was supposed that the University of London might be represented in Parliament, the graduates were not long in fixing upon him as a proper person for such a post; his answer to their request will be found in the following reply to Dr. Sibson:

"Saville-row, March 26, 1860.

"My dear Sir,—I am very much obliged to yourself and your friends for such an expression of your opinion, and I feel very much flattered by it. I cannot, however, take advantage of the proposal which you have made. It is too late in life for me to enter on a parliamentary career, for which, indeed, I am in no degree fitted by my previous habits. Besides that, the public duties which I have already undertaken afford me a great deal of occupation, and I could not, with any degree of justice either to myself or to others, venture to make any addition to them.

"I am, my dear Sir, yours very truly,

"Dr. Sibson, F.R.S." "B. C. Brodie.

Up to a late period of his life, the health of Sir Benjamin Brodie had been extremely good; but we are told by Mr. Hawkins that in 1834, while in the Isle of Wight, he fell from a pony, and dislocated his right shoulder—in which joint, as it will be seen, disease showed itself long afterwards. The biographer in the 'Lancet' thus alludes to the accident:

"Mr. White Cooper tells us, that about 1834, while staying at an hotel in the Isle of Wight, he saw from the window a carriage drive up, from which was lifted a gentleman covered with mud, and evidently in some pain, who was no other than Sir Benjamin Brodie. He had been thrown from a pony, and was suffering from dislocation of the shoulder-joint. Mr. Bloxam, a well-known practitioner of that day and place, came in, and Mr. White Cooper and Mr. Bloxam together reduced the dislocation. Sir Benjamin said that he used to think lightly enough of dislocation of the shoulder, but he should never do so again."

In July, 1860, according to Mr. Hawkins, his vision became impaired, and he found it necessary to consult some of his medical brethren. He submitted to iridectomy on both eyes, afterwards to extraction of a cataract, and, finally, to an operation for an artificial pupil.

But any hopes that might have been entertained as to the success of these operations were not to be realized. Sir Benjamin had been in the habit of having his patients placed under the influence of chloroform in all serious operations, and in those of a very painful nature; but he was averse to its being indiscriminately administered on trifling occasions. When he himself underwent the operation of iridectomy, the operation was performed under its influence; but when the subsequent operation for cataract and artificial pupil were undergone, chloroform was not exhibited. According to the writer in the 'Lancet':

> "Sir Benjamin was accustomed to express his aversion to operative measures more strongly than ever subsequently to the unfortunate results of which he was the subject. The ultimate result was, that he was left with just so much glimmering perception of light that he could track his way along a favourite path, after it had been dusted with white sand so as strongly to reflect the light."

His general health, however, continued good, or, at least, "in a fair state." In the winter of 1861-62 he was in London, and while there attended the meeting of the Royal Medical and Chirurgical Society for the purpose of voting an address of condolence to the Queen, on the death of the Prince Consort; but this was his last appearance on a public occasion. In 1860 he had proposed to retire from the Presidency of the Royal Society, but remained in office until the anniversary of 1861, at the earnest request of the Council, and because he had still a hope of recovering his eyesight sufficiently to enable him to discharge his duties. But in the year named he resigned, though he was re-elected into the Council, appointed to be a Vice-President, and so continued to his death.

At the end of April, 1862, he returned to Broome Park, and in a few days was seized with severe lumbago, followed by a protracted attack of fever. About July he began to complain of pain in the right shoulder, as well as of much prostration, for which he went to the seaside. The pain in the shoulder increased, being attended with feverish symptoms. In the early part of September a swelling, it was feared of a malignant character, appeared in the shoulder, and gradually increased. On October 21, 1862, he died, remaining perfectly conscious till within a few hours of his death, and with as little suffering as possible under the circumstances of the case. Anything that concerned the welfare and honour of the medical profession interested him to the last. How much he thought of his brother practitioners, how deeply he identified his feelings and his position with those who were members of his own guild, is touchingly shown by his farewell words to Mr. Charles Hawkins, which he uttered a few days before his death when speaking of the probable speedy termination of his life—"If any of my medical friends should speak to you of me, remember me kindly to them." To this same kind and watchful friend he talked shortly before the closing scene of the mysterious link connecting our consciousness with our material and visible organization, descanting with keen interest on the relations between mind and body, and the mutual reactions of one on the other. As he thus lay on his sofa, and suffering somewhat—having scarce for many months seen that outer world which had once been so much to him and to which he had been so much—those grand topics, the existence of evil, the terrible nature of physical pain, the future state, &c., passed in contemplative procession before him. Mr. Hawkins writes:

"For the malady connected with his vision he had the benefit of Mr. Bowman's advice, who performed the different operations on his eyes. During his last illness, he was attended by the late Mr. Peter Martin, of Reigate, and myself; and before the termination of his life we had the benefit of the advice of Dr. Watson, Mr. Hodgson, Mr. Cæsar Hawkins, and Mr. Cutler." (p. xxv.)

He was buried in the churchyard of Betchworth, the parish in which Broome Park is situated. His funeral was private, with the exception of the attendance of the Presidents of the Royal Society and of the Royal Colleges of Physicians and Surgeons, together with the Senior Surgeon of St. George's Hospital. Mr. Weekes, R.A., the sculptor well known to the profession by the busts ornamenting the staircase of the College of Surgeons, as also by his statue of John Hunter, succeeded in taking a very satisfactory cast of the deceased surgeon, to be the foundation for a bust for the Council-room in Lincoln's Inn. At one time, during his latest years, a report arose that he would be raised to the peerage, as Baron Betchworth, of Betchworth; but Lord Derby's ministry made haste to give official contradiction to a rumour which was so welcome to the medical profession.

A friend received, shortly after this rumour, a letter from Sir Benjamin, in which, with his usual and unaffected modesty, he expressed the satisfaction he felt at the want of confirmation which the report had received. There can be little doubt, however, that if Lord Palmerston's plan of creating life peerages had not been defeated, Sir Benjamin Brodie would not have passed away uncoronetted. Such an honour is yet, however, so far as precedent is concerned, beyond the reach of the profession of medicine. It threatened Brodie, as we have seen. Sir Astley Cooper is said to have been once nearly receiving it; and it has been affirmed by a relative of Sir Richard Croft, that the latter was promised a peerage by George IV., if matters had proceeded happily with the Princess Charlotte. But, after all, nothing than mere idle rumour may have been at the bottom of even this much.

It is scarcely necessary to point out the many foreign societies with which Sir Benjamin Brodie was connected; we may state, however, that he was a Foreign Correspondent of the Institute of France, an Associate of the Academy of Medicine of Paris, of the Royal Academy of Sciences of Stockholm, and that the University of Oxford conferred upon him the honorary degree of Doctor of Civil Law. Nor did our continental brethren forget him after he ceased to be one of their honoured associates, for M. Geraldes delivered, as President of "La Société de Chirurgie de Paris," a well-written and correct eulogium on his character, and on his influence over the art which he had professed.

For ourselves, there is no need that we should describe the *personnel* of the eminent surgeon of St. George's. But for those who come after us, we place on record some little account of his appearance. His biographer in the 'Lancet' very truly observes, that his habits of life were simple, and that he was a sincere Christian. Notwithstanding his many occupations, he found time for religious duties, being to be seen, when in town, a regular attendant at St. James's-church, Piccadilly, on Sunday afternoons. He was an early riser, unaffected in dress and manners, and, in spite of an originally delicate constitution, he preserved a far healthier and more vigorous aspect than has been often met with at his age. His slight stoop was scarcely more than would be natural to a young man of studious habits. As in a quiet way Sir Benjamin Brodie took his part in medical politics, was always interested in the elections at St. George's Hospital, was known to be not indifferent to who were elected to professorial chairs at King's College, and was otherwise considered to possess much influence, if he chose to exert it, it was not to be expected that he could pass through the course of a prominent public and professional life without both open and quiet opponents. Dr. Acland says of him, in his memoir:

"He was thought by some reserved—he was modest; by others hasty; he valued time, and could not give to trifles that which belonged to real suffering: he was sometimes thought impatient, when his quick glance had already told him more than the patient could either describe or understand. . . . . If ever he was bitter in society, it was when they [medicine and surgery] were undervalued; if ever sarcastic, it was when the ignorant dared presume to judge them."

But here is another, and not too friendly, portrait sketched of him in 1844, soon after he had resigned the surgeoncy of St. George's; and which, on the principle of *audi alteram partem*, we append:

"He is a spare, delicate man, with a sharp, intelligent, care-worn face. His features are good—a prominent, well-shaped nose, placed obliquely, gives him two distinct profiles, so that, like a Roman divinity, he may be said to have duplicity stamped on his countenance; his forehead is more broad than high, an indication always in our mind of the possession of talent; eye sunken, denoting absence of great command of language; perceptive organs very much defined; secretiveness and acquisitiveness large, and self-esteem towering above all the rest. The eye is sharp, penetrating, reminding us of the canny expression which is to be seen so common in the Highlands of Scotland; comparison and causality well developed, and in consonance with this he is admitted to be a man of quick and nice discrimination, his detection of disease rapid, and his treatment bold and decided. His features, on the aggregate, are expressive of intellectual activity, mingled with a good deal of severity of thought. His mouth denotes determination of character. His mind, though not sufficiently original or creative to be classed with men of genius, possesses a great fertility of profound and practical reflections. His profession has been the food of his meditation. the ardour with which he has cultivated it proves that it has been enlivened with his warmest predilections. As an author, plain, precise almost to a fault: no ornament, no illustration, there is no appearance of effort or art in it. This style, though so simple, is very difficult to be attained, as the poet truly observes:

'Ut sibi quivis
Speret idem, sudet multum frustraque laboret
Angus idem.'

He appears to be more studious of the idea than of the dress in which it is clothed. . . . . They say that some dissimulation, or rather indecision, marks his course in general politics, that he plays Pangloss well, and is all things to all men, and is only consistent in consulting the instincts of his own interest. . . . . He is a very hard-working, clever, and intelligent man, an accomplished surgeon, and studious physiologist, but he has no pretensions to genius; and some of his injudicious friends, when they place him on a very elevated pedestal, and genuflect before it, and offer up the frankincense of adulation, make themselves and the object of their idolatry ridiculous. His career has been marked and advanced more by consummate tact than commanding ability, favoured by auspicious circumstances, and sustained by untiring perseverance."[1]

Such, then, as we have noted, were the chief features in the life of Sir Benjamin Brodie. In his history there is nothing of the melodramatic or of the startling character, and for which so many look in the career of well-known and eminent men. But we would repeat here what was said in the pages of this 'Review,' when the life of Sir Astley Cooper came under notice, now many years ago — viz., that men may be very illustrious in a professional or public capacity, and yet differ very little from ordinary people in the details of their private life. They are born like others, they live by the exercise of similar functions, they have their peculiarities of disposition and of temper, their personal attachments and aversions; they die, and are remembered by the world only through the enduring influence of the master-mind which has impressed its own character on some particular department of human knowledge or human activity. The individuals whose private history is possessed of "sensational" interest, are those who have been involved in striking personal adventure. However impressive may be the scientific life of a Newton or a Kepler, the political history of a Richelieu or a Chatham, or the military career of a Napoleon or Marlborough, the private life of any one of them will contain very little more than that of their most commonplace contemporaries. Far inferior, indeed, in point of striking incidents would it be to the history of a Vidocq, or some such character, who has passed through great vicissitudes of fortune, or surmounted extraordinary difficulties and dangers. Whilst the biography of Sir Benjamin Brodie is deficient in exciting narratives, the record of it, penned by himself, will perhaps disappoint some in another manner. Coming into contact, as he did, with the highest as well as with the lowliest in the land, with statesmen as with paupers, with wise men and with fools, with maidens and with young men in their hours of pleasure as well as of woe, the witness of many strange scenes and the depositary of many confidences, it might be expected that he would have recorded some curious details. But nothing of the kind. The Duke of —— may have been his patient, but Sir Benjamin relates no jokes; her Grace may have trusted him, but her foibles remain untold. The whole circle, indeed, of that strange medley of anecdote and reminiscence which is in the power of the medical confidant alone to collect, remained, so far as the public was concerned, *perdu* in the memory of the Surgeon of St. George's and of the Courts of three successive reigns. And herein not only was he right, but he was faithful to the traditions of the pro-

[1] Pencillings of Eminent Medical Men. Medical Times, vol. ix. 1844, p. 198.

fession to which he belonged, which has always obeyed that principle of reticence and trust which is really, after all, what the world expects of it. Yet the world is often inconsistent, it is true, insisting upon silence one day, and on "confessions" and "revelations" on another. Nor have these been unprovided for it, though well known to the initiated to have been simply manufactured for the occasion. But if Sir Benjamin's autobiography be wanting—as it was to be rightly expected it would be—in such excitement as this, it is not deficient in some delicate pencillings of certain of his contemporaries, whose lives and histories were, to a greater or less extent, public property. A sagacious observer like Sir Benjamin could not fail of scrutinizing the characters of those who were runners in the same race as he had engaged in. As it is interesting to know what was thought of them by one so well qualified to judge, we shall place before the reader a few gleanings from the field before us.

Naturally enough, Sir Benjamin tells us much about Home. He was always in close contact with him; and although Sir Everard's story is now more than a thrice-told one, it is not uninteresting to listen to his pupil's thoughts of him. Home had, according to the latter, some very considerable qualities. He had great perseverance, never wasted his time, and, whatever special matter he had in hand, would return to his occupation in every interval of leisure from his ordinary pursuits. He had also great sagacity, never being deterred from any undertaking which he had once begun by subsequent difficulties: he was a great practical surgeon, his mind going directly to the leading points of the case before him, disregarding all those minor items by which men of smaller capacity are perplexed and misled: hence his views of disease were clear, and easily communicated to the pupils. His practice was simple and decided. Still "Mr. Home never had a very large practice, such as at all corresponded to his reputation:"

"In his later days he had an overweening desire to appear before the world as a discoverer. . . . . Some years before he died he got great discredit from having destroyed a considerable portion of John Hunter's manuscripts, which had come into his possession as one of Hunter's executors. The act was equally unjustifiable and foolish. It was unjustifiable, because the manuscripts should have been considered as belonging to the museum which Parliament had purchased; and it was foolish, because it led to the notion that he had made use of John Hunter's observations for his own purposes much more than was really the case. I had frequent opportunities of seeing these papers during nine or ten years, in which I was accustomed, more or less conjointly with Clift, to assist him in his dissections. They consisted of rough notes on the anatomy of animals, which must have been useful to Hunter himself, and which would, I doubt not, have afforded help to Mr. Owen in completing the catalogue of the museum, but they were not such as could be used with much advantage by another person. In pursuing his own investigations, Home sometimes referred to them; but I must say that while I was connected with him I never knew an instance in which he did not scrupulously acknowledge whatever he took from them, and do justice to his illustrious predecessor. Unhappily he was led afterwards to deviate from this right course, and in his later publications I recognise some things which he has given as the result of his own observation, though they were really taken from Hunter's notes and drawings. One of these is a paper on the 'Progressive Motion of Animals,' and another a series of engravings representing the convolutions of the intestinal canal, and neither of them of much scientific value. When the Duke of Cumberland had been wounded by Sellis in the attempt to assassinate him, he attended the Duke in Carlton House. This circumstance first introduced him to the Prince Regent. The prince found his society agreeable, and used to invite him frequently to dinner, treating him with much familiarity." (vol. i. p. 102.)

As a practical surgeon, Mr. Thomas Keate, the senior of St. George's, was not thought by Sir Benjamin to be at all inferior to Home, and as having the advantage rather over the latter in the medical treatment of his patients. But Mr. Keate, as surgeon-general to the army, occupied what at that time was a very high station. In the time of war this was a place of great responsibility, and with extensive patronage. Partly in consequence of his attention being thus very much occupied, and partly from being naturally of unpunctual habits, Mr. Keate became negligent of his hospital duties, and was not estimated as with his talents and knowledge he would have otherwise been. On the resignation of Mr. Keate, in 1813, his nephew, Mr. Robert Keate, was elected surgeon in his place. The latter had been introduced by his uncle to the Royal Family, with whom he was a considerable favourite. He thus became surgeon to the Queen and some of the royal dukes and princesses. These things interfered for a considerable period with his devoting himself so much to the business of the hospital as he would have done otherwise; nevertheless, he had early very considerable practical knowledge of his profession, and was an excellent operator. Of him Sir Benjamin writes:

"We acted together as colleagues until I resigned my office as surgeon, in the year 1840, and it is, I hope, to the credit of both of us that, during the whole of those thirty-two years, the most perfect harmony and friendship always subsisted between us. We had the most implicit confidence in each other; and not only did we never openly disagree, but I do not believe that either of us entertained even unkind thoughts as to each other. He was, and still is, a perfect gentleman in every sense of the word; kind in his feelings, open, honest, and upright in his conduct. His professional knowledge and his general character made him a most useful officer of the hospital; and now that our *game has been played*, it is with great satisfaction that I look back to the long and disinterested friendship that existed between us." (p. 51.)

Mr. Robert Keate continued his connexion with St. George's long after his colleague had resigned. He died in 1857, in his eighty-first year.

At one time, Mr. Brodie was associated a good deal with Mr. Clift, the late conservator of the museum of the College of Surgeons. His history is rather curious. Mr. Hunter was acquainted with Mrs. Gilbert, a lady of fortune in Cornwall. In conversation with her, he observed that he had great difficulty in obtaining fit persons to assist him in forming his museum of anatomy, and that he believed his best way would be himself to educate a lad especially for this purpose. Mrs. Gilbert said that she knew a very clever boy, who was accustomed to come into her kitchen at Cornwall and make drawings with chalk on the floor, who would with proper instruction become an excellent draughtsman, and who from the ability which he displayed would probably answer his purpose very well in other matters. Mrs. Gilbert offered to negotiate with the boy and his parents for him to come to London on trial. Mr. Hunter gladly availed himself of the offer, and the negotiation ended in Clift becoming an inmate in Hunter's house. On the occurrence of Hunter's death, his executors—Dr. Baillie and Mr. Home—engaged Clift to take charge of the museum until they had found the means of disposing of it for the benefit of the family. It was purchased by Parliament and consigned to the care of the College of Surgeons. The council of the College retained Clift for the same purpose, under the title of "conservator," in which position he continued during the remainder of his life. According to Sir Benjamin—

"Clift's early education had probably not extended beyond reading and writing, but he had a vast desire of acquiring knowledge, had read a great deal in an irregular manner; but his chief study was that of the museum, in which he lived for many years, and with this he had a more intimate acquaintance than any other person after the death of the great philosopher by whom it was founded. He had great sagacity, great powers of observation, and great memory, but he wanted that method which a better early education would have afforded him, and his knowledge, though extensive, was of a very desultory kind. His devotion to the memory of Hunter, and his attachment to the museum, formed a remarkable feature of his character, at the same time that his simplicity of mind and the kindness of his disposition gained him the affection of all who knew him." (p. 41.)

It was both an agreeable and fortunate event for Mr. Brodie when Mr. Home introduced him to Sir Joseph Banks, who invited him to his house and patronised him. His London residence was in Soho-square, there being extensive premises behind his dwelling-house, containing his library and botanical collection. During the greater part of the summer Sir Joseph resided at his seat in Lincolnshire, where he occupied himself chiefly with agricultural pursuits and in presiding over agricultural meetings. In November he returned to Soho-square in time to preside at the first meeting of the Royal Society. During the winter, besides the weekly evening meetings in his library, he was in the habit of entertaining parties of scientific men at dinner. Every morning he had a sort of public breakfast in his library, at which foreigners of distinction and others were introduced to him. As the spring advanced he left his house in London to reside at a villa known as Spring Grove, near Hounslow, where he remained until the meetings of the Royal Society were over. Here he dined daily at four o'clock, in order that his frequent visitors from London might have ample time to return home in the evening. When the weather permitted, his guests adjourned to take tea and coffee under the cedars in the garden. In the intermediate time his hot-house and conservatories were visited, under the auspices of his unmarried sister, Miss Banks. The dairy was not forgotten, too, as it was beneath the especial supervision of Lady Banks, who was proud of displaying in it a fine collection of old china-ware :

"On the whole, it is difficult to conceive that any one could perform his duties as president of the Royal Society in a manner more honourable to himself, or more beneficial to the community, than that in which they were performed by Sir Joseph Banks. It is to be observed at the same time that he had some peculiar advantages, having an ample fortune and no family, and having also the good taste to avoid being involved in political discussions and pursuits. . . . . The attention which Sir Joseph Banks paid to the affairs of the Royal Society was unremitting. He was very much of an autocrat, but, like other successful autocrats, he maintained his authority by consulting the feelings and opinions of others, and no one complained of it." (p. 46.)

Sir Joseph's principal librarian was the well-known Swede, Dr. Dryander, whilst Dr. Brown, the eminent botanist, connected with Captain Flinders' voyage of discovery, had the charge of the herbarium. The former managed the president's bibliographic treasures so well, that although they were lent to men of science in the most liberal manner, not a volume was lost. "Dryander was indeed a pattern as a librarian. The library over which he presided was to him *all in all.*"

Sir Benjamin tells us that Dr. Wells, the author of the 'Essay on Dew,' and secretary to the Society for the Promotion of Medical and Chirurgical Knowledge up to 1812, was one of the most remarkable persons with whom it had been his lot to become personally acquainted. He was never married, but lived by himself, with only a single maid-servant, in a small house in Serjeants'-inn, Fleet-street. Although he had paid great attention to his profession, and had ample opportunities as physician to St. Thomas's Hospital, he had never more than a very limited practice. For this, indeed, Sir Benjamin says, he was in many respects very unfit, having dry and, in general society, ungracious manners, and being apt to take offence where no offence was meant. Yet he had great kindness and warmth of heart mixed up with these less amiable qualities, and while he was greatly respected by those who really knew him, he was even beloved by the very few with whom he was intimate :

"His autobiography, which is prefixed to the posthumous edition of his works, is very characteristic, and when I read it, reminded me very much of that of David Hume, to whom, indeed, as to the character of his intellect, he bore a considerable resemblance, however different he may have been from him in some other respects." (p. 60.)

Dr. Wells, F.R.S., &c., died in Serjeants'-inn, September, 1817.

It so happened, that on the Thursday after the anniversary on which Mr. Brodie received the Copley medal, Lord Holland was admitted a Fellow of the Royal Society. As forming part of the minutes read on this evening, came the address of Sir Joseph Banks to Mr. Brodie, and which, of course, Lord Holland heard. From this combination of circumstances, Mr. Brodie was early invited to Holland House. Here he made some valuable acquaintances, amongst whom may be mentioned Samuel Rogers, Sydney Smith, General Fox, and Allen, the Master of Dulwich College. Mr. Brodie seems to have been a favourite both with Lord and Lady Holland, and their friendship and kindness towards him was uninterrupted. Yet, at this time, he confesses that he was a shy and diffident young man, contributing very little to conversation, and not feeling himself so much at home among the politicians and persons of rank he met with at Kensington, as he did among the members of the Royal Society and his acquaintances of the legal profession. However, so it was; the quiet, unobtrusive little man was welcomed, while more pushing and noisy *parvenus* received their *congés*:

"Lord Holland was himself one of the kindest of human beings, at the same time being a zealous politician, a thorough Whig, a Liberal in the very best sense of the word, and that not only in politics, but in everything else; not what would be called a democrat, but, at the same time, valuing others more with reference to their general character, talents, and acquirements, than to their rank and station. He was an accomplished scholar, well acquainted with general literature, delighting in poetry, and of refined taste, but having little or no acquaintance with science. I remember dining at Rogers's, in company with Sydney Smith, his brother Robert, and some others, when a question arose as to who at that time excelled most in conversation, and they all agreed that it was Lord Holland. He was, indeed, in society, a most agreeable person, full of valuable information, which was enlivened by appropriate anecdotes, not claiming too large a share of attention for himself, a good listener as well as a good talker. He had also this excellent quality, that he never spoke ill-naturedly of others, while he was continually heard to say, when he thought that others erred a little in this respect, 'Come, now, I think you are a little too hard on him.' He might sometimes have indulged in some good-natured sarcasm, but he never went beyond this. Lady Holland was a woman of strong sense, with considerable knowledge of human nature; a zealous and active friend, but with considerable prejudices. Some held her to be capricious, but I have certainly no cause to complain of her in this respect. Fortunately, I had no favours to ask of her, or of any one else, but during the thirty years of intimate acquaintance with her I never knew her miss an opportunity of showing me any small mark of kindness in her power." (p. 68.)

We have had already occasion to refer to the friendship that existed between Sir William Knighton and Brodie. The latter, along with Sir Stephen Hammick and Dr. Chambers, were the only persons besides his son who attended Knighton to the grave. Knighton was originally of humble origin, but ambitious, and determined to succeed. In his earlier years he had a large practice in London as a physician, but left it to accompany the Marquis Wellesley on a temporary diplomatic mission to Spain. On his return to England, Lord Wellesley introduced him to the Prince Regent, and soon afterwards he was created a baronet. Sir William possessed considerable natural powers: he had great sagacity, a very clear head, and an excellent judgment, seeing at once the main points of the question before him, divested of those which were of no real importance. He was one of that very limited class of persons who have great influence over the minds of others. This was to be attributed, in his case, in part to his engaging manners, but more to the circumstance that he entered, or seemed to enter, into the views and interests of those for whom he entertained a regard, as cordially as if they were his own. Having been originally imperfectly educated, he was deficient in some of the qualities which would have fitted him for general society; but these defects were more than compensated by his ready insight into the characters of other men, his knowledge of the world, and of what went on in it. Though he had much practical knowledge of his profession, he was quite deficient of any scientific appreciation of it. He seemed to have pursued it, in the first instance, merely for a livelihood, and afterwards to amass a fortune:

"According to common report, which I believe in this instance to have been well-founded, an accidental circumstance led to his being more intimately acquainted with the Regent. McMahon, who at that time held the office of Keeper of the Privy Purse, died, and in his will named Knighton as his executor. Among the papers of the deceased was found some which belonged to the Regent, which ought to have been destroyed. Knighton at once took the papers to the Regent, and from that time was his friend, exercising a considerable influence over him. I do not pretend to unravel the mysteries of a Court, but of this I feel assured, that, however much the production of the papers might have contributed to it in the first instance, he was indebted to the long continuance of the Regent's favour more to his engaging manners, his knowledge of the world, his habits of business, and his usefulness, than to anything else. When Sir Benjamin Blomfield (who after McMahon was Keeper of the Privy Purse,) was made a peer, and became our Minister at Stockholm, Knighton was appointed to succeed him, and he retained his office until the death of his master, 1830." (p. 76.)

But Sir Benjamin thinks that, on the whole, Knighton would have been a happier person if he had never entered on this career. Indeed, when the Regent first proposed to him that he should become one of his household, Lady Knighton offered strong objection to the idea, and neither she nor his son and daughters were ever presented at Court.

At first, and for several years after the Regent had succeeded to the Crown, everything in Knighton's department went on smoothly. The Keeper was very useful, and the King's private affairs were managed in a way—only too well, for some persons—in which they had never been managed before. He thus became inconvenient to many about the Court, who rendered his position so disagreeable that Knighton desired to resign his office. But as he still possessed the King's confidence, and was one of his chief advisers, he was overruled in his desire. How much the King himself was attached to him, was shown by the fact of his being left, in conjunction with the Duke of Wellington, one of his Majesty's executors. After the death of the latter, Sir William mixed little with the world, leading a very retired life at his country residence in Hampshire. He survived his Royal master just six years.

In the early part of Mr. Brodie's career, Sir Richard Croft—the accoucheur of the Princess Charlotte—who was connected to the former by marriage, rendered him much service by recommending him to his patients for those smaller services for which they might reasonably apply to a junior practitioner. Sir Richard, we are told, was a man of acute—too acute, let us add—feelings, a thorough gentleman, having a high sense of honour, and of a kind and liberal disposition.

In consequence of Dr. Baillie having married Brodie's first cousin, one of the daughters of Dr. Denman, the Surgeon of St. George's had ample opportunity of becoming well acquainted with that eminent physician. He had, however, scarcely any means of personally knowing him as lecturer and hospital physician, as Baillie had resigned his public duties before young Brodie had arrived in London. In the beginning of the present century, and being then about forty years of age, Dr. Baillie had acquired a very considerable share of private practice. This went on increasing, however, until it attained an extent greater, perhaps, than that of any physician since the days of Radcliffe and of Mead. His reputation was of that superior order which depends on the opinion formed of its possessor by the members of his own profession. The latter looked upon Baillie as the fittest person to be consulted in cases of difficulty or danger. This preference for him was due partly to his knowledge and sagacity, especially in what related to the diagnosis of disease, and partly to his general character for probity, and his consideration for others; at the same time that he never seemed to be anxious about his own reputation, or to take any trouble to obtain peculiar credit for himself:

"Baillie was not originally (as I apprehend) a man of great physical powers. It seemed to me that he found exertion, either of body or mind, beyond a certain point, always inconvenient and painful. . . . . When he was fully engaged in private practice, his labours were very arduous. He rose at six o'clock in the morning, and was occupied until he breakfasted, at eight o'clock, in answering the letters of his correspondents; from that time he was employed in seeing patients until six or seven o'clock in the evening, when he returned home to dinner. He had to make another round of professional visits in the evening, and seldom retired to rest much sooner than twelve o'clock. These labours continued for several successive years: at the same time, however, he always allowed himself a vacation during the summer, which gradually became prolonged from three weeks to three or four months. Notwithstanding this periodical retirement, he had always the appearance of being overworked. He was nervous and irritable; and while others looked, if not with envy, with some sort of admiration at his large practice, he complained of it, as if it was a great hardship; and I have no doubt he felt it at the time to be so. His professional brethren had little sympathy with, and smiled at, these complaints; yet they were well founded, and I suspect he would have been a happier man, and have lived longer, if he had had a smaller amount of professional success. For some years before he died, he had limited his practice merely as a consulting-physician with other physicians or surgeons; at the same time passing two days in the week in Windsor Castle, taking his turn with the other physicians who were in attendance on King George the Third, during the long period of his mental derangement. But he did not make this change until both his mind and body had suffered from the over-exertion of preceding years; and no one who knew him merely towards the close of his career could form a right notion of what he had been formerly. He left to his son a sufficient, but not a large fortune. He might have left a much larger one, if he had made it his object to do so. But he had no desire to be rich, and was liberal, not only to his patients, but to others, performing, as I have reason to believe, many acts of charity and kindness. The irritability of temper, to which I have already referred, led him at times to say hasty and somewhat ungracious things, for which he was always sorry, and apt to worry himself afterwards. Mrs. Baillie was a lady of great good sense, an excellent adviser, and a great help to her husband in a variety of ways." (p. 87.)

Dr. Baillie was physician to St. George's Hospital from 1787 to 1800, and died in September, 1823, aged sixty-two years. By the time that Brodie had made a good practice of five or six thousand a-year, which was about 1823, a great change had gradually taken place in the staff of the hospital to which he belonged. Sir Everard Home had resigned, and retired to the house which belonged to him as Surgeon to Chelsea Hospital. Gunning had left also, and become a resident in Paris. Mr. Robert Keate was Brodie's colleague, whilst Messrs. Jeffreys and Rose were the two junior surgeons. The physicians were Drs. Pearson, Nevinson, Chambers, and Young. Of these, we are told that Dr. Nevinson was an excellent practical man, and had a very wide reputation amongst the members of his own profession. He might with the greatest ease, according to Sir Benjamin, have succeeded to a very large practice—probably equal to that of Baillie himself; but this formed no part of his ambition; and while he devoted a very large portion of his time, not only to the in-patients but also to the out-patients of the hospital, he seemed to shrink from the more lucrative engagements of the profession. The same cannot be said of Dr. Pearson, who, however, never succeeded as a practitioner, except to a very limited extent. In fact, circumstances, combined with various eccentricities, stood in his way, though he was a person of considerable genius, and obtained a good deal of credit by his papers published in the 'Philosophical Transactions:'

"Young, one of the greatest philosophers of the age, and, indeed, second to none but Davy, never prospered as a physician. His biographer, Dr. Peacock, has ascribed his failure to his being too good for his profession, and to his being above certain ignoble arts which were, as he believed, made use of by his competitors; and he has availed himself of this opportunity of publishing a very illiberal tirade against those who belong to this division of the medical profession. Nothing can be more unjust than the whole of Dr. Peacock's observations on this subject. There may be among physicians, as well as in other professions, some individuals who acquire a reputation to which they have no claim; but my experience justifies me in asserting that no physician acquires a large reputation, or retains what may be called an extensive practice, who is really unworthy of it. The public are, on the whole, pretty good judges in a matter in which they are so much interested; and if by any accident they have been led to give their confidence to a wrong person, they are seldom long in discovering and correcting their mistake. With regard to Young, the truth is, that either his mind, from its having been so long trained by the study of the more exact sciences, was not fitted for the profession which he had chosen, or that it was so much engrossed by other, and to him more interesting, pursuits, that he never bestowed on it that constant and patient attention, without which no one can be a great surgeon, or a great lawyer, or a great statesman. The students at the hospital complained that they learned nothing from him. I never could discern that he kept any written notes of cases, and I doubt whether he ever thought of his cases in the hospital after he had left the wards. His medical writings were little more than compilations from books, with no indications of original research. I offer these observations as a matter of justice to others, and not in depreciation of Dr. Young, for whom I had a great personal regard, whose vast and varied attainments out of his profession, and whose great original genius displayed in other ways, place him in the foremost rank of those whose names adorn the annals of our country. Dr. Peacock mentions, as a proof of his superiority as a physician, that the list of his hospital patients presented a larger proportion of cures than that of any of his colleagues. I doubt not that the statement is true; but the conclusion from it is wrong. Hospital patients, as well as private patients, have their preferences, and those who labour under dangerous diseases will take some trouble to be admitted under the care of the physician or surgeon in whom they repose the greatest confidence; while those whose ailments are less important, are contented to take their chance of being admitted under one person or under another. Moreover, many patients are sent to a hospital by private practitioners; and it is no matter of wonder that those who, if they themselves laboured under severe illness, would consult, not Young, but Chambers or Nevinson, showed the same preference as to poor persons in whom they were interested." (p. 91.)

Of Brodie's other colleagues, Chambers attained to a very extensive practice and reputation, being at one time the most successful competitor of the fashionable physician, and President of the College of Physicians, Sir Henry Halford. Dr. Chambers had great natural sagacity, and a clearness of perception and judgment which enabled him at once to see the important part of whatever subject was placed before him, discarding all irrelevant matter. He was likewise no mean scholar, possessing extensive literary attainments, as well as other qualities, which caused him to be very generally popular:

"Although Sir Henry Halford continued to be in attendance on King William, the Queen seemed to prefer Dr. Chambers's straightforwardness to the courtier-like manners of the other. Latterly, Chambers was consulted by the King himself, and he was in attendance on his Majesty during his last illness, in conjunction with Sir David Davis, the King's domestic physician. From this time Dr. Chambers had the largest share of medical practice in the metropolis; and he well merited the estimation in which he was held by both the public and the members of his own profession. But his physical powers were scarcely equal to the labours which were thus imposed on him. One forenoon, when I was occupied in seeing patients at my own house, he called on me in a state of considerable alarm, having been suddenly attacked with a difficulty of articulation. This attack was not of long duration; but it was the first symptom of a disease of the brain, which, though for a long time imperceptible to others, was too plain to those who were intimately acquainted with him, and which caused his death several years afterwards." (p. 111.)

High as Chambers stood in his own days, unlike his colleague Sir Benjamin, he never ventured to communicate the result of his observation and experience to the profession at large, and thus has left nothing behind him by which he will be known to another generation. For some years after the death of George the Fourth, until, indeed, Dr. Chambers took the lion's share, Sir Henry Halford retained the largest practice as a physician. The necessary result of the position which Sir Henry and Sir Benjamin occupied in their respective departments, was, that they were in more frequent communication with each other than with any other members of the medical profession. Sir Benjamin describes his *confrère* to have been a clever and sagacious practitioner, but without any of that scientific knowledge which is necessary for the superior diagnosis of obscure disease. Still he was, on the whole, a very useful and successful practitioner, though his views of pathology were limited, and he was too apt to be satisfied with relieving present symptoms. His reputation as a Latin scholar is well known; in fact, he prided himself more on his facility in Latin verse-making than on anything else. His 'Essays' must be admitted to be instructive as well as interesting reading; and some may still live who think we "could have better spared a better man," so favourable a delegate from medicine to the higher ranks of literature and society did he form:

> "From being in frequent attendance on the Royal Family, with whom he was a favourite, he had acquired too much of the habits and feelings of a courtier, without that simplicity of mind and sincerity which characterized his predecessor Baillie. Still he was, in many respects, an ornament of his profession, and was a worthy representative of it as President of the College of Physicians." (p. 111.)

Though we have exhausted our limits, we have not exhausted this gallery of portraits which Sir Benjamin has allowed us to glance at as we have made our way through his biography. Sketches yet remain of Gunning, Brande, Lawrence, &c., which we must leave the reader to select for himself. We have treated him to more than is sufficient to show how much interesting matter is contained in the work under notice. The whole of the first volume of the series may be as much enjoyed by the intelligent public as by the profession; the latter, however, will have the privilege of rejoicing that it can refer to so skilful, so thoughtful, and so upright a "representative man" as was the late Sir Benjamin Brodie—a man who is likely to be so well remembered by those of our own time from personal knowledge or report, and by the future from these three goodly volumes so satisfactorily laid before us by Mr. Hawkins.

PART SECOND.

Bibliographical Record.

ART. I.—1. *On the Chemical Circulation in the Body.* By HENRY BENCE JONES, M.A., F.R.S., &c. pp. 12.

2. *On the Rapidity of the Passage of Crystalloïd Substances into the Vascular and Non-Vascular Textures of the Body.* By H. BENCE JONES, F.R.S. (Pamphlet.)

IT is interesting to see how new discoveries lead to new researches. The papers, the titles of which are given above—one a lecture, delivered at an evening meeting of the Royal Institution, on the 26th of last May, the other, a letter to the Secretary of the Royal Society, published in the Proceedings of that Society for January last—afford a striking example of the kind, and an admirable example of the intimate manner in which the several sciences are associated, and the aid that one may afford in investigating the problems of another.

Our readers are aware that spectral analysis, which has done so much for elucidating the material composition of the heavenly bodies, has been the means of effecting some notable discoveries in the mineral kingdom. It has effected more. To Dr. Bence Jones the great merit is due of applying this refined and searching method of inquiry to the animal body. His results, as described in the two papers above named, are of the highest degree of importance.

He finds that certain substances are diffused with remarkable rapidity through different tissues of the animal body, passing from one part to another by osmotic action, reaching even the non-vascular textures, such as the articular cartilages, and the crystalline lens, resting for a while, and only for a while, being removed, passing out, and carried off through the lymphatics, with a rapidity little differing from that experienced when brought in by the blood. When half a grain of chloride of lithium was given to a guinea-pig for three successive days, it was detected in every tissue of the body, not excepting the cartilages, cornea, and crystalline lens. And in man like results were obtained; in instances of cataract operated on at short intervals, after taking the same salt, it was found in the extracted lens.

Besides the discovery of the rapid diffusion of certain crystalloïd substances through the body, Dr. Bence Jones has extended his researches to the influences exercised by these substances in producing ulterior changes in the way of secretion and excretion. The conclusions which he has arrived at, and which seem warranted by the facts adduced, are, that the alkaline and alkaloïd substances promote oxidation and increased vital action, whilst vegetable acids, which are also diffusible, have a contrary tendency—viz., to check or arrest oxidation, and its correlative, the changes essential to vital energy.

To what extent these new views of the animal economy may affect therapeutics, we can hardly venture to say, except that it seems highly probable they may tend to bring this, the most obscure part of the *ars medica*, within the limits of exact science.

ART. II.—1. *Memoirs read before the Anthropological Society of London,* 1863–4. Vol. I. pp. 533.

2. *Transactions of the Ethnological Society of London.* Vol. III. New Series. pp. 417.

THESE two volumes display the activity of the rival societies.

A striking and novel feature in the publication of the younger society is, the liberty of language which is more than tolerated, and which appears to be approved at its meetings. In this liberty or licence Captain Burton takes the lead, and he is followed by Messrs. Sellon and Pritchard. Captain Burton, in his 'Notes on certain Matters connected with the Dahoman,' opens his discourse with "congratulating himself upon the fact, that we find in this room a liberty of thought and a freedom of speech unknown, I may assert, to any other society in Great Britain." He adds: "It is well so;" and assigns as a reason the objects of study, saying:

"Our objects of study being Man in all his relations, physical, moral, psychical, and social, it is impossible to treat the subject adequately without offending, in general, the *mauvaise honte*, the false delicacy, and the ingrained prejudices of the age. Without some such refuge for destitute truth as the rooms of the Anthropological Society, we should find it equally difficult to relate and publish facts. Indeed, some years ago, I was induced to propose that if the terminology of certain natural objects be held too gross for ears modest and polite to hear, the physiologist might adopt some system of conventional symbols which, like the finger-language of the Chinese ideologist, would obviate the displeasure of articulation. Some such symbolism is everywhere instinctively known to the natural man. This highly decorous proposal was, however, I regret to say, utterly ignored."

Mr. Pritchard, who follows Captain Burton, adopts his principle in 'Notes on certain Anthropological Matters respecting the South-Sea Islanders;' and Mr. Sellon, in his 'Account of the Phallic Worship of India,' does the same, but with an expression of trust, not of congratulation, that "the members of the Anthropological Society will not be offended, if, in consideration of this subject (Phallic Worship), a spade is called a spade, and not a rake or a hoe."

A distinction of the kind which Captain Burton claims for this society, surely is not an enviable one: we should have been better pleased had he been called to order by the president. There is a certain propriety of language to which gentlemen are expected to conform, perfectly compatible with liberty of thought and descriptive power in all scientific matters. Hitherto the Latin language has been used whenever the vernacular cannot be employed without offending delicacy; and we deprecate the relinquishment of this honoured practice. It would be disgraceful to a society to employ such a licence of terms: it would be, as it were, holding out an attraction to its meetings at the expense of good morals and good company. What would be said of a medical professor, if, in his anatomical and physiological details, he were to employ words which are used only by the lowest and rudest vulgar? If the anthropologist thinks it conducive to the advancement of his science to enter into descriptions such as these gentlemen have given, let them, we pray, be as much as possible in the words of a dead language, and given in the least animated, the least sensuous manner possible.

Of the papers contained in this first volume, altogether fourteen in number, the most considerable in point of length are the president's, and Mr. Bendyshe's; the former, 'On the Negro's Place in Nature,' the latter, entitled 'The History of Anthropology.'

The president's paper, our readers must be aware, has already attained a certain notoriety, from the degrading light in which its author has represented the negro character, and the African races generally. A polygenistic in principle, Dr. Hunt holds the negro to be a distinct species, nearer allied to the ape than to the European, incapable of any advanced civilization, of a brutish nature, prone to every vice, inclined by nature to no virtue. Throughout his long dissertation, extending to sixty-four pages, his quotations, which are many and long, so far as we can judge from the last forty-seven, those which should precede being omitted, are from authors who have adopted views of the negro similar to his own, and many of them of the Southern States of America, and the advocates of slavery. Did our limits permit, we should not only enter our protest against the majority of the statements made by Dr. Hunt, deprecatory of the negro, but also show, by reference to facts, how erroneous most of them are. It is true, that in more than one passage he repudiates such charges, and commends the negro. Here is an example: he says, page 55:

"I by no means join in that indiscriminate abuse of the negro character which has been indulged in, especially by those who have only seen 'the negro in his savage state,' or 'the emancipated' (from work?) in the West India Islands. On the contrary, there is much that is to be admired, and more that is useful in the negro, when properly and kindly treated. Brutal masters there are in every part of the world; but we must not found a law on exceptions. Scientific men, therefore, dare not close their eyes to the clear facts as to the improvements in mind and body, as well as the general happiness, which is seen in those parts of the world in which the negro is working in his natural subordination to the European."

The paper of Mr. Bendyshe, giving a history of anthropology from the earliest period to nearly the present time, is so far interesting, and may repay the perusal, as showing the vast variety of opinions which have been entertained of man, in relation to his origin and place in nature, and the innumerable and vain attempts which have been made to solve the problem—a problem which, as far as origin is concerned, regarded from a scientific point of view, we apprehend is insoluble—where, as M. De Quatrefages well remarks, "observations and experiments, those two guides which human science ought never to lose sight of, are absolutely unavailing:" where, as he further says, "the true philosopher feels compelled to pause, lest he should set his foot in a land of hypotheses and conceptions, where it is easy to wander from the proper path, and where truth itself—supposing it attainable—cannot be distinguished by any certain test." The most interesting portion of this historical sketch is that which relates to the varying views of Linnæus on the subject of species, strikingly illustrative of the futility of the attempt in the definite way he proposes.

The papers which appear to us of most value in this volume, are those on the skulls of different races, ancient and recent, contributed by Dr. Peacock, Dr. Thurnam, and Dr. Davis, all of which are deserving of being consulted. That the size and weight of the brain merit special attention is proved by the many attempts which have been made, the great labour that has been expended to arrive at averages, and with only partial success. And we fear this will continue to be the case, until the research is conducted with all possible means to insure accuracy, especially as regards weights and measures, and the state of the organ itself, whether belonging to individuals who, before death, were in possession of health, or were labouring under chronic and wasting disease. The weights used in this country, exclusive of the grain, have a value so different, that if their denomination be not determined, serious errors may arise; and the same may happen if their exactness have not been tested by comparison with a standard.

The volume of the Ethnological Society's Transactions contains many and interesting papers. In reading them, we could not but feel impressed by the intimate relation which is displayed between ethnology and other branches of human knowledge, and how for the successful study of it an acquaintance with them (and the more intimate the better) is needed. We shall generally find that the more accomplished the authors are in the sister sciences, so much the more valuable and instructive are their communications. We may refer in proof of this to Mr. Wallace's paper, 'On the Varieties of Man in the Malay Archipelago;' and to Mr. Crawfurd's several papers, especially the first, 'On Language as a Test of the Races of Man;' to the second, 'On Sir Charles Lyall's Antiquity of Man,' and on Professor Huxley's 'Evidence as to Man's Place in Nature;' to the third, 'On the Early

Migrations of Man;' and to his fourth, 'On the Fecundity of the Human Race.'

To those who wish to study the contents of this volume—all the papers in it are more or less deserving of a careful reading—we would recommend their beginning with that of Mr. Wallace, already mentioned, which we think may serve as an interpreter to the rest, as showing how varied, how many, and how dissimilar are the rude races which he describes, in manners, habits, and pursuits; and at the same time how, in many respects, they are similar, the grade of their social condition depending very much on the circumstances in which they are placed, on the influences to which they are exposed, whether favouring improvement, or the contrary; and showing also how, even amongst the rudest, those commonly called savages, there are qualities kindred to those possessed by races which are highest in the scale of civilization.

From Mr. Wallace's the student might pass with advantage to Mr. Crawfurd's, in which he controverts the worth of language as an ethnological test, and his next paper, that in which he expresses himself opposed to the unity of the human race, maintaining that instead of one there are several races, which, though marked by hereditary peculiarities, by distinctive qualities, are so closely allied, that they are, as it were, one great natural group, and capable of breeding together with unimpaired fruitfulness. In accordance with this hypothesis, he, in his third paper, holds that races in an early stage, with the useful arts in their rudest state, and the means of subsistence and conveyance difficult, are incapable of migrating far, so rendering it impossible that the whole earth could be peopled from one spot and from one family. We need hardly remark, that all these views are maintained with much force of argument, and are supported by a great array of facts, as might be expected from one of so much learning, and vast and varied experience of mankind; his, like Mr. Wallace's, chiefly acquired in those Eastern countries so prolific in animal and vegetable life, and in which peculiarities of circumstances influencing the character of man are most striking and in greatest activity. Our limits do not permit us to consider in any detail either his arguments or his inductions from facts. We would merely observe, that we think he has hardly made due allowance, as regards the wide-spread of the human races, and their distinctive qualities as they now appear, for the vast physical changes which there is reason to believe the earth's surface has undergone in the unlimited time, humanly speaking, that man has come into existence, as is well insisted on by Mr. Wallace, and by some of the other contributors to this volume, especially the disruption of old continents. What Mr. Crawfurd adduces in opposition to those ethnologists, who view certain different races as distinct species, and their progeny as hybrids, appears to us most satisfactory. In support of his arguments, and in refutation of an assumed law first propounded by Count Strzelecki, and adverted to by Mr. Oldfield in his account of the 'Aborigines of Australia'—viz., "that no native woman, having once borne a child to a European, ever bears to one of her own race afterwards," we would refer to a letter of Mr. Robinson, to be found in the January number of our Review for the current year, in which, from his own knowledge, he shows that that asserted law is a delusion.

The same necessity, want of space, that compelled us to give little more than the title of the principal papers in the 'Memoirs of the Anthropological Society,' equally obliges us to pass over unnoticed the majority of papers in the other volume before us. We have read them all, and we can recommend them as deserving of a perusal; and not only those descriptive of different rude and presumed aboriginal races, on which there are as many as eight communications, but also the others of a more miscellaneous kind, either argumentative or descriptive, all of them either strictly ethnological or having an ethnological bearing. Not the least value of some of the latter is the new lines of research which they open up, and above all praise is the free spirit of inquiry under the influence of which the best of them have been written.

In a former article, that already referred to, we have advocated the doctrine of the unity of the great human family, believing that view to be supported by the largest number of well-authenticated facts, and least open to exception and sound objection: and we cannot but feel some satisfaction in finding that, so far as we are capable of judging, the evidence afforded in this volume preponderates in favour of that hypothesis.

ART. III.—*A System of Surgery; Pathological, Diagnostic, Therapeutic, and Operative.* By SAMUEL D. GROSS, M.D., Professor of Surgery in the Jefferson Medical College of Philadelphia, and Surgeon to the Philadelphia Hospital, &c. Third Edition. In Two Vols.—*Philadelphia*, 1864. pp. 1049 and 1087.

OF the original edition of this work our readers will find a notice in our number for April, 1861, since which period it has been translated into the Dutch language. The present edition, considerably augmented, contains several chapters which have been re-written, and is furnished with a large number of additional woodcuts, some of which, however, we must observe, appear to us to be far too coarse and clumsy in character. We gladly endorse the favourable recommendation of the work, both as regards matter and style, which we made when noticing its first appearance.

ART. IV.—*Meddelelser om Nervefeberen i Kragerö Lægedistrikt Aar* 1864. Ved C. HOMANN og C. HARTWIG.

Report on the Nervous Fever in the Kragerö Medical District in the Year 1864. By C. HOMANN and C. HARTWIG. (Reprint from the 'Norsk Magazin for Lægevidenskaben,' Bd. xix. H. 6.)—8vo, pp. 68.

THE authors publish a report of the recent epidemic of fever in their district, with special reference to two inquiries: 1. What part contagion plays in the spread of the disease; and 2. How far the line drawn between typhus and typhoïd fever, as two distinct forms of disease, ought to be maintained.

"In the fourteenth volume of the 'Magazin' we have given," they say, "a report of an epidemic of dysentery observed by us; from that report it will be seen that from the scattered nature of its population our district is peculiarly well suited for observations upon the diffusion of contagion; our present investigations proceed in the same direction, and have led to a similar result. From them it will appear that we now believe that we have had to deal with both forms of nervous fever—the abdominal and the cerebral—and that each form has maintained itself as a distinct epidemic. The disease has prevailed in our district both in the towns and in the country parts; the first case occurred in February, 1864, and now in April, 1865, the disease has not yet entirely disappeared. With us, in all, 344 were attacked, of whom 32 died. We are, moreover, aware that the disease has prevailed also in the adjoining districts; in one of these, Risöer Medical District, where the connexion with the disease among us can be distinctly demonstrated, 97 were attacked up to the end of the year, and of these 12 died." (p. 2.)

Of the abdominal form, the mean duration might be stated as about six weeks. Post-mortem examination was made only in one case, the patient having died in the fifth week of the disease. In the most inferior part of the ileum, and in the cæcum, numerous ulcerations were met with; in some of these, yellow gangrenous crusts were found still adhering, the intestinal glands were infiltrated, the mesenteric glands were swollen, the spleen was large and flaccid. Three patients, who died with distinct signs of perforation, were not examined after death.

The average duration of the cerebral form was about four weeks. Where death occurred, it usually took place early in the disease. The most striking differences between the two forms were the occurrence of diarrhœa in the abdominal, and of bronchitis in the cerebral variety. Of the abdominal form, the total number of cases noted was 204, of which 14 were fatal; of the cerebral, the cases were 133, in 19 of which the patients died.

Sex did not appear to have any essential influence as a predisposing cause. As to age, neither infancy nor advanced age (beyond fifty years) seemed in any special degree to exempt from the disease. It has just been shown, that the mortality was much less in the abdominal than in the cerebral form; in the first, the percentage of fatal cases was, in fact, but 6·86, while in the second it was 14·2. The influence of advanced age in increasing the mortality was exhibited in the fact, that of 27 individuals attacked at above fifty years, 13 died.

Commencing with the abdominal form, the authors next proceed to demonstrate its importation and distribution through contagion. A sailor came home in 1863, labouring under nervous fever, but his disease was known before he landed, he was isolated, and the illness did not spread from him. The first case which, in 1864, came under the author's treatment, occurred in the month of February; it was that of a woman, from whom another person in the same house took the fever; the wife and children of this latter patient were subsequently attacked, next a family in the adjoining room, and later, another family in the same house. The disease did not spread beyond this house before the end of May. In June, a person was taken ill in the next house, who had frequently visited the sick, and then a girl in a family living a couple of houses off. This girl had constantly acted as messenger for one of the sick families in the house first affected, while all the children were ill; some time after she was seized, her brothers and sisters sickened. It was not until the beginning of August that the disease spread to several of the neighbouring houses; in the second half of August, and in September, almost all the houses in the vicinity were affected. But if it is impossible in towns to trace the contagion to every separate spot, the same difficulty does not exist in the rural districts, and the authors state that their investigations in these parts leave no doubt of the distribution of the disease exclusively through contagion. This position they proceed to make good by the history of the invasion of twelve localities in which the abdominal form prevailed, and of six where the cerebral type was present. Our space does not permit us to follow them through the details of their careful and apparently conclusive observations, which extend also, in addition to the places already mentioned, to fourteen localities in Drangedal, suffering from the cerebral form of the fever. The abdominal form prevailed, it may be again remarked, chiefly in town, the cerebral in the rural district; nor did the season of the year appear to influence the predominance of one or other variety, as both preserved their peculiar and defined characters during the entire period, and the best marked cases of each form were under treatment at the same time, but in different places.

The authors remark, that the contagion of the cerebral variety appeared to act much more intensely than that of the abdominal, the time in which it produced its effect being much shorter. The length of time, three months, which elapsed in the instance we have mentioned, before the contagion spread beyond the house first attacked in Krageró, would prove that this did not depend simply upon a longer period of incubation.

The authors next enter upon a review, through the details of which we shall not follow them, of the last fourteen years, for the purpose of establishing their opinion, that typhoïd fever never spreads epidemically in their rural districts, but that it is always propagated by contagion, and that contagious nervous fever never arises spontaneously. In their concluding paragraph, they point out the practical measures of prevention which flow naturally from their views—such as the establishment of isolated receptacles for cases of imported disease, small-pox, nervous fever, &c., and the employment of disinfectants. One point mentioned by the authors in their description of the symptoms of the disease which forms the subject of their work, struck us as remarkable—viz., the statement that in the abdominal variety no exanthema was observed, while in the cerebral such a phenomenon was seen only once; petechiæ, which do not, strictly speaking, come under the head of "exanthema," were met with in two cases of the abdominal form. On the whole, the report before us contains much valuable information, and though we think the writers are probably too exclusive in their views, is worthy of careful study. It is to be regretted that necroscopic examination was obtained in only one of the fatal cases.

ART. V.—*Essai sur la Nature et le Traitement du Choléra.* Par ADOLPHE RODRIGUES BARRAUT, M.D. Edin., Médecin Attaché au Dépôt de l'Immigration, et Assistant Médecin de la Pratique au Port Louis, Ile Maurice.

Essay on the Nature and Treatment of Cholera. By ADOLPHE RODRIGUES BARRAUT, M.D. Edin.—*Mauritius*, 1863. pp. 36.

THE deportation from India of individuals by which a due supply of labour in the Mauritius is maintained, has given occasion to repeated visitations of the worst forms of cholera in the island. In the present treatise, the fact of contagion from personal contact, and from fomites, is thoroughly accepted as being in accordance with notorious local facts; and especially we find much stress laid upon the bearing which the existence of a *pabulum* seems to have in determining the spread of the devastating principle: that is to say, the author insists on the readiness with which subjects, hitherto beyond the area of contagion, are affected when they come in contact with such as have already passed under its influence, whether these latter have suffered or not from its active manifestations, whether, in fact, they display the symptoms of the malady, or merely serve as carriers of the disease to other persons, without experiencing themselves any of its ill effects. Dr. Barraut's conviction is decisive against the theory of a ferment as explaining the diffusion of the pestilence; his experience of the success which often attends segregation of the sick, and separation of them from the unaffected, militating strongly against such a view. After noticing the particular visitations of the years 1819, 1854, 1859, and 1862, attributable, in the main, to coolies and shipwrecked persons admitted to *pratique* in unwashed, unchanged clothes, he brings before us the following experience:

"At the Immigration Depôt, Port Louis, besides the Hindoos who have arrived direct from India, there are others who have performed their period of service in the colony, and who await the arrival of the vessel that is to convey them back to their Indian homes. The departures take place every month, and during the last fortnight of the month there are ordinarily assembled in one location a considerable number of Hindoos, collected thither from all quarters of the town, expecting their return to their mother country. We disembarked in February more than six hundred new immigrants, full of life and spirits. No sooner had they arrived at the depôt than two cases of cholera occurred among them; these cases were sent to the hospital outside the depôt, and orders were given to prevent the admission of any old immigrants till such time as all the recent arrivals had been cleared out, so as to protect these last from any opportunity of infection. These orders were strictly attended to for some days; but as no cholera showed itself, the injunction became disregarded, and a batch of immigrants who had performed their term of service were allowed to mix with the rest. On the day following, attention was called to several cholera cases; the orders were, in consequence, put strictly in force, and the cholera again was stayed. After a lapse of eight days, it unfortunately happened that some more of the immigrants who had completed their time, and who were on their return to India, were admitted into company with new arrivals, and again the cholera reappeared, and always, mark! among the latter. This experiment, for such it may be termed, was thrice repeated, and thrice with equal result. In the Mauritius Coolies there was no manifestation of the disease; but their systems being impregnated with it, they transmitted the taint to the newly arrived. Here, then, we have demonstration of a virus and a pabulum."

The so-termed "epidemic constitution" is treated as mere fiction by the author. In his enumeration of symptoms of cholera, he affirms explicitly that a contracted and immobile pupil will be found to precede all other phenomena; suppression of urine follows next in order; and next to this an intermitting pulse, verified by him in radial and axillary arteries, and decidedly preceding that thread-like peculiarity usual in the course of the disease. All division of the disorder, however, into stages, he ignores as unpractical, for death, as he truly says, will not seldom occur an hour or two after the reaction of the circulating system is established, as evidenced by returning heat. The operation of a toxic agent is, indeed, made evident throughout by certain features which resemble the train of symptoms produced by septic substances, and also by some of those which distinguish the effects of irritating and acrid poisons.

Dr. Barraut has adopted a treatment by belladonna, which seems to have originated with M. Leclerc, of Tours, in the epidemic of 1854: he believes this medicine to have the power of modifying the venous circulation through the medium of the nerves. This treatment requires frequently repeated doses (for adults $\frac{1}{4}$ grain every half-hour), until colour returns to the surface, and the pupils dilate; for children, one drachm of the tincture, of the London Pharmacopœia, in an ounce of water: a dessert spoonful to be taken every ten minutes, with the same restrictions as above.

The action of this medicine is said to be revulsive, and different from its physiological effect. It somehow relieves choleraic diarrhœa, but has no influence in diarrhœa of ordinary occurrence; in correspondence with dilatation of the pupils, the skin becomes warm and dry, and this warmth may even become excessive if the remedy is pushed too far; our author has the idea of abating this stimulating effect to the nerves by conjoining his remedy with henbane.

Severe cramps were allayed by subcutaneous injection of sulphate of atropine. Though something of exaggerated expectation should be allowed for in the statements of the author, we deem this small work not unworthy of attention.

ART. VI.—*Sopra la Frequenza e la Cagione della Congestione Semplice ed Emorrhagia delle Cassule Sopra-renali e di altre parti nei Feti.* Per RAFAELLE MATTEI, Professore nella R. Università di Siena. (Estratto dalla 'Sperimentale,' Aprile, 1865.) p. 14.

On the Frequency and Causation of Simple Congestion and Hæmorrhage in the Supra-renal Capsules, and other parts of the Fœtus. By RAFAELLO MATTEI, Professor in the University of Siena. (Reprint from the 'Sperimentale,' April, 1865.)

IN a previous number[1] we have already given a short epitome of Dr. Mattei's investigations into the pathology of the supra-renal capsules. A particular degree of interest, it will be remembered, attaches to his researches in regard to sanguineous effusions described by him, as occurring in these bodies. The present *brochure*, in continuation of the subject, treats of apoplectic clots discovered in the fœtus, including in the term fœtus the first day of extra-uterine existence.

Signor Mattei finds an apoplectic, or, at least, a highly congestive condition in these organs to be almost constantly present soon after parturition. In his numerous comparative observations, amounting altogether to the number of 90 cases examined, he found the extent of the effusion to diminish in proportion as the term of extra-uterine life was prolonged, so as to be far less apparent, or totally absent, towards the end of the first month after birth.

Of all the viscera in the fœtus the supra-renal capsules are the softest in structure, not even excepting the spleen; and the occurrence of hæmorrhagic effusion in them is thought to be favoured by the ample dimensions of the liver, and the position of that portion of the vena cava which lies between the hepatic viscus and the spinal column.

We must content ourselves with indicating the scope of our author's investigations; we would not have it understood, however, that pressure from the narrow outlet of the pelvis in the act of parturition, is regarded by him as the sole possible cause of hæmorrhage or infiltration into the supra-renal capsules, or, indeed, into any other parts of the fœtus; these effects may follow any arrest of circulation from contractions of the womb, from pressure on the cord, or detachment of the placenta; but such results bear no measure of proportion or frequency to the fore-mentioned.

The views advanced by Krahmer, and supported to a certain extent by Hecker,[2] which suggest a respiratory nisus in the uterine fœtus as an immediate consequence of arrest of circulation in the placenta or cord (the "besoin de respirer" being called into play), fail to convince our author, as an argument in explanation of hæmorrhage in the organs; such a theory he conceives to be scarcely applicable to hæmorrhages of the early months of fœtal life, and, indeed, the feebleness of the thoracic walls, the firmness of the lung structure, and the competency

[1] See Brit. and For. Med.-Chir. Rev., Jan. 1864. [2] Ibid., April, 1864.

of the heart, make it unlikely that the vessels should yield considerably to an effusion which must be mainly passive in character, occurring simply from a tendency to a vacuum thus created.

ART. VII.—*The Philosophy of Health; or, an Exposition of the Physiological and Sanitary Conditions conducive to Human Longevity and Happiness.* By SOUTHWOOD SMITH, M.D. Eleventh Edition, revised and enlarged.—*London*, 1865. pp. 395.

WE noticed with commendation this work of the late Dr. Southwood Smith, on its first appearance, now about thirty years ago. It was then comprised in two volumes, the first of which was published in 1835, the second in 1837. Since that time, we are informed by the editor, Dr. Smith's grandson, that it has gone through ten editions, and that the present posthumous one was revised, and in part re-written, but not completed, owing to the death of its author. The editor assures us, that having had the assistance of a professor of anatomy well acquainted with the latest discoveries in science, nothing will be found in the entire work incompatible with the present state of knowledge. This is promising very much, much more, we apprehend, than the contents will justify; even in the first page, we perceive there is a definition of life which will not bear exact criticism, life being there defined as a result of organization; passing over the fact that there are animals, those lowest in the scale, in which no organs can be detected, no differentiation of the living matter having taken place. And there are other passages which we might point out of the same exceptional kind, not in accordance with advanced science. Of these, we shall notice only one, relating to the composition of the atmosphere, which the author (instead of describing it, as is fully proved, and this not recently, to be a mechanical mixture of the two principal gases, oxygen and nitrogen,) asserts is a chemical compound of them in definite proportions; thus, in p. 251, he says: "oxygen and nitrogen combined in one proportion form atmospheric air; in another proportion, nitrous oxide; in another, nitric oxide; in a fourth, nitrous acid; and in a fifth, nitric acid;" and he asserts the same in a preceding page, 163. But these are slight blemishes, and interfere very little, if at all, with the usefulness of the work as a whole, nor are they likely to impair its popularity.

The same qualities which gained it approval and secured it so wide a circulation in the first instance, will be found, if not improved, at least maintained in this last—viz., a style at the same time animated and philosophical, a great amount of information, happily and amusingly illustrated, and an optimism very captivating as to the destiny of the human race and its perfectibility; the author's great argument being that health and happiness are correlative, that pleasure is the normal result of healthy functional action, and pain the abnormal. Another attraction and claim to popularity is the largeness of treatment of his subject: chemistry, physiology, pathology, most of the kindred sciences are put under contribution, and are made subservient to the doctrines which he inculcates; indeed, the volume in its entireness may be considered as an elementary treatise on the more important of these sciences—human anatomy and physiology.

Those disposed to find fault further, might say, and we think not unjustly, that many of the anatomical descriptions given are unnecessarily minute, inasmuch as the work is not designed for the medical student but for the general reader, and this without distinction of sex. We received this impression especially in glancing through those pages which are appropriated to the bones and muscles. The author too, we think, lays himself open to censure for not always doing justice to his countrymen; one striking example arrested our attention, where he quotes Müller, relative to the properties of blood, as if he was the discoverer of its plastic element—fibrin; overlooking entirely the researches of the last century and of the early part of this, and especially what had been accomplished by Hewson.

He might, we think, have given additional interest to his subject had he been less sparing in introducing historical details. Of the few he has given we will quote one, and that a very memorable one, relating to the discovery of the stethoscope, to which pathology is under such vast obligations. We give the entire passage, as it affords a fair example of his animated style; it follows an account of the structure of the thorax, and of the muscles employed in respiration:

"The external air which, in obedience to the physical law that regulates its motion, thus rushes to the lung in order to fill the partial vacuum created by the dilatation of the thorax in inspiration, produces, in passing to the air-vesicles, a peculiar sound. When the lungs are perfectly healthy, and the respiration is performed in a natural manner, if the ear be applied to any part of the chest a slight noise can be distinguished both in the action of inspiration and that of expiration; a soft murmur, somewhat resembling the sound produced by the deep inspirations occasionally made by a person profoundly sleeping. This sound, though appreciable even by the naked ear, and though produced many times every minute in every healthy human being from the first moment of the existence of the first man, had never been attended to until the year 1816, when the stethoscope was discovered by accident. A physician, Dr. Laennec, of Paris, having occasion to examine a young female labouring under, as he supposed, some disease of the heart, and scrupling to follow his first impulse to apply his ear to the chest, chanced to recollect that solid bodies have the power of conducting sounds better than the air; thereupon he procured a quire of paper, rolled it up tightly, tied it, and then applied one extremity to the patient's chest and the other to his ear. Profiting by this result, which was that he could hear the beating of the heart much more distinctly than he could possibly feel it by the hand, he substituted for this first rude instrument a wooden cylinder, which he called a stethoscope, or chest inspector. The attentive and practised use of this instrument is found to be capable of revealing to the ear all that is passing in the chest almost as closely and certainly as it would be visible to the eye, were the walls of the chest and the tissues of its organs transparent. Besides, the entrance of the air into the lung in inspiration, and its exit in expiration, even the motion of the blood in the heart and in the great blood-vessels, is rendered by this instrument distinctly manifest to sense, and as the ear which has once become familiar with the natural sounds produced by these operations in the state of health can detect the slightest deviation occasioned by disease, the practical application of this discovery has effected for the pathology of the chest what the discovery of the circulation of the blood has accomplished for the pathology of the body."

We have hitherto made no remark on the title given to this work by its author. It is of a more ambitious pretension than we should have expected from a man of his character. As an excuse for its grandiose manner it may, perhaps, be said, that as a philanthropist, intent on preserving his fellow men and improving their condition, he gave the name to render the volume more attractive and to propitiate readers. And, undoubtedly, though the means are not definitely anywhere pointed out either for procuring happiness or prolonged life, yet the physiological knowledge communicated, if practically applied, ought to contribute to both, and is well adapted to serve as an introduction to the special study of both.

Art. VIII.—*Notes of a Visit to some of the Northern and Midland County Lunatic Asylums.* By Robert Boyd, M.D., F.R.C.P., and Superintendent of the Somerset County Lunatic Asylum. —*Wells*, 1865. pp. 31.

These short notes are deserving of a wider circulation than they are likely to obtain. We hope that a copy of them will at least reach each county lunatic asylum in the kingdom, and be read by its medical superintendent and official visitors. We have read them, and with a feeling of satisfaction, the accounts of each of the asylums visited being, on the whole, good, as showing the ample provision made to meet not only the wants, but likewise to contribute to the comfort of the unfortunate and pauper inmates. The weekly charge for maintenance affords some proof of this : of eight asylums, of which the cost per head is given, it is stated to vary from 9*s.* the highest, to 7*s.* 7*d.* the lowest; the average being 8*s.* 4½*d.*

In most of the asylums, it would appear that there is a considerable proportion of cases of a chronic or incurable kind, which might with propriety have been left in the union workhouses—i.e., where there are, as at Nottingham and Leicester, wards set apart for them, with paid nurses.

It is interesting to find how generally the patients are employed, especially in farming operations, and this with profit to the establishments, and unquestionably with benefit to themselves; and also, that besides useful occupation being provided for them, cheerful recreation, often music and dancing, are permitted, and religious observances are not neglected.

Knowing how much we might rely on Dr. Boyd's judgment and large experience, we could have wished that he had made some remarks on the results of varied treatment. The only one he gives is, that Mr. Denne, medical superintendent of the asylum for the three counties, Bedford, Herts, and Hants, "had observed in some epileptics pain on pressure on a portion of the spine, and that he found the application of tincture of iodine as a liniment an effectual remedy in these cases."

Incidentally, he makes mention of a female idiot, aged fourteen years, about the height of a child of half that age, with a very small head, but strongly-formed limbs, who had formerly been taken about and exhibited as an "Astec," her skin, to favour the imposition, having been dyed by walnut juice.

Dr. Boyd engaged in his very commendable undertaking at the request of the visitors of the asylum of which he has the medical charge. The example surely is worthy of being followed. The experience so gained might be turned to good account; improvements in one asylum might suggest the correction of defects in another, and the friendly communication and exchange of ideas of the medical superintendents could hardly fail of being instructive.

ART. IX.—*Therapeutics and Materia Medica. A Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History.* By ALFRED STILLÉ, M.D., Professor of the Theory and Practice of Medicine in the University of Pennsylvania, Physician to St. John's Hospital, &c. Second Edition. In Two Volumes. Vol. I. pp. 776; and Vol. II. pp. 819.

THE reader will find the recent edition of this work enriched by many additions; and for the American physician its usefulness will be specially enhanced, inasmuch as "the nomenclature of the materia medica and the formulæ for officinal preparations have been made to conform to the recent edition of the pharmacopœia" of the country. The indexes—one of the materia medica, and the other of therapeutics—have been entirely prepared anew, and their fulness and particularity are most conspicuous.

ART. X.—*A Manual of Practical Therapeutics.* By EDWARD JOHN WARING, F.R.C.S. Second Edition.—*London*, 1865. pp. 941.

IN the preface to the first edition of this work, which appeared twelve years ago, the author remarks:

"In most works of this class (upon Materia Medica and Therapeutics), many of them distinguished by much research, talent, and a profound knowledge of the subject of which they treat, the botanical, chemical, and pharmaceutical departments have been so fully and minutely entered into that their authors have doubtless found it impossible to devote space to the consideration of the medicinal application of the various articles of the Materia Medica to the treatment of morbid conditions of the human body, which, from its great practical importance, it demands."

There is unquestionably much truth in this observation, and in writing a work specially upon the action of medicinal agents on the human body in health and in disease, Mr. Waring has fulfilled a prominent indication in medical literature. And this leads us to inquire *how* he has fulfilled his task. A writer on the action of medicines might set to work in two distinct ways. He might make his book the embodiment of his own personal opinions, founded upon a laborious and life-long observation at the bedside, or he might set about collecting, condensing, and putting together the scattered observations of others. This latter is the plan which Mr. Waring has followed. His work is avowedly a compilation. As such it does him great credit, composed as it was when he was on duty as a surgeon in the Indian army, at an isolated station in India, far away from any storehouse of medical literature. Yet the research displayed in the book is very great, and the references to the original seem, as far as we have examined, correct as well as numerous.

The first part of the work takes up in alphabetical order the "Articles of the Materia Medica," giving shortly the nature of the drug, its medicinal properties and actions, its officinal preparations, its dose, its incompatibles, and very fully its therapeutic uses. Perhaps a single example will best convey an idea of the character of the work. We select a short one:

"2260. Potassii Bromidum. Bromide of Potassium K. Br. Hydrobromate of Potash. *Comp.* 1 eq. Bromine=80+Potassium=39=119 eq. wt.; or Bromine 67·22, and Potassium 32·78 in 100 parts.

"*Med. Prop. and Action.*—Stimulant, alterative, anaphrodisiac, and deobstruent. Its action is similar to, but milder than that of iodide of potassium. When administered internally it is absorbed into the system, and has been detected in the blood and in the urine. 'Its action,' observes Dr. Glover,[1] 'is exceedingly obscure; it acts in most cases as a diuretic, occasionally produces diarrhœa, and possesses somewhat of that action on the secretions and excretions which renders the corresponding iodide so powerful a deobstruent.' Dr. Garrod,[2] however, states that he has not found it exert any marked action on the kidneys or skin. In large doses it may give rise to drowsiness and headache; and in still larger it produces loss of power in the lower extremities, and exerts a remarkable influence over the sexual function, which it diminishes in a remarkable degree; as an anaphrodisiac its powers are unequivocal. It is, perhaps, one of the most powerful agents of that class. It also exerts an anæsthetic influence over the mucous membranes generally, but especially over those of the pharynx and larynx—a circumstance which has been taken advantage of in preparing patients for laryngoscopic examinations and operations. As an instance of its power in producing anæsthesia of a mucous surface, M. Riemslagh[3] cites the case of a man whose eyes had been injured by the discharge of a pistol. Under the use of the bromide, the insensibility of the conjunctiva became so perfect that the membrane was partially removed, and particles of powder, &c., extracted from the sclerotic itself without the least manifestation of pain. To obtain this effect, it requires to be given in large doses, gr. xv.–xxx., in two or three doses at intervals of an hour. Some persons whilst taking it experience a peculiar dryness of the throat and neighbouring parts. According to Dr. Garrod, it does not produce the symptoms of the condition known as 'Iodism.' Externally it is applied in the form of ointment (gr. xx.—gr. cxx. ad adipis oz. j.).

"*Dose.*—Gr. iij.—gr. xv., or even more.

[1] Edin. Med. Surg. Journ., Oct. 1, 1842, p. 340.
[2] Med. Times and Gaz., March 12, 1864. [3] Medical Circular, Oct. 15, 1862.

"*Incompatibles.*—Acids and the salts of most metals and earths.

"2261. *Therapeutic Uses.*—*In Scrofula*, the bromide, employed internally and externally, proved successful in the hands of MM. Bonnet, Magendie, Pourché, and others. Dr. Glover relates several cases treated by it; in some, particularly in one case of scrofulous ulcer of the leg, it was productive of great benefit; but in others the results were unsatisfactory.

"2262. *In Enlargements of the Spleen*, Dr. R. Williams employed the bromide successfully in four cases. He commenced with gr. j. thrice daily, and gradually increased the dose to grs. iv. He considers that in these cases it is possessed of unusual, if not of specific powers. In other hands it has occasionally failed. *In Enlargement of the Liver* it was also found serviceable.

"2263. In Epilepsy, it has been highly spoken of by Dr. C. B. Radcliffe, Dr. Ramskill,[1] Dr. H. Jackson, and others. In cases uncomplicated by loss of memory and other symptoms of serious cerebral affection, Dr. Radcliffe has found excellent results from the bromide. In such cases it may be administered in doses of gr. x.—xx. three times a day. It seems to have the power of keeping the fits off for long periods—months, or even a year; but they return when the drug is given up. Its anaphrodisiac properties indicate it as a remedy for *Epilepsy* dependent on masturbation. It has been prescribed in *Epilepsy following Diphtheria*, by Dr. Ramskill.[2]

"2264. Besides the above, it has been employed in *Amenorrhœa and Hypertrophy of the Ventricles*, by Magendie; in *Carbuncle*, by Mr. Bennett; in *Tinea Capitis*, by Prieget; and in *obstinate Dartrous Affections* and *Malignant Ulcers*, by Dr. Glover.[3] *In the Incontinence of Urine in Children*, Dr. Hewson[4] tried the bromide (gr. ijss—iij. thrice daily) in 63 cases; of these, 9 were cured and 4 were benefited; the other 50 derived no benefit. In *Gonorrhœa*, M. Riemslagh found the bromide an effectual cure in doses of gr. xv.—xxx., taken in two or three doses at intervals of an hour. It effectually relieved the *Chordee* in these cases. In *Hysterical Epilepsy* occurring at the menstrual periods, Sir C. Locock successfully employed the bromide in doses of gr. x. thrice daily. To be effectual, it requires to be persevered in for some months. It acts in a marked manner in subduing generative excitement; and it may be given with advantage in *Nymphomania*, *Priapism*, and some forms of *Spermatorrhœa*, and in *Menorrhagia* depending on uterine and ovarian excitement. In 'Syphilitic Eruptions, Dr. Garrod has substituted it for iodide of potassium with complete success.'"

The foregoing extract very fairly represents the manner in which the properties of each medicine are discussed. In each case the amount of literary research exhibited is very great, although the results are compressed into small compass. The list of remedies thus treated is likewise great, indeed exhaustive, many substances being included which are comparatively little known and rarely used.

The second part of Mr. Waring's book is headed "Medicinal Agents and Classes of Medicines." The former term includes Acupuncture, Baths, Blisters, Blood-letting, Cataplasms, Counter-irritation, Electricity, Electro-puncture, Enema, Gargles, Ice, Inhalation, Injection, Insufflation, Issues and Setons, Leeches, Spongeo-piline, Water. Under these headings the practitioner will find much useful information. Whilst he will thank the author for bringing into so small a compass the fruits of much inquiry, he must exercise his own discretion and judgment in accepting the true and rejecting the false. The author's

[1] Med. Times and Gazette, Aug. 29, 1863. [2] Ibid., Nov. 28, 1863.
[3] Op. cit. [4] Amer. Journ. of Med. Science, Oct. 1858.

aim seems to have been to collect every observation on practical therapeutics, and to hand over the result to his professional brethren. And in doing this, we think he has been eminently successful. His work will be daily serviceable to the busy practitioner.

ART. XI.—*Requisitions of the Naval Medical Officers, Based on the Principle of Equality with the Army.* By F. J. BROWN, M.D. Lond. and Edin., F.R.S., &c., and formerly Assistant-Surgeon in the Royal Navy.—*London*, 1865. pp. 40.

THE title of this pamphlet is sufficiently descriptive of its object. The grievances of the medical officers of the navy, as indicated by the very "Requisitions" made by its author for redress, are more numerous than we had supposed; and several of the assigned ones, we are inclined to think, will be held by those who have a knowledge of the service and of the ameliorations introduced of late years into the medical department of the navy, of too trivial a kind, if real, to be deserving of serious consideration.

No doubt it would be well for the public service were there no ground for complaint, no plea, as at present, of *mala fides*, of broken promises, on the part of the Government. Liberal and just treatment is undoubtedly the only way of creating contentment, and securing that average amount of ability and zeal which is needful for efficiency in any profession or department, especially of the medical, in the army and navy. At present, we are assured that there is not only a difficulty in finding recruits for the medical service of the navy, but also for that of the army, and this, as regards the latter, notwithstanding what has been done in the way of increase of pay and improvements of status since the Crimean war. The cause of this backwardness, we apprehend, is not so much dissatisfaction from a sense of grievances, as the severity of the trials to which the candidates who come forward are subjected, as indicated by the large proportional number of the rejected, and the better openings in civil life for those who would be most eligible, such as first-class men.

For our part, considering the nature of the naval medical service, we are only surprised that any well-educated young man should engage in it, unless pressed by the *res angusta domi*, or from the impulse of a higher and better feeling, a desire to obtain a world-wide experience, to profit by the great opportunities afforded afloat for visiting the various and remote regions of our globe, and acquiring a knowledge of different climates and their diseases. To men of this character, the advantages of their position in the Royal Navy will probably preponderate, and they will not be repelled by any thoughts about comparative rank and slight differences of pay, comparing their fixed allowances with those of the same grades in the army. How many were the eminent men who entered the naval service when the condition of the medical officers was so inferior to that which it is at present—such as Lind and Blane in the olden time, such as Clark, Forbes, Richardson, at a somewhat later period; and still later, such as Huxley, Goodsir, Clarke, Macdonald—all of whom, we presume, were chiefly influenced by motives of the better kind to enter the service.

That this remonstrance of Dr. Brown, with its many "Requisitions" and suggestions, will have the effect he desires, we are not sufficiently sanguine to expect; the least we can hope is, that his pamphlet may reach the Admiralty and be read; and we should congratulate him if it produce even the least good. He bears in mind probably the unjust judge in Scripture, and the result of importunity.

ART. XII.—*Sea Air and Sea Bathing for Children and Invalids: their Properties, Uses, and Mode of Employment.* By Monsieur le Docteur BROCHARD, Physician to the Sea Bathing Establishment La Tremblade, &c. Translated and Edited by W. STRANGE, M.D., Physician to the General Hospital, Worcester.—*London*, 1865. pp. 184.

IN addition to the more positive and direct information conveyed in this unassuming little volume, it contains many incidental suggestions and remarks touching on the general training and education of children, their habits, amusements, &c., which add much to its interest and utility. The author is evidently well versed in all pertaining to his subject, and that he has much to talk about may be gleaned from the headings of the various chapters, which, in addition to "General Observations upon Sea Bathing," treat of "The Ocean and its Marine Atmosphere," "The Utility of Sea Bathing for Children and Invalids," "The Physiological and Therapeutical Operation of Sea Water and Sea Air," "The Diseases and Disordered Conditions Common in Children and Invalids, which require the Use of Marine Medication," "The Choice of Bathing Places," "Rules to be Observed in Using Sea Bathing," and "The Management of Children at the Sea-side." Under each of these headings we find numbers of excellent and judicious observations, evidently the result of personal experience; the whole constituting advice rendered comprehensible to any intelligent unprofessional reader. The work is conspicuous for its simplicity, unegotistic, and practical character, and is written in a sprightly and pleasing manner by one who is free from that overweening desire to exalt his own watering-place as a panacea for all evils and to the disadvantage of others, which is only too manifest in many who treat of the benefits to be derived from sea-side places. He is sufficiently discriminating, and points out fairly and honestly the class of cases and constitutions to which the place of his choice is but ill-suited. It may be stated, that to this treatise was awarded the silver medal of the Imperial Academy of Paris.

We would observe that the forest of La Tremblade, in which Dr. Brochard's establishment is situated, is on the south-west coast of France, below Rochelle, and at a part remarkable for the salubrity of its warm and moist Atlantic breezes. Dr. Brochard's translator and editor, judging from his short preface, appears to have found his task a labour of love, and to have executed it with care and fidelity.

PART THIRD.

Original Communications.

Art. I.

On the Morbid Anatomy of Bright's Disease. By T. Grainger Stewart, M.D., F.R.C.P.E., Pathologist to the Royal Infirmary and Lecturer on Pathology, Edinburgh.

Dr. Bright showed that certain forms of renal affection are associated with dropsy, and albuminuria; and it was at first conceived that they constituted one individual malady, which was termed Morbus Brightii, or Bright's Disease. But later observation has proved that several forms in reality exist, each of which has a distinct morbid anatomy and clinical history. Over these forms, however, much obscurity still hangs. The object of the present paper is to show the views entertained by the author, as to the morbid anatomy of the different affections. These views are, of course, in many respects neither original nor novel, but the author thinks that they are more distinct than those generally entertained, and embrace certain points not hitherto recognised.

It would be tedious to enter into the history of the progress of knowledge upon this subject, and would take time even to mention the names of the authors who have contributed towards it. For since the illustrious Dr. Bright began to observe, we have had eminent works from the London Schools, as well as from Edinburgh, Paris, Berlin, &c.

There are three forms of Bright's Disease, which, though frequently occurring together, are essentially independent of one another. 1. The fatty degeneration, or, as it may be better termed, the inflammatory form. 2. The waxy or amyloïd form. 3. The gouty or contracting form.

Before describing these forms minutely, let me say a few words as to fatty degeneration.

Fatty Degeneration of the Kidney.—The occurrence of fat in the epithelium of the uriniferous tubules is not characteristic of any individual form of Bright's Disease, nor indeed of Bright's Disease at all. Simple fatty degeneration in the cells may occur, with or without a similar change in other organs, as the liver and heart, and without the occurrence during life of any symptom referable to the kidney.

Besides this simple alteration, we find in all the forms of the disease, fat in the epithelium, but always as a consequence of previous changes, though it is certainly most abundant in the inflammatory form, constituting what has been commonly called the fatty kidney.

1st. *The Inflammatory Form* may be divided into three stages: first, that of inflammation; second, that of fatty transformation; and third, that of atrophy. Of the first stage we find three varieties: first, the desquamative; second, the acute; and, third, the chronic inflammatory. The second and third stages of all these appear to be identical.

The desquamative variety seems to follow upon some of the exanthemata, and is characterised by a rapid desquamation of the epithelium, with a comparatively slight congestion of the organs. The acute inflammatory form is characterized by extreme congestion and rapid exudation[1] into the epithelium, and into the cavity of the tubules. In the chronic inflammatory the congestion is less marked, and the exudation is thrown out less rapidly than in the acute form. Let us observe more minutely the second and most important of these varieties.[2] The organ is extremely congested; there are frequently numerous points of extravasation, particularly in the cortical substance. The bulk of the organ is increased, and its texture softer than natural. The capsule readily strips off, and leaves a smooth deeply-coloured surface. On microscopic examination, the small vessels are found gorged with blood, and here and there, particularly in the Malpighian bodies, smaller branches having given way, extravasations are found. The epithelium is in the state of "cloudy swelling," the cells larger than natural, their outline less defined, their nuclei not so distinctly visible. The cell contents more abundant and less transparent than natural. Not unfrequently we find tubules lined by epithelium, which has simply undergone this change, but more commonly we find the lumen filled up by exudation. This exudation is sometimes transparent, sometimes more dense, and not unfrequently contains blood corpuscles.

On making sections at right angles to the tubes, we see these changes more distinctly. The tubules of the cortical substances are usually most affected, but those of the cones are often partially involved. On looking at a section with a low power, we frequently see individual tubules dark with exudation, passing far down among the healthy tubules of a cone.

The second stage is commonly known as the "large fatty kidney."[3] The inflammatory process has passed away, or become very chronic, but its effects remain. The organ is large, of a pale fatty colour, its capsule is easily stripped off, the surface is for the most part smooth, but not unfrequently slightly uneven, little depressions existing here and there. The colour is pale, but here and there congested stellate vessels are seen. The surface presents a mottling of yellow fat colour, with

[1] *Exudation.*—I employ this convenient term as one which is in general use, and descriptive of the condition referred to in the text, but do not regard it as an accurate expression. The idea upon which it was originally founded—viz., that certain elements of the blood were poured or secreted out of the vessels, as a consequence of changes in the vessels or in the blood—is entirely exploded. The view now generally held, and which I have adopted, is that in certain irritated conditions the tissues attract to themselves certain elements from the blood, and that this constitutes the dense matter which we see in the parenchyma of, for example, inflamed parts. But though the theory of its production be altered, the descriptive term need not be changed; and therefore I think that, for practical purposes, we may continue to call this matter "exudation."

[2] Bright's Reports, Plate V. Figs. 1 and 2.

[3] Typical example in Bright's Plates, Pl. I. Figs. 1 and 2.

the pinkish hue natural to the kidney. On section the cortical substance is found relatively larger than the cones, and presents the same variety of colour which we have remarked on the surface. Some parts have a dense untransparent fatty or sebaceous look, while others have more the structure of the ordinary renal tissues. The groups of straight tubules also, as they pass out into the cortical substance, are more widely separated from one another by the bundles of convoluted tubules than natural, and the groups of convoluted tubules between the cones are particularly large and mottled.

On microscopic examination of a large section under a low power, many of the tubules, particularly the convoluted, are seen to be distended with dense dark material. The Malpighian bodies are enlarged, but not prominent; and here and there among the cones an individual tubule, or a group of them, present the same distended appearance. Under a high power, these distended tubes are seen to be filled with solid exudation, enclosing cells and numerous oil globules. Many of these globules are situated within cells, or lie in groups, marking where a cell has been. Some of them lie in the exudation itself, and appear to be a result of the transformation of its material. The tubes are, moreover, found to be irregularly distended, in some parts much dilated, in others narrow, or of the natural calibre. The parts in which the exudation is seen by the microscope correspond to those untransparent, sebaceous-looking portions recognised by the naked eye.

The third stage is that of atrophy.[1] It is one of the forms of what used to be called the granular kidney. The organ is diminished in bulk and weight, its capsule is less easily torn off than natural, and on its removal, the surface revealed is very uneven, and full of little elevations and depressions. It presents a few stellate vessels coursing over it, and has the mottled appearance, but a greatly smaller proportion of the sebaceous-like untransparent matter than we see in the second stage. On section, we find that the diminution of bulk has taken place mainly or exclusively at the expense of the cortical substances; that while the cones remain nearly of their natural size, the cortical substance is small and atrophied, and the secreting structures between the cones have also diminished. In this situation a deposit of adipose tissue takes place in order to supply the loss of bulk resulting from their atrophy; besides, the vessels are thickened and enlarged. The arteries which pass between the cortex and the cones are dilated, their walls thicker than natural. The organ is, moreover, firmer to the touch, and more difficult to cut; and while the mottling continues as in the second stage, there is much less of the fatty element, and a marked increase of the fibrous stroma.

On microscopic examination of a large section under a low power, we at once remark the unusual prominence of the arteries and the thickening of their walls, the increase of the fibrous tissue, and the occurrence of dense, dark matter in portions of convoluted tubules. Many of the tubules are shrivelled, atrophied, closed; where there is exudation it is in scattered patches. Many of the Malpighian bodies

[1] Bright's Reports, Plate III. Figs. 1 and 2.

are reduced to small dimensions, and surrounded by a rather thick sheath of fibrous structure. The Malpighian bodies do not constitute a prominent object, and the variety in their size is very striking.

How are the different stages related to one another?

The first stage is that of inflammation, in which exudation is poured out mainly into the tubules, though partly into the parenchyma of the organ. This exudation leads to fatty degeneration of the epithelium—firstly, by its presence within the cells; and, secondly, by its shutting them off from functional activity; thirdly, perhaps by cutting off their vascular supply. This fatty matter being partly carried off by the urine, and partly probably absorbed into the system, gradually diminishes the bulk of the organ; and as this advances, the third stage is developed.

This form of Bright's disease may prove fatal at any stage of its course. Patients not unfrequently die in the first stage, more commonly in the second, and certainly most frequently in the stage of atrophy. Recovery often takes place after the first stage, and partial recovery is frequent after the second; but of these I hope to speak more in detail in a future paper on the symptoms and treatment of these forms of the disease.

As to the time required for passing through these different stages, I cannot speak positively. It is obvious that, according to the character of the first stage, the duration must vary. I have seen the second stage typically developed within three months, and a very chronic case may go on for years before the changes of the third stage lead to a fatal termination.

This is the most common form of Bright's disease in Edinburgh. Out of 84 cases of that disease which I have examined in the Infirmary, 35 were of this form.

2nd. *The Waxy or Amyloïd Form.*—The characteristics of this form are the pallor and peculiar semi-translucency of the organs which it affects, and the reactions with iodine, with iodine and sulphuric acid, and with various other colouring matters which are exhibited by certain portions of the organs. With iodine the degenerated parts invariably assume a brownish-red colour; with iodine and sulphuric acid a purplish red, or rarely a blue colour, is produced; with chromic acid a bright yellow tinge is seen; and with solutions of indigo, magenta, &c., these colours are markedly absorbed, and so the affected particles become very distinct. This last fact has been noticed by Dr. Bennett. It thus appears that the degenerated portions absorb colouring matters; but I think that in the case of iodine, and certainly of iodine and sulphuric acid, a distinct reaction and not a mere staining occurs.

The kidneys in the earliest stage of this affection, when examined by the naked eye, present little or nothing to distinguish them from healthy organs. Their size and weight are natural, the relative bulk of their cortical and conical substance is normal; the capsule is easily torn off; the surface is smooth. Its colour and that of a section is natural, or a little paler than usual. Only the experienced eye may observe that the Malpighian bodies are a little more distinct than in a healthy organ, and that the surface glistens, and appears scattered over with minute spots like granules of boiled sago. But even the most experienced eye may err or be in doubt; but if we apply a little iodine (the best form is the liquor iodi. comp.), the reaction renders the nature of the case certain. But in many cases a microscopic examination is necessary in order to our recognising the earliest changes. Let us observe what these changes are.

There are three stages of the waxy, as of the inflammatory form of Bright's disease. The first is that of simple degeneration of the vessels, the second that of enlargement, the third of atrophy of the organ. As we saw that the inflammation was the primary affection in our first form, the enlargement, fatty degeneration, and atrophy resulting from it, so here we see that the peculiar degeneration of the vessels is the primary change; the enlargement and atrophy are but consequences.

First Stage.—The degeneration commences in the capillary tufts of the Malpighian bodies, and in the transverse or circular fibres of the small arteries. By the microscope the tufts are seen to be somewhat swelled and the individual vessels more transparent than usual. On the small arteries, again, we observe thickenings here and there, prominent rings being thrown out. I have sometimes seen it almost like the rings in the ipecacuan root, and these swollen parts are more translucent than the rest of the walls. On adding a little solution of iodine a bright colour is developed in the degenerated part, while the whole field assumes a yellowish colour. This is the earliest stage; but gradually the degeneration spreads from the centres in which it began to the rest of the vessel, until the whole of the small arteries with their branches, and the Malpighian bodies, are so completely degenerated that a section treated with iodine presents the appearance of an exquisite injection of that system of vessels. The straight arteries of the cones are also not unfrequently degenerated. In this stage the tubules are natural.

Second Stage.—The organ is obviously abnormal.[1] It is increased in bulk and weight; its capsule is easily stripped off, and the surface is smooth and pale. A few stellate vessels ramify on it, and it presents none or little of the mottled appearance seen in the second stage of the inflammatory form. On section, the cortical substance is seen to be relatively increased, to be pale and dense, though not fibrous, and to present much the appearance of white wax. The cones are pink and of natural size; the whole secreting substance has the peculiar waxy appearance, and scattered over it are the pale and semi-translucent points, best seen when the light falls on them obliquely —the Malpighian bodies. On examining a section under a low power, we see the Malpighian bodies and the arteries degenerated as we have already described them, but, in addition, many of the tubules are full of matter, not dense and untransparent, as in the inflammatory forms, but tolerably transparent, yet, on the other hand, not presenting the peculiar translucency nor the reaction with iodine which are characteristic of the degeneration, and occur constantly in the vessels. Sometimes, however, we see the basement membrane, and occasionally some

[1] Bright's Reports, Plate IV. Figs. 1 and 2.

of the epithelial cells, taking on a special reaction with iodine, and then it is apparent that the degeneration has extended beyond its ordinary limits. The cells are usually fatty, the fat granules being, however, very numerous and minute.

What is the cause of the increase in bulk of the organ? To a slight extent the enlargement of the truly degenerated parts must account for it, but it is mainly due to the distension of the tubules in the manner we have described; and this distension of the tubules most probably arises from the transudation of the fluid parts of the blood through the degenerated walls of the vessels. A slow transudation of fibrine most probably takes place; this coagulates in the tubules, and so we have the condition closely resembling what occurs in the inflammatory form of disease. This explains, too, the fatty degeneration of the cells; and it is to this stage that the term waxy kidney is most applicable.

The third stage of this form is the atrophic. In this condition the organ is reduced in bulk and weight. The capsule may be torn off without much difficulty; its surface is uneven, full of elevations and depressions, of a pale, waxy colour, but also occasionally mottled here and there with sebaceous-looking material. On section, the cortical substance is found much diminished, while the cones are nearly natural. The Malpighian bodies are large, prominent, closely grouped together; the tubular structures are mostly absent; the smaller arteries are dilated, and their walls thickened. On examining a thin slice under a low power, we find the relative increase of the vascular elements very remarkable. In some parts, and in extreme cases, I have seen the Malpighian bodies so closely grouped together as to remind one of a bunch of grapes, the degenerated artery representing the stem; at the same time, here and there, the tubules continue distended, but many have been emptied, and their walls are collapsed. The degree of atrophy varies in different instances from about the natural size of the organ to a sixth part, or even less.

As to the time required for these changes it is difficult to speak, for I have not yet traced a case from its commencement to its fatal termination, and I am not aware that any case has been so observed; and the early symptoms are often so little attended to that it is difficult to make out the date of origin of the disease in cases which come under observation. I know of one case which has been going on for more than five years, and does not appear to be approaching a fatal termination. I have examined the kidneys in another case, which had been under my observation for three years, and they were not much smaller than those of a healthy individual. And in another fatal case which I lately examined, I found that distinct symptoms had existed for about six years, and yet the organs were less atrophied than I have frequently seen them.

This form is common in Edinburgh. Out of eighty-four post-mortems, twenty-six were cases of this kind, besides a number of others in which the inflammatory was combined with the waxy. As to the real nature of the degeneration we have no very certain information. That it is a form of altered nutrition is apparent; that it has no relation to cellulose or starch, but is closely allied to albumen, and therefore cannot with propriety be termed amyloïd, has been proved beyond a doubt by various chemists, and particularly by Kekule, Kühne, and Roudueff. That this degeneration is the primary lesion, and leads to certain other secondary changes, has been already shown in this paper. But what is the exact nature of this peculiar product of altered nutrition, why it chooses vessels, nay arteries, and certain elements in arteries as its chosen seat, and what is its exact relation to syphilis and other diseases, which it so often follows, are questions still involved in obscurity, and calling for further investigation.

3rd. *The Gouty or Contracting Kidney.*—This form of disease cannot, like the other two, be said to consist of several stages, for it exhibits throughout one uniform character. *It consists essentially of a hypertrophy of the connective-tissue of the organ, and a consequent atrophy of all the other structures.* In the commencement of the process there is little diminution of the bulk of the organ, the capsule is less easily torn off than usual, and the surface, instead of being smooth, is uneven and scarred. Even with the naked eye the fibrous stroma is seen to be increased. On section, the cortical substance is found greatly diminished; the colour is various, some parts being paler, others darker than natural. At an early stage the arteries are dilated, and their walls thickened. Exudation is thrown out into many of the tubules, the cells undergo fatty degeneration, and frequently from the closure of tubules, cysts, or cystic dilatations are formed. These alterations become gradually more marked, the volume of the organ diminishes, the surface becomes more uneven. At length the secreting structure comes to be represented merely by a mass of fibres. I have seen a kidney reduced to a twelfth of its natural size, but it is seldom that the disease advances so far without leading to a fatal result.

This form is rare in Edinburgh. It occurred only in 10 out of 84 cases of Bright's disease which I have examined. I have thus had comparatively few opportunities of studying its characters.

Such are the only forms of Bright's disease that I have met with. In a tabular form they may be represented thus:

I. Inflammatory Form	Stage 1.	Inflam. (acute, chronic, & desquamative).
	„ 2.	Large pale fatty kidney (large fatty or yellow kidney).
	„ 3.	Atrophic (granular kidney).
II. Waxy or Amyloïd Form	Stage 1.	Degeneration of vessels.
	„ 2.	Ditto with transudation (large white kidney).
	„ 3.	Atrophic (granular kidney).
III. Gouty or Contracting Form (granular kidney).		

While this includes all the forms with which I am acquainted, it is to be remarked that cases are very common in which two of them are combined. Particularly frequently this is observed of the first and second forms, and the fact may, I think, serve to explain the tardy recognition of the fact that they are distinct diseases.

ART. II.

Sketch of the Geography of Epidemic Cholera. By GAVIN MILROY, M.D., F.R.C.P., President of the Epidemiological Society, &c.

IN former numbers of this journal (for April and July, 1864), I have given a sketch of the geographical distribution of the oriental plague and of yellow fever over different regions of the earth, since the beginning of the present century. I now attempt to do the same in respect of a pestilence of far wider extension and range of epidemic force, and whose career during the last fifty years can scarcely fail to take a place in the world's history. It has nearly girdled the globe in its course from the shores of China and Japan to the western seaboard of the American continent; and it has extended from at least the 60th degree of north latitude to about the 25th degree south of the equator. From the want hitherto, in medical literature, of anything like a systematic and connected registration or record of epidemic visitations in different countries, our available information has necessarily been fragmentary, often dubious, and always imperfect. Many of the following details are the mere occasional jottings from journals, newspapers, and books during the last twenty years, while others have been derived from numerous official communications which at various times have come under my notice, and specially during the large and comprehensive inquiry on the subject of quarantine, which was carried out, from 1859 to 1862, by the National Association for the Promotion of Social Science, with the aid of the Foreign and Colonial Offices and of the Board of Trade. Until more attention be paid to the geographical and chronological history of this and other epidemic diseases, together with the history of their concomitant phenomena in different regions and localities, we shall lack the most important data in seeking to discover the laws which may regulate or influence their development and spread, and we must fail to throw a clear light upon their ætiology or causal relations, the knowledge of which is of course essential to the sure advancement of that most practical of all subjects—their prophylactic and preventive treatment.

The present paper is but a contribution, as it were, of materials which may be found useful by others in the building up of a larger and more finished work, illustrative of the world-history of epidemic cholera.

Although the first great migratory movement of this pestilence, of which we have any record, began in 1816-17, the disease had been long well known to medical men, more especially since the first occupation of India by Great Britain. It is as truly indigenous in India as the yellow fever is in some parts of the coast of Africa, or in the West Indies and along the shores of the Caribbean Sea. Many graphic descriptions of the distemper — often under the popular appellation of "*mort de chien*," from the sudden virulence and fatality of the attack—were given by English and French writers in the course of the last century. In some seasons the cholera had prevailed over very extensive tracts of the Peninsula; this was the case in 1781-82, when several provinces remote from each other seem to have been simultaneously or successively attacked. In the spring of 1781, it broke out with great fury among a part of Sir Eyre Coote's army, when on their march and near to Ganjam, latitude 19°, on the Coromandel coast. "Men previously in perfect health dropped down by dozens, and even those less severely affected were generally past recovery in less than an hour. The spasms of the extremities and trunk were dreadful, and distressing vomiting and purging were present in all." Soon afterwards, the disease made its appearance at Calcutta, lat. 22° N., and, after causing great mortality there, pursued its course still further northward. Next year (1782), however, it seems to have been prevalent in the opposite direction, viz., at Madras, lat. 13°; at Pondicherry, lat. 12° N.; and at Trincomalee, in Ceylon, lat. 8°. Not a symptom of the disease as it is now seen is wanting in the descriptions then given by Drs. Curtis and Girdleston. "The hands and feet generally become sodden with cold sweat, the nails livid, the pulse more and more frequent and feeble, and the breath so condensed as to be both seen and felt, issuing in a cold stream, at a considerable distance. The thirst was insatiable, the tongue whitish but never dry, vomiting became almost incessant, and the spasms, cold sweats, and thirst increased with the vomitings. Some died in the first hour of the attack, others lived a day or two, with remissions."

In 1782 there was a dreadful outbreak at Hurdwar, lat. 30° to the north of Delhi, when upwards of 20,000 persons are believed to have perished.

That several other migratory epidemics of the pestilence occurred at subsequent periods, during the latter part of the last century and the early part of the present one, over a greater or less extent of Hindostan, is well known to have been the case; but the records of their synchronous or successive outbreaks in different districts are too imperfect to enable us to follow them with any accuracy. We must, therefore, come down to the period when the disease, having acquired, in some mysterious manner unknown to us, a greater force of diffusive power and a more abiding perpetuity of existence than it had previously shown, commenced that world-wide career of destructive energy which has rendered it so memorable in the annals of epidemiology.

The outbreak in 1816-17 in the delta of the Ganges was by no means so sudden an event as it has often been represented. For many months at least, in that and other parts of India, there had been an unusual amount of sickness and mortality, consequent it was believed upon excessive rains and great atmospheric vicissitudes during the previous autumn and winter, whereby the crops had been ruined and the people reduced to the greatest suffering. A pestoïd fever prevailed extensively in some districts, while others were desolated by dysentery, ague, and remittents.

It was in the summer of 1817 that the pestilence broke out with great malignity at Jessore and various other towns and villages in the Gangetic Delta, springing up about the same time in many places often considerably distant from each other. The radiation of the poisonous agent was certainly not from one point only, but from numerous foci, and over a wide extent of country. There were, moreover, during the year, several local and occasional outbreaks of the pestilence remote from the scene of its chief prevalence, while the intermediate districts were altogether unaffected. One of the most remarkable of these was that which occurred, towards the end of 1817, in the camp of the Marquis of Hastings, in Bundelcund, more than a thousand miles from the delta of the Ganges. Thousands of troops perished on that occasion, and the operations of the campaign were seriously interrupted in consequence of the terrible sickness.

In 1818, the disease not only spread over the greater part of Hindostan, and more especially over the central and northern provinces, but it extended also to Burmah, Arracan, and Malacca, in a south-easterly direction.

In 1819, it invaded Siam, Penang, Sumatra, and Singapore, and it simultaneously spread along the west or Coromandel coast of the Indian peninsula, on to Ceylon, which was attacked early in the course of the year. Towards the close of 1819, it appeared in the island of Mauritius, lat. 21° S.

In 1820, besides extending eastward to Tonquin, Cambodia, Cochin-China, and the southern provinces of China Proper, as well as to the Philippine Islands, it spread in the opposite direction until it reached the banks of the Indus, Beloochistan, and other regions to the west of British India.

In 1821, the pestilence followed the same double course. Many of the islands in the Indian Ocean were now visited for the first time, and simultaneously with their invasion it was advancing westwards to Muscat, on the south-east coast of Arabia, and up along the Persian Gulf to Bussora and Bagdad.

During the next two years, while still prevailing in many of the countries to the east of India, it extended its ravages through Persia and Mesopotamia, on to Syria and Palestine in one direction, and to Georgia and Circassia in another.

By 1823 it reached Astracan, on the north shore of the Caspian, and also the town of Orenburg on the river Ural, some hundred miles further north, and began to menace Europe from this quarter, as the general course of the pestilence seemed to be that of a steady advance in a north-western direction.

But now, from some inscrutable cause, there supervened a remarkable lull or suspension of its diffusive or migratory power. The march westwards was arrested; and it was fondly imagined that, as the disease was of Asiatic origin, it would probably be confined to the continent that gave it birth, although the history of other pestilences which had sprung up in the east certainly showed no warrant for such an expectation.

There is reason to believe that, in the interval between 1823 and 1829, the cholera existed with varying malignancy not only in different parts of northern Persia, but also in those vast unexplored regions lying between China and the shores of the Caspian. We know for certain that it was in some parts of Siberia in 1827, a year when it resumed great intensity in Bengal and India generally, and in which, passing for the first time (it is supposed) to the north of the Himalaya mountains in their western ranges, it invaded Bokhara, Cabool, &c.

The year 1828 appears to have been one of comparative respite. In August of the following year the pestilence broke out a second time, and with great violence, at Orenburg; and in the same month, or a little later, it reappeared at Tabriz, Tiflis, and other places on the Georgian frontiers of Persia and Russia.

In July, 1830, it reinvaded Astracan, and with intense malignity, sweeping off four thousand persons in that marsh-surrounded city, and upwards of twenty thousand in the province within the space of two or three weeks; thence it extended along the course of the Volga, visiting Saratoff and various other towns, until it reached Moscow in September. During the same period, it had been also advancing from the south in a westerly direction towards the northern shores of the Black Sea (Odessa was attacked about the same time as Moscow), and thence along the lines of several of the rivers to the southern and central parts of European Russia. Poland was invaded in the beginning of 1831; and at Warsaw and other places it proved very destructive in April and May, during the insurrectionary war in that unhappy country. Hungary was assailed in May, and between that month and the end of September more than 100,000 of its people perished from the pestilence. In the early summer of this year, it made its appearance on the southern shores of the Baltic at Dantzic, Riga, &c.; and in June it was at St. Petersburg and Cronstadt. From Hungary and Gallicia it advanced in a nearly due westerly direction to Vienna, which was reached in August, and also through Moravia, Bohemia, and Saxony, towards Belgium, and the north of France. The southern provinces of the Austrian Empire, Styria, Illyria, Tyrol, Vorarlberg, also Bavaria, Franconia, and the other Riverain states of Germany, altogether escaped for the present, although uninterrupted communication existed all the time with the infected provinces. The whole of Rhineland from Cologne to Basle, as well as Savoy and the Rhone districts of France, also remained exempt.

The countries, too, on the northern shores of the Baltic experienced at this time a nearly like immunity. Stockholm was the only point in Sweden where the disease appeared, and then only in a very partial degree; most of the cases which occurred in that city were supposed to have been brought from Russian ports. Denmark escaped altogether; and Finland and Norway were not visited till 1832.

While penetrating by the way of Russia into the heart of Europe, the pestilence had spread, probably through Arabia, to Egypt and Turkey. Cairo suffered dreadfully in 1830–31; and both Constantinople and Smyrna were invaded towards the end of the summer of 1831.[1] In August of that year it had reached Berlin; in September it was at Hamburg; and at length, on the 26th of October, the first officially declared case in this country (for many of almost equal severity had been observed in different places months before) took place at Sunderland. Three or four weeks subsequently, it appeared at Newcastle; and in December at North Shields, Gateshead, Tynemouth, and other adjacent towns, as well as at Haddington in Scotland. It was not till the second week in February, 1832, that the earliest case of the epidemic occurred in London, notwithstanding that there had been uninterrupted communication by land between the metropolis and the infected districts in the North, since its first manifestation in the country. Dublin was attacked in March; and it was reported to have appeared about the same time at Calais—viz., in the second week of that month; and a fortnight later or so at Paris, where it committed its greatest ravages, it is well known, in April and May.

The general direction of the pestilential current through France seems to have been chiefly due westward; for the disease appeared at Quimper, on the coast of Brittany—a hundred and twenty leagues west of Paris—before any place a quarter of that distance to the south was attacked; and it had not reached so far as Dijon by the time when, having traversed the Atlantic, it broke out in June at Quebec, Montreal, and New York.[2] By July it had spread to Philadelphia and several other cities in the United States, eventually spreading over nearly the entire extent of that great country. New Orleans was invaded in November.

In the spring of 1833 it appeared at Havanna,[3] and also in Mexico. The city of Mexico was attacked in June, and Vera Cruz on the coast in August. In the early summer of this year it made its appearance for the first time in Portugal; it was in Lisbon in June. Cases had occurred on board several of the British and other ships of war in the Tagus as early as April; and the fleet continued for months to be

[1] It is stated in the Reports of the Health of the Navy, that a rapidly-fatal case occurred in a marine of H.M.S. *Madagascar*, at Malta, shortly after his return from the shore. It ran its course, with all the characteristic symptoms of the disease, in eight hours. No other instance occurred among the crew, and no mention is made of any case having been seen among the population on shore. Malta was not visited by the epidemic until five or six years later.

[2] Dr. Parkin, in a pamphlet published in 1847, states that the potato blight commenced in Europe in 1830, and in America in 1832—the years in which epidemic cholera first appeared in those parts of the world. An authentic detailed narrative of the rise and spread of this and like epiphytics would be highly interesting, and might possibly be very instructive.

[3] In H.M.S. *Skip-jack*, the disease broke out soon after her arrival at Havanna, where it was prevailing very destructively. The two first cases occurred in two deserters, who were carried on board moribund. Six other cases occurred, and, in all, three died on board. The disease appeared also that year in H.M.S. *Wasp*, soon after leaving England, a little to the south of Madeira, early in October. Within a week, twenty-six men were attacked, and four died. There was some doubt at the time whether the disease was genuine Asiatic cholera, or only an unusually severe form of ordinary cholera.—Reports of Health of Navy for 1830–36.

affected with unusually severe bowel complaints, both there and also at Vigo, on the north-west of Spain, and at Santander, on the coast of Biscay.[1] During the autumn and winter months, the disease appears to have been in abeyance throughout the Peninsula generally.

It was not till the spring of 1834 that Spain came fairly under the breath of the pestilence. It broke out at various points, and without paying any regard to the sanitary cordons which guarded the frontiers of Portugal, then in full civil war. Andalusia and New Castile, particularly their capitals, Seville and Madrid, were ravaged during the summer months; and later in the year, numerous places on the southern and eastern coasts, as Malaga, Alicante, Carthagena, and Barcelona, were attacked, some of them with extreme violence. At Gibraltar sporadic cases occurred in May; but the disease did not become epidemic till the following month. It then increased progressively till the middle of July, when it began to decline, and subsequently ceased in its epidemic form about the beginning of August, though bowel complaints of a severe character prevailed for several weeks after. The visitation had been preceded by influenza during the spring months, and by an unusual prevalence of slight bowel disorders among the garrison and the general population. One account states that the developed disease had been prevailing, during the earlier part of the year, in several Spanish villages in the vicinity of the fortress. It may be added that the disease was at Tangiers, on the opposite side of the Straits, in November, and that it was believed to have been brought thither from the interior of Morocco.

During the summer of 1834, there was a partial recrudescence of the disease in England (where indeed there had been a slight reappearance in the summer of 1833), and in some parts of the Continent—as at Berlin and other places in Prussia—as well as in Canada and the United States. Nova Scotia, and New Brunswick, which had escaped two years before, were now attacked; it was in Halifax from June to the end of September.[2] Sweden and Norway also experienced, for the first time, a distinct epidemic visitation this autumn; Stockholm and Gottenburg suffered most severely in September.

The pestilence seems to have advanced, during 1834, in a N.E. direction from the eastern coast of Spain towards the Mediterranean districts of France. In the spring and summer of 1835, Montpelier,

[1] In H.M.S. *St. Vincent*, while anchored in Vigo Bay in March, there were twelve cases and five deaths. The disease was not admitted by the authorities at that time to exist on shore, although several sudden deaths had already occurred among the inhabitants—from eating putrid fish, as it was alleged. Its presence was, however, detected in some patients in a military hospital, and, moreover, other ships in the bay were known to have suffered. There is reason to believe that the epidemic was generally diffused along the north coast of Spain, as well as in various parts of the interior.—Navy Reports, 1830-36.

[2] H.M.S. *President*, which lay near to the town of Halifax, had eighteen cases in August (1834); four were fatal. She was moved further out from the shore, and the disease ceased. The rifle-brigade, and also the ninety-sixth Regiment, had at first suffered severely; on shifting their quarters to some distance, it at once abated.—Navy Reports for 1830-36.

Nismes, Avignon, Valence, and other towns in the department of the Drôme and Bouches au Rhone were attacked, the disease generally attaining its chief force in all these places about August. It re-appeared in Marseilles (where cases had occurred in the latter part of 1834) in June, and about the same time Toulon,[1] Cette, &c., were smitten. From Marseilles it seemed to spread up to different inland parts of Provence, and also along the sea-coast to Nice, Villafranca, and Genoa, which city became affected in July and August. Thence extending into the interior of the country by Coin, it reached Turin and other towns and villages in Piedmont, the outbreaks occurring very generally in the month of August. Lombardy became first affected in the course of September. During this autumn, the pestilence had shown itself also in numerous other districts of Northern Italy, as at Venice, Trieste, Pisa, Leghorn, Florence, and Pontedera; and its influence had begun to be felt even so far south as Rome and Naples.

The southern shores of the Mediterranean did not escape in 1835; Alexandria and several places on the north coast of Africa are known to have suffered; and, according to one account, Malta experienced a slight visitation this year.

In 1836, all the Lombardo-Venetian territory, including the towns and districts of Brescia, Cremona, Mantua, Lodi, and Milan, as well as the Duchy of Parma, and the Genoese Riviera, suffered severely during the summer months; upwards of fifty thousand, at least, of the inhabitants perished. In the beginning of August it appeared on the Dalmatian coast; also at Ancona, Paglia on the confines of the Roman and Tuscan States, and at various other places. In the summer and autumn it was very fatal in Rome; and, during the last three months of the year, Naples lost between five and six thousand of its inhabitants from its ravages.

The disease had continued to appear in various places in Egypt throughout this year. In the new world, the region of Central America seems to have been the principal seat of its power. At San Salvador, on the Pacific, a seventh part of the people perished, and many of the towns and villages in the adjoining districts were depopulated. The British settlement of Honduras did not escape; the disease, preceded by the influenza, appeared there in August, soon after, it was alleged by some persons, the arrival of a vessel from Havanna where the disease was then prevailing.

1837 was characterized by the reappearance of epidemic cholera

[1] In 1833, the French frigate *Melpomene* arrived at Toulon from Lisbon, where the cholera was then prevailing. She had lost fifteen men before starting, and more than half of her crew had been attacked during the voyage. The sick were landed at the lazaret, and four galley-slaves, with an inspector, were deputed to wait upon them—such was then the dread of the pestilence. Four ordinary attendants were sent on board to give assistance to the patients who could not be removed. All these attendants were attacked within the next two days, and three of them died. Of the four galley-slaves in the lazaret, three were attacked and one died; the inspector also fell a victim. No case occurred beyond the lazaret, and Toulon remained exempt for nearly two years.

(and in a much more severe form than on its first invasion), after several years' entire absence, at Dantzic, Berlin, and other places in the north of Germany, during the autumn; and in our own country by two isolated outbreaks—one on board the *Dreadnought* Hospital Ship in the Thames, in October, and the other at the end of the year in the House of Industry at Coventry. During the summer months, it also reappeared in the South of France, at Cette, Marseilles, Porte-Vendre, &c.; likewise in Catalonia, at Genoa and Leghorn, in Venetia, and at Rome and Naples. It raged with great violence in Rome during August; the official statistics admitted a mortality of, at least, between five and six thousand. At Naples, too, the visitation was more severe than in the preceding year; upwards of fourteen thousand deaths took place in the city alone; and in the kingdom of Naples on the mainland, the statistical tables of the year showed a diminution of the population by sixty thousand seven hundred souls, instead of the usual augmentation of fifty thousand.

Sicily was visited this year for the first time; none of its considerable towns escaped, with the exception of Messina. Palermo suffered dreadfully, losing, between June and November, at least twenty-six thousand of its inhabitants out of a population of one hundred and sixty thousand. The entire mortality in the island from this visitation was estimated at seventy thousand out of a population of about two millions. During this most sickly season, the southern provinces of Italy, and more especially Sicily, suffered to a much greater extent than the northern.

Malta and the small adjacent island of Gozo were attacked about the same time as the city of Palermo. The disease reached its acme in Malta in July and August; it ceased in October. On board many of the ships of the Mediterranean fleet, the outbreak of cholera was preceded by influenza, and generally also by an excessive amount of bowel complaints among the crews. According to some statements, the occurrence of the developed disease took place in several vessels at sea, when they came near to the harbour of Valetta, as if they encountered a poisoned atmosphere; whereas the Reports of the Health of the Navy assert that "there was no instance of the disease occurring in any ship as long as she continued in the open sea, or even in the channel of Malta, unless she had previously communicated either with that island or with Palermo, while it was prevalent in these places." On this, as on too many other similar occasions, the history of the epidemic invasion is far from being so exact and detailed as the requirements of accurate research call for.

Egypt still continued to be infested with the morbific poison; and many districts of Syria and Asia Minor, as the country around Damascus, Aleppo, Adana, Tarsus, Antioch, also the regions along the Orontes, and away towards Bir, Orfa, and Diarbekir, and along the range of the Taurus to Byssa, suffered during the summer of 1837.

This year was marked, it will be remembered, by a widespread epidemic of influenza over Europe; also by the unusual prevalence of the plague in many parts of the Ottoman dominions, and of pestoïd fever in Rajpootana, &c.; and a great prevalence of yellow fever on the coast of Africa, in the West Indies, Gulf of Mexico, &c.

After 1837, the malignant cholera ceased to be heard of in Europe or in America for the next nine or ten years. In India, it was of course never entirely absent; and, every now and then, severe local outbreaks, which occasionally extended over a wide tract of country, and continued for a considerable space of time, were known to occur throughout the peninsula.

In the early part of 1842, the disease appeared in the northern districts of Burmah, and in the course of the summer of that year it seems to have travelled steadily southward, raging first at Ava and Amarapoora, and then passing down towards Rangoon along the Irawaddy and its tributaries. In August it was at Martaban, nearly opposite the British settlement of Moulmein, where it appeared in September, and continued, with varying remissions and intermissions, till the following July, after which time it ceased for the next two or three years. From Moulmein it continued its course in the autumn of 1842 due south, reached Tavoy, the second chief town of the Burman empire, about 150 miles distant, in November, and Margui, about the same distance still further south, in January, 1843. The disease pursued, it was generally believed, a like course throughout the Malay peninsula and Siam.

Throughout this entire progress from north to south it attacked, chiefly or exclusively, the towns and villages situated in low marshy places, on the banks of rivers or on the sea-shore, and did not extend much inland, so that the Burmese were accustomed to escape it by leaving their houses and travelling into the jungle. After the second or third day's journey they invariably got rid of it, it was alleged. The Philippines, among other groups of the Indian Archipelago, experienced a second visitation in 1842. How long the disease lasted there, and whether it was widely diffused or not in the Indian or China seas during the next year or two, I am unable from want of data to say.

During the spring of 1845, the cholera is known to have prevailed with great violence along the banks of the Indus, and, somewhat later in the season, in the north-west provinces of India. It broke out in Cabool at the commencement of the hot season, and from that period till June devastated whole districts in the Punjaub and in Affghanistan. At Loodiana and Ferozepore its ravages were frightful. Umballa was attacked in July; from the 10th of that month till the beginning of September the 31st regiment lost one hundred and forty-two out of three hundred and thirty-two attacked. Soon after it had appeared at Umballa, it broke out in the hill districts, and extending down the country attacked Kurnaul, Meerut, Cawnpore, and other towns. During the five or six months of its continuance, it travelled from the north-west about as many hundred miles in a nearly southerly direction, sweeping away whole villages in its course. From Cabool the pestilence seems at the same time (the summer of 1845) to have been extending westwards into Persia, traversing that country from east to west, and spreading northwards into Tartary and southwards into Kurdistan and the Pachalic of Bagdad. In September it was at Samarcand, and one account states that it was in Bokhara in November.

After being quiescent during the winter of 1845-46, it broke out with extreme virulence at Teheran in May, destroying in a few weeks twenty thousand of the inhabitants. The disease was of the most intense malignancy, many persons being smitten with death from the first, and expiring in a few hours without vomiting or convulsions. Contemporaneous with this state of things in Persia, occurred the dreadful outbreak, in June, among our troops in Kurrachee at the mouth of the Indus—an outbreak which recalled the memory of the terrible disaster in the camp of the Marquis of Hastings in 1817.[1]

From Teheran it spread in two directions—one to the south-west in the line of Ispahan, Shiraz, and Bagdad; and the other towards the north-west in the line of Tabreez, where it broke out in September and was most destructive. Its course was extremely irregular and wayward; passing over wide districts for a time, and appearing at different points remote from each other, it subsequently visited these districts, although no change either in the condition of the people or in the intercommunications of the country had occurred in the meanwhile. While Tabreez, as well as Reschd and other places on the southern shores of the Caspian, were suffering, diarrhœa and dysentery prevailed extensively among the populations to the north and west. The same thing had been observed in Persia generally for weeks and months prior to the invasion of the pestilence. In October, cases occurred at Salian and Lankeran, frontier Trans-Caucasian towns in Russia, and at Khoi, Matsan, and Bajasid, in Armenia. Meanwhile it had spread from Bussorah, at the head of the Persian Gulf, to Mousul and Diarbekir on the Tigris, threatening Syria from that direction. Mecca was smitten in December.

Early next year, 1847, it appeared to the west of the Caucasus, and ravaged the Russian army in Circassia. In May it was at Tiflis, and also at Astrachan, where it raged with the greatest force about the end of July. The towns of Kars and Kutais, west of Erivan and Tiflis, were attacked about the same time.

Many places in the Black Sea and Sea of Azoff—such as Taganrog, Kertch, Mariopol, Odessa, &c.—suffered about midsummer, and subsequently the disease spread in a northerly direction towards the inland provinces of Charcow, Kiev, &c. It was at Batoun in August, and at Trebizond and Erzeroum in September. At the end of that month Moscow was invaded; and in the middle of October, so widespread was the pestilence, that, without counting Georgia and the

[1] More than three hundred European and native soldiers died during the first forty-eight hours after the invasion. For the next five days the death-storm lasted, and then began to abate, but with occasional exacerbations. By the end of the month, upwards of four hundred more of the troops had perished. The mortality among the camp-followers and inhabitants of the town amounted to several thousands. Before the pestilence entirely subsided at Kurrachee, it had appeared at Hydrabad and other places higher up the Indus.

Caucasus, it was prevailing in sixteen different governments of the Russian empire, while at the same time fresh outbreaks had taken place in the North of Persia and also at Bagdad. About the end of October cases began to appear in and around Constantinople; influenza had been prevailing there just before.

In the middle of November, the most westerly points which the cholera had reached were Alexandrof, in Kherson, and Olgapol, in Podolia, not above thirty miles from the Austrian frontier. It had spread northward from Moscow to Novgorod, and also nearly due west to Dwinaberg, near Riga, within forty miles of the Prussian territory. Sporadic cases had by this time occurred not only in different parts of Germany and along the southern shores of the Baltic, but also in France and Britain, as well as in Malta and other places in the Mediterranean, along with an unusual prevalence of diarrhœa and gastro-intestinal ailments, which were often accompanied with typhoïd symptoms. The same thing had been observed in 1831-32. For some years prior to 1847, a marked increase in the number of deaths from diarrhœa and summer cholera had occurred in England. The winter and spring of 1847-48 was the epoch of the next widespread epidemic of influenza since 1837. During the winter months the whole of the west of Europe, between the parallels of the north of Scotland and of Algiers, was affected by this epidemic. It had previously spread over Russia, Poland, and Turkey. Besides influenza, epidemic typhus, which had commenced the year before—memorable for the potato blight—acquired much force in 1847; and from being associated in many districts with scurvy (which was then more extensively prevalent in Europe than it had been for the preceding fifty years) it was disastrously fatal.

In 1848, the cholera continued to prevail very widely over the Turkish empire, from Trebizond and Brussa to Constantinople, Bucharest and Galatz in one direction, and to Beyrout and Alexandria in another; also in numerous provinces of Russia, from the Black Sea to Warsaw, Petersburg, and Finland. The chief ravages occurred between June and September. Advancing through Austria into Germany and Hanover, it reached Berlin in August, and Hamburg about the beginning of September. Belgium and Holland were affected soon afterwards; and, by the beginning of October, cases had occurred both in England and in Scotland, and about the very same time at Bergen, in Norway. Six or seven weeks later, the disease appeared in Belfast.[1] It was in the last week of November that it manifested itself, at sea, on board two emigrant vessels bound the one for New York and the other for New Orleans, when they had been out the former sixteen days, and the latter twenty-seven days, from Havre, which was unaffected at the time of their departure. The circumstances attending the nearly simultaneous appearance of the disease in two vessels traversing the Atlantic, and about a thousand

[1] The disease must have been at or near to Vigo about this time, as the Board of Health of that Spanish port published a short report on the subject in November, 1848.

miles apart, are among the most curious on record in the history of epidemic cholera. The disease did not extend beyond the limits of Staten Island hospital, at New York, after the arrival of the infected ship there; but at New Orleans it seems to have spread rapidly, not only in the hospital but also in the city generally, although it did not exist at the time in any other part of the United States.

France had become infected towards the end of 1848; the disease appears to have passed from England to Fécamp, Douai, and other towns in the north of France, and not to have reached Paris till February, 1849; whereas, on the former occasion it leaped, so to speak, from London to the French capital, leaving the intermediate districts unaffected for a considerable time. Paris this time suffered most severely in June. The south of France was now attacked much sooner than in the first visitation, after the manifestation of the disease in the country. After having reached the department of Charente, and then the Gironde, Languedoc, Gard, &c., it appeared at Marseilles in August, and soon afterwards at Toulon, Nice, Genoa, Leghorn, and thence on as far south as Naples and Brindisi, notwithstanding every attempt to arrest its progress. The great city of Lyons, which had remained intact on the first visitation of the pestilence in that part of France in 1834–35—owing, as the pious inhabitants have recorded on a tablet over the front of the church of Fourvières, to the interposition of the Madonna—did not wholly escape; it was partially affected in the autumn, when the disease was prevailing with much greater severity at Avignon, Valence, and the adjoining districts. The Italian frontiers of the Swiss canton of Ticino, and in and around Mendrisio, which had been scarcely touched on the former visitation, were now much more decidedly infected. These facts indicate that the diffusive energy of this epidemic was considerably greater than that of its predecessor.

Towards the end of 1849, Tunis, Algiers, Oran, and other places on the north coast of Africa, suffered; but whether the course of the disease along the southern shores of the Mediterranean had been throughout from east to west, or whether it had passed over from the southern shores of France or Spain, it is impossible, from the want of data, to say.

In the New World, the disease, which had broken out at New Orleans in the second week of December of the previous year, seemed to extend northwards up along the valley of the Mississippi, as it appeared at Memphis towards the end of that month, at St. Louis in the first week of January, 1849, and at several places on the upper Mississippi in March. Chicago and other towns, situated on the chain of the great lakes, were affected in May. It was not till then that New York was visited by the epidemic, notwithstanding the importation of the disease at Staten Island, and the occurrence of several cases in the hospital there, six months before. Nearly about the same time, Philadelphia, and the chief cities on the seaboard of the United States, became infected.

Throughout Canada the disease prevailed extensively at various points of the province, chiefly between the months of July and September. It was believed by many of the residents that, on this occasion, it reached Montreal and Quebec from the westward, and not from the sea coast, as it did in 1832. Only a few cases occurred at Grosse Isle, the quarantine station on the St. Lawrence, below Quebec; whereas, on the first visitation, this station suffered very severely.

It thus appears that the pestilence, in this its second great migratory course both in Europe and in North America, spread much more rapidly from country to country, and invaded a larger area of the world's surface (and with more deadly consequences, it may be added) than in 1831-32. In Germany, many districts to the south of the Danube had been visited for the first time, as well as various portions of the southern Rhineland. Cologne suffered very severely in the autumn. In England and Wales, the deaths from cholera in 1848–49, exclusive of those from diarrhœa, amounted to 54,398; whereas, in 1832–33, they were estimated at 30,924. In London, the mortality was, making due allowance for the great increase of population in the metropolis in the interval, less by at least two-fifths on the first than it was on the second visitation.

1850.—Although the epidemic of last year, so widely spread over Europe and North America, nearly ceased in most places during the following winter, and although the state of the public health generally in our own and several other countries, which had suffered most severely, was, on the whole, favourable during 1850, yet the cholera was far from being extinct throughout this year.

China, including the island of Macao, Cochin-China, and various parts of India, suffered much during the spring and early summer.

There was a sudden and unexpected outbreak at Halbertstadt, near Magdeburg, in April; and several towns in Ireland were the seat of attacks in the spring. From July to September and October it existed with varying intensity in Sweden and Norway, in Denmark and Schleswig-Holstein, at Lubeck, and also in several points of the Austrian dominions. About the same time it raged at Alexandria, Cairo, and especially at Suez, where its ravages were dreadful. The whole of the northern coast of Africa, from Egypt to Algiers, and probably still further in that direction, seems to have been under the pestiferous cloud. At Tunis, it had reappeared in the spring, and reached its acme in June. Tripoli was ravaged about a month later. Malta became affected in June, and the sickness continued till October. The small island of Gozo suffered in July; and in the following month Cephalonia, one of the Ionian group, experienced a disastrous visitation — "the maritime population was reduced to famine by the rigid quarantine, which excluded them from all intercourse with Greece and with their brethren."

In the New World, the disease continued to prevail over a wide extent of North America. Halifax was affected in the autumn. New York and Washington (where the President fell a victim) suffered during the summer months; and, indeed, most of the Southern States were more or less severely visited between June and August. About the same time, or rather earlier, the epidemic had spread over a great extent of Mexico. The city of that name, at an elevation of many thousand feet above the sea level, lost nearly 8000 of its inhabitants; and St. Luis Potosi, Jalapa, and Vera Cruz (which appears not to have been attacked before August), also suffered greatly. California also, it is believed, was likewise visited; and we know that Chagres and other places on the isthmus of Panama were the seat of the disease during the autumn. When it first appeared in these parts it is not possible to say; probably in early summer; for at that time Bogota, the capital of the Caraccas, and many villages along the course of the river Magdalena, as well as the towns of Carthagena and Santa Martha on the coast, were affected. Moreover, Havanna and other places in Cuba were also very sickly throughout the summer; the mortality among the slaves in many districts was appalling. In September, the disease broke out on the south side of the island.

In the first week of October occurred the earliest cases of the epidemic in the adjoining island of Jamaica (which, as well as the other British West India islands, entirely escaped in the first visitation), where it rapidly spread with destructive fury during the remainder of the year.

In 1851, fewer parts of the earth's surface seem to have been the seat of the cholera than had been the case for some years past. In Europe the only places where, as far as I know, it existed, were some districts in Poland and in Silesia, between August and the end of the year. Breslau was about this period the seat of a pretty sharp attack; the disease, according to one statement, having reached that city from Bohemia, which had experienced considerable mortality in different districts.

In Algeria, Oran and other adjoining localities again suffered in July and August. During the summer a severe outbreak occurred in the island of the Grand Canary, in lat. 28° 30′, off the N.W. coast of Africa. No other island of the Archipelago was affected. These isolated invasions are among the most interesting phenomena in the history of epidemic cholera. The origin of the disease could not be traced. Suspicion fell upon a vessel which had arrived from the Havanna about three weeks before, but no cases had occurred on board of her during the voyage from the West Indies. The earliest cases among the inhabitants were observed in a poor and filthy part of the town about the beginning of June; then the disease rapidly spread, and occasioned a dreadful panic, followed by an enormous loss of life. While the Grand Canary was being depopulated by the cholera, two of the Cape de Verde islands, further to the south, were ravaged by a malignant fever, which carried off, it has been said, two-thirds of the population of St. Vincent. The weather previously had been exceedingly stormy, and had caused the destruction of the crops, so that the people were in the greatest destitution.

There was a partial and limited reappearance of the cholera in Quebec and some other towns in Canada, also in various parts of the

United States, during the autumn months of this year. The pestilence continued to prevail during the spring in Cuba and in Jamaica, but with diminished force: in the latter island it ceased about the beginning of summer, and was followed by an epidemic of small-pox.

1852.—The disease, which had broken out last year at Bussorah and other places in the south of Persia, spread to various other districts of the country during this year. Following the course of the Tigris, it reached Bagdad in the spring; and thence traversing Kurdistan, extended into Azerbijan, ravaging its capital, Tabreez, with great fury. It then seems to have followed a S.E. course, along the borders of the Caspian Sea, but not to have spread onwards at present to the Russian frontiers. The cholera in Persia was followed by the small-pox in the course of the autumn.

Many parts in Northern Russia, and also in Poland, suffered during the summer and autumn; but the disease seemed not to have reached these countries from the East, but to have sprung up spontaneously. It broke out suddenly in Seeradz, in the government of Warsaw, towards the end of May, and spread in every direction, but in the most irregular manner; sometimes concentrating itself in certain localities, and then unexpectedly appearing in places at a distance, while the intermediate regions were for the time left unscathed. In Warsaw the epidemic reached its height in August, and lasted till the end of September; 20,000 persons perished. The town of Kalish, on the frontiers of Prussia, suffered severely in June; and Ostrowo and Pleschen in the Duchy of Posen were attacked in July and August. Dantzig was affected soon afterwards, and later still, Berlin and Landsberg, together with many other places in Brandenburg and Silesia. In Petersburgh the earliest cases occurred in October; the disease continued, but without much force, till the following May, when it subsided.

The almost tropical heat of the summer occasioned an unusual amount of general sickness not only on the Continent,[1] but also in this country. Although a large number (1381) of deaths from summer cholera occurred this year in England and Wales, and although, also, the annual mortality from diarrhœa had been steadily on the increase during the previous three years, there was no evidence of the genuine epidemic cholera having again manifested its presence among us.

In Quebec and other places in Canada, there was a slight reappearance of the disease during the autumn. The United States, also, and chiefly the western provinces (in Indiana, there had been a recurrence every year since 1849), were affected in the summer. Various places, too, on the isthmus of Panama, and the island of Cuba, continued to be the seat of the pestilence; the port of St. Jago de Cuba was attacked for the first time in September, and now the group of the Bahama islands became affected about the same time; the disease lasted there till November.

1853.—There was during this year a marked increase in the diffusion

[1] Malta was the seat this summer of a rapidly-fatal fever, which caused great mortality in Valetta.

and epidemic force of the cholera; there was, moreover, a great prevalence in different regions of various other zymotic diseases.

In the spring,[1] Teheran and its environs became the scene of a most severe visitation, which reached its acme in May and June, and by which it was calculated that 15,000 persons out of a population of 100,000 perished. By the beginning of August the disease had ceased there, but it still prevailed in the eastern and southern provinces of Persia; in some places at great elevations, as at Emmenah, 7000 feet above the level of the sea. During the same period it continued to prevail in European Russia, as at St. Petersburgh, Abo, Helsingfors, Riga, &c., in the north; also at Moscow, where, this time, the disease seemed to have come not from the East, as on former occasions, but from the direction of Warsaw and St. Petersburgh. The visitation was comparatively mild; various places in the governments of Kiev and Tola suffered severely.

Stockholm, after an immunity of nineteen years, Gothenburg, Christiania, and other places in Sweden and Norway, were attacked between July and September or October; and in many of them there was great loss of life. In Denmark, particularly in Copenhagen, it raged with extreme violence in June and July, all the inhabitants who could do so flying from the city.

In Breslau, the capital of Silesia, the disease had appeared early in the year, and continued during the spring and summer; but it was chiefly from July to September that the towns in the north of Prussia, such as Dantzig, Thorn, Berlin, and various places in the Baltic provinces, which had been affected the year before, again suffered.

Meanwhile the south-eastern and central districts of Europe were also affected. Numerous places in Bessarabia, Moldavia, and Wallachia, besides the towns of Odessa and Jassy, were attacked between August (if not sooner) and the latter part of the year. The Russian army in Bessarabia suffered much in August and September. In Gallicia and some other parts of the Austrian empire, the disease manifested itself a month or two earlier.

In the south-eastern departments of France, too, it appeared in the autumn. While that of the Drome was suffering severely, Lyons experienced its second visitation; this was more severe than that of 1849, although still comparatively mild for so populous a manufacturing city; for the number of attacks did not exceed 400 out of a population of 300,000.

The district of Racconigi, lying to the south of Turin in Piedmont, appears to have been the seat of the disease at or about the same time; it is also known that the southern province of Portugal, the Algarve, was infected in the course of the autumn.

In Paris, where there had been much choleraic disease in the spring, followed by a severe and fatal epidemic of typhoïd fever during the summer and autumn, cholera made its appearance in November.

For two or three months prior to this period, the epidemic had been manifesting itself along the shores of the Baltic and the German

[1] Peshawur and Khorasan were the seat at this time of a destructive pestoïd fever.

Ocean, appearing in the Hanse Towns, Hanover, Holland, and on the coast of Great Britain. In Hamburg it appeared in July, the month after its outbreak in Copenhagen; Lubeck, Hanover, Holland, and this country seem to have been infected in August. The first cases of the epidemic in London were observed in that month; and at or about the same time several suspicious cases, some fatal, occurred at Stockton, Hartlepool, &c. Newcastle was smitten soon afterwards with extraordinary severity.

On the coast of Barbary the disease is known to have existed in some places, as in Tripoli, &c., from April to November.

In the New World, besides various parts of the United States, as New York and New Orleans, in both of which cities it was present towards the end of the year, there was about the same time a marked extension of the epidemic poison among the north-east group of the West India islands. Virgin Gorda, St. Thomas, and Tortola were invaded in December. Nevis also, one of the North Caribbean group, was attacked in the same month. Early in the year and through the spring and summer, the disease is known to have been present in the city of Mexico; also in Jalapa, and at Vera Cruz.

1854.—This year is memorable for the extremely wide extension of epidemic cholera over Europe. From the Gulf of Bothnia to the coast of Morocco, and from the Black Sea and the Levant to our own shores, there was scarcely a land which escaped its influence. In the beginning of the year it had continued to manifest its presence in those countries near the mouth of the Danube, which were soon to become the theatre of war. Both Varna and Odessa are known to have been affected in January. As the season advanced, the sickness increased in and around these towns, and over all the adjoining provinces where the Russian and Turkish forces were encamped on the opposite sides of the Danube. The French and English troops, which arrived in the Dardanelles in the summer, became affected soon afterwards. The vast increase of the disease in the allied armies in Bulgaria, the dreadful disaster among the French division sent to the Dobrudscha, the sickness in the fleets off Varna, and the great mortality among the troops on shore until the sailing of the combined force for the invasion of the Crimea, together with its persistence among the troops there after the landing, are striking episodes in the history of the epidemic during this year. Northern and Central Europe had been suffering during the same period. Almost every Russian port in the Baltic visited by the allied fleets was the seat of the disease, and the fleets themselves experienced a considerable amount of sickness. At Bomersund the troops, landed there, suffered a good deal. Hamburg, Holland, &c., did not escape.

All Germany was more or less affected between June or July and October. Many parts of the Austrian empire, of Saxony, Bavaria, &c., were seriously attacked during the summer and autumn; and, during this season, the pestilence penetrated to several places which had hitherto remained intact in all former visitations. This was the case with North Switzerland and Savoy. The cantons of Argovia and

Zurich, and also the districts of Chambery and Annecy, were visited for the first time this autumn—Chambery in August, and Annecy in September. The southern frontiers also of Switzerland suffered more this year than they had done in 1849. This remark applies equally to Piedmont generally. All Italy, from Lombardy and Venetia to Sicily, may be said to have felt the breath of the pestilence. Nice, Turin, and neighbouring towns, Milan, Venice, Genoa, Leghorn, Florence, Rome, Naples, Palermo, &c., were affected simultaneously in July and August. Messina, the second town in Sicily, which had escaped in former visitations, was then smitten, and with great severity.

In one direction, Greece, with some of the islands in the Archipelago, and away on to the coast of Syria, and in the opposite direction, the island of Sardinia (slightly), and the Iberian Peninsula, were affected about the same period. The cholera broke out among the French and British troops at the Piræus in June and July, but it did not spread to Athens, only six miles off, till October. The island of Syra was affected in August.

Spain, throughout its length and breadth, was visited by the disease during the year; scarcely a province escaped. In the neighbourhood of Vigo, and other parts of Gallicia, it had appeared in the early spring; but the great prevalence over the country generally, from Barcelona to Seville and Cadiz, and from Corunna and Vigo to Alicante and Malaga, was between June and October. The Balearic islands did not entirely escape.

Various parts of Portugal, from the province of Minho on the north to Algarve in the south, were invaded. Much choleraic diarrhœa prevailed in Lisbon during the summer, but no decided case of cholera occurred there till the following year.

Gibraltar was visited slightly; the Spanish districts, immediately adjacent to the rock, suffered considerably more severely.

Never had France suffered so fatally from the cholera as during this year. It reappeared in the spring in Paris, and other parts of the empire, and continued to prevail throughout the summer and autumn with great severity. Marseilles was long a focus of the disease: the constant arrivals of large bodies of troops on their way to the seat of war in the East served, as is always the case with the congregation of masses in epidemic localities, to keep up the activity and to aggravate the operation of the poison. Many transports and ships of war left the port with cases of the disease on board. The entire mortality from cholera throughout the year in France was not less than 150,000, while, in 1849, it did not exceed 102,000. Corsica was the seat of a severe outbreak during the autumn.

Great Britain, although sharply attacked in some places, suffered much less than France. The mortality from cholera throughout the year in England and Wales was rather more than 20,000, and from diarrhœa and dysentery 22,000 more. In Scotland, from August, 1853, to November, 1854, 6848 persons died of cholera.

While the south-eastern provinces of Spain were affected, the disease existed at the same time—July and August—on the African shores of the Mediterranean, at Tunis, Tripoli, and Algiers. Fez, in Morocco, seems to have suffered a month or two later.

It was stated at the time that cases of the disease repeatedly occurred on board several British and French transports, just before reaching Malta. There was, however, no epidemic prevalence in that island this year.

Across the Atlantic, numerous places which had escaped in former visitations were invaded. Newfoundland was attacked, for the first time, in August; the disease had been existing for a month or two previously in Canada and New Brunswick. Many parts of the United States and of Mexico were more or less affected during the summer and autumn months. The disease was in Honduras at the beginning of the year, at which time Cuba (where it seems to have been almost constantly present), Jamaica partially, the Virgin group, and the island of Nevis were also infested. In June, it began to appear in Barbadoes and Grenada; afterwards at St. Lucia, and in September at St. Vincent and Trinidad. St. Kitts, although close to Nevis, was not attacked till November. The French island of Guadaloupe also suffered this year. At Tobago, a strong tendency to choleraic affections was observed, while Barbadoes, Grenada, and Trinidad were suffering; but no fully developed cases seem to have occurred there.

Passing to an opposite quarter of the globe, we find that the island of Mauritius, after an immunity from the pestilence for thirty-five years, was the seat of an epidemic outbreak this season. The disease began in April, and continued till August.

1855.—In most of the countries of Europe where the cholera had prevailed last year, it continued or reappeared with more or less severity during the present one. In St. Petersburg, it seems to have become almost endemic. Throughout the Turkish dominions, from Volo and Larissa in Thessaly to Kars in Armenia, its pressure was almost everywhere felt. Wherever the troops of the Czar, or the nations at war with him, were stationed, there the disease infallibly appeared at one period or another. At Constantinople and Varna the greatest amount of sickness was in April and May; before Sebastopol, and at Sinope, during May and June. From May till the end of autumn it prevailed in Alexandria and Cairo; many cases occurred also at Tripoli during the summer. In October and November it existed in Palestine.[1]

Throughout Central and Southern Europe the pestilence was very widely diffused. Between the beginning of May and the end of November, Austria alone is said to have suffered a loss of two hundred thousand souls; her immense army was paralysed in consequence. Vienna, Pesth, Prague, and other towns were most affected in June, and various places in Venetia and Lombardy were extremely sickly about the same time.

The disease penetrated further into Switzerland this summer than

[1] Domestic Life in Palestine. London, 1862.

it had yet done; for, besides Basle and Geneva, the town of Zurich was visited for the first time in the months of July and August. The canton of Ticino, and the adjoining district of Lugano, had been affected a month or two before. Naples suffered partially during the summer, and, simultaneously, some points in the island of Sardinia. Several of the provinces of Spain, as Andalusia, Estremadura, &c., were again the seat of the disease during the spring and early summer. In Arragon, Zamora, Logrono, and Valentia, it was prevailing during February and March; and in Madrid during April and May. Various places on the Douro were affected in May and June; and, after an unusual prevalence of stomach and intestinal disorders for three or four months in Lisbon, the first cases of developed cholera in that city were officially admitted by the authorities in October.

In France, as well as in Great Britain, the disease continued to manifest itself in a few scattered localities, but only to a very limited extent. In our own country, it was succeeded by a widespread and severe epidemic of influenza, which was more fatal than had been known since 1847–48.

In the West Indies, the widespread prevalence of the pestilence over the Windward islands had subsided by the end of 1854. It still existed in St. Kitts at the beginning of the present year. Sporadic cases occurred in some districts of Jamaica about the same time. Towards the end of the year the disease visited, for the first time, the Spanish island of Porto Rico. Cuba was seldom free. Brazil, too, experienced its earliest visitation in the course of this year. Para was affected in May, and Rio Janeiro from July to October, and other districts, as St. Catherine's and Rio Grande, about the same period.

The Caraccas, where the pestilence had appeared five or six years before, again suffered. It was in this year that the Cape de Verde group were first affected. The disease appeared in the island of Fogo, at the beginning of July. It was conjectured to have been introduced by a Sardinian emigrant vessel from Savona, bound for Buenos Ayres, which had touched there. All that could be learned, or at least that was ever made known, was that many of the passengers were in a sickly state, and that there had been some deaths during the voyage; but no reliable information as to the true nature of the sickness on board was ascertained at the time. None of the other islands of the group were attacked till the following year.

1856.—The northern provinces of India experienced a widespread and very fatal epidemic from May to August. Nearly 100,000 persons are said to have perished. In Russia, for some years past, the cholera seems to have never entirely disappeared from some of the provinces of the empire. Wherever large bodies of troops had been encamped the disease was pretty sure to show itself. During the present year it was at Moscow in August, and so severely that the coronation of the Czar had to be deferred. In the same month, Stockholm is known to have been affected. Numerous places in

Turkey were the scenes of partial outbreaks. The southern countries of Europe suffered more than the northern. Messina experienced a re-visitation in August and September. In Malta, also, numerous cases occurred. Many districts in Spain and Portugal were again ravaged by the disease. Cadiz and Seville suffered severely in the summer, and Lisbon and its neighbourhood between July and October.

Along the entire line of the north coast of Africa, from Alexandria to beyond the Straits of Gibraltar, the disease seems to have been prevailing, during the summer months more especially. Tripoli, Tunis, Bengazi, and Mesurata, in Barbary; Mogadore and Saffi, in Morocco, are mentioned as places which were affected. Nearly on the same parallel of latitude (32°) as Mogadore, and about four hundred miles westward, lies Madeira, where the pestilence appeared for the first time during this summer. The neighbouring island of Porto Santo was also visited.

Seventeen degrees to the south of Madeira are the Cape de Verde islands, three of which, St. Vincent, St. Antonio, and St. Nicholas (Fogo had been attacked last year), were invaded in the autumn. About the end of August, or beginning of September, upwards of two thousand died in St. Antonio within a fortnight after the appearance of the disease. The intermediate group of the Canaries had remained exempt since the visitation, in 1851, of the Grand Canary. These data are of great interest. The island of Mauritius experienced another visitation after an interval, this time, of only two years. The cholera appeared in March, and lasted till June. In the Gulf of Mexico, Porto Rico continued throughout the year to be infected; and in the island of St. Thomas there was a return of the scourge during the summer and early autumn. On the Spanish main, Nicaragua, Costa Rica, and Venezuela were all the seat of the disease. British Guiana became affected towards the end of the year; and the Dutch island of Curaçoa, one of the Leeward group, also suffered at this time.

In Brazil, the pestilence continued to prevail in all the districts where it had made its appearance in the previous year.

My memoranda of the geographical distribution of epidemic cholera after 1856 are too scanty and unconnected to enable me to follow any further its course or extent of prevalence. I shall, therefore, merely add that the countries and parts of the world which, to the best of my knowledge, had remained down to that period exempt from any visitation of the pestilence, were Australia, New Zealand, and other islands in the Pacific; the Cape of Good Hope and adjoining settlements; the east coast of Africa, from the Cape as far to the northward as the Gambia, and including the islands of St. Helena and Ascension; the Azores, Bermuda, Iceland, the Faroe islands, and also the Orkney and Shetland; the southern half of the eastern coast of South America, from the Rio Plata, inclusive, to Cape Horn, and the whole of the western coast of that continent, from the Cape and along the shores of Chili and Peru to Panama.

ART. III.

On the Functions of the Cerebellum. By WILLIAM HOWSHIP DICKINSON, M.D., Cantab., Fellow of the Royal College of Physicians, Curator of the Pathological Museum, St. George's Hospital; Assistant-Physician to the Hospital for Sick Children.

EVER since anatomists learned to distinguish the several parts of the encephalon from each other, the function of the cerebellum has been the subject of speculation. Their conjectures are various and contradictory.

Galen thought that the cerebellum must be the source of a large amount of vital force, since it was the origin of all the nerves distributed through the whole body. After his time the belief seems to have prevailed that the ventricles, not the substance, were the active part of the brain. According, however, to the statements of later writers, it had been customary for the early anatomists to regard the cerebellum as the seat of memory. "To show that memory is placed in the cerebellum, they plead that the substance of the part, being harder, is best qualified to retain impressions; and that we are apt to scratch the hinder part of the head when we are eager upon calling anything to mind." (Pierre Dionis.)

Varolius claims to have been the first to teach that the cerebellum is the seat of the faculty of hearing.

Our own countryman, Willis, writing in the year 1664, thus speaks of the organ: "Some affirm this to be another brain, and to perform the same actions with it; but if any one should have a soft and foolish brain I greatly doubt if he should become wise, though he should obtain perhaps a more hard and solid cerebel." He finally argues that this part of the brain is the source of involuntary motion, instancing the action of the heart, the movements of the bowels and respiration. He dwells upon the voluntary character of cerebral operations, but maintains that "the spirits inhabiting the cerebel perform unperceivedly and silently their works of nature without our knowledge or care."

Henry Ridley, towards the end of the same century, endorses the opinion of Willis as regards the heart and the alimentary canal, but refines upon the question of respiration, holding that a "sensitive faculty" resides in the cerebellum, which receives impressions from the lungs through the pneumogastric nerves, and transmits them to other parts which are the true source of the respiratory movements.

Boerhaave was of opinion that the heart and the muscles of respiration derived their power from the cerebellum; and his commentator, Van Sweeten, more than half a century later, adopts the view, though at the same time he states some objections which would appear fatal to the theory.

Haller considered the preceding views to be amply confuted by the fact of the cerebellum giving origin to the fifth cranial nerve, and as a necessary consequence being a seat of sensation, as well as a source of voluntary muscular power.

Rolando, after many experiments on living animals, came to the conclusion that the cerebellum was the cause of all muscular movements. Gall, and after him Broussais, and many others, maintained that the sole function of the organ was to preside over the act of reproduction. Flourens, reasoning from the effects of the partial removal of this portion of the nervous system in birds and mammalia, argued, from the muscular disturbance which resulted, that the office of this large portion of the brain was to regulate or "coördinate" voluntary movements. The muscles, according to this view, derive their nervous supply from some other source, while the cerebellum merely regulates and directs its distribution.

Serres, who shortly afterwards made experiments in which lateral injuries were inflicted upon the organ in horses and dogs, states that loss of power in the side opposite to the wound was a constant result. Bouillaud, four years later, who made a wider series of observations bearing upon the same question, denies that paralysis was occasioned by such partial removals as he practised, and concludes that the only office of the cerebellum in vertebrate animals is to maintain such equilibrium between the two sides as is necessary for the performance of locomotion. Thus he limits the co-ordination theory to the harmonizing of the movements of the right and left limbs. The theory of Flourens has since been supported by Longet, Hertwig, Budge, and Carpenter.

Majendie relates experiments and cases to prove that a power resides in the cerebellum which continually impels to forward movement; which, in a natural condition, is balanced by forces generated in other parts of the brain, which tend to produce retrogression.

Foville holds that the organ is a seat of sensation. Wagner, while yielding a partial assent to the doctrine of Flourens, revives the theory of Willis as to the influence of the organ upon the involuntary muscles. Finally, a physiologist no less distinguished than Brown-Séquard, holds that clinical observation and vivisection agree in showing that the cerebellum has not any of the functions with which it has hitherto been credited.

This diversity of opinion as to the use of the cerebellum has suggested a further inquiry; and it may be well to say a word in starting upon the principles on which it has been pursued.

In all the vertebrate animals the brain is divided into the same great divisions—the medulla, the hemispheres, the optic and olfactory lobes, and the cerebellum; and it may be inferred that the function of each of these grand components is invariable. It is not necessary to justify this assumption.

As to the cerebellum in particular, not only does it always hold the same position and maintain the same connexions, but it has a peculiar microscopic structure which is different from that of any other part of the brain, and which is essentially the same in whatever part of the animal kingdom it may be examined. There can, then, be no doubt as to the identity of this organ throughout the vertebrate class; and it may be fairly assumed that its function, whatever that may be, is actually the same everywhere.

Under these circumstances, observations made upon the lower animals will supply deductions which will be equally applicable to the higher; and experiments of a conclusive kind will be possible, such as mammals and birds have not sufficient tenacity of life to survive.

Commencing with those animals in whom the cerebellum is least developed, it will be first ascertained what are the capabilities of the subject of the experiment when left with the medulla oblongata as the only remnant of the encephalon. In a similar animal, if an operation then be performed in all respects the same, except that the cerebellum is left in attachment to the medulla, a comparison may be made which will display, in the powers or susceptibilities which the one has more than the other, the functions of the organ of which the possession constitutes the only difference. Finally, it will be ascertained what is the effect in each species of the removal of the cerebellum by itself.

By this system it will be easy to ascertain what powers belong to the medulla with the spinal cord; and what additional faculties are proper to the cerebrum on one hand, and the cerebellum on the other. The properties of the cerebellum can thus be estimated in two ways. We may measure the gain to the animal which this organ makes, as an addition to the medulla; and conversely, we may find what is the loss when this alone is subtracted from the nervous system.

The positive results of the experiments made on this system have been entered into a table, in which the species have been arranged in an ascending scale, according to the weight of the cerebellum, compared to that of the central nervous system.

Some of the experiments will be also given in detail. All observations of a merely negative character will be omitted, both in the table and in the detailed accounts, and given together subsequently.

The accuracy of every experiment has been verified by examination of the parts after hardening in spirit.

Some of the observations will now be more fully given, commencing with those which display the effect of the additions of the cerebellum to the medulla.

ADDITION OF CEREBELLUM TO MEDULLA.

Common Snake.—Two snakes were taken, and the hinder part of the skull was cut away in each—a work of some difficulty, owing to the great hardness of the bone. In both of these the cerebrum was separated from the medulla by a transverse section close behind the optic tubercles, and the cerebellum was then taken away from the medulla with cutting forceps, so that in each case only the medulla oblongata was kept in connexion with the cord. Subsequent examination proved that this centre was left unhurt, and that the separation was complete.

In both there was a moderate loss of blood. The animals became collapsed, and apparently lifeless. They were closely watched, and no further signs of life were noticed, excepting trifling movements of the body, under irritation, evidently of a reflex character; mere wriggling

Table *showing the capabilities of some of the Lower Animals when deprived of definite portions of the Encephalon; arranged in an Ascending Scale, according to the Proportionate Weight of the Cerebellum compared to that of the Central Nervous System.*

(The figures in brackets refer to the number of times the operation has been successfully performed.)

Subject of experiment.	Proportionate weight of cerebellum to central nervous system.	Whole encephalon removed or isolated excepting medulla oblongata.	Possessing medulla oblongata and cerebellum.	Possessing medulla oblongata and cerebrum.
Common Snake	1 to 200	Immediate collapse; no further sign of life except a few weak wriggling movements on irritation; no evidence of consciousness. (2.)	Feeble locomotion; head and neck pushed passively along by motion of trunk; resists manipulation, with every appearance of consciousness. (2.)	Active when irritated, but at other times unusually sluggish; movements sudden and emotional; apt to roll over in water and on land. (4.)
Frog	1 to 160	Temporary collapse; feeble, irregular progression, by means chiefly of hinder limbs; head depressed. (4.)	Temporary prostration; vigorous walking; movements general and regular; head depressed; no hopping. (2.)	No evident loss of activity or of power of co-ordination. (3.)
Salamander ...	1 to 112	The animal which suffered least walked regularly, naturally, and for considerable distances; it made regular swimming movements, which were wanting in vigour; all the limbs were used as before. (3.)	Walked well, and swam vigorously and steadily; all the limbs used naturally; more quiet than natural. (1.)	Walked in an irregular manner and rolled over and over in water with much rapidity; made efforts to steady itself.—*Note.* Not possible to be quite certain of amount of injury. (2.)
Common Toad.	1 to 101	Shuffled about on the belly with irregular movement, which could scarcely be called walking; hind legs used most; appeared sensitive; tried to remove irritation from any part of the skin. (2.)	Holds the head down; walks about freely, regularly, and well; swam naturally, but feebly; hind legs used most. (3.)	Fore legs rather straighter than natural; walking and swimming with natural regularity and activity. (2.)
Land Tortoise.	1 to 42	For several hours walked about slowly for short distances, in curves; excited to more active movement by putting in water; movements ceased two days before death. (2.)	Walked about as well and as actively as before operation. (1).	Great loss of activity; in 2 cases remained without motion for 4 days; movements then few and sluggish and stilted. (3.)

Eel	1 to 40	Wriggled the fore part of the body, and made a few half turns over without rotating; no movement produced by irritation; became motionless, and died in a few hours. (1.)	Turned over many times in both directions; jerked and wriggled when touched; lived 12 hours. (1.)	Rolled over and over in water and swam backwards, and often belly upwards; motor power scarcely diminished. (2.)
Water Tortoise	1 to 33	Walked about slowly with stilted limbs; swam regularly; hind legs most used; often walked backwards. (1.)	Walked in a natural, even, and rapid manner; swam naturally; became torpid, and moved little except when irritated. (3.)	Walked and swam actively, though less disposed to move than natural; always raised itself on tiptoe to utmost extent of limbs. (2.)
Perch	1 to 16	Lay motionless, with occasional gasp; no locomotion or posture; frequent spasmodic twitching of anterior part of trunk. (1.)	Lay on side nearly motionless, but breathing regularly; now and then slight lateral movements of body; occasional convulsive start; no locomotion or posture. (2.)	Swam about a great deal, with continued rotation, using all the fins; movements sudden; when at rest trunk bent; gradually became prostrate and died in 6 hours. (1.)
Pike	1 to 15	Immediate collapse and apparent death; breathing at once ceased; in an hour became stiff. (1.)	Great collapse, but after a few minutes partially recovered and swam about on its back with the use only of the tail; motions continuous; anterior fins flat against the side. (1.)	Lay on side motionless, but breathing; did not swim, but jumped about actively when out of the water, and bit at a thermometer put into its mouth. (2.)
Dace	1 to 12	As if dead; a little irregular gasping for a short time, and scarcely perceptible twitching of tail; in half an hour all evidence of life ceased. (1.)	Swam about for a few minutes, lying belly upwards, using only the tail, while the anterior fins were motionless; steadily preserved the same posture, but movements became fewer, and in an hour it died. (2.)	Swam rapidly, with rapid and continuous rotation; often lay motionless, but sprang quickly away if touched. (1.)
Tench	1 to 12	Floated on side perfectly motionless; breathing reduced to an occasional gasp; 8 hours after the operation a convulsive movement took place when it was grasped. (1.)	Lay on side, breathing regularly, with now and then a little flexion of trunk and movement of tail; struggled when grasped; no posture or locomotion. (1.)	Swam about with rotation or oscillation; fins and tail used; sprang away when touched; agitated by sound; in one case 15 revolutions, on long axis, in a minute. (2.)
Common Carp	1 to 10	No further movements except an occasional slight jerk when touched; breathing continued; lay on side.	Remained for some time in normal posture; bent trunk when taken hold of; swam in a feeble manner, not using anterior fins. (5.)	Lay motionless, and appeared as if dead, but respiration continued for 3 days. (1.)

Subject of experiment.	Proportionate weight of cerebellum to central nervous system.	Whole encephalon removed or isolated excepting medulla oblongata.	Possessing medulla oblongata and cerebellum.	Possessing medulla oblongata and cerebrum.
Golden Carp ...	1 to 10 (?)	Immediate collapse and death. (1.)	Much collapse; very trifling movements; speedy death (much loss of blood). (1.)	Swam about actively, using tail and fins, but with continued oscillation, like a ship at sea; sprang away actively when touched, and was agitated by sound. (2.)
Pigeon	1 to 9	.. ..	Tremulous convulsions; animal made progress along the ground by flapping the wings in an irregular manner; in 5 minutes expired. (1.)	Bird lay as if dead, except that breathing went on regularly; the eyes remained wide open, but were not sensitive; the body was very flexible, but retained any posture it was placed in; 2 convulsive attacks; death after 5 minutes. (2.)
Guinea Pig ...	1 to 9 (?)	... ...	Slight convulsive action, which subsided, leaving him as if dead, but with heart beating and respiration active; convulsive start and a cry on pinching any of the limbs. (1.)	Giddiness, staggering, loss of power in hind legs; rolled in both directions; scratched nose when it was irritated; pawed, chiefly with fore legs; convulsion; lived 24 hours. (1.)
Stone Loach ...	1 to 9	No sign of life, except that when the tail was pinched a little flexion of the trunk was produced. (1.)	Swam about steadily, but for short distances, using only trunk and tail; anterior fins motionless. (1.)	Posture normal but quiet, except when irritated; then made sudden, impulsive movements, with rapid rotation; all the members used. (1.)
Rudd	?	Lay on side, giving only one feeble flexion of tail; no posture or locomotion; breathed for about half an hour. (2.)	Swam steadily, but in unusual positions, without the use of the anterior fins. (2.)	After irregular movements swam actively, with oscillation, using tail and fins; occasional sudden movement, as if from convulsion. (2.)
Gudgeon	1 to 5	Lay as if dead, irregular gasping for about half an hour, and a scarcely perceptible twitching of tail. (1.)	After collapse had passed off made feeble progression by means only of trunk and tail; soon became motionless and expired. (2.)	Rotated and oscillated, all members used; often quiet, but sprang away suddenly when disturbed by sound or touch. (1.)

of the trunk when touched. On the following day they were both unmistakeably dead.

Two others underwent the same injury, as far as the cranium was concerned. In one the cerebellum was left attached to the medulla, while the whole of the cerebrum was removed. He now coiled himself up, and so remained for about an hour, he then recovered some power of movement. When held suspended by the tail he assumed a corkscrew shape, and revolved quickly in this position. On the ground it shuffled along in a peculiar manner, not using the head upraised and alert, as is the habit of snakes, but pushing it along by the motion of the trunk, while it and the neck remained passive. When a thermometer was put down its throat, it coiled its tail round a support and pulled steadily against it. When the parts came to be examined, it was found that the cerebrum had been completely separated, as intended, and that the cerebellum was left, but one side of the latter organ had been slightly injured.

In the other the section was made a trifle in front of the junction of the optic tubercles with the medulla, so as to ensure the integrity of the cerebellum. The same peculiarity of movement was noted regarding the head and neck, but no rotation took place. The animal was sluggish, but locomotion took place to a considerable extent when the animal was disturbed.

Hence it appears that the possession of the cerebellum gives a power of movement limited to the trunk, enough to produce locomotion, and that this is of a kind to be adapted to external circumstances. It further appears that a lateral injury to the cerebellum gives a lateral inequality to the movements.

Frog.—Two similar frogs were taken, and the same opening was made in the skull of each. A vertical transverse section was then made scrupulously in the same position in both, so as to separate the optic lobes from the cerebellum and medulla. In one the cerebellum was afterwards removed from the medulla, while in the other it was left.

The frogs were placed together for the sake of comparison.

The animal which retained only the medulla had immediately after the operation a transient convulsion, which was followed by a minute or so of prostration. It then walked slowly and with difficulty, as if the limbs were heavy. The fore-legs were peculiarly motionless. It continued very sluggish. It could not be stimulated to change its place, though when a limb was pinched, it wriggled with a perseverance suggestive of pain. In water the movements were few, irregular, and restricted to the hind legs. During the night following the experiment it died. The medulla was found quite separated from everything else, and unhurt.

The companion, who still possessed the cerebellum, after a temporary prostration, began to walk with considerable vigour. The head was depressed, though it was sometimes raised as the animal stepped. It continued to walk in a tolerably rapid and active manner when disturbed, though it did not hop. It swam in water with general and regular movements. It lived two days. The medulla and cerebellum were uninjured, and separate from the cerebrum.

In another frog, the cerebrum was cut away from the rest of the encephalon, leaving the cerebellum in its normal relation, as already described. After collapse of the duration of a minute or two, the animal began to walk about, and continued to do so much as before the operation. It however did not hop. Excepting in the last particular, no loss of motive power could be made out. On the following day the cerebellum was taken away also. The animal then was able to make only few and feeble movements, scarcely enough to produce locomotion. When put on its back it made ineffectual efforts to turn over. It remained in much the same condition for two days, and then expired. The medulla was uninjured. The cerebellum had entirely disappeared, and the cerebrum had been completely cut away.

In order to limit with more certainty the motive power which belongs to the medulla, another experiment may be quoted. A transverse section was made across the brain, close behind the attachment of the cerebellum, so that the medulla oblongata only remained in connexion with the cord and limbs. The animal was no longer able to walk except in a peculiar manner; it shuffled along with the belly upon the ground and the head depressed. There was more power in the hind than in the fore legs. The hinder parts of the animal were, in consequence, often pushed underneath the head, so that the creature fell over backwards. It was unable to turn over when on its back, though it made attempts to do so. The pupils were contracted; the eyes half shut. Ammonia to the nostrils caused great agitation. The section was afterwards found to have exactly separated the medulla from the cerebrum and cerebellum.

The proceeding was repeated in another animal with closely similar results.

It hence appears that the movements which depend upon the medulla and cord are feeble, irregular, and almost restricted to the posterior members. The limited amount of locomotion which is possible has not the regularity proper to walking or swimming. The addition of the cerebellum gives a distinct increase to the motive power of the trunk and limbs; regular and combined movements become possible, so that walking and swimming, though weak, are scarcely unnatural.

Toad.—By a proceeding such as has been described, the cerebrum and cerebellum were detached. At first attempts to move were made, which were unsuccessful, because the fore legs did not second the hind; afterwards, however, all the limbs were used, the anteriors very feebly. The result was a little progression, which could scarcely be called walking. The creature shuffled along on its belly, and on one occasion was found to have moved several yards from a marked position. In water irregular movements were made, chiefly of the hind legs. A drop of ammonia was laboriously scratched off its body by the hind legs. It attempted, but in vain, to turn over when put on its back. When after six days it died, the operation proved to have been performed as intended.

In a successful repetition of the experiment, the animal walked a foot or so after the operation, but soon became quiet, only moving when irritated, and then but for a short distance, with a feeble and irregular action. It shuffled along with the head depressed, and the belly upon the ground. In water, it either fell to the bottom motionless, or made swimming movements of a very feeble and irregular character. It made efforts to remove ammonia from its skin, first with the hind leg of the same side, and when this was held, with the corresponding fore leg.

The same injury to the cranium was now inflicted in a similar animal, and the cerebrum only separated. The animal carried the head depressed, but walked much, regularly, and naturally. In water it was sluggish, but swam in a normal manner on the surface. Both on land and in water the hinder limbs were used more than the anterior.

The results of two successful repetitions of the experiment may be shortly given. In the first, after a very temporary prostration, the creature walked for a considerable distance with the nose upon the ground. It used the limbs naturally, with even and continuous motion. It did not hop, and was apt to remain without movement until disturbed. It then walked nearly as well as before the operation. The hinder limbs evidently retained more freedom of movement than the anterior, and the creature was particularly prone to go backwards. It swam when placed in water, using chiefly the posterior limbs. The attitude was natural when at rest.

The second walked off with much rapidity immediately after the section. It went considerable distances with a persevering and not unnatural walk. It made attempts to hop, but not with enough force to raise it off the ground.

It must appear from these experiments that the possession of the cerebellum is followed by a gain in the power of moving the limbs, and of a certain regularity in their action which did not before exist. It is obvious that these acquisitions were due simply to the possession of the cerebellum, since in the two classes of experiments the cerebrum was cut away scrupulously in the same situation, the external injury was the same in both, and the only difference between them was in the possession of the organ in question.

It further appears that the cerebrum has a greater control over the anterior than over the posterior members.

Water Tortoise.—In a small animal of this species the cerebrum and cerebellum were taken out of the skull, so that only the medulla oblongata remained, which on subsequent examination was found to have escaped injury. The severance had taken place close behind the optic lobes.

At first, no movements were made excepting frequent opening and shutting of the mouth. The limbs were pulled in on irritation. In the course of an hour it walked six or seven inches, in a very peculiar way, with the limbs straightened and the body lifted as high as possible. When put on its back it made unsuccessful attempts to turn over. In water tardy swimming movements were made, the hind legs being used in chief. At times the movements seemed regular, while sometimes the limbs of one side were used without those of the other. On the second day after the operation, it walked more than a yard backwards with much rapidity. Irritation caused much agitation of the limbs, and occasionally a cry. The peculiar stilted gait remained, but the movements became feebler, and death took place nine days after the operation.

In a similar animal, the cerebrum was separated from the rest of the encephalon by a transverse section. It was found by several failures that it was very difficult to cut exactly between the optic lobes and the cerebellum without injuring the attachments of the latter to the medulla. In this case, therefore, the incision was commenced in the substance of the optic lobes, and then carried downwards and backwards so as to isolate all their inferior part, with the rest of the cerebrum, while some of their upper part was left as a protection to the cerebellar attachments. Eventually the medulla was found in normal connexion with the cerebellum, and attached by a slender isthmus to a remnant of the optic lobes.

Immediately after the operation the animal walked with much rapidity for several yards, in a perfectly natural and even manner. In a few minutes it became quiet, but always walked naturally, and with considerable vigour when irritated. When put in water it always remained motionless for a short time, and then swam in a perfectly natural manner. Excepting in its sedentary habits, it was not different from an uninjured animal. The evenness of its gait was a marked contrast with the kind of movements which followed the removal of the cerebellum.

In one instance, the section appeared to have passed exactly between the optic lobes and the cerebellum without injuring either. The animal walked about freely afterwards, and swam well. The movements were as before the operation, with the single exception that the right limbs were rather less active than the left. On dissection, a trifling injury was found upon the left cerebellar attachment.

In another experiment, the right attachment was unintentionally injured. The animal walked and swam, but with only three legs. The left hind leg was always kept within the shell, and offered more resistance than its fellows to being pulled out, so that its power of resistance was inverse to its freedom of motion.

The gain in the power of walking and swimming which follows the addition of the cerebellum is sufficiently evident. If the cerebellum maintains its perfect connexion with one side only, the limbs on the opposite side will acquire more freedom of movement than those on the same. The lateral inequality is more evident in the hind legs. Beside this, movements which with the medulla only were stilted and irregular, with the cerebellum became even and well adjusted. Since in these experiments the cerebrum has been previously taken away, it follows that the "co-ordinating" action is not a modification of impulses which arise in that part of the encephalon.

Pike.—A small fish of this species was removed from water, the back part of the skull rapidly cut away, the cerebrum separated by a transverse section behind the optic lobes, and the cerebellum detached from the medulla oblongata. The loss of blood was small. The animal became at once collapsed and motionless. It lay on its side in the water, without breathing or any other sign of life. In an hour it was rigid and evidently dead. The portions intended had been cleanly separated, while the medulla was uninjured.

In a similar animal the proceeding was repeated, save that the cerebellum was left in connexion with the medulla. It immediately became prostrate and motionless, but in a few minutes it had so far recovered that it swam, but in a continuous automatic manner, with the belly upwards. The tail only was used, while the anterior fins remained flat against the body. It so continued for about half an hour, when it sunk to the bottom and ceased to breathe. Three hours after the operation it was stiff.

The only difference, on comparison of the parts, proved to be in its possession of the cerebellum; and this, it appears, enabled the second animal to execute regular locomotion by means of the tail; though the anterior members were as incapable of use as in the former case. The movements did not appear to be influenced by external circumstances.

Dace.—A dace suffered the removal of both cerebrum and cerebellum. It then lay as if dead. Carefully watched, a little irregular gasping was observed, and a scarcely perceptible twitching of the tail. It never moved from its position, and in half an hour all evidence of life had ceased. The medulla proved to have escaped injury.

When in the corresponding experiment the cerebellum was allowed to remain, the animal swam about for a few minutes by means only of the tail. It moved quite steadily, but with the belly uppermost. The movements became fewer, and in an hour it was dead. The operation had been performed as intended. It was repeated with similar results.

The power of using the tail so as to produce locomotion is seen here, as in other experiments, to depend upon the possession of the cerebellum. The influence of this organ appears to stop short of the anterior fins.

Carp.—In the manner already indicated, the cerebrum and cerebellum were both separated from the medulla oblongata of a moderate-sized gold fish. It became immediately prostrate, and no further sign of life was observed. The operation proved to have been done as intended.

The effect of the removal of the cerebrum by itself will be seen in the following example. The cerebrum was isolated by a transverse section, so that when subsequently examined, the cerebellum only was found to be in connexion with the medulla, which, like itself, was perfectly uninjured.

After the operation the fish swam for a short distance without the use of the anterior fins. It then became still, and lay on the top of the water breathing regularly. It soon discharged air and sunk to the bottom, where it lay on its side. When touched it responded by a movement of the trunk. In about twenty minutes the creature began to use the tail, and by its means raised itself gradually into an upright posture, which it retained for a minute or so, and then fell over on the opposite side. This was repeated a good many times, and afterwards the animal swam forwards by a few strokes of the tail. All this time no use had been made of the anterior fins. They were generally flat against the side, but were floated out by disturbance of the water; and it was noticed that on touching the side of the body the corresponding fin jerked, as if by a reflex action. The animal remained in the same state until it died two days after the experiment.

A repetition of the same proceeding might have been described in almost the same words. In this case it was noticed that for a time the anterior fins jerked with the inspiration. They swayed with the water, as in the first case, and were not used to effect the movements of the fish.

The same experiment was performed upon two other fish of the same species with similar results. In another, in which the cerebrum had been taken out of the cranium, the loss of blood was very great, and death almost immediate. The power of using the tail and trunk so as to maintain a posture, and even to produce a certain amount of locomotion, is here seen to depend upon the possession of the cerebellum. The total prostration and speedy death which followed the removal of both cerebrum and cerebellum were so accordant with what has always been found in fish under the same circumstances, that it was not judged necessary to repeat the experiment.

From the preceding experiments the effect of the addition of the cerebellum to the medulla may be thus stated as regards reptiles.

The snake with the medulla only is incapable of locomotion, or of any movement directed to a purpose. On the addition of the cerebellum it acquires a power of regular locomotion, which depends entirely on the muscles of the trunk; the head remaining passive.

The salamander, with only the medulla oblongata, is only able to make feeble and irregular movements, though it will make attempts to get rid of an irritation. With the cerebellum it becomes able to walk and swim in a natural manner.

Frogs, toads, and both kinds of tortoises, are able with only the medulla to make progression in a feeble, awkward, and irregular way; and will execute certain actions called for by external circumstances. Their fore legs retain much less power than the posterior. With the cerebellum added, these creatures are enabled to walk and swim in a regular and natural manner; the anterior limbs, however, wanting in motor power.

With regard to fish, it appears that the medulla oblongata, in every species experimented upon, is insufficient to give rise to any locomotion, to the maintenance of posture, or to any act not obviously involuntary. The great prostration and speedy death of some individuals, particularly perch and tench, after the removal of the cerebrum, made it impossible to draw positive conclusions from all the experiments.

The following results were obtained :—With the addition of the cerebellum, eels became able to turn about with some freedom; pike, dace, carp, roach, rudd, and gudgeon are enabled to preserve a steady though not always an erect posture, and to move along in the water with the aid of the tail and trunk, while the anterior fins remain motionless. These movements are of a continuous kind, and appear little influenced by external causes.

Hence it appears that in those animals where the movements which belong to the cord and medulla are few and insignificant, where they are insufficient to produce locomotion or to maintain an unstable posture, the addition of the cerebellum generally gives both these capabilities.

In certain reptiles where feeble and irregular locomotion can be produced by means of the cord and medulla, the addition of the cerebellum gives a marked increase in the motor power of the limbs, and so adjusts their action that most of the movements of the animal are naturally executed.

Furthermore, it is a necessary conclusion that since the removal of the cerebrum in reptiles weakens, and in fish paralyses, the anterior extremities, that these members derive thence a large proportion of their motor power; while, since the hinder limbs and the trunk are not thus affected, it must appear that the cerebellum with the medulla and cord are the main centres by which these parts of the body are moved. The preceding deductions must show how much of this power is due to the cerebellum, and how much to the cord and medulla.

REMOVAL OR PARTIAL DETACHMENT OF CEREBELLUM.

Snake.—In three of the animals of this species which were experimented on, the cerebellum, as appeared by subsequent dissection, was completely removed without any further injury.

One never recovered from the immediate prostration, and died in a few hours; the others soon began to move about pretty freely. They were ready to take alarm when approached, and one of them escaped from a basket in which it was kept. The head was carried upraised and on the alert, and the tongue was used with its ordinary vivacity. It was noted, however, that on land, and more particularly in water, there was a tendency to move with the belly uppermost; but there was no rotation. There appeared to be in each case a loss of habitual activity; they lay motionless for long periods unless disturbed; but it was not possible to say that this deficiency was more than must be ascribed to the wound in the cranium.

The only effect that must necessarily be ascribed to the loss of the nervous centre is the failure in lateral balance.

In another experiment, similar in all respects, excepting that the cerebellum retained an attachment on one side, the same general stillness was observed, and the same rapid and irregular movements on agitation or in water. But a striking peculiarity was noticed. Whenever it was held up by the tail, which was done repeatedly, it twisted into a corkscrew shape and rapidly revolved in this position, so that the tail became twisted until it was in danger of breaking, which it eventually did. The rotation took place in both directions. An experiment has been already recorded in which the same rotation followed a lateral injury to the cerebellum, the cerebrum having been previously taken away.

Frog.—After the removal of the cerebellum the animal hopped about so briskly as to be difficult to catch, and, as far as could be made out, in a perfectly natural manner. It sprang vigorously and fell with proper elasticity. In water it was as active as ever, and perfectly steady, using the legs regularly, and with the ordinary swimming movement. It attempted to elude capture; and though closely watched, it was not possible to detect any difference from the natural state, in the amount of activity or in the character of its actions. It however had, after putting in water, one or two attacks of transient loss of consciousness, resembling fainting fits. The animal was killed on the day after the operation, and the parts examined. No trace of the cerebellum remained. The ventricle was uncovered, but its edges were quite smooth, and the medulla and optic tubercles were unhurt.

In one repetition of the experiment the same absence of result was noted, with the exception that in hopping the animal fell flat and awkwardly. The first experiment, however, is conclusive, and proves that in cases where further effects may have been observed, some injury must have been inflicted beyond the mere removal of the organ.

In another animal the left attachment of the cerebellum was cut with perfect exactness; the only effect that could be detected was that the right limbs seemed slightly weaker than the left. In its ordinary posture the animal bent down on that side. It however walked, swam, and hopped without any noticeable inequality.

Hence it is clear that, in these animals, the power of co-ordinating voluntary movements depends so little upon the cerebellum, that the organ may be lost without any failure in this respect being apparent. Secondly, it appears that the effect which it has upon voluntary movement itself is not enough to make its loss evident.

It would be, of course, impossible to appreciate a very slight deficiency in this particular.

Toad.—A large, strong toad underwent the loss of the cerebellum; directly afterwards it hopped about with much activity, springing away from a touch; it struggled vigorously when taken hold of. In water it swam steadily, rapidly, and in all respects naturally. It walked quickly and steadily; in all its actions it would have passed for an uninjured animal, and it required close comparison, side by side, with a fresh toad, to render any peculiarity evident. It then appeared that the fore legs were a little straighter than natural, and the shoulders consequently higher; and it seemed that though the creature was as active as ever when disturbed, it was less apt to move of its own accord. There was no diminution of power in any limb, and in its various movements there was certainly evidence of "co-ordination."

It was watched for two days, during which it underwent no change. It was then decapitated, and the brain examined: the cerebellum was found to have been completely removed; the medulla was smooth and unhurt, and the optic tubercles in the same condition.

In a repetition of the experiment, where, to appearance, the neighbouring parts had equally escaped injury, a decided amount of collapse followed the operation; and when the creature began to walk about it was with a very marked peculiarity of gait: the fore legs were extended, and the head and shoulders raised so high that the animal occasionally fell over on one or the other side; swimming was irregularly performed, chiefly with the fore legs. It was generally without movement save when irritated.

Though the first experiment is necessarily the more conclusive, the greater results in the second must not be disregarded, insomuch as they closely correspond with what takes place in animals where the cerebellum is more developed.

In a similar animal a section was made, with fine scissors, of the left attachment of the cerebellum to the medulla. This afterwards proved to have been done completely and without injury to any other part of the brain. No peculiarity could afterwards be discovered, excepting that the right shoulder was rather higher than the left, more especially as it stepped. It walked perfectly naturally in every other respect, and in swimming no peculiarity of any kind could be seen.

It must be inferred that the loss of the cerebellum in the toad does not entail any necessary loss of regularity of movement or of motor power; the only obvious result is a peculiar stilted manner of using the legs, which, when the organ is cut away on one side only, is productive of a lateral inequality. When the power of using the limbs is unequally affected the posterior suffer most.

It will be seen by reference to the table that all the removals of the cerebellum hitherto reported have been upon animals in which it forms less than one-hundredth part of the central nervous system. The loss of the organ is accordingly little felt.

Tortoises.—In consequence of their more active habits, water tortoises were found to be more adapted for these experiments than their relations of the land.

In one of these creatures the cerebellum was completely taken away, and, as it proved, neither the cerebrum nor the medulla hurt. The animal remained quiet for a short time, and then began to move about, but in a very remarkable manner: it raised itself as high as the limbs would extend, and often came down rather suddenly as it stepped forward. It swam with steadiness and activity, and without any observed peculiarity. All the limbs were used. When excited by the contact of water it was always active, though unusually sluggish on land and prone to remain motionless for long periods. It lived for nearly five weeks, and retained for the whole time the peculiarities that have been noticed.

The experiment was repeated several times with precisely the same results—the loss of activity and the remarkable stilted gait.

Land tortoises were found to display exactly the same peculiarities. In them the immobility was more conspicuous, insomuch that two of them, deprived of the cerebellum, remained in the same position each for four days.

The effects of lateral injuries to the cerebellum were ascertained in both varieties. In a large, strong water tortoise all the connexions of the cerebellum to the right of the median line were severed. On dissection, it was found that this had been accurately done. The organ was a little displaced, so as to uncover the fourth ventricle, but it was not damaged itself, and the left attachments were entire. The medulla had escaped injury. The peculiarity of the walk was striking; when stimulated to move, it raised itself high on all the limbs except the right posterior, which remained little protruded, while the other three were extended to the uttermost, as if its cerebellum had been entirely removed. This was calculated to give an erroneous impression that the right posterior limb was used less than the others; while, on the contrary, its freedom of movement was greater. In water, the peculiar gait was no longer evident, but the right members were used more freely than the left, and the anterior more freely than the posterior. These observations were placed beyond doubt by two successful repetitions of the operation. The superior freedom of movement in the limb which was least extended was very evident.

Hence it appears that in the tortoise the loss of the whole cerebellum alters the muscular condition of the limbs, and lessens the habitual activity of the animal. And that if the attachment on one side remain undivided, the hind leg of the opposite side will retain its normal muscular state and its normal activity, while the three other limbs are affected as if the whole organ had been removed.

Perch.—Two similar perch were taken for the sake of comparison, and exactly the same injury inflicted upon each by removing the vault of the skull and exposing the encephalon. One was now restored to the water without further mutilation, while, from the other, the cerebellum was removed, which was done with great ease and celerity. The former swam swiftly, and with perfect steadiness; its behaviour seemed natural in all respects. The second swam with continued rotation on its long axis, to the right or the left indifferently. All the fins and the tail were used. The movements were apt to be sudden, and the speed of the animal was decidedly less than that of its companion. The trunk was bent to one side or the other when the creature was at rest. It gradually moved less, and in six hours was dead. The cerebellum proved to have been removed as intended, without injury to the medulla.

Dace.—It is needless to repeat accounts of the removal of the cerebellum in fish, since the results are the same in all who survive the operation long enough.

After the removal of this organ from a dace, some splashing irregular movements at once took place. It then progressed a little on its back or sides, and as the collapse passed off it swam rapidly, with rapid and continuous rotations. It was apt to be motionless, but at a touch would dart away rapidly. The tail and fins were alike used. Seven hours after the operation, which proved to have been accurately performed, it was found dead, having jumped out of the vessel in which it was kept.

Gold Fish.—Two gold fish were deprived of the cerebellum in the manner already described. The details of one experiment will suffice for both. Immediately after the removal of the organ the movements of the animal became a little irregular, and it rolled over once or twice on its long axis. It soon recovered so far as to swim about with some activity, but it rolled from side to side like a ship at sea. This unsteadiness was particularly manifested upon any disturbance of the water, or upon the slightest touch on its own body. It did not rotate. When grasped it sprang away with activity, and was agitated by sound. All the fins and the tail were used, as appeared, naturally. It died on the fifth day after the operation.

In fish, the results of the removal of the cerebellum present a great uniformity. The most obvious effect is a loss of lateral balance. No member appears to lose its power of movement, though, so far as possible to judge, the habitual activity of the creature is diminished.

Birds and Mammalia.—The effects of cutting away part of the cerebellum in some of the higher animals have been made well known by Flourens and his imitators. It is also known that after such partial removals as he executed, the loss of "co-ordination" is only temporary. I have made many such experiments as he relates, upon pigeons, and the smaller rodentia, with results similar to those he describes. As an instance of the loss of the whole organ, the following experiment may be cited.

In a guinea pig the cerebellum was so far removed that only a small crumb of nervous matter hung on to each lateral peduncle. No other part of the brain was damaged.

The animal supported itself on the fore legs, with the head and shoulders elevated, and swayed from side to side. The hinder limbs were spread out flat along the table. He scrambled about a good deal, chiefly from the action of the anterior limbs, though all retained some power of movement. He could not walk, nor stand otherwise than as described. One or two attacks of convulsion occurred. The creature lived about thirty-six hours. He scratched ammonia from his nose with his front paws.

Many other experiments have been made, in which an extensive mutilation of the cerebellum in birds and quadrupeds has been followed by total loss of motor power and speedy death, but from the fact that in other cases like that recorded voluntary acts have been performed where no cerebellum existed, it is clear that the total paralysis is owing to the approach of death.

In such experiments as I have made, involving only a partial removal of the organ, it was proved that with guinea pigs and rabbits there was an invariable loss of the power of walking, while motor action remained more in the fore than the hind limbs. Apparent giddiness, or loss of balance, was conspicuous in some of the cases, the more so the more of the organ had been removed.

In a guinea pig, where a piece had been cut from the left side of the cerebellum, the right posterior limb became spasmodically contracted, while the other hind leg and the right fore leg were affected with continual tremor.

In pigeons the results were very uniform. Staggering with a peculiar drunken manner and wild stare; falling over frequently, backwards or sidewards; finally, as successive slices were taken away, total loss of motor power, the bird lying flaccid and inanimate, but with the heart beating and the respiration active; then death.

It will be observed that these observations upon the higher animals, though less complete, and therefore less conclusive, give much the same results as have been obtained lower in the scale of creation.

As to the negative results of these experiments, it appeared that in no case was the possession of sensation interfered with by the removal of the cerebellum. It was also found that with copulating frogs, the male grasped the female with as much fervour without as with that organ. Fish deprived of it were found not to have lost the activity of their alimentary canal, insomuch as shot introduced into the œsophagus, made the passage of the bowels as if no mutilation had been performed. Observations were made with a delicate thermometer, constructed for the purpose, which proved that the temperature in the œsophagus was not invariably altered by the removal of the cerebellum; and in cases where it was reduced by the operation, it was to so small an extent that it was believed to be no more than the loss of muscular activity in the animal easily accounted for. Finally, abundant secretion was found in the gall bladder, and on the mucous membranes, in animals which had lived for some time without the organ in question. It may, therefore, be inferred that the cerebellum is not concerned as the seat of sensation, nor as a channel for its passage; that it is not the instigator of the sexual propensity; that it is not the source of power for the involuntary muscles; that it has no function which is directly concerned in the maintenance of animal heat; and that it is not the excitor of secretion.

The consequences of the removal of the entire cerebellum may now be summed up.

No faculty is lessened excepting such as concerns the voluntary muscles.

With snakes, where the organ is at a minimum, it is not possible to be sure of any loss consequent upon its removal, excepting a want of lateral equilibrium.

With frogs the consequences are almost inappreciable.

In the salamander, the smallness of the parts renders it difficult to limit the injury with accuracy. A tendency to rotation in water appears to follow the removal of the organ, though it is clear that in the absence of both cerebrum and cerebellum, the animal can walk in a natural manner.

With toads the only effect which is well marked and constant is a peculiarity in the use of the limbs, which are more than usually extended.

Tortoises, of both kinds, display in a more marked degree the stilted manner of walking. They also lose much of their habitual activity. This loss has been noticed in the previous cases, but it was not possible to state with certainty that it was more than followed from the external injury.

Of fish, eels swim backwards, roll over and over, and appear to possess diminished activity. Perch, dace, tench, carp, loach, rudd, and gudgeon, manifest a remarkable tendency to rotate or oscillate upon their long axes, and on comparison, their swiftness and habitual tendency to motion are found to be diminished. All the members are used.

Pike become prostrate, and die too soon to allow of any trustworthy estimation of the effects of the injury.

Pigeons scarcely survive the removal of the whole organ long enough to display the characteristic effects.

Guinea pigs manifest a loss of lateral balance, and of motor power in the posterior limbs.

The effects of detachment of the cerebellum from one side only may be thus stated:

In snakes there is a remarkable rotation when the creature is suspended by the tail. Frogs lose, under similar circumstances, a slight amount of power on the side opposite to the injury, and toads present a lateral unevenness of gait. In tortoises there is the same uncalled-for extensions of the limbs, and loss of freedom of movement, as take place in the total absence of the organ, with the exception that the posterior limb on the side of the injury completely escapes in both particulars. In the guinea pig, an injury on one side of the organ was found to produce a spasmodic constriction and loss of mobility in the hind leg of the opposite side.

Thus it may be generally said that, when the cerebellum is very small, its removal is scarcely productive of any effects. As it increases in size, a want of adjustment in the muscles of each limb is noticeable, and there is a want of co-operation between the two sides of the body. There also becomes evident an absolute loss of motor power, with a diminished tendency to spontaneous movement. A lateral inequality of action is produced by a lateral injury to the cerebellum, the deficiency being on the contrary side to the mischief. Lastly, when the power of movement is unequally affected in the anterior and posterior extremities, the posterior lose most.

A series of experiments was made upon the water tortoise, with a view of defining the action of the cerebellum upon the voluntary muscles.

The natural posture of these creatures, when quiet, is with the limbs hidden in the shell. If a limb be pulled out the animal will try to withdraw it; and if the limb be irritated by pinching, the efforts will be increased as far as the strength of the member allows. The weight that a limb is able to raise under these circumstances is a measure of its strength.

It was found in this way, by many trials which need not be given in detail, that—

1. The removal of the cerebellum is followed by no loss of lifting power in any limb, or by so slight a loss, equally distributed, that it may fairly be assigned to the loss of blood and general effects of the wound.

2. The cutting of the cerebellar attachments on one side does not produce any inequality in the lifting power of the right and left limbs.

3. The removal of the cerebrum, or decapitation, has little or no effect upon the lifting power of the hind legs, but diminishes by about one-third that of the upper limbs.

From these facts it may be concluded that in the tortoise the cerebellum has no share in such movements of the limbs as are directly in answer to a local stimulus. It appears that such movements in the hind legs depend entirely, in the fore legs chiefly, upon the cord. It is probable that actions of this nature are such as must be termed instinctive or reflex; and hence it appears that whatever the cerebellum may have to do with voluntary, it has no part in the production of reflex actions.

DEDUCTIONS FROM HUMAN PATHOLOGY.

It is necessary to use caution in applying the facts of clinical medicine as a guide to the functions of the cerebellum. This organ is so enclosed and connected that an addition to its bulk must often compress adjoining structures; and it is believed that the question of its functions will be much simplified by leaving out of consideration all cases where the disease has been a morbid growth, an abscess or an extravasation of blood. In each of these conditions there may be an uncertainty how far the results are due to the loss of cerebellar structure, and how far to pressure on the medulla oblongata.

It will remain to examine cases of congenital deficiency of the cerebellum, and cases of morbid alteration pervading its tissue.

In collecting the examples, great care has been taken to exclude those in which disease of any other part of the nervous system may lead to uncertainty as to the origin of the symptoms.

There are but two instances of congenital deficiency:

1. Alexandrine Labrosse died at the age of ten years in the Saint Antoine hospital. The details are very fully given in Majendie's 'Journal of Physiology;' and as to the post-mortem appearances, we have the evidence of Majendie himself, who dissected the brain, and of Cruveilhier, in whose great work it is represented.

The cerebellum was entirely absent, as also were the pons Varolii and the cerebellar peduncles. The occipital fossæ were occupied by serous fluid, and a semicircular band of areolar tissue lay across the medulla in the place of the absent organ.

The child had been generally slow in development, especially in the lower limbs. She could not stand until she was five years of age. When nine she was apparently paraplegic. Subsequently the legs, although very weak, allowed of her standing, though she often fell.

She then took to her bed, where it was observed that she could hardly move her legs, which, however, were not wanting in sensibility. The hands and upper limbs appeared always to have been used naturally. She was addicted to masturbation. She eventually died of a disorder of the bowels. She had been epileptic and nearly idiotic.

This conclusive case affords a confirmation of the deductions which have followed from other evidence. No special sense suffered, nor was ordinary sensibility impaired. Voluntary motion was diminished but not destroyed, and the loss was mainly evinced in the lower limbs. "Co-ordination" was executed naturally. The epileptic fits and the feebleness of intellect may be presumed to depend upon some alterations in the remaining parts of the encephalon.

2. A man, forty-four years of age, died in the Guernsey Hospital. His brain was exhibited at the Pathological Society by Dr. Salter, and Dr. Cockburn supplies the details of the case. The left hemisphere of the cerebellum, as well as the central parts of the organ, were altogether absent. The right lobe only remained. The various peduncles on the left side were absent, while those on the right were perfect. A condition of chronic hydrocephalus also existed. The patient from whom these parts had been taken was a deformed idiot. "Taste, sight, hearing, smell, and touch were all perfect. He never walked, but could use his arms as far as his deformity allowed him." He was epileptic, and was addicted to masturbation.[1]

It is to be regretted that this patient had not been more minutely observed during life, but as far as the record goes it appears that the same loss of power in the lower extremities took place here as in the preceding case. Both legs appear to have been equally affected. The epilepsy and the want of intellect may be ascribed to the morbid state of the cerebrum.

In the tables are the details of thirteen cases of softening of the cerebellum and three of active congestion.

TABLE I.—SOFTENING.

Reference.	Post-mortem appearances.	Symptoms.
1. Arch. Gén., Dec. 19, 1862.	Softening of entire cerebellum.	For a long time trembling in the lower limbs, which gradually became weakened. In a man 65 years old.
2. Jour. de Physiol., Majendie's, vol. vi. p. 162.	Cerebellum entirely disorganized and transformed into a white "bouillie."	A soldier, who was struck on the back of the head. Peculiar condition of vision; no absolute paralysis, but an inability to walk except backwards, and for a few feet only; head always supported by hands; sudden death 13 days after accident.

[1] Pathological Transactions, vol. iv.

Reference.	Post-mortem appearances.	Symptoms.
3. Lancet, 1855, p. 210.	Cerebellum universally softened; disease of lung, liver, and kidneys.	For 15 years gradual loss of power in lower extremities; able to walk by means of a stick, but when hurried fell down. When spoken to quickly, legs thrown into a state of convulsive agitation; addicted to masturbation, and extremely fond of women; incontinence of urine; sudden death.
4. Lallemand, vol. ii. p. 39.	Membranes of cerebellum depressed and wrinkled, and containing only half an egg-shell-full of brown, fœtid, sero-purulent fluid.	Man 49 years of age. Dull pain in the head; for one year vertigo and vomiting; staggering on the legs, and inclined to fall forwards.
5. Jour. de Physiol., Majendie's, vol. iii. p. 137.	Circumscribed softening, 9 lines long, 5 wide, in the right lobe, opposite to attachment of the peduncle; the rest of the lobe harder than the left; ulceration of bowels.	Man 68 years old. After drinking turned round repeatedly from right to left; loss of consciousness; hemiplegia of left side—this remained permanently in the leg, while the arm partially recovered, so that he could work as a shoemaker; no loss of sensation; death from diarrhœa.
6. Ibid., p. 139. (Serres.)	Left lobe softened from the upper to the lower vermiform process, also the left peduncle; left side of pons harder than right; lungs and bowels diseased.	A journalist, 66 years old. Sudden and complete loss of use of right leg, without any loss of feeling; the limb became shrunk. Stammering for 8 months before death, which was apparently chiefly due to disease of chest and bowels.
7. Amer. Journal of Medical Sciences, Feb. 1839.	Left lobe collapsed to $\frac{1}{5}$th the size of the right; the whole interior destroyed from the cores downwards; a shell only left, a line or two in thickness; the cavity occupied by a delicate, brownish tissue and some serum; a minute coagulum in crus.	Man 72 years of age. Four years before death severe pain in left side of head, dizziness, and appearance of objects whirling round from left to right. Two years before death hemiplegia of right side; revival of sexual feeling to the extent of a "morbid salacity," which decreased before death; latterly no emission; imbecility, epilepsy, delirium, stupor, death.
8. Medico-Chir. Trans., 1849, p. 107. (Mr. Dunn.)	Whole inside of right lobe softened and pulpy, small clot in its centre; median lobe also softened; convolutions of brain and optic nerves shrunken; mesocephale unhealthy in appearance.	Enfeeblement of mind; impairment of sight; constant desire for sexual intercourse; latterly loss of virile power; weakness and stiffness of left leg and foot; unsteadiness of gait; apoplectic attack—death four hours afterwards.
9. Lallemand, vol. i. p. 134.	White substance of left lobe reduced to pulp; membranes and substance of brain slightly injected.	Man 56 years of age. Loss of consciousness and paralysis of right side, which remained immovable; commissure of lips drawn to left; loss of sensibility in eye and lid of right side; death in 8 days.

Reference.	Post-mortem appearances.	Symptoms.
10. Andral, vol. v. sec. 2, Case 1.	Mass of softening occupying ⅔rds of the right lobe of the cerebellum, which somewhat affected the crura; pia mater generally injected; ventricles distended with clear serum.	Woman 31 years old. Gradual accession of hemiplegia of left side, commencing with the arm; amaurosis; pain in the head; intelligence unaffected; no loss of sensation; convulsive movements in paralysed limbs; coma.
11. Ibid., Case 2.	Yellow softening as large as a nut in the centre of the left lobe; large recent effusion of blood in the left hemisphere of the cerebrum.	Man 53 years of age. For two months pain at the back of the head; gradual loss of power in the extremities of the right side, latterly with contraction; no loss of sensibility; sudden attack of apoplexy, which proved fatal in a few hours.
12. Ibid., Case 3.	Two-thirds of right hemisphere of cerebellum only existed in form of "bouillie;" no other change.	Shopkeeper, 29 years old. While in apparent health, sudden cry, apoplectic fit, convulsive agitation of the four limbs; return of consciousness in less than an hour, but complete hemiplegia of left side, with loss of sensibility. After 7 days, seizure exactly similar to the first, after which coma and death.
13. Ibid., Case 4.	Membranes injected; reddish softening of left lobe of cerebellum, its posterior and inferior half.	Groom, 39. Pain in head, after a time concentrated in occiput; giddiness; vision weakened on right side; no loss of power or of sensibility in limbs, but all four were convulsively agitated; muscles of respiration similarly affected; intelligence dull, but no loss of consciousness; death from apnœa.

TABLE II.—CONGESTION.

Reference.	Post-mortem appearances.	Symptoms.
14. Jour. de Physiol., Majendie's, vol. ii. p. 173. (Serres.)	Lobes of cerebellum greatly injected, as also were the superior and inferior peduncles, in which were points of extravasation; tuberculæ quad. slightly injected; genital organs congested.	Man 32 years old. Attack of apoplexy while in the act of intercourse; unconsciousness; from time to time seized with convulsive movements and tetanic rigidity, which lasted several minutes; erection of penis and heat of genital organs, contrasting strongly with coldness of extremities.
15. Ibid., p. 179. (Serres.)	Volume of cerebellum increased, and of a red colour; medullary substance of a bright red; little extravasations on surface and in substance; tuberculæ quad. and processes and testes reddened.	Man 46 years old. Apoplectic attack; somnolency; general spasmodic and convulsive movements; respiration slow and irregular; erection and congestion of penis, with much ejaculation of serum; heat of genital organs; limbs stiff; increased satyriasis; death day after attack.

Reference.	Post-mortem appearances.	Symptoms.
16. Jour. de Physiol., Majendie's, vol. ii. p. 262.	Induration and redness of superior and inferior vermiform appendices, in front of which is some softening; cerebellar arteries enlarged, as also are those of the pelvic organs.	An irreclaimable prostitute, 33 years of age. For last 4 years violently given to masturbation; became imbecile, and died of phthisis.

Softening.—The whole organ was softened in four cases. In none was any loss of sensation reported. In each there was a loss or alteration of the power of using the lower extremities, and not the upper. In one, the patient could only walk a few feet, and that backwards. In another, he staggered in walking and frequently fell forwards. In the two others, the lower limbs gradually became weakened, and were affected with convulsive or tremulous movements. A peculiar condition of sight in one case, and genital excitement in another, complete the symptoms ascribed to softening of the entire organ.

Nine cases are reported where one lobe of the cerebellum was softened while the other remained natural.

In one, in which the affection was limited to a part of the lobe, there was comvulsive action of the four limbs, without any apparent loss of power. In the rest, the limbs on the side opposite to the mischief were enfeebled. The loss of power was in every case either equally distributed between the upper and lower limbs, or was chiefly marked in the lower. The latter condition was observed in three instances. Once, where the paralysis was observed to have commenced in the arm, the crura cerebelli were included in the morbid change.

The only other symptoms which occur often enough to suggest any pathological connexion, are impairment of vision, which was noted in three cases, and genital excitement, which took place early in the history of two, while later in their course the virile powers were impaired. Common sensation and intelligence were generally noted as unaffected.

Cases in which the cerebellum is simply softened furnish probably the best physiological experiments which nature is capable of making. There is no product which can occasion pressure upon neighbouring organs, or affect them in any injurious manner. Such symptoms as arise, then, may be fairly attributed to the deficiency of the cerebellar tissue, and this deficiency is generally extensive, since no limiting membrane or abrupt boundary preserves to use any part of the lobe which is the seat of the disease.

The loss of power in the voluntary muscles, which was the prominent symptom in every case, was confined to the trunk and limbs with so much consistency, that we must necessarily conclude that the cranial nerves derived none of their influence from the organ to which the change has been confined.

The more marked effect upon the lower than upon the upper limbs accords with what has been deduced from experiments on animals.

The next table contains three cases in which the organ, without any limitation to one lobe or the other, was the seat of active congestion. A prominent symptom in all was genital excitement. In one, there were frequent attacks of convulsive movement, with tetanic rigidity; in another, there were convulsive or spasmodic movements, with stiffness of the limbs; while in the third case, in which the morbid condition was not general, no disorder of the motor powers was noticed.

Drawing such conclusions relating to the function of the organ as follow from the foregoing details, it must appear that the only faculty which constantly suffers in consequence of destruction of the cerebellum is the power of voluntary movement.

In the two cases where it was absent or defective as a congenital state, there was want of action in the muscles of the lower extremities. Where the entire structure was changed by disease there was always loss of voluntary motor power, either general throughout the trunk or limited to the lower limbs. Where the whole organ was softened, there was in every case loss of power confined to the lower extremities. Where it was generally congested, tremulous or convulsive movements affected all the limbs. Unlike what takes place in cerebral disease, the faculty of superficial sensation was always unimpaired.

Of the cases where a morbid change was limited to one lobe, there was one where all the limbs were affected with convulsive movements, while in the others, eight in number, the loss of power was only in the limbs of the opposite side. In three of them it was most marked in or confined to the leg.

We are thus warranted in concluding that in the human being the cerebellum is an especial source of motor power to the lower limbs, each lobe mainly effecting the leg of the opposite side. It further appears that the organ has a more remote influence of the same sort upon the upper limbs. It is certain that it has no effect upon the mobility of the parts supplied by the cranial nerves.

It is scarcely needful to review the effects upon the genital organs, and upon the visual power, which are recorded in some of the cases of cerebellar disease. It is manifest that since the entire organ may be congenitally absent, without any impediment of the sexual appetite, that the cerebellum is not the excitor of that propensity. Similarly, since in the case of congenital absence, and in cases where the whole structure has been destroyed by disease, the eyesight has remained unaffected, it is evident that none of the capacity for vision depends thereon. Both those coincident affections must be ascribed to the conveyance of an influence to parts connected with, but distinct from, the organ in question.

Summary.—Drawing together the deductions from the several divisions of the inquiry, it will be seen that:

1. The addition of the cerebellum to the medulla oblongata gives

an increase of voluntary motor power in the four limbs; to the posterior in a greater degree than to the anterior. The power thus obtained is distributed in such a way as to produce even and balanced movements, and often appears to be exercised in a continuous and automatic manner.

2. The removal of the cerebellum has an effect upon the muscles of the limbs, which increases in proportion as the organ increases in size. It consists in a diminution of voluntary power and of muscular adjustment. When an inequality of effect can be noticed, the loss is greater in the posterior limbs. There is a loss of habitual activity. From the effect of lateral injuries, it must be assumed that each lateral half of the organ has an influence upon both sides of the body, but to a greater extent upon that opposite to itself.

3. The removal of the cerebellum has no effect upon superficial sensation, on any special sense, on the action of the involuntary muscles, or on reflex movements.

4. In the human being it appears that there is no constant effect from loss or alteration of the cerebellum, but failure of voluntary muscular power.

Disease or deficiency of the whole organ invariably lessens voluntary power in the limbs especially in the lower. The loss of one lobe produces its effect more particularly on the opposite side. Disease confined to the cerebellum has no effect upon superficial sensation, on the intellectual powers, or on the action of the muscles supplied by the cranial nerves.

Hence it must be believed that the function of the cerebellum is to supply the voluntary muscles of the body and limbs with self-regulating motor power. This is distributed in an inverse manner to the influence of the cerebrum. The latter has the sole control over the parts supplied by the cranial nerves, and the chief control over the anterior limbs. The cerebellum has its greatest effect upon the posterior limbs, less upon the anterior. Thus the muscles of the trunk and limbs are under a double rule. The influence of the cerebellum is apt to produce continuous, and probably habitual movements, which are subservient to the cerebrum, but not dependent upon it.

Art. IV.

Case of Fatal Purpura associated with Waxy Degeneration of the Striated Muscles, and also of the Vessels in the Affected Parts. By WILSON FOX, M.D. Lond., Professor of Pathological Anatomy, University College, London; and Assistant-Physician, University College Hospital.

I PUBLISH the following case of purpura in an isolated form, in the hopes that the observations which I have made upon some of the lesions found post-mortem, may induce others to compare them with their own experience; and, inasmuch as fatal cases of purpura are not of very frequent occurrence, and the hæmorrhagic tendency which we express under this name may probably depend upon more than one anatomical alteration, it appears to me desirable for as many as possible to contribute what lies in their power to the elucidation of the pathology of this somewhat obscure malady.

R. L., aged thirty-three, married, grainer in wood, admitted into the University College Hospital, May 16th, 1865; a native of London; father and mother living, both about sixty years of age, and healthy. No history of any hæmorrhagic diathesis in the family either on father's or mother's side. Has five brothers and three sisters all living and healthy, except one sister, who died of small-pox in extreme youth.

Previous diseases.—Has been vaccinated and not had small-pox; has had measles, scarlet fever (?), and gonorrhœa some years ago. No other illnesses before present.

Habits.—Lives well and has good wages. Drinks about a pint and half of beer daily, and occasionally some spirits on Saturday, and strongly denies any habits of intoxication. Eats fresh meat and vegetables in ordinary quantity daily. Is not in habit of eating salt meat.

Present illness.—Always enjoyed perfectly good health until November, 1864, when he contracted an indurated chancre, followed by indurated bubo, which disappeared without suppurating; he took pills at this time which made his mouth sore; after this he continued well until the middle of April, 1865, when he was attacked with sore throat, and some ecthymatous pustules appeared at the same time on the scalp. He took no more mercury, with the exception of a few doses of bichloride. He took iodide of potassium for some time, but not continuously.[1] Since sore throat supervened he has felt very ill, and has been able to do very little work for the past three or four weeks. About a week before admission he first noticed some swelling on the inside of both thighs, of a reddish hue, and attended with considerable pain; the discoloration and swelling quickly spread over the inside of the thighs, and the colour changed to purple. A purple eruption first appeared on the face on May 16th.

Present state, May 16th.—Aspect of great suffering; patient almost unable to lie many minutes in one position; on face are some patches of a mingled papular and tubercular eruption, passing here and there into a vesicular form, all of a deep purplish-brown colour, and affecting the forehead, eyebrows, root of nose, and lower and upper lips. On scalp are several ecthymatous pustules. On right ear are several purpuric spots. Skin over these is hotter to hand of observer than on opposite side, is painful, but not indurated. Whole of back of left hand is greatly swollen, pits on pressure, feels very hot, and is of a dull, dusky-purple hue. Besides this swelling there are several small purpuric spots, not attended with swelling or induration, on the thumb and fingers. The whole of the upper part of right arm is

[1] I am indebted for the details of his previous treatment to inquiries kindly made for me by Mr. Fuller, of Albany-street, of the chemist who prescribed for the patient before he came under his own supervision.

greatly swollen, and of a reddish-purple hue; the only spot not affected is a portion of skin over the biceps muscle. The skin is indurated, brawny, intensely painful, and very hot. The dull purple of the centre fades off to a reddish hue at the margins. The length of this patch is nearly seven inches. At one place it completely encircles the arm, in other parts its average diameter is about six inches. Similar patches of nearly equal extent occur on the other arm. The whole of the anterior part of the left thigh, and in some places the whole circumference of the limb, is indurated, brawny, painful, and of a dark reddish-purple. Many similar spots occur on the opposite limb. Numerous petechiæ cover the leg below the knee. Calves of legs are of brawny hardness. Skin above ankles is œdematous, and pits on pressure. Skin of scrotum is œdematous, and there are here one or two patches of a purplish colour, where ulceration has already commenced. There are also two patches, of about four inches in diameter, on the back, of same characters as in rest of body; a few smaller ones are also found on front of chest. The abdomen has fewer marks of the kind than any other parts of the body. No perspiration on skin. Patient's movements are tremulous; he has great difficulty in conveying a cup to his mouth. The effort requires both hands, and motions of arms are very tremulous, and are effected with great difficulty, but there is no impairment of volition, or any misdirection of movement. Hæmorrhagic sordes on gums, breath horribly offensive, patient hawks up a thick gelatinous mucus mixed with blood. There is a deep, ragged ulcer, with evident syphilitic characters, on the left tonsil, and petechial spots are seen over whole of roof of mouth, soft palate, and fauces. Tongue furred, and stained of a reddish-brown, is protruded without difficulty. Great thirst; no vomiting; appetite bad from difficulty of swallowing; no diarrhœa; bowels said to be regular. Slight cough; slight dulness at right apex posteriorly, none elsewhere; respiration over chest healthy. Heart's apex in normal situation; percussion dulness normal; sounds normal at apex and base; pulse 128, weak, regular; respiration 30. Blood under microscope contains a great excess of white corpuscles. Red corpuscles aggregate into rouleaux with ordinary characters, and present no deviations from normal appearance. To have claret Oj., asparagus, beef-tea with pounded meat, milk. ℞. Pulv. opii, gr. j. ter die.

May 19.—Purpuric spots have much extended since last report. Large vesicles filled with discoloured serum have appeared on thighs and arms. Swelling on left hand is now more intensely coloured, but has not yet assumed dark purple hue of other affected parts of body. Back of right hand is now swollen and intensely painful. There is also pain in the palm of the hand. State of legs below knees is the same as at last report. No increased failure of motor power.

Heart.—There is now a soft blowing murmur, with first sound heard with greatest intensity at second left interspace; heard also, but less clearly, at apex, and not conducted into axilla. The whole of walls of thorax are tender and painful, and the lower axillary regions pit, on pressure. Left axillary region is dull below sixth interspace; in back, dull below ninth rib. Fine friction and crepitation can be heard below this level, but not above. Right base is dull below sixth rib in front, and eighth rib in back. Friction and fine crepitation also audible here. Vocal resonance weak at bases. Vocal fremitus increased. On 18th had a pale solid evacuation. Took last night pil. calomel., gr. v.; haust. dom. this morning. Bowels have not yet acted. To have tinct. larch bark, ʒss.; aquæ, ℥j. ter die. To have pulv. opii once daily, and sol. arg. nit., gr. xv., ad aq. ℥j., applied to throat daily.

May 20th.—Bowels acted freely after last visit; motions good colour. Skin now perspiring. Pupils somewhat contracted. Some small additional purpuric spots on abdomen. Skin in centre of swellings in thighs appears dead and without sensation. Some sputa seen, are of dark red, and very tenacious. To have pulv. jalap. co., ℈j., cras mane, followed by sodæ sulph., ʒiij.; acid. sulph. dil., ♏v.; aq. menth. pip., ℥j. pro haustû; and after bowels have freely acted, to take ol. terebinth., ʒj., mucilage, ℥j., 4$^{\text{is}}$ horis.

May 22nd.—Turpentine treatment was commenced at 9 P.M. on 20th, and continued until 7 A.M. on 21st. Resumed again at 4 P.M. on 21st, and continued till 11 P.M. on 21st. Has taken altogether ʒxij. of turpentine up to this time (2 P.M., 22nd). Had three relaxed motions last night, of pale colour, but not without bile. Complains that he has pain in rectum from turpentine unless medicine is taken immediately after food. Purpuric character has disappeared from eruption on face. No fresh patches have appeared, and there is no marked extension of any previously noted. Swelling noticed on right hand has disappeared, and there is now no discoloration in this situation. Prostration increased; manner excited; pulse 136, small, weak, jerking. Spots on palate are less marked than before. Those on back have decidedly faded. Skin moist and perspiring. There are some spots of vesicular eruption near scapulæ; skin around neither indurated nor purpuric, and only slightly inflamed. Fine crepitation still heard at left base. Dulness at right base has disappeared. Blowing murmur at apex as before. The comparative number of white blood-cells in a drop of blood drawn from finger is decidedly diminished; but many of them are very granular, and some are seen distinctly disintegrating, and some granular débris is seen in the field corresponding in all essential characters to the granules seen in the cells. This character was again tested with one of Powell and Lealand's $\frac{1}{25}$ × 1250 diameter, and the observation was found to be confirmed. There was no distinct outline to a great number of the white corpuscles, but in others this was very distinctly present, and they were in many cases becoming granular and breaking down. The nuclei appeared to be unaffected by the granular change. Is this a physiological or pathological condition (?). The red corpuscles were entirely unaffected. Urine acid; no albumen. Not a trace of blood. Sp. gr. 1013.

22nd.—Ordered, brandy ℥vj. in addition to claret; three eggs.

23rd.—Prostration greatly increased. Great restlessness and jactitation. No more purpuric spots. Dulness and physical signs in lungs unchanged. Brandy, x℥. Died at 3 A.M. on 24th.

For the following table of the temperatures of the patient I am indebted to Mr. B. H. Allen, Physician's Assistant:

		10 A.M.		10 P.M.
17	....	—	....	$100\frac{1}{5}$
18	....	$100\frac{3}{5}$	....	$100\frac{2}{5}$
19	....	100	....	$101\frac{1}{5}$
20	....	$101\frac{4}{5}$	....	$102\frac{1}{5}$
21	....	$101\frac{3}{5}$	....	—
22	....	102	....	$102\frac{2}{5}$
23	....	$101\frac{4}{5}$	....	—

Post-mortem twelve hours after death.—Rigor mortis well marked in all the extremities; Purpuric marks in skin somewhat faded, but very like those observed during life.

Body opened.—Amount of subcutaneous fat moderate. There are some small petechial spots on parietal peritoneum and on upper surface of the rectus muscle on right side, but this muscle presents no deviation from the ordinary colour and appearance. On left side there are numerous petechiæ on parietal surface of rectus, and in many spots this muscle presents the following peculiar appearances: Patches of the muscle from one quarter to half an inch in diameter are of a whitish-grey, with none of the usual appearance of muscle, and contrasting markedly with the normally coloured tissue around. The portions so affected resemble the muscles of a sole or turbot. They are dry, friable, brittle, and break with a granular fracture. They have also a strong refraction. Such portions of the muscle stain of an intense reddish-brown with iodine—a change which does not ensue in other non-affected parts, though intermediate conditions may be found where the muscular tissue, though not so markedly discoloured, is still paler than natural, and markedly drier, crisper, more friable, and more refracting. These latter portions also stain with iodine much more deeply than natural. These changes have not affected the whole of the muscle continuously, but only in spots and patches scattered irregularly throughout the tissue, and which only form a small proportion of the whole bulk; and to the naked eye the extreme degree of the pallor is only found in a few comparatively small spots. Running through the muscle, and especially near the affected spots, are fine lines of injection, with here and there petechial spots of extravasated blood, but the greater part of the extravasations in the wall of the abdomen are in the subserous cellular tissue, rather than in the substance of the muscles. In the subcutaneous tissue of the front of the thigh, blood is extravasated for nearly half an inch in depth; but the muscles either in the back or front of thigh are but little affected by extravasations, though there is some hæmorrhage in their superficial parts; and here and there in patches, the same characters of alteration may be found in the neighbourhood of hæmorrhagic spots, as have been described in the left rectus abdominis. The great bulk of these muscles, though rather drier than normal, present no other change, and do not discolour with iodine.

The psoas muscles also present some spots similarly affected, and in the neighbourhood of these, minute hæmorrhages have taken place.

Heart presents a large white patch on anterior surface. On the under surface of the sternum is a rough prominence, due to the thickening of the periosteum.

Both auricles contain firm clots in which the fibrin has separated. There are great numbers of white corpuscles embedded in the fibrin, forming in many parts a complete crusta granulosa. Lining membrane and muscular tissue of auricle healthy. Tricuspid and pulmonary valves healthy. Muscular tissue of right ventricle soft, granular-looking; is too pale; breaks down too easily under finger.

Left ventricle: mitral and aortic valves healthy; wall well contracted; muscle here and there mottled as if fatty; throughout it is a great deal too pale, and in some spots colours very intensely of a reddish-brown with iodine; in places it fractures very crisply; but the fibres are brittle, the fracture crackling under the finger, and contrasting strongly with the more pulpy fracture of the right ventricle. These spots are here and there very vascular, as if from small extravasations.

Soft palate and roof of tongue are deeply ulcerated and sloughing. There are three ragged syphilitic ulcers, with sloughing surfaces, in the larynx, on the vocal cords, and on the under surface of the epiglottis.

Right lung free from adhesions. Bronchi present nothing remarkable; tissue loaded with frothy serosity, especially at base, but everywhere crepitant. Left lung firmly adherent to parietal pleura by old adhesions; the whole of the lower lobe is completely consolidated by pneumonic infiltration; cut surface is finely granular, of reddish-grey colour, dryish and friable. Upper lobe is much congested, and loaded with serosity. No tubercle in either lung.

Liver large and heavy; measures $10\frac{1}{2}$ inches in breadth, 9 inches anterio-posterior diameter; $3\frac{1}{2}$ inches greatest thickness in right lobe; weighs 67 ounces. Tissue very firm; does not stain much with iodine; has a friable fracture; is pale, especially in central parts of acini. Gall-bladder empty, contains a small quantity of pale, tenacious, yellow bile.

Kidneys.—Capsules separate with difficulty, splitting into layers and tearing kidney substance. Section finely granular. Cortical substance under capsule rough. Malpighian bodies prominent; tissue firmer than natural; gives no stain with iodine.

Supra-renal capsules very firm, section smooth and glistening, but distinction between cortical and medullary substance well preserved. Tissue of both stain intensely, and far more than ordinary, with iodine.

Spleen much injected; pulp very granular; Malpighian bodies very prominent; tissues very soft and cloudy-looking. It does no stain in the least with iodine.

Pancreas has a fatty look; tissue rather soft, but not otherwise remarkable.

Stomach.—Mucous membrane covered with thick gelatinous mucus, is abnormally pale and more glistening than natural, but does not present lardaceous characters to any marked degree; stains with considerable intensity with iodine.

Duodenum.—Much fatty degeneration of Brunner's glands, which are very prominent; there is considerable hyperæmia, and one small ulceration, quite superficial, seen in mucous membrane. The whole of the tissue stains very intensely with iodine.

Jejunum and Ileum.—Mucous membrane is pale, too transparent, has in dots and spots a waxy look, and the points of the villi stain of an intense reddish-brown with iodine. The waxy look and staining are very marked in the lower half of the ileum. These characters are not found with equal intensity in the large intestine.

Brain and spinal cord carefully examined, present nothing remarkable. In no part, though generally tested, was there found any discoloration with iodine.

Mesenteric glands small, present nothing remarkable, do not stain with iodine. Inguinal glands much indurated; present in some places considerable tracts of firm fibrous degeneration; but in other parts, where gland tissue is preserved, it has a pale look, and colours with iodine with considerable intensity.

Microscopical Examination.—Blood: White corpuscles of clot in heart were found quite normal as a rule, but a few were more granular than natural. Hardly any traces of their disintegration could be found. The red corpuscles in the clot in the heart were perfectly normal in all respects.

Muscles.—The pale portions above described presented a mixture of two appearances—1. Some fibres were excessively pale, had a uniform waxy look, and had lost nearly all appearance of striation. They broke up very easily, and in many places ruptured within the sarcolemma. Some presented an appearance as if made up of innumerable refracting particles, but I could not succeed in breaking up these fibres, so as to examine separately the constitution of the individual particles. These fibres did not appear particularly enlarged. 2. Other fibres in the same field, which were much paler than natural, had not the glistening waxy look, but were very finely granular. The transverse and longitudinal striation were indistinct, but these fibres in many cases split up very easily into fibrillæ. The granules disappeared for the most part with liq. potassæ or acetic acid, leaving a few scattered fat drops in the field. The nuclei appeared about as distinct as usual in the more waxy specimens. They were indistinct, but not enlarged in those which were granular.

The exceedingly pale spots in the rectus abdominis presented the waxy change in the most marked degree. The changed spots before described in the neighbourhood of the hæmorrhagic extravasations in the thigh, though presenting some waxy fibres, were more generally granular, but in both situations they stained of an intense reddish-brown with iodine, which deepened into an intense red on the application of sulphuric acid: I could not obtain from them a violet tint. The same reddish-brown was produced by Schulze's reagent (chloride of zinc and iodine).

The heart showed in a few parts similar waxy fibres, but in the affected spots the more general appearance was that the fibres were finely granular, with indistinctness of the transverse striation. The granular character disappeared, as a rule, with acids and alkalies. A few fibres here and there were distinctly fatty.

In the vessels of the skin and muscles near the affected parts I was able to trace similar changes.

I endeavoured to inject the right forearm from the brachial artery at the bend of the elbow, using Beale's Prussian blue injection fluid, but I found a very great difficulty in injecting the finer vessels of the skin; in fact, in hardly any portions could these be said to be completely injected, though the fluid returned in great quantities through the collateral circulation into the axillary arteries. As this injecting material ordinarily penetrates with great ease into the finest vessels, I was led to the belief that there must be something in the condition of the vessels themselves which caused this difficulty.

Sections of the skin near, but not in the parts effected with the hæmorrhagic extravasations, gave, either with Schulze's reagent or with iodine, or iodine and sulphuric acid, a most intense reddish-brown, in portions between the fat vesicles corresponding to the course of the capillaries; this coloration did not pass much into the papillæ, but was chiefly limited to the situation above described. The colour with Schulze's reagent was somewhat evanescent, but that with iodine lasted for a considerable period of time (forty-eight to seventy-two hours), and in some preparations the marking out of the capillaries was beautifully effected in this manner. It was not constantly met with in all portions of the skin tested, but was best marked in portions taken in close proximity to the affected spots. In some of these parts I succeeded in isolating portions of the capillaries and smaller arteries. I found that they broke up very easily, that some presented a peculiar glistening, waxy look, while others had a more granular appearance, in no respect corresponding to the appearances observed in health.

In some of the small arteries taken from the muscular tissues near affected portions, I found that the middle coat stained most intensely with iodine, the adventitia being unaffected; and I found this change in one or two injected portions. In some places there seemed to be an increase in size and number of the nuclei of the adventitia, but I was not able to satisfy myself of this point in a sufficient number of instances to speak very positively regarding this change. I have tested portions of skin taken from other bodies with the same reagents, and find that they do not present the same appearances. These changes in the vessels of the skin were not general, but occurred in scattered spots and patches, chiefly in the neighbourhood of the extravasation. The vessels of the omentum presented no changes whatever.

Remarks.—It will be observed that the above is not an uncomplicated case of purpura, inasmuch as the syphilitic affection under which the patient was suffering was running at the time of the attack a very acute course, and its local expression (the angina faucium) appeared to be much complicated by the secondary affection. The blood affection here does not appear to have been a very definite one; and it is difficult to associate the increase in the number of white corpuscles with any direct causation of the hæmorrhage. I have already questioned whether the appearance of disintegration observed in some of them be anything but a physiological phenomenon, as it has been long the opinion of many eminent histologists and physiologists that the red corpuscles are only the nuclei of the white.[1] It will be observed that there was no post-mortem evidence of any liquefaction, or increased fluidity of the blood.

The discovery of an appreciable alteration in the *capillaries* in this affection is, I believe, a new fact in its history, though the well-known reaction with iodine of tissues affected by the lardaceous or amyloid degeneration has been observed by Prof. Virchow and by myself, in the Rete Malpighi, in a case where there was general lardaceous disease of many of the organs of the body.[2]

Another very important question, however, here arises as to how far this affection of the capillaries can be logically considered to have been the cause of the hæmorrhage. A direct association of the two changes will probably be considered doubtful by many who know that lardaceous affections of tissues are rarely if ever associated with hæmorrhage, and further, that the change in the parenchyma of organs thus affected, and also in mucous membranes, is often preceded by a similar change in the smaller vessels.[3] The evidence as it stands at present is decidedly against such a theory of causation, unless one or two possible hypotheses may be admitted to explain the connexion of the phenomena observed; but, as far as my own observation goes, these can at present only be stated as queries:—

1. May this lardaceous degeneration, which we know chiefly as a chronic disease, occur occasionally in a more acute form, and in this manner so rapidly alter the elasticity of the vessels, before their diminished calibre can have retarded the flow of blood in the part that rupture and hæmorrhage ensue?

2. Is it possible that this lardaceous or waxy change, occurring only in *tracts* of tissue, may throw such a stress on the collateral capillary circulation of tissue around, that adjacent but comparatively unaffected capillaries give way?

3. Is it possible that this waxy change in the capillaries may pass, as it often does in other tissues (liver, kidney, muscle), into a softer

[1] See Mr. Wharton Jones On Blood Corpuscles considered in Different Phases of Development in the Animal Series. (Phil. Trans. 1846.)

[2] See a paper by the author, On the Pathology of the Glandular Structures of the Stomach. (Med.-Chir. Trans., vol. xli. p. 388.)

[3] Virchow, Cell. Path., Chance's translation, p. 374.

and more granular condition, which, when affecting the coats of the vessels, may lead to their rupture, in the same manner as it causes that of the voluntary muscles?

These hypotheses receive some support from the observations made in the dissemination of the degeneration in this case, and also from the observations of Zenker on a similar degeneration of the muscles occurring in isolated patches in typhoïd fever.[1]

It will be observed that the description of the muscles which I have given accords very closely with Zenker's, as the objects seen under the microscope did with his beautiful drawings; and therefore, if on no other ground, this case is of interest, as adding another to the list of acute diseases in which similar alterations have been observed, and which Zencker has collected in his valuable monograph.[2] Zenker and Virchow[3] have shown that such changes in muscles are not unfrequently the source of their rupture, and of consequent hæmorrhage. Here there appeared to have been no rupture on any large scale of the muscular fibres, and they were comparatively free from the extensive infiltration of blood occurring in the subcutaneous connective tissue. There appeared in this case to be a tendency to a pretty general affection of the muscular system, though it was only in limited patches that the change was decidedly marked, and I think it very possible that the same condition may have obtained for the vascular system, though the indications of minor degrees of the alteration were much less noticeable here, where, however, it must be remembered that the difficulties of observation were much greater.

It appears to me that the affection of the muscular fibres of the heart was also one that had supervened acutely—an opinion borne out by the development of an apex murmur, while the patient was under observation, and which I should be disposed to attribute to corresponding imperfection in the contraction of the papillary muscles, as no organic alteration of the valves was discoverable post-mortem.[4]

These features of the cases all bear out the hypothesis that the alteration in the vessels had been an acute one, though whether this is sufficient to account for the hæmorrhage, must, I think, remain an open question, until supported by further facts of a similar kind.

I have classed the affection both of the muscles and vessels with the waxy, lardaceous, or amyloid degenerations, both from the naked eye appearances and from the reactions with iodine; and though I consider the latter the least valuable of the criteria by which we judge of this change, it is the only one often applicable for the discrimination of the affection. Its value was, however, very marked in judging of the affected spots in the skin. Simple pallor of the muscles I should not

[1] Ueber die Veränderungen der Willkurlichen Muskeln in Typhus Abdominalis. Leipzig, 1864.

[2] Zenker has done justice to Mr. Bowman's earlier observations on this condition of the muscles, as found in tetanus, Phil. Trans., 1841.

[3] Verhand. der Phys. Med. Gesellsch. in Wurzburg. 1857.

[4] A similar impairment of the functions of the voluntary muscles was also noticed in the weakness and tremulous movements of the extremities during life.

regard as indication of this change; though Zenker is inclined to believe that a peculiar pale appearance observed by Dr. Bennett[1] in the muscles in the neighbourhood of some tumours, indicates a change identical with those which he has described. I have lately observed appearances corresponding with those described by Dr. Bennett in a gluteus maximus tensely stretched over a fibroplastic tumour, which had grown very rapidly in a child from the sacro iliac-synchondrosis. The fibres of the muscles here were extremely pale and indistinct. The normal colour and consistence of the muscle was completely wanting; it did not react with iodine, and instead of being crisp and firm and brittle, it was simply much softened; and though under the microscope the striation, both transverse and longitudinal, and also the nuclei, had almost completely disappeared, there was none of the peculiar waxy refraction which Zenker has described, and which occurred also in the case now under consideration. As far as my observation has extended, I believe the firm but very brittle character of the fibres to be an essential accompaniment of the true lardaceous change in muscle. That the change was of this description is also borne out by a similar affection of the intestines having been observed, the appearance of which corresponded closely, though not existing in as highly marked a degree as in some instances that have come under my observation, with those universally admitted as distinguishing this affection in these structures.

Other questions of considerable interest arise with regard to the causation of these alterations by the syphilitic affection under which the patient was suffering. Syphilis is undoubtedly, as shown by Dr. Wilkes, Frerichs, Grainger Stewart, and numerous other observers, a not unfrequent precedent of this degeneration in other organs; but there is very little doubt that it occurs with equal frequency independently of the constitutional state induced by the syphilitic poison, and I can discover no observations in other authors on the mutual relations between syphilis and purpura.[2]

The main causes of purpura have hitherto been sought for in alterations of the blood, but as modern research has largely discredited the theories of hæmorrhage by exhalation (to which the morphological conditions of the blood in this special instance were also opposed), we must, I believe, seek for the causes in alterations of the capillary system; and although the observations on this case leave many questions uncertain, yet I trust that it may serve as an incentive to further research, either for correction or corroboration of the opinions which I have ventured to bring forward. The cessation of the purpuric tendency under the use of turpentine was a very striking feature of this

[1] Cancerous and Cancroïd Growths, p. 104.

[2] It is interesting to note, in relation to this case, when moderate doses of iodide of potassium had been taken, that a purpuric eruption has been observed to follow the administration of this drug, both by Ricord and by Virchow (Handb. du Spec. Path. et Therap., vol. i. p. 244), and Dr. Walshe informs me that he has seen similar consequences follow immediately the use of bromide of potassium in a previously well-nourished individual, who had never before suffered from any hæmorrhagic tendency, in whom the purpura disappeared on the discontinuance of the drug.

case; but I do not see that it invalidates any theory which may be formed of the causes of the hæmorrhage resulting from an organic alteration of the capillary system. Our science is not yet sufficiently advanced to base any sound reasoning on the juxtaposition of therapeutical and pathological facts, except as subjects for further induction, and the discovery of organic pathological changes by no means excludes the possibility of their cure by therapeutic measures; and I am disposed to regard it as very probable that this patient would have completely recovered, had it not been for the serious complications in his case, both of a constitutional state, and local lesions in the lungs and throat of great severity.

ART. V.

Cases illustrating the Formation of Morbid Growths, Deposits, Tumours, Cysts, &c., in connexion with the Brain and Spinal Cord, and their Investing Membranes. With Observations. By JOHN W. OGLE, M.D. Oxon., F.R.C.P., Assistant-Physician and Lecturer on Medical Pathology, St. George's Hospital.

(*Continued from No.* 71, *p.* 238.)

VIII. DEPOSITS, TUMOURS, ETC., IN CONNEXION WITH THE INTRA-CRANIAL BLOOD-VESSELS.

A.—ARTERIES.

I. ANEURYSMS.

CASE CCXLIII. *Aneurysm (of the size of a Nutmeg) of the Left Anterior Cerebellar Artery, compressing the* LEFT *Crus Cerebelli, Pons Varolii and Cerebellum, and Fifth Nerve. Loss of Sight, Paralysis of the Face and Body on the* LEFT *side, with Hyperæsthesia of the Face on the same side. Epilepsy.*—Mrs. S., aged forty-six, the mother of several delicate children, had enjoyed tolerably good health until the year 1848, when she began to complain of pain at the front and top of the head, along with dimness of sight, worse on stooping, and pain referred to the back of the eyes. Occasionally she quite lost power of vision for a few seconds, the upper part of any object regarded becoming invisible before the remainder; she was also the subject of feelings of stupidity and heaviness. I saw her first in December 1851, shortly before which date she had several epileptic attacks. She was perfectly blind, having been so since about a year after her illness began. She was pale, and the mouth was drawn to the right side; the *left* side of the face and forehead being considerably paralysed as to motion, but exquisitely sensitive to impressions. The pupils of both eyes, which were large and equal, were quite inactive. There was no ptosis, and the tongue was protruded and straight. Deafness of the *left* ear, and want of power of smell in the *left* nostril existed. At times the patient's memory was defective, and she would talk of circumstances long past as if they had just occurred, but generally her mental powers were intact. There was great want of power in the muscles of the whole *left* side of the body. The various viscera were apparently healthy. The patient was slightly salivated by mercury which had been given to her. During a few months she improved, the hyperæsthesia diminished, and the paralysed limbs somewhat recovered power, but she had a troublesome twitching of the left arm, which became painful, and later on all the limbs became very painful, and she became inclined to drowsiness, and complained much of "sawing" and other strange sensations in the head. Subsequently twitchings and contractions of the muscles of the right side of the neck and shoulders, and stiffness of the left side of the neck, came on. The sense of taste on the *left* side became impaired. For two years she went on the same, the head-ache being much less, but the convulsive attacks occurred from time to time, the left arm being specially convulsed, and the left eye often twitching. She died in September 1856, after a severe fit. The treatment adopted was at first the use of mercury, then of quinine and strychnine, and towards the end of life the use of the seton in the neck.

Post-mortem Examination.—Cranium: The skull was natural; the arachnoïd membrane was thickened in places, and much fluid existed in the sub-arachnoïd tissues and ventricles; the vessels of the brain were very congested, and the arteries at the base of the brain very atheromatous. Connected with the anterior cerebellar artery on the *left* side of the brain was an aneurysm of about the size of a small nutmeg, resting immediately upon the inferior surface of the left middle crus cerebelli, and indenting, though very slightly, the contiguous structures of the pons Varolii and left lobe of the cerebellum, which parts were very softened. The fourth nerve was pressed upon by the aneurysm anteriorly, and the seventh nerve on the same side was much stretched by the growth. The aneurysm was nodulated on its surface, and was firmly attached to the dura mater: when cut into it was solid and full of blood-clot and firm discoloured fibrin. The optic nerve, commissure, and tracts were very dwindled and softened, and of a semi-transparent yellowish colour, as was also the seventh nerve near the aneurysm.

Microscopical Examination showed the usual appearances presented by dwindled and atrophied nerves, and many capillaries of the brain-substance were in a state of fatty degeneration; otherwise the brain appeared healthy.[1]

CASE CCXLIV. *Aneurysm of the Middle Cerebral Artery on the* LEFT *side, which burst in the Cerebral Hemisphere, breaking down the outer walls of the Lateral Ventricle. Epilepsy. Coma after a Fit, and Death in a few hours.*—William P., aged fifty-three, was admitted into our hospital, March 4th, 1856, quite insensible, with contracted pupils, but free from stertor, or vomiting, or spasm. For some time he had been subject to fits, which only lasted a short time, and on the day of his attack he had eaten a comfortable dinner. Shortly afterwards he was attacked by a fit, and died a few hours subsequently, without any change in symptoms having occurred.

Post-mortem Examination.—Cranium: The skull and cerebral membranes were natural. In the substance of the *left* cerebral hemisphere was a large cavity full of blood, communicating with the cavity of the left ventricle, the outside wall of which was much disintegrated. Both lateral ventricles contained much blood and coagulum, and their septum was destroyed. The cavity in the hemisphere was owing to the bursting of an aneurysm of the middle cerebral artery, the upper part of which was situated at the lower and outer part of the left corpus striatum, which was much broken down. The brain-substance around the aneurysm, where broken down, was very shreddy. The under surface of the aneurysm, which was of about the size of a walnut, was seen at the base of the brain, on separating the middle from the anterior cerebral lobe, divided into two lobules, as if by the pressure of one of the branches of the artery. The arteries at the base of the brain were not athero-

[1] For further details of this case, see the Trans. of the Royal Med.-Chir. Soc., vol. xlii. p. 403, and also observations in connexion therewith. See also St. George's Hospital Catalogue, Series viii. No. 113.

matous. The muscles of the eyeballs were fatty, as determined by the *microscope*, and the arcus senilis of the cornea was well developed. *Abdomen:* The kidneys were granular. *Thorax:* The heart was natural in outward appearance, but the fibres of its muscular walls were in a fatty state, though it was not diminished in consistency.[1] (46.)

CASE CCXLV. *Aneurysm of the Left Internal Carotid Artery in the Cavernous Sinus. Symptoms referrible to pressure upon the third, fourth, and fifth Cranial Nerves. Disease of the Heart.*—John T., aged sixteen, having long had disease of the heart, was suddenly seized with giddiness, followed on the next day by slight ptosis of the left upper eyelid and interference with the movements of the left eyeball. He was admitted into the hospital, Aug. 21st, 1860. These symptoms increased, and between two and three weeks afterwards there was numbness of the left side of the forehead, almost complete loss of sight in the left eye, and dilatation with immobility of its pupil. Later on, the sight of the eye had returned, and the patient saw double. The ptosis had diminished, and also headache and giddiness. He was made out-patient, but returned to the hospital Nov. 7th, with cough, dyspnœa, and dropsy, and died on the day afterwards.

Post-mortem Examination.—Thorax and Abdomen: The lining membrane of the left auricle and the edges of the mitral valve-flap were covered by recent soft fibrin, and masses of fibrin were met with in the spleen and kidney, and of extravasated blood in the lungs. *Cranium:* At the anterior part of the left cavernous sinus was an aneurysm (size of a small nut) of the whole circumference of the left internal carotid artery, filled (at its outermost parts) with firm coagulum, but free, and containing fluid blood in its centre. The vessel was otherwise quite healthy. The third cranial nerve was so stretched by the tumour as to be almost divided near the sphenoïdal fissure; and the fourth cranial was also very thin, owing to its being greatly stretched by the tumour. The first division of the fifth nerve was in close proximity to the lower part of the tumour. The brain was quite healthy, as also the vessels at its base.[2] (296.)

CASE CCXLVI. *Aneurysm of the Basilar Artery. Rupture. Convulsive Attacks. Unconsciousness. Rigidity of the Left Arm.*—George W., aged thirty-nine, a shoemaker, and temperate, was admitted Feb. 22nd, 1865. Eight years previously he had acute rheumatism. Four days before admission he had been seized with vomiting and purging in the night. He got better for some hours, but a convulsive fit came on, followed by five others, the sickness and purging ceasing. On the morning of admission he had another convulsive attack, and when it was passed consciousness did not return. When admitted he was regardless of all around. He moved the right hand about, but the left one was rigidly flexed, though not palsied. The extremities were cold. There was no cardiac bruit, but the heart's rhythm was uncertain. A turpentine injection and aloetic purgatives were given. He remained incoherent until death on the day following.

Post-mortem Examination.—Cranium: The cerebral convolutions were much flattened, and at the base of the brain much blood was found extravasated in the arachnoïd and sub-arachnoïd cavities, imbedding the pons Varolii and medulla oblongata. The fourth ventricle was full of blood, and the spinal cord

[1] See St. George's Hospital Catalogue, Series viii. No. 112, also Trans. of Path. Soc., vol. vii. p. 127, where fuller details are given. [In a case of aneurysm of the middle cerebral artery in St. Bartholomew's Hospital Museum, Series vi. No. 44, there are also pouches in the walls of the vertebral artery; and preparation No. 59 in the same series shows aneurysm of one middle cerebral artery, and a rupture of the opposite artery in the same patient, a woman aged eighty-four.]

[2] The details of this case have been fully related by Mr. Holmes in vol. xii. (p. 61) of the Path. Soc. Trans. See also St. George's Hosp. Cat., Series viii. No. 114.

along its whole length was surrounded by blood. The lateral ventricles contained blood-coagulum. This extravasation of blood proceeded from a large rupture of an aneurysm of the basilar artery, of the size of a small bean, projecting from the right side of the vessel near the junction of the vertebrals. There was no atheroma of the cranial vessels. *Thorax and Abdomen:* Excepting a few pleural adhesions, slight atheroma of the aorta, and a cyst in one kidney, the various organs were natural.[1] (59.)

CASE CCXLVII. *Aneurysm of the Anterior Cerebral Artery on the* LEFT *side. Peculiar white, flake-like Bodies in the Arachnoïd Membrane of the Spinal Cord. Blindness for Four Years. Paraplegia.*—The patient was a person who died under the care of Dr. Seymour and Mr. C. Hawkins, many years ago.

History and Symptoms.—Of these the only circumstances remaining on record are, that for twelve years he had suffered from paraplegia and loss of power over the sphincters, and for the space of four years had been quite amaurotic. He had also for some time before death been in a state of fatuity.

Post-mortem Examination.—The cranium itself and its coverings were natural. The cranial dura mater and arachnoïd were healthy; but beneath the latter, in many places, a quantity of semi-solid gelatiniform substance existed. Moreover, there was much clear serous fluid in the arachnoïd cavity and cerebral ventricles. The brain itself was quite firm and healthy, excepting at one part of its base, where pressure had been exercised upon it by an aneurysm of the left anterior cerebral artery. The part of this vessel where the aneurysm existed was just at its commencement, and consequently it was the so-called anterior perforated space on the left of the brain which formed, as it were, the bed in which lay the aneurysm; the nervous substance external to the left optic tract, reaching as far forward as the root of the left olfactory nerve, and outward as far as the commencement of the fissure of Sylvius, being softened by the pressure of the aneurysm, and of a darker colour than the rest of the brain. The left optic tract itself was thinner and flattened by the aneurysm. As to the aneurysm, it was about equal to a threepenny piece in diameter, and spherical in shape, and its walls were very transparent and attenuated; its cavity, which contained a certain amount of loose coagulum, communicating freely with the trunk of the main arterial branch on which it was situated.[2]

On examining the spinal cord, the same kind of gelatine-looking material was found beneath the arachnoïd membrane as existed in the case of the cerebral sub-arachnoïd; and, in several places, patches of a white deposit were found in the substance of the spinal arachnoïd membrane, having to the naked eye something of the appearance of thin flakes of cartilage. The spinal cord itself presented nothing unusual.

Microscopical Examination showed the contents of the aneurysm to be made up of the more ordinary elements of fibrin and blood-coagulum. The white flakes seen in the spinal arachnoïd membrane were found to consist of indistinct granular material for the most part, in which numbers of delicate fibres and small nuclear bodies existed, clearing considerably under the action of dilute acetic acid. I found nothing like cartilage stroma or cells in this substance.[3]

In the Middlesex Hospital Museum (omitting preparations of intracranial aneurysms, Nos. 35 and 36 in Series v., which have been

[1] This interesting case occurred in the practice of my colleague, Dr. Fuller, who brought it before the notice of the Pathological Society of London. (See Trans., vol. xvi.) We have in our Hospital Pathological Museum a drawing of the preparation, which is catalogued in Series viii.

[2] See Hospital Pathological Catalogue, Series viii. No. 111.

[3] See Hospital Path. Cat., Series viii. No. 144.

described by members of the hospital staff at the Pathological Society), No. 17, Series v., shows aneurysm of the internal carotid artery within the cranium; and No. 2780 in the Museum of University College shows aneurysm and obstruction of the middle cerebral artery in connexion with softening of the brain (on both sides?). In St. Thomas's Hospital, Section N contains several instances of aneurysm of the intra-cranial arteries. No. 61 shows aneurysm of the basilar artery; 61.1, aneurysm of the anterior communicating artery; 62, of the middle cerebral artery.

II. FIBRINOUS COAGULUM IN THE ARTERIES.[1]

CASE CCXLVIII. *Plugging up by Old-standing Fibrin of most of the Arteries within the Cranium. Softening of the* LEFT *Cerebral Hemisphere. Fibrinous Masses attached to the Mitral Valve-flaps of the Heart. Hemiplegia on the* RIGHT *side.* MISAPPLICATION OF WORDS. *Convulsions before Death.*—Robert C., aged forty-five, was admitted Oct. 30th, 1850, having been bled and salivated. About ten days before (having previously been in good health), he had two teeth drawn owing to severe tooth-ache. He began immediately afterwards to lose the power of speaking and of using the *right* side of the body. There was no unconsciousness, and no convulsive attack. When admitted the face was drawn to the left, and the tongue was protruded to the right. He was quite conscious and intelligent, but unable to answer questions or express himself in words. He made noises and sounds which seldom formed words, and *miscalled objects*. The pupils were dilated; urine free from albumen; heart's sounds healthy. He was blistered and regained a certain degree of power over the leg, but became more childish, crying suddenly without apparent cause, and the evacuations passed unconsciously. On the 7th of February following he was seized with convulsions, chiefly affecting the *right* side, after which the muscles of the right arm remained rigid, and he died Feb. 10th.

Post-mortem Examination.—*Cranium:* The bones of the skull and cerebral membranes were natural. The large veins on the surface of the brain were very full of blood, and the white substance of the brain very vascular, with many and large "puncta." The grey cerebral matter was but slightly congested. In the neighbourhood of the lateral ventricles the white matter was of a pinkish colour, and in the *left* hemisphere it gradually became soft and at last quite diffluent, as well above the ventricle as below it. The other parts of the brain were natural. Firm fibrinous coagulum, for the most part colourless and adherent—in some places most firmly—to the inner surface of the vessels, was found partially closing the basilar, both posterior cerebral arteries, as well as both carotid arteries. The *right* carotid artery (in the neighbourhood of the cavernous sinus) at the anterior clinoïd process was reduced to one-third its natural calibre, but in other parts was natural. On the *left* side the carotid artery was more extensively affected; its calibre was so reduced by contained coagula that room was scarcely left for the passage of a small bristle; and the coagula extended into the commencement of the anterior and middle cerebral arteries. In the neck the carotid arteries were natural. Some opaque fluid existed in the lateral ventricles. *Thorax:* Some old-standing small fibrinous deposits existed on the surface of the mitral valve-flaps, and slight atheroma of the aorta and mitral valve existed; otherwise the organs were natural. *Abdomen:* Organs natural.[2] (29.)

[1] Many such cases from our hospital practice I have already detailed in the Medical Times and Gazette, in connexion with a series there published, of Softening of the Brain and Spinal Cord. (See vols. i. and ii., 1864, to be continued.)

[2] This case has been related by Dr. Bence Jones in the Trans. of Path. Soc., vol. iii. p. 40; see also Hosp. Path. Cat., Series viii. No. 115.

CASE CCXLIX. *Plug of Fibrin in the* LEFT *Internal Carotid Artery, and one of the Coronary Arteries of the Heart. Softening of the* LEFT *Corpus Striatum.*—A woman, aged fifty-six, having been for some time previously subject to so-called hysteria, was admitted into St. George's Hospital in 1829, and there died. Only a few days before death she complained of much pain at the region of the heart, and this was followed by œdema and incipient gangrene of the legs.

Post-mortem Examination.—Thorax: Masses of old decolorized fibrin were found in the right ventricle of the heart, and a few in the left ventricle also. Some of these contained puriform fluid in their centres. A large part of the upper posterior of the left ventricular wall, and one of the fleshy columns of this cavity were converted into a yellowish-white mass, and a branch of a coronary artery passing through the mass was blocked up by old-standing fibrin. *Cranium:* The left internal carotid, at the side of the sella turcica, contained a quantity of firm, long-standing fibrin and clotted blood. The corpus striatum on this side was of a yellow colour, and much softened.[1]

CASE CCL. *Plugging up of the* RIGHT *Posterior Cerebellar Artery by Fibrinous Coagulum. Similar Plugging of one of the Coronary Arteries of the Heart. Extravasation of Blood into the Superficial Part of the Cerebellum. Fibrinous Deposits on the Surface of the Mitral Valve-flaps and Lining of Left Auricle.*—Joseph W., aged sixteen, was admitted into St. George's Hospital on the 10th of September, 1856. He had been well on the 7th, and on the following day had much pain in the head, and been very sick after supper. He then became unconscious, and when admitted was in a state not unlike one of continued fever. There was much albumen in the urine. He remained comatose, but restless, until he died, on the day following admission.

Post-mortem Examination.—Thorax: The mitral valve of the heart showed numbers of single fibrinous masses attached to the edges and surfaces of its flaps; and this was also the case with the lining membrane of the left auricle. Moreover, one of the branches of the coronary arteries contained a plug of fibrinous coagulum, and was much dilated at the part. *Abdomen:* Masses of fibrinous deposit were found in the substance of the spleen and the kidneys, and in the small blood-vessels of the kidneys in the neighbourhood of the fibrinous deposits: attached to the mucous surface of the colon also were similar masses of fibrin. In the substance of the supra-renal capsules numbers of nucleated fibres, and also a large number of lymph-like corpuscles, as well as their ordinary elements, were seen by the microscope. *Cranium:* The right cerebellar artery was found to contain a plug of coagulated fibrin, and, correspondently, a portion of the surface of the right lobe of the cerebellum showed a mass (the size of a pea) of coagulated blood, which had been extravasated into its substance, the capillary vessels around containing a slight amount of fatty matter. The dura mater also, covering both cerebral hemispheres, was lined by a thin layer of reddish fibrin, slightly adherent to the membrane.[2] (215.)

CASE CCLI. *Fibrinous Coagulum blocking up the Basilar Artery. Absence of any Fibrinous Deposits on the Valves or Lining Membrane of the Heart. Hemiplegia on the* LEFT *Side. Hysterical and Typhoïd Symptoms.*—Thomas M., a butler, aged thirty-nine, was admitted into St. George's Hospital, on the 29th of March, 1856, in a semi-comatose condition. He was reported to have been weak and

[1] See Trans. of Path. Soc., vol. xiv. p. 3. We have in our museum a drawing showing the softened fibrinous deposit in the cavities of this heart.

[2] See Trans. of Path. Soc., vol. xv. p. 15; also Beale's Archives, No. vi. p. 88, where the case is related, owing to the fibrinous layer or false membrane lining the dura mater.

silly, and impotent for two years previously. For two weeks before admission he had complained much of giddiness, and had several "fits," which were described as being like hysterical fits, in which he sobbed and laughed much. On the day before admission he began to lose the use of the arm and leg on the *left* side. This loss of power rapidly increased, and on the day after his admission he had lost all power over the sphincters. The pulse was 112 and weak; skin moist, but the lips and tongue became dry and black from sordes. The pupils were quite inactive, neither dilated nor contracted. He never rallied, but died on the 31st, two days after admission.

Post-mortem Examination.—Cranium: Cerebral vessels congested; brain-substance showing many puncta on section, but otherwise quite healthy; lateral ventricles distended with serous fluid. The walls of the basilar artery were thickened; its calibre was much dilated and its tube rendered quite impervious, owing to the presence of a firm, dark, fibrinous coagulum, which was adherent to the parietes of the artery. *Thorax:* The lungs were congested; the ascending aorta somewhat atheromatous. The walls of the heart were flabby, but no disease of the valvular structures of any kind was found. *Abdomen:* The kidneys were congested; all the other organs were natural.[1] (76.)

CASE CCLII. *Hemiplegia coming on in a Case of Bronchitis. Dropsy, and Disease of the Heart and its Valves. Supposed Embolism* (?)—Matilda D., aged thirty-six, was admitted March 2nd, 1860. She had been in good health until the previous November, when she had cough and pain in the chest, but was never known to have had rheumatic fever. In December she was treated as an in-patient for bronchitis and dropsy and palpitation. She went out of the hospital and was re-admitted in a worse state, having had wandering of the mind and suffering from spectral delusions and some degree of paralysis of the *left* arm and leg, which did not prevent her from walking, and also from dyspnœa, &c. There was a systolic cardiac bruit at the apex. Much crepitation existed in the lungs and albumen in the urine. She became worse, and died on the 10th.

Post-mortem Examination.—Unfortunately the head was not examined. There was great hypertrophy with dilatation of the heart, and the flaps of the aortic valve, as also the ventricular aspect of one of the mitral flaps, had a number of large and soft fibrinous deposits attached. Indications of pleurisy and bronchitis and consolidation of the lung existed. The kidneys were cysted and otherwise diseased. (69.)

In the above case, though no proof exists, yet I think it not unlikely that the hemiplegia was connected with some arrest of circulation in the intra-cranial arteries by fibrinous plugging up.

CASE CCLIII. *Fibrinous Plug obliterating a part of the* RIGHT *Middle Cerebral Artery. Softening of the Brain in the Neighbourhood. Hemiplegia on the* LEFT *side. Convulsions. Gangrene of Great Toe.*—Charles E., aged thirty-four, was admitted into St. George's Hospital, Feb. 22nd, 1860. He had drunk very freely, and had been subject to epileptic seizures. At some former period it had happened that a heavy lump of coal had fallen upon his back. When admitted his manner was heavy, and he had pain in the right side of the head and the right temple. The left arm was colder than its fellow, and also weaker; the left side of the face was inexpressive, the pupil of the left eye was dilated, and squinting existed. The pulse was 82, and tongue clean. A blister to the neck was ordered. Shortly afterwards an epileptic attack occurred, with convulsive movements of the left side, and the mouth was drawn to the right. He went on much the same until the little toe on the

[1] See Trans. of Path. Soc., vol. xv. p. 14.

left foot began to show signs of gangrene, which eventually extended upwards to the dorsum of the foot. Brandy and opium were freely given; but all the soft parts of the toe came away, leaving the bone exposed. He sank and died April 23rd.

Post-mortem Examination.—Cranium: Much fluid was found in the lateral ventricles, and beneath the arachnoïd membrane. The middle cerebral artery on the right side was firmly plugged up with firm fibrin (for the distance of one inch and a half), which was at one part quite adherent to the arterial walls, and decolorized. This vessel was obliterated from a point close to the termination of the carotid artery, almost as far as to the so-called Island of Reil. At this part the subjacent brain was very softened, indeed it was quite of a grumous consistence; and this diffluent condition extended as far as to the corpus striatum, but not to its ventricular surface.

Microscopical Examination showed the softened brain-tissue to contain a large number of nuclei and granular bodies; but no nerve-tubes were visible. *Thorax:* Heart's walls and cavities healthy, the ascending aorta slightly atheromatous; and adherent to its walls, about one inch above the aortic valves, were numerous and large fibrinous accumulations, exactly like those often found connected with the heart's valves. *Abdomen:* A mass of fibrinous material was found occupying about a quarter of the entire substance of one kidney; also a slighter one in the other kidney. Indications of both old-standing and recent peritonitis were found in the abdominal cavity.[1] (116.)

CASE CCLIV. *Plugging by firm Fibrinous Deposit of the* LEFT *Internal Carotid, the Anterior and Middle Cerebral Arteries and their Branches, and the Ophthalmic Artery. Hemiplegia on the* RIGHT *side. Coma before Death.*—John H., aged thirty-nine, a coachman, who never before had been affected in like manner, was admitted after having suddenly fallen down in a fit, June 21st, 1861. The fit was attended by foaming at the mouth and insensibility, and by three or four attacks of vomiting. On admission he was quite insensible, with total loss of sensation and power in the muscles of the *right* side. The mouth was drawn to the left, and there was slight ptosis of the *left* upper eyelid; also, absence of reflex action on tickling the soles of the feet. Evacuations passed unconsciously. The vomiting continued, and in the evening he had a second and similar attack, after which he remained stertorous until death.

Post-mortem Examination.—Cranium: The *right* cerebral hemisphere was found larger, fuller, and paler than the other, and its lateral ventricle was distended with fluid. The left hemisphere was of natural consistence and vascularity, and its lateral ventricle was empty. The left internal carotid artery was found to be full and round at the base of the brain, owing to its being filled with a coherent blackish coagulum, extending from within the middle lacerated foramen to its termination. The clot also extended into the ophthalmic and whole length of the anterior and middle cerebral arteries, as well as their branches; outside the skull the artery was natural. The walls of the vessels were natural. *Thorax:* Heart flabby; slight thickening of the mitral and aortic valves existed, and there was a patch of hæmorrhage in the lungs. The blood in the body was generally very fluid. (159.)

CASE CCLV. *Plugging up of the Carotid Artery on the* LEFT *side by Fibrinous Coagulum. Death after Coma and Convulsive Attack following Scarlet* (?) *Fever and* CHOREA.—Edith S., aged eleven, admitted October 23rd, 1861, with slight chorea, chiefly of the *left* side (of three weeks' standing), which was said to have followed a quarrel in which she had been engaged.

[1] See Trans. of Path. Soc., vol. xv. p. 12.

Her general health was good, but her father had been subject to epilepsy, and had died of aneurysm. The bowels were much loaded, and she was purged and treated by generous diet and stimulants; after a time, fever and sore throat (? scarlet fever) came on, but without any eruption on the surface, and was attended by an albuminous state of the urine. Eventually, drowsiness supervened, the albumen still existing in the urine. An epileptic attack came on, and death shortly followed.

Post-mortem Examination.—Cranium: The brain was anæmic; there was no excess of serous fluid in the ventricles. The carotid artery in the cavernous sinus on the left side, as far as the origin of the ophthalmic artery, was full of firm fibrinous coagulum. *Neck and Thorax:* The organs were natural, except that the trachea was lined by soft fibrinous exudation; the heart's cavities being full of yellow blood-coagulum. An abscess, however, existed in the neck, about the cervical glands. *Abdomen:* The kidneys were large, congested, and dripping with blood. Two extra spleens (the size of a boy's marble) were found in the omentum. (288.)

CASE CCLVI. *Fibrinous Coagulum plugging up many of the Intra-Cranial Arteries. Disease of the Kidneys. Sudden Death.*—Sarah O., aged twenty-three, who had had rheumatic fever when aged thirteen, was admitted Sept. 18th, 1863, having one month before been laid up with vomiting and shivering, from which she quite recovered. In the beginning of November her appetite failed, and dyspnœa came on, and forthwith she was unable to lie on the left side. Six weeks before admission she coughed up a mouthful of blood, and had slight cough and spitting; and on admission, December 23rd, there was great rapidity and irregularity of the heart's impulse. She varied much, anasarca set in, and eventually the disorder of circulation and respiration became extreme. Whilst washing herself she became faint, and died suddenly, December 27th.

Post-mortem Examination.—Cranium: The vessels of the scalp were much congested. The bones of the skull, the cerebral membranes, and the brain-substance in all parts were quite natural. The internal carotid arteries, however, within the cranium, and their middle cerebral branches for about two inches, and the anterior cerebral at their commencement were distended with almost black coagulum. The anterior communicating arteries were empty, but the small subdivisions connected with the carotid vessels contained minute plugs here and there of fibrinous coagulum. The vertebral vessels were natural. The internal carotids outside the skull were natural, but the external carotid on the right side from its bifurcation, and also its thyroïd branch, were distended with coagulum. *Thorax:* The mitral and tricuspid valves were affected by former disease, but no indications of recent disease about the heart were met with. *Abdomen:* Kidneys rather roughened on their surface. Other organs were natural.[1] (315.)

CASE CCLVII. *Plugging up of both* MIDDLE *Cerebral Arteries by Fibrinous Coagulum. Fibrinous Masses adherent to the Mitral Valve-flaps and to the Lining of the Left Auricle, which was ulcerated, and also the Seat of a Mass of Calcareous Deposit. Softening of the Brain on both sides. Hemiplegia on the* RIGHT *side.* MISAPPLICATION OF WORDS.—Emma C., aged twenty-one, was admitted into St. George's Hospital on the 24th of December, 1863. She was anæmic, and had been out of health some years. Of her history nothing could be exactly ascertained, excepting that a few days before admission she had had some sort of a so-called "apoplectic" attack. On admission her face was anxious but intelligent. Articulation was defective, her words being clipped and running

[1] Hosp. Path. Cat., Series viii. No. 182 B.

one into the other. Tongue protruded in a straight direction. No paralysis of the facial muscles. Pulse ninety, weak, but tolerably full. Heart's action much increased, a slight bruit accompanying the first sound. The arm on the right side was quite wanting in power, but the muscles were free from rigidity. The leg on the same side was almost but not quite wanting in motor power also. The tactile sensibility of the skin of the paralysed side was greatly *exalted*. The pupils of both eyes were rather dilated, otherwise natural. Urine loaded with lithates; later on it contained much albumen. Under the use of diuretics and aperients, and subsequently of vegetable bitters, the heart's action became diminished, and she went on well, excepting that she got thinner. Subsequently the pulse and respiration became much quickened. She would answer questions rationally, excepting sometimes when she gave objects their *wrong name, and generally misused words*. After becoming restless and moaning much at night, she sank and died on the 16th of January, 1864.

Post-mortem Examination.—Cranium: Bones and cerebral membranes natural. The substance of the brain at the anterior and upper part of the left corpus striatum, and at the base of the anterior part of the middle cerebral lobe on the right side, was softened. The commencement of the middle cerebral arteries on both sides was occupied, and rendered impervious, by masses of fibrinous coagulum. *Thorax:* Fibrinous masses were found adherent to the edges of the mitral valve-flaps, and also to the lining membrane of the left auricle, which at one spot was slightly ulcerated, and in another part was occupied by a quantity of hard calcareous matter. Other organs natural. *Abdomen:* Masses of fibrinous material occupied a portion of one kidney. Other organs in the cavity healthy.[1] (16.)

CASE CCLVIII. *Plugging up by Fibrin of the Middle Cerebral Artery on the* LEFT *Side. Extravasation of Blood into the* LEFT *Hemisphere of the Brain. Hemiplegia on the* RIGHT *Side.*—George H., aged seventeen, was admitted December 21st, 1864, with a sallow complexion, and having been out of health four months. He had a pulsating, elastic swelling occupying the front of the right forearm, in which a single whizzing bruit could be heard. There was increased action of the heart, and a soft, distinct bruit following the systolic sound. On the 11th of January he suddenly became unconscious, the left arm being motionless, but he was constantly moving the right one. He improved mentally, but continued prostrate, and a second similar attack came on. He became conscious, but speechless. The right arm appeared palsied, and the left side of the mouth rather drawn. The pupils of the eyes were equal. He died January 22nd.

Post-mortem Examination.—Thorax: There was much ragged fibrin on the mitral valve-flaps, which were thickened, and on the lining of the left auricle. *Abdomen:* Blocks of fibrin existed in the spleen and kidneys. *Cranium:* The middle cerebral artery in the Sylvian fissure on the left side lay in a mass of blood which had been extravasated in the substance of the middle lobe, and at the origin of this vessel was a small mass of decolorized fibrin blocking it up.[2] *Forearm:* The swelling in the forearm was owing to a thin-walled aneurysm of the ulnar artery, of the size of a swan's egg, containing old laminated coagulum throughout its greater part.[3] (33.)

CASE CCLIX. *Plugging up by Fibrinous Coagulum of the Basilar, Left Middle Cerebral, and other Intra-cranial Arteries. Softening and Porous State of the* LEFT

[1] See Trans. of Path. Soc., vol. xv. p. 13.
[2] See Hosp. Path. Cat., Series viii. No. 182, *c*.
[3] See Hosp. Path. Cat., Series vi. 129, *b*.

Cerebral Hemisphere.—Emma L., aged seventeen, an anæmic girl, was admitted December 23rd, 1864, with subacute rheumatism, and an affection of the aortic valve. She suddenly became unconscious ten days after admission. There was, at the time, no increased heat of surface, but the radial pulse became fuller than before. When roused she only said the word "no," and she often rolled the eyes uneasily. She passed her evacuations unconsciously. Two days later the right eye was noticed as less sensitive than the other one, and when asleep the eye did not quite close. On the 8th of February the *right* arm was noticed as paralysed, and became painful when flexed, which appeared to be from the diseased joint, and the *right* side of the face was also partially paralysed. The pupils were equal but sluggish, especially the right one. Deglutition became affected. She varied much, the pain in the affected arm being always very great, and she never became rational. She died February 12th.

Post-mortem Examination.—Thorax and Abdomen: The aortic valves were so reduced by disease, that their place was almost quite occupied by soft fibrinous masses, and the mitral valve-flaps were covered by the same; the lungs were in a hepatized state in places, and in the spleen and one kidney fibrinous blocks existed. *Cranium:* The whole of the *left* cerebral hemisphere, except a small part at each end, was soft and porous-looking, and easily washed away by water dropping on it. The left corpus striatum was softened.

Microscopical Examination showed the softened part to contain numbers of rounded dark granular corpuscles, soluble in liquor potassæ, but unaffected by acids. The arteries at the base of the brain were much obstructed by decolorized fibrinous deposit. This was the case with the bifurcation of the basilar, the origin of the left middle cerebral, and one or two others in more remote branches.[1] (52.)

CASE CCLX. *Plugs of Yellow Fibrin obstructing both Middle Cerebral Arteries. Congestion of the Brain. Delirium and Restlessness before Death.*—James C., aged twenty, was admitted August 30th, 1864, with anxious expression, congestion of the right conjunctiva, and in a stupid condition, not replying to questions. Attempts to straighten the arm produced rigidity of the biceps muscle. Skin perspiring, but not very hot. Pulse 92, equal. There was no strabismus or facial paralysis. He became violent; could not be made to put out the tongue. The pulse rose; the skin became hot. He remained in a restless and sleepless state until he died, Sept. 3.

Post-mortem Examination.—Cranium: There was great vascularity of the surface of the brain and distension of all the intra-cranial vessels, and at the commencement of both the right and the left middle cerebral artery, filling but not distending the vessel, was a plug of yellow fibrin. *Thorax:* Old-standing small masses of fibrin were found attached to the inner surface of both ventricles of the heart. (233.)

[1] The condition of the cerebral arteries is shown by the specimen No. 182, *a*, Series viii., in our museum; and the heart as No. 199, *a*, Series vi.

In the same year (1864) a woman, Elizabeth Y., aged thirty-five, died in our hospital, Sept. 27th, suddenly, whilst suffering from subacute rheumatism. After death a quantity of fibrinous deposit was found attached to the mitral valve, and fibrinous plugs in the mesenteric vessels, and a very minute quantity of fibrinous coagulum at the origin of the middle cerebral artery on the *left* side, not sufficient to create obstruction. (257.) Also in the same year, a girl, Anne T., aged nineteen, died June 11th of acute rheumatism and a similar state of the heart's valves, in whom, in addition to plugging of the pulmonary artery, a minute plug of fibrin was found in the *right* middle cerebral artery, the brain being natural. (167.)

CASE CCLXI. *Peculiar Septum in the Basilar Artery, and unusual size of the Vertebral Arteries. Softening of the Central Parts of the Brain. Fatuity.* —Luke R., aged thirty, an Irish soldier, became insane in 1835 without manifest cause, and was admitted into Fort Pitt in 1839, in a state of fatuity, and disposed to tear his clothes. Cough and emaciation, and œdema of the feet came on, and finally a number of boils, which passed into ulcers. He sank and died.

Post-mortem Examination.—The limbs were rigid. *Cranium:* A slight amount of blood was found effused beneath the pia mater, covering the inner surface of the left cerebral hemisphere. The fornix, corpora quadrigemina, corpora striata, and optic thalami were exceedingly softened, and a rather considerable amount of fluid existed in the lateral ventricles and at the base of the brain. The following peculiar state of the large blood-vessels of the base of the brain was met with. Each of the vertebral arteries was larger in diameter than the basilar, and in the anterior part of the latter vessel a delicate membranous septum existed, dividing the vessel longitudinally into two parts, at least a quarter of an inch in length. Immediately in front of this membrane was a small coagulum, very firm in character, as if it had been formed during life. *Thorax and Abdomen:* Scrofulous deposits and vomicæ existed in the lungs, and much scrofulous deposit in the bronchial and mesenteric glands, and there was ulceration of the cæcum.[1]

CASE CCLXII. *Deposits (Fibrinous?) in the Basilar Artery. Disease of the Inner Surface of the Internal Carotid Artery. Perforation of the Dura Mater and Absorption of the Cranium by Pacchionian Bodies. Disease of the Colon.*—John D., aged twenty-nine, a soldier, said to have been strumous and an epileptic, was admitted into the hospital at Malta, October 2nd, 1830, with griping and tenesmus, slight abdominal tenderness, and yellowness of the conjunctivæ of the eyes. The bowels were confined, and tongue furred. Saline cathartics, with calomel and Dover's powder, and subsequently a blister to the abdomen, and an anodyne enema gave no relief, and bloody stools and bilious vomiting set in, and he sank and died at the end of the sixth day.

Post-mortem Examination.—Thorax and Abdomen: Pleural adhesions existed; the lungs were free from scrofulous deposit. Some firm fibrinous concretions existed in the cavities of the right side of the heart. The colon was extensively and deeply ulcerated on its inner surface, and much fibrinous and purulent deposit existed in the substance of its coats. The peritoneum corresponding to the diseased bowel was very pulpy. The mesenteric glands were much enlarged, but other organs natural. *Cranium:* The substance of the brain was natural. On each side of the superior longitudinal sinus the dura mater was perforated by minute excrescences (not unlike the Pacchionian bodies), apparently having origin by peduncles from the pia mater, which here was adherent to the dura mater.[2] Corresponding to these growths, *the inner table of the Skull, and a large portion of the outer, were absorbed* in three or four places to the extent of the size of a pea. The internal carotid arteries, just before entering the cavity of the cranium, were rather enlarged, especially the one on the right side, whose inner coat was in a finely-shreddy condition (reminding one of the terminal valvular part of the common bile-duct. In the

[1] I have to thank Dr. Davy for the details of this case.

[2] These bodies may be often found not only piercing the dura mater in its entire thickness, but may also be seen projecting where one of the layers of the dura mater is absent, the other remaining—obviously a congenital arrangement of parts. Moreover, I have often found them projecting in large numbers into the cavity of the superior longitudinal sinus, and arranged in a nested or botryoïdal manner, as illustrated by the accompanying woodcut (Fig. 21). The growth of these bodies may no

basilar artery minute concretions existed of about the form of an apple-pip, and two lines long, with smooth surfaces. They had the appearance of

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doubt constitute much disturbance, and result in the formation of actual tumours. They are often found so enlarged as not only to pierce the dura mater, as may be seen

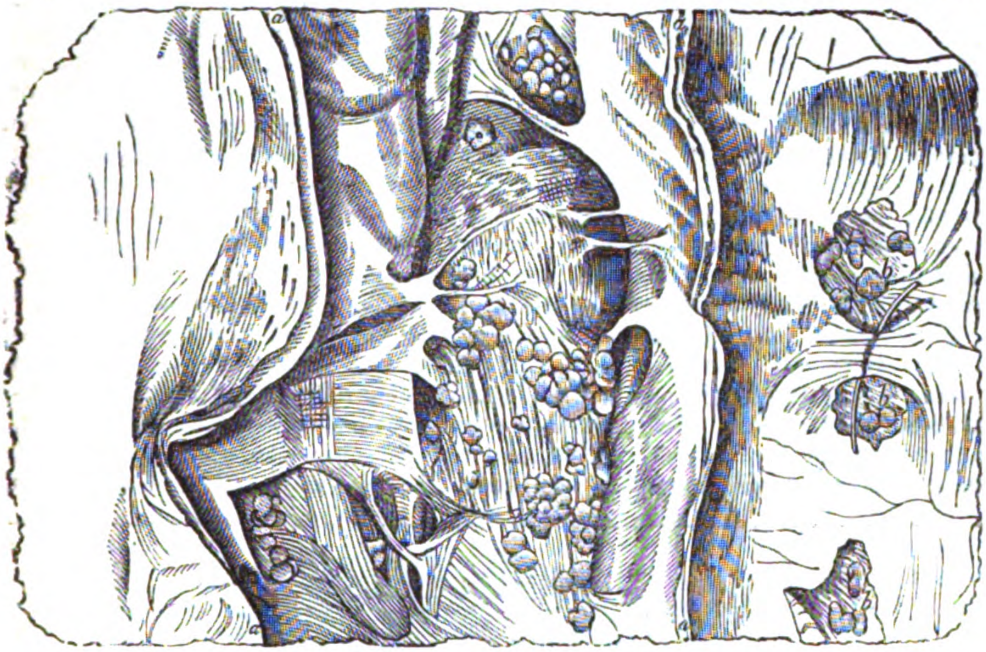

Fig. 21.—Showing the under surface of the dura mater and the superior longitudinal sinus laid open. *a*, the divided edges of the sinus spread out, displaying numbers of Pacchionian bodies in its cavity; *b*, spaces where the inner layer of the dura mater is naturally absent, or has been removed, showing numbers of Pacchionian-like structures connected with the remaining layer.

in this case and in preparation 758 in King's College Museum, but also to produce depression in, and even foramina through the bones of the calvarium, of which we have one or two good examples in St. George's Hospital Museum. This condition is well illustrated by the following woodcuts Fig. 22 and 23:

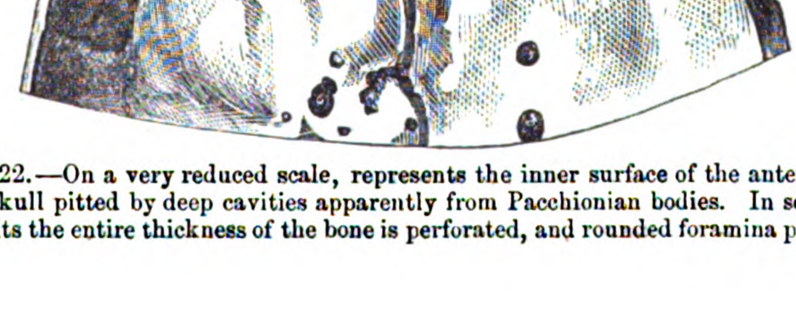

Fig. 22.—On a very reduced scale, represents the inner surface of the anterior part of the skull pitted by deep cavities apparently from Pacchionian bodies. In several of these pits the entire thickness of the bone is perforated, and rounded foramina produced.

"coagulable" lymph which had become vascular.[1] Much gritty matter of phosphate and carbonate of lime existed in the pineal gland.[2]

CASE CCLXIII. *Fibrinous Coagulum blocking up the Basilar and both Internal Carotid Arteries. Softening of the Under Surface of both Cerebral Hemispheres, corresponding to Masses of Soft Fibrin-looking Substance, as also of Central White Structures of the Brain.*—James W., a soldier, aged thirty-four, stout and well made, was admitted into Fort Pitt, August 27th, 1839, after returning from Canada. He had been subject to epilepsy, with occasional attacks of delirium tremens. The mind had not been, however, impaired. A short time before landing, the *left* side of the body was noticed as being paralysed, and the left eyelids closed. On admission he was comatose; the pulse was 90, and weak; the pupils dilated; the evacuations passed unconsciously; the breathing was laborious. He continued in this state, taking no food, until the 29th, when the pulse rose to 120; the skin became hot; the pupils contracted on exposure to light; the breathing was stertorous, and he died in the evening.

Post-mortem Examination.—Cranium: The vessels of the cerebral membranes were much congested. The general substance of the brain was softened, and the fornix and septum lucidum, also the walls of the lateral ventricles, broken down. Two masses of recent soft material, apparently of fibrin, adhered to the tentorium cerebelli, and pressed upon the under surfaces of both cerebral hemispheres, one on each side of the junction of the optic

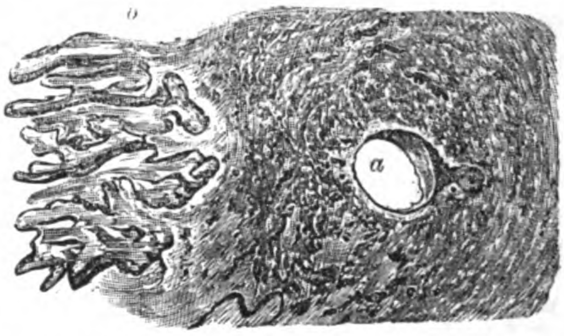

Fig. 23.—Represents the exterior of the upper part of the same skull as the foregoing figure (No. 22). *a* is one of the perforations, of the *natural* size, in the neighbourhood of *b*, the interparietal suture.

Mr. W. Turner, of Edinburgh, informs me that although he is familiar with skulls in which the absorption of the bone formed by enlarged Pacchionian bodies has gone so far as to leave but a very thin plate between the enlarged gland and the pericranium, he is only acquainted with one specimen in which this absorption has gone on to such an extent as to occasion an actual perforation, and this, he observes, is in the right parietal bone, immediately behind the coronal suture. In this case of his the aperture is large enough to transmit an ordinary pea, but the bone for some distance around the aperture is much thinned, so that the internal depression is much larger than the external opening. In the same skull, Mr. Turner observes, immediately in front of the coronal suture, are two Pacchionian fossæ, the bone over both of these being reduced to a thin plate.

[1] In connexion with the appearance of these bodies, I would refer to a case (No. 56) which I published in my series illustrating Softening of the brain and spinal cord, in the Medical Times and Gazette (December 31st, 1864, p. 696), in which a fibrinous mass was found attached by a peduncle to the inner surface of the basilar artery (illustrated by a woodcut).

[2] The details of this case were given to me by Dr. Davy.

nerves, the brain substance at the part being soft and disorganized. Each of these was of about the size of a hazel-nut. The posterior portion of the basilar artery was much enlarged, distended, and completely closed by fibrinous coagulum to the extent of about one-third of an inch. The internal carotid artery on the left side was also enlarged, and quite plugged up by firm fibrin; the right one was also enlarged, but only partially plugged up by coagulum. *Thorax:* The outer coat of the thoracic aorta was thickened and the inner one thinned, and the wall of the left auricle of the heart was exceedingly thinned, in one part to so great an extent that the parietes were quite wanting in muscular fibre, and only consisted of a *transparent* membrane. The heart contained some liquid blood, otherwise was natural. The lungs were congested. *Abdomen:* Excepting two calculi in the kidney the abdominal organs were natural.[1]

CASE CCLXIV. *Peculiar Band across the Diameter of the Basilar Artery. Brain generally softened. Phthisis Pulmonalis.*—George M., aged twenty-nine, was admitted into Fort Pitt in 1840, with pectoriloquy under the left clavicle, having for a year suffered from dyspnœa, uneasiness in the larynx, weakness of the voice, &c. He quickly sank and died.

Post-mortem Examination.—Thorax and Abdomen: The lungs contained vomicæ and were much consolidated, and there was much ulceration of the larynx and trachea. There was also much ulceration of the ileum and colon. *Cranium:* The brain was generally softened, and much fluid existed beneath the arachnoïd, which was generally opaque. In the basilar artery, a band close to the junction of the vertebral arteries existed, supporting a white, nearly oval concretion, of the size of a grape-stone.

CASE CCLXV. *Supposed Embolism of one or more Intra-cranial Arteries. Partial Hemiplegia. Diseased Heart.*—Maurice R., a private patient of my own, aged about thirty-five, who when a boy had been liable to "faintings," was seen by me in 1863, suffering from great debility, breathlessness, and palpitation of the heart. The face was very flushed, and almost purple at times on lying down. The pulse was equal at both wrists. On listening to the sounds of the heart, which was enlarged, every other beat was found to be exceedingly feeble and but seldom represented by the pulse; a strong systolic bruit existed. The liver was enlarged; the urine very albuminous. He was at times rather anasarcous about the legs. In the middle of April, the 14th, 1863, he was seized quite suddenly with partial paralysis as to motor power of the *left* arm and leg; but the sensibility of the skin remained entire. There was no interference with swallowing, nor yet with articulation; nor was there any paralysis of the facial muscles; and the tongue was protruded straight. There was no febrile disturbance, and the digestion was good. On the following day he had regained more power in the arm, and in about ten days he had quite regained his ordinary power in the affected limbs. He went on the same for several months; the palpitation and irregularity of the heart's action subsequently got worse, and much headache about the temples came on, and afterwards in the loins. General anasarca and hæmoptysis, and general and physical indications of extravasation of blood into the lungs came on. He died in the night, quite suddenly, after being much worse for a day or two, in February, 1864.

No post-mortem examination could be obtained.

Postscript.—In this case I was under the belief that the temporary loss of power in the arm and leg was owing to some temporary disturbance of the circulation in some district of the brain, determined, most likely, by embolism, (some fibrinous fragments being carried to the intra-cranial vessels from the

[1] I have to thank Dr. John Davy for the details of this case.

valves or other portion of the heart), or possibly to the dilatation of some intra-cranial artery.

In connexion with this portion of the series, I would allude to several preparations in the various Metropolitan Pathological Museums illustrating the same subject. Thus, in the Middlesex Hospital Museum (in addition to others of the kind which I will not detail, as having been already described by medical officers of the institution, in the 'Transactions of the Pathological Society'), is one specimen, No. 42, Series v., showing a fibrinous plug in the middle cerebral artery; and in St. Thomas's Hospital Museum, No. 61.2, in Section N, shows obliteration of the internal carotid artery on the left side.

B. Veins and Sinuses.

I. FIBRINOUS COAGULA (THROMBOSIS), WHETHER UNDERGOING SOFTENING AND DISINTEGRATION, AND ASSUMING A PURIFORM CHARACTER, OR NOT; ALSO, GENUINE PURULENT DEPOSITS APART FROM SOLID COAGULUM.[1]

Case CCLXVI. *Purulent Fluid and Fibrinous Coagulum in the* LEFT *Lateral Sinus following Fracture of the Temporal and Parietal Bones, and Laceration of the Sinus.*—Philip B., aged thirty-seven, was admitted July 17th, 1835, owing to a scalp-wound denuding the bone, which had been followed by an epileptic fit. About five weeks after the accident the patient was trephined on the exposed bone, owing to purulent discharge from the ear, rigors, and delirium. After three days he died.

Post-mortem Examination.—*Cranium:* Fractures of the left parietal and temporal bones were found, and pus existed in the cavity of the tympanum. The left lateral sinus contained a quantity of purulent fluid and coagulated fibrin, and was lacerated; at its inner and outer parts were openings also from ulceration, and from that on the inner part pus had passed over both surfaces of the tentorium cerebelli. The pus in the tympanum had come through a fracture from one of the openings on the outer part of the sinus.[2]

Case CCLXVII. *Purulent Fluid in the Cavernous Sinus. Softening of the Brain.*—William H., of middle age, was admitted June 23rd, 1841, and died July 30th, with carcinoma of the antrum. We possess no further history.

Post-mortem Examination.—The arachnoïd membrane lining the anterior fossa of the base of the skull was covered with pus, and the corresponding part of the brain was soft and pulpy. Much fluid existed in the ventricles. Several parts of the walls of the antrum were ulcerated, and the tumour had made way into the orbit and projected towards the inner side of the eye. The right cavernous sinus was filled with pus. (133.)

Case CCLXVIII. *Firm Fibrinous Coagulum in the Superior Longitudinal Sinus, and Arachnitis, following Fracture of the Skull.*—Matthew B., aged fifty-three, was admitted April 23rd, 1844, with fracture and depression of bone of the skull at the fronto-parietal suture, a little to the left of the median line of the skull. The injury was owing to the fall of a quoit upon the head, and the accident was followed by insensibility for a few minutes. No vomiting

[1] Other cases of this kind I have related in connexion with positive and extensive softening of the brain in a series devoted to such cases in the Medical Gazette for 1864. Again, similar instances of thrombosis of the intra-cranial veins and sinuses will be found among the cases of Abscess of the brain in the present series.

[2] See Hosp. Path. Cat., Series viii. No. 117.

existed. Restlessness and pain at the vertex and back of the head came on, and he was delirious during sleep. The pulse on admission was 60, and labouring; and the *right* pupil acted more sluggishly than its fellow. The depressed bone was removed, and the pulse rose to 84, but giddiness and much pain of head were complained of. Relief was obtained from bleeding, but the pulse rose to 120, and was jerking. Convulsions and subsequently twitchings of the entire body came on, lasting two hours. Coma (free from stertor) set in before death, the mouth being drawn to the right side. He died on the 25th.

Post-mortem Examination.—Cranium: In addition to the fractured state of the bone, the dura mater (though uninjured) was covered by blood and fibrin, and sero-purulent fluid existed in the sub-arachnoïd tissues of the upper part of the left cerebral hemisphere, which part was in places so injected as to give the appearance of having been bruised. Blood was extravasated in the sub-arachnoïd tissues of the back of the right cerebral hemisphere. All the cerebral ventricles were distended with clear fluid, and their internal surfaces were *rough, as if sprinkled with white sand.* The superior longitudinal sinus was occupied by a quantity of firm fibrinous coagulum. (89.)

CASE CCLXIX.—*Purulent Fluid in the Superior Longitudinal Sinus. Arachnitis following a Scalp-wound. Secondary Deposits in the Lungs and Pneumonia.*—John C., aged forty-five, was admitted May 4th, 1845, with a large scalp wound on the right side of the head, partially exposing the bone. On the thirteenth day afterwards the patient appeared drowsy; and on the following day slight rigor came on; and on the following day (pus having been evacuated from the scalp) a fit and rigor occurred, and the *right* side of the body became paralysed. The mind at times wandered. The trephine was applied to the right parietal bone. Pus was found in the diploë and on the surface of the dura mater. The patient died May 25th.

Post-mortem Examination.—Cranium: Much pus was found in the cavity of the arachnoïd and in the sub-arachnoïd tissues, also in the diploë of the bone. Purulent fluid also existed in the superior sinus. *Thorax:* Evidences of pneumonia and pleurisy existed, and purulent deposits in the lungs.[1] (128.)

CASE CCLXX. *Disintegrating Fibrinous Coagulum in the Superior Longitudinal Sinus, and Arachnitis, &c., following a Scalp-wound.*—Henry L., aged twenty-six, admitted Sept. 8th, 1845, with a scalp-wound laying the left parietal bone bare, and with much epistaxis. He had been stunned for two minutes by the accident (the fall of a piece of iron). There was much pain in the neck when the head was rotated. Fever came on, and a sloughy state of the wound, followed by rigors, nausea, and headache, which recurred, and drowsiness came on. On the 29th there was loss of power in moving the *right* arm, and occasional muscular twitchings of the *left* side of the face and the *right* side of the body. On the 30th there was partial unconsciousness, with delirium, paralysis of the face and limbs on the *right* side, and pus under the scalp was found. A trephine was applied at the injured part of the skull, and pus evacuated from beneath the bone (or the diploë.) After this he was more sensible, but had repeated twitchings of the right side of the body. During this time the pupils remained natural. The pulse became rapid and irregular, the pupils dilated, respiration quickened, and he died on the 2nd of October.

Post-mortem Examination.—Cranium: On the left side there was fracture of the left part of the frontal and cribriform part of the ethmoïd bones, and pus existed external to the dura mater about these parts, as also in the arachnoïd sac on the left side, and in the sub-arachnoïd tissues on this side. A few patches

[1] This case has been related by Mr. Hewett, in his paper on Injuries of the Head, in the Trans. of the Royal Med.-Chir. Soc., vol. xxxvi. p. 331.

of recent fibrin existed in the right arachnoïd sac. The grey parts of the brain in contact with the fibrin were of a leaden hue. The ventricles were dilated with turbid fluid. In the posterior part of the superior longitudinal sinus existed a good deal of firm fibrinous clot, mixed with purulent fluid. *Thorax and Abdomen:* The heart was softened, and so-called secondary deposits existed in the liver. (231.)

CASE CCLXXI.—*Fibrinous Plug and Puriform Fluid in the Superior Longitudinal Sinus. Arachnitis. Hemiplegia on the* RIGHT *side. Scalp-wound. Application of Trephine.*—John C., aged forty-five, was admitted May 4th, 1845, with a scalp-wound extending nearly the whole length of the right side of the head, exposing much bone, having been found in a cellar in a state of unconsciousness. He was quite sensible; and, excepting pain in the head, went on comfortably until the 17th, when he was heavy and dull, and the wound was not looking so well, and some fever existed. Sickness followed by rigors set in, and pus was evacuated from below the flap. On the 22nd he had a convulsive attack, with rigors, after which the *right* side of the body and face was found paralysed as to motion, and the speech indistinct. He wandered at times, and there was slight strabismus and restlessness. The trephine was applied over the exposed bone, which was dry and greenish, and much yellow recent fibrin let out from the surface of the dura mater. He nevertheless became worse, and died May 25th.

Post-mortem Examination.—Thorax and Abdomen: The heart was dilated and softened, and so-called secondary deposits were found in the left lung. *Cranium:* Bones of skull not fractured. The bone, where exposed, was much diseased, being of a dead yellow hue. Much of the dura mater about this part was separated from the skull by concrete fibrinous deposit, and was also *thickened by fibrinous deposit* in its own structure. The right arachnoïd sac contained much purulent fluid and fibrin, and a slight amount of extravasated blood was found adhering to the dura mater (source not discoverable); and pus was found covering both cerebellar lobes, and also the pons Varolii and medulla oblongata. Where the recent lymph existed the brain was of a leaden hue, but otherwise it was quite natural. Much coagula and a great amount of puriform fluid existed in the superior longitudinal sinus. (128.)

CASE CCLXXII. *Disintegrating Fibrinous Coagulum within the Superior Longitudinal Sinus. Laceration of Brain and Extravasation of Blood in connexion with Fracture of the Skull.*—F. H., aged eleven, was admitted May 5th, 1847 (having fallen a distance of twenty-two feet), in a moribund state, with bruises on the shoulders and sides. He vomited twice, the pulse rose, and he was bled. He talked incoherently, moving the *right* arm incessantly, and generally raising it up to the head, the *left* arm being paralysed. The pupils were ALTERNATELY DILATED and CONTRACTED, or natural. He continued unconscious, and frequent tonic flexion of the left, and occasionally so of the right arm existed. The face was flushed, the temporal veins distended, and he was again bled; and during the bleeding the pulse rose in frequency and diminished in strength. On the 4th general convulsions and coma came on; on the 9th there was screaming; and on the 10th the eyes were noticed for the first time as only half open; the lids closed well when touched. A slough on the sacrum came on. On the 12th the *right* pupil was much dilated, and the *left* contracted, both acting but slightly. Coma continued till death on this day.

Post-mortem Examination.—Cranium: There was fracture of the right parietal and occipital bone, which was deprived of pericranium. Blood was found between the bone and dura mater, and to a slight degree in the arachnoïd cavity on the right side. Bloody puncta and a slight degree of extravasation existed in the middle of the right cerebral hemisphere; and a blood-clot (of the size of a pea) was found extravasated in the substance of the right optic thalamus. The under surface of the middle lobe of the left cerebral hemisphere and of the left cerebellar lobe was lacerated; and blood was extravasated between the dura mater and bone at the back of the base of the cranium. In the posterior part of the superior longitudinal sinus was a quantity of fibriuous coagulum, softening down into a puriform fluid. (112.)

CASE CCLXXIII. *Purulent Fluid and Lymph in the Superior Longitudinal Sinus. Inflammation of the Brain and Sub-arachnoïd Tissue following a Scalp-wound.*—George S., aged sixty, was admitted June 19th, 1847, for a large scalp-wound, not exposing the bone. For a week he went on well, and then diffuse inflammation of the scalp came on, and sloughing followed, exposing the bone. He recovered from this attack, but was seized with symptoms of inflammation of the cerebral membranes. No sign of compression of the brain came on. He died July 27th.

Post-mortem Examination.—Cranium: At the left side, and corresponding to the scalp-wound, the dura mater had a quantity of pus adherent to its outer surface. The whole of the left cerebral hemisphere was covered by lymph, and much pus existed beneath the arachnoïd everywhere, extending at the base to the right hemisphere. Slight extravasation of blood in the arachnoïd cavity existing opposite the seat of injury. The whole of the cortical part of the left hemisphere was very dark, and much softened. The ventricles contained much serum, and in the posterior part of the superior longitudinal sinus was a quantity of pus and lymph. *Thorax and Abdomen:* So-called secondary deposits existed in the lungs, and the aorta was enlarged and diseased.[1] (163.)

CASE CCLXXIV. *Disintegrating Fibrinous Coagulum in the Superior Longitudinal Sinus, and Arachnitis following Scalp-wounds.*—Anthony P., aged fifty, was admitted September 26th, 1848, with a sloughing lacerated scalp-wound on both sides of the cranium. Rigor and tympanitis, and involuntary passage of evacuations, came on; also spasm of the muscles of the *right* arm, and loss of power of the right leg. No reflex action could be excited on tickling either foot. He died Oct. 14th.

Post-mortem Examination.—Cranium: Pus existed between the bones of the skull and the dura mater on the *left* side, and infiltrated the bone in the neighbourhood of the course of the middle meningeal artery. Pus was also found in the sub-arachnoïd tissues on the left side of the brain. A quantity of firm fibrinous coagulum, undergoing softening and decomposition, existed in the superior longitudinal sinus. Other organs natural. (211.)

CASE CCLXXV. *Purulent and Fibrinous Deposit in the Cavernous Sinuses. Broken-down Blood-clot in the Middle Cerebral Arteries. Suppuration in the Orbits. False Membrane lining the Dura Mater. Arachnitis, &c. Delirium, Unconsciousness, and Dysphagia before Death.*—Richard H., aged thirty-nine, was admitted July 10th, 1848. He had been ill eleven days, his illness beginning with "sore throat," which proceeded to abscess and discharge of much pus. For two or three days the eyes had been affected, and he had been without food and otherwise much neglected. When admitted he was delirious; he was also sleepy, but if roused tried to get out of bed. His speech was thick, and a brown offensive froth came from his mouth. The skin was cool, the eyelids œdematous and red, but the rest of the face pale. There was dysphagia, and he could not be made to protrude the tongue. Bark and wine and ammonia were given. He remained unconscious until death, which occurred two days after admission.

[1] This case has been mentioned by Mr. Hewett, in his paper on Injuries to the Head, in the Trans. of the Med.-Chir. Soc., vol. xxxvi. p. 329.

Post-mortem Examination.—Thorax and Abdomen: The lungs were congested, the kidneys occupied by cysts, and having adherent capsules. *Cranium:* The bones of the skull were natural, as also the substance of the brain. On each side the cavernous sinus contained a large quantity of pus and broken-down fibrinous material, being in a state of what was at the time called diffuse suppuration. At the base of the brain, much purulent deposit existed in the sub-arachnoïd tissues of the fissure of Sylvius, each side of the pons Varolii, and crura cerebelli (not in the anterior sub-arachnoïd spaces). The middle cerebellar arteries were filled with brown grumous fluid, apparently altered blood; and in some parts peculiar cells were found *microscopically*, mixed up with the blood. *The inner surface of the dura mater covering the anterior cerebral fossæ was lined by a thin membrane of fibrinous material, containing spots of extravasated blood.* Among the various structures contained in both orbits there was diffuse suppuration, and the blood-vessels in these cavities contained similar grumous fluid to that found in the middle cerebral arteries.[1] (141.)

CASE CCLXXVI. *Old-standing Fibrinous Coagulum in the Superior Longitudinal and Straight Sinus. Brain soft. Fornix in a shreddy state. Scarlet Fever. Dropsy.*—Michael K., aged five, was admitted November 15th, 1848, with dropsy, albuminous urine, following scarlet fever, and consolidation of the lung. Vomiting, and finally convulsions, preceded death, which occurred on the 26th.

Post-mortem Examination.—Thorax and Abdomen: Patches showing old pneumonia existed in the lungs, and in one a patch of coagulated blood. *Cranium:* The bones of the skull were natural. The brain generally was wet and soft, and the fornix quite shreddy, and much fluid existed beneath the arachnoïd membrane. In the superior longitudinal sinus, as well as in the straight sinus, a quantity of fibrinous coagulum existed, which at one part was discoloured and softened. (237.)

CASE CCLXXVII. *Purulent Deposit in the Superior Longitudinal Sinus. Abscess in the* RIGHT *Cerebral Hemisphere. Arachnitis, &c., following Scalp-wounds and Trephining. Hemiplegia on the* LEFT *Side.*—George D., aged twenty-five, was admitted November 21st, 1849, owing to two scalp-wounds (middle of forehead and middle of vertex), one of which exposed the bone. He was stunned at the time of the accident, but had nearly recovered on admission. Three days after he came in, slight erysipelas ensued. From this he recovered, but rigors supervened (December 1st), and great prostration, and his manner became flighty and incoherent, and he complained of pain in the head; on the day after the rigors he was pale, with a vacant expression; partial paralysis of the left arm and leg came on, the pulse being frequent, and the tongue dry. Pus oozed from the wounds and was evacuated from beneath the scalp. The wandering of mind continued, and on the 4th cough came on, and involuntary passage of fæces, with complete paralysis of the *left* side of the body, the face being drawn to the right, and the muscles of the right side of the neck being rigid. The trephine was applied, and about half an ounce of fœtid pus evacuated, and the operation was repeated. No relief followed. He lost the power of speech, and was greatly affected by spasm of the muscles of the right side of the face. He sank and died December 5th.

Post-mortem Examination.—Cranium: Green pus was met with in the diploë of the skull-bones, and pus and blood were found covering the outer surface of the dura mater. Pus and recent lymph were also found in the arachnoïd sac

[1] I have notes of certain cases in which purulent deposits were found in the cavity of the orbit in connexion with arachnitis, apart from any affection of the blood-vessels of the cranial or orbital cavities.

and sub-arachnoïd tissues covering both cerebral hemispheres, but chiefly the right one; and adherent to the inner surface of the dura mater on both sides extravasated blood was found. In the superior longitudinal sinus, and occupying about an inch at its middle part, a quantity of purulent fluid existed. On slicing up the brain, an abscess, of the size of a hazel nut, was met with in the *right* cerebral hemisphere, situated about a quarter of an inch from the surface corresponding to the part of the skull to which the trephine had been applied. *Thorax and Abdomen:* Recent deposits of fibrin were found in the lungs and pleural sacs, and the kidneys were congested. (245.)

CASE CCLXXVIII. *Pus in the Superior Longitudinal Sinus. Arachnitis. Cerebral Abscess following Scalp-wound and Trephining of the Skull.*—A man, aged twenty-five, was brought into the hospital, Nov. 21st, 1849, with two scalp-wounds, one exposing the bone, and symptoms of slight concussion. Erysipelas followed; and he was recovering from this when a rigor set in (the tenth day), with delirium and great prostration. On the twelfth day partial, and then complete, paralysis of the *left* arm and leg came on, and the bladder and rectum became paralysed. The skull was trephined in two places, and half an ounce of fœtid pus evacuated. The patient died on the day after the operation.

Post-mortem Examination.—Cranium: Extensive effusion of pus was found in the arachnoïd cavity on both sides, and beneath the arachnoïd membrane; and a small abscess existed in the substance of the brain. Pus was also found in the diploë of the bone and in the superior longitudinal sinus. *Thorax and Abdomen.* Purulent deposits existed in the pleural cavities and the substance of the lungs. (245.)

CASE CCLXXIX. *Plugging up by Fibrinous Deposit of the Superior Longitudinal and Right Lateral Sinuses in connexion with Caries (Scrofulous) of the Bones of the Skull. Phthisis Pulmonalis.*—George C., aged twenty-four, was admitted March 6th, 1850, with decided symptoms of phthisis, general and physical (confined to left lung), and with bloody and purulent expectoration. He drew attention to a "lump" on the scalp, at the vertex and to the right side of that part, which he had only noticed a day or two before admission. This was found by means of an exploratory needle to contain pus, and a large quantity was accordingly evacuated. The discharge continued; the part was often opened, but the abscess burrowed, assumed a scrofulous unhealthy character, and a large part of the cranium became exposed. He gradually sank in spite of stimulants, good food, &c.

Post-mortem Examination.—Thorax and Abdomen: The right lung contained much scrofulous deposit and two large vomicæ. The other organs presented nothing unusual. *Cranium:* Excepting the anterior part of the frontal bone all the bones on the right side of the cranium were devoid of pericranium; and the entire surface of the right parietal, half the occipital, the squamous and mastoïd elements of the temporal bone, the temporal parts of the great wing of the sphenoïd and of the frontal bone, were carious and covered with thick purulent fluid, worm-eaten, and in places so thin that perforation had taken place. On the inner surface correspondently the surface of bone was in the same state, and the dura mater was detached and separated from the bone by pus and lymph; but its arachnoïd or inner surface was smooth and glossy. The bone at the base of the skull was natural. The brain was natural in substance and consistence, but the superior longitudinal sinus, and also the lateral sinus on the right side, were quite obliterated by firm fibrinous deposit or lymph. *Ear:* The interior of the mastoïd cells on the right side, and the cavity of the tympanum of the right ear, were filled with pus; and the lining membrane was thickened and vascular, but not ulcerated. The "ossicula" of the ear were in a natural condition; the membrana tympani was destroyed, and the external auditory canal filled with pus. (85.)

CASE CCLXXX. *Fibrinous Deposit blocking up the Cavernous Sinus. Arachnitis following Fracture of the Base of the Skull.*—William S., aged fifty-two, was admitted March 10th, 1852, with much watery discharge from the left ear, having fallen, four days before, in some kind of a fit, and struck the head. No hæmorrhage had occurred. A small scalp wound on the right side of the back of the head (without noticeable fracture) existed. Pain in the head was complained of, and his manner was slow and heavy. The hearing on the left side was all but gone, but no paralysis of the face existed. Symptoms of inflammation of the cerebral membrane set in, and the patient died four days after admission.

Post-mortem Examination.—Cranium: Extensive fracture of the base of the skull was found, and the membrana tympani on the left side was ruptured in two places. The cavity of the left lateral sinus was blocked up by a firm coagulum of a rusty-brown colour, and adhering to the inner surface of the sinus. The membranes of the brain presented extensive marks of diffuse inflammation.[1] (64.)

CASE CCLXXXI. *Plugging up of various Intra-cranial Sinuses, and of one of the Ophthalmic Veins, by Fibrinous Coagulum. Arachnitis. Pus in the Orbit. Disease of the Ear.*—Mary A. P., aged twenty-two, was admitted Oct. 20th, 1852. She was married and had one child. She had been into some hospital for "inflammation of the chest," and on one occasion was taken there, having attempted to poison herself with laudanum, and saying that it was her husband who gave it to her. Subsequently she made overtures to another man and married him, not letting him know that she was already a married woman. The reservation on this subject of course depressed her extremely, and she only confessed a day before her death. She was subject after her second marriage (whether before or not is uncertain) to "fits," and was often found lying across the floor, &c. She at one time wanted to murder her second husband, when afraid of his getting to know about her real state. About three weeks before her death she was attacked by persistent retching and vomiting, and excessive discharge from the left ear. She had often complained of head-ache and pain in the ear since her marriage. She became delirious, and was brought into the hospital. When admitted she had a flushed face and considerable swelling on the left side of the neck and face. There was ptosis of the left eyelid to a great extent, with great protuberance of the eyeball and internal strabismus of the eye, though it could be slightly moved in all directions. The conjunctiva was vascular, and at the external part wrinkled and œdematous. The eyelids were red and œdematous, the pupil *rather* dilated, but answered somewhat to light. The *right* eyelid was natural, and also the movements of the eyeball. The pupil was much dilated and only slightly acting. The patient asserted she could see the best with the left eye. There was a very offensive discharge from the left ear and total deafness. There was great difficulty in opening the mouth and in swallowing, also occasional hiccoughing and slight cough, but without expectoration. On forcible closure of the mouth the left side seemed slightly the weakest. The skin was very hot; the pulse 150, regular; the respirations 68 in a minute; the tongue and lips were dry and baked. On auscultation the respiratory murmur anteriorly was natural and loud, and the cardiac sounds, which were heard over a large extent, clear and loud. There was much pain on pressure over any part of the thorax. The patient asserted that she was subject to palpitation and occasional swelling of the legs. She was inclined to obesity. She became very delirious in the night, and had great difficulty in swallowing. She became comatose, and died in the course of the night.

[1] This case was related by Mr. Hewett, in his paper on Injuries of the Head, in the Trans. of the Royal Med.-Chir. Soc., vol. xxxvi. p. 348.

Post-mortem Examination.—Cranium: Pus was found in the cavity of the orbit, and fibrinous coagulum in the ophthalmic vein on the left side, in the cavernous, the superior and inferior petrosal sinuses, and the lateral sinus. The bone was vascular in places, but not carious. Recent lymph existed at the base of the brain covering the dura mater, also under the tentorium cerebelli on the left side, which was adherent to the cerebellum. Fluid existed in the ventricles and many bloody puncta in the brain, and there was an oval and softened discoloured patch in the right cerebral hemisphere above the level of the corpus callosum. Disease of the tympanum was found, but not of the internal ear, and there was flattening of the membrana tympani against the walls of the tympanum, the membrane of the external meatus still remaining.[1] (204.)

CASE CCLXXXII. *Fibrinous Deposits (as pendent bodies) in the Superior Longitudinal Sinus. Diminished consistency of Brain, &c., in a Patient affected by Delirium Tremens.*—John M., a drayman, aged thirty-eight, was admitted May 13th, 1851, having been crushed between two carts and dislocated the cartilages of certain of the ribs from the sternum. He was evidently on the verge of delirium tremens, and had been a "great drinker." On the day after admission violent delirium tremens came on, and he was treated by opium and stimulants in various forms. He nevertheless sank and died on the 17th.

Post-mortem Examination.—Thorax: In addition to the dislocation of the cartilages, evidences of slight pleurisy and crude scrofulous deposit in the lungs existed. The aorta was atheromatous; other organs natural. *Abdomen:* The liver was pale and fatty, and the capsule of the spleen very thick and indurated (like cartilage). The kidneys were congested; the walls of the stomach unusually thinned. *Cranium:* The calvaria was much thinner than usual; the dura mater was thickened and very adherent to the bone. The meningeal vessels were very congested, and much sub-arachnoïd fluid existed, the arachnoïd being opaque in places. In the superior longitudinal sinus a number of pendent bodies, apparently fibrinous coagula, existed. The brain was wet and impaired as to consistency, and much clear fluid existed in the ventricles. (104.)

CASE CCLXXXIII. *Firm Fibrinous Coagulum within the Superior Longitudinal Sinus, and Arachnitis following a Scalp-wound. Secondary Deposits in the Liver, &c.*—Richard W., aged thirty-seven, was admitted September 14th, 1851, with a sloughing scalp-wound on the left side of the head. He had symptoms of delirium tremens (attacks of which he had frequently had), and was treated with opium, porter, bark, and mineral acid. He went on well until the 29th, when pain in the head and chest set in. The skin became hot and the pulse sharp, and on the 3rd of October symptoms of compression of the brain came on. The tongue became protruded to the RIGHT. He was only so far conscious that he could imitate any gesture of those around him. Complete coma set in. The skull was trephined, and pus in the substance of the bone and between it and the dura mater was found and evacuated. This gave no relief, and he died October 6th.

Post-mortem Examination.—Cranium: Much purulent fluid was found in the bone around the part trephined, also above the periosteum of the orbit, and in the frontal sinus; and in the superior longitudinal sinus a quantity of thick tough fibrinous coagulum existed. Purulent fluid and soft fibrin were found in the arachnoïd cavity on the left side, also in the sub-arachnoïd tissues of the left cerebral hemisphere. On the right side turbid fluid existed beneath the

[1] See Hosp. Path. Cat., Series viii. No. 116; also Trans. of Path. Soc., vol. iv. p. 25.

arachnoïd. The brain generally was rather diminished in consistency. *Thorax and Abdomen:* So-called secondary deposits existed in the liver, and evidences of pleurisy. (199a.)

CASE CCLXXXIV. *Plugging up of a Petrosal Sinus and Part of the Internal Jugular Vein by Firm Coagulum. Arachnitis, &c., following Fracture of the Base of the Skull.*—Silas W., aged thirty-two, an epileptic, was admitted March 10th, 1852, with fractured base of the cranium, supposed to be owing to a fall which occurred in a "fit." There were frequent twitchings of the face, and attempts to reach imaginary objects; but the pupils of the eyes were natural, and the muscles of the face not drawn on one side. The urine was albuminous. He died four days after admission.

Post-mortem Examination.—Cranium: In addition to extensive fracture of the base of the skull, there was a lacerated state of the membrana tympani, and laceration of the internal jugular vein, with much bruising of the base of the brain. Extensive arachnitis had been set up, and the lower part of the inferior petrosal sinus and the upper part of the internal jugular vein were greatly blood-stained, and contained firm coagulum of blood and fibrin adherent to their walls. *Thorax and Abdomen:* The heart was hypertrophied, and disease of the kidneys existed. (64.)

CASE CCLXXXV. *Fibrinous Coagulum in the Left Lateral Sinus, and Purulent Deposits in the Cavernous and Circular Sinuses, also in the Ophthalmic and Frontal Veins. Empyema. Purulent Deposit in the Pericardium.*—Thomas P., aged twenty-eight, was admitted May 11th, 1853, with symptoms of pleurisy of one month's standing, chiefly of the left side, the heart being pushed to the right side. He had had several boils of late in various parts of the body, and there was slight irregularity of the forehead, which was thought to be owing to the formation of one of these boils. There were also decided symptoms of pericarditis. On the 19th the elevation of the forehead became red, and two curved lines of redness became apparent; the surface became erysipelatous. He sank rapidly and died on the 21st.

Post-mortem Examination.—Thorax and Abdomen: Empyema and pleuritic adhesions existed, and also pericardial adhesions, and in the pericardial sac a cavity containing purulent fluid. Considerable fibrinous coagula, in the centre of which was much pus-like fluid, existing in the jugular and innominate veins. *Cranium:* The bones of the skull were natural. Both frontal veins were found to be full of cream-like pus; the coats of the vessels being natural. Pus was also found in both ophthalmic veins, as also in the cavernous sinuses and in the circular sinus. In the left lateral sinus large clots of blood-coagulum existed. The brain-substance was natural. (115.)

CASE CCLXXXVI. *Plugging up of the Superficial Cerebral Veins, and of the Left Lateral Sinus, by Fibrinous Coagulum. Death from Disease of the Rectum and Colon.*—Mary H., aged thirty, was admitted September 20th, 1854, with stricture of the rectum. She got weaker, and sank gradually without any fresh symptoms occurring until about six days before death, when she lost the power of speech, but there was no unconsciousness, or paralysis, or jactitation of the limbs, or deafness. She died October 26th.

Post-mortem Examination.—Thorax and Abdomen: Extensive ulceration of the lower part of the large bowel, and contraction with stricture existed. The liver was fatty; other organs natural. *Cranium:* The cranial bones and dura mater were natural. Much fluid existed beneath the arachnoïd and in the ventricles. The veins of the arachnoïd membrane, and especially most of those on the left side, as well of the side and base of the cerebral hemisphere as the side of the cerebellum, were very prominent and contained firm fibrinous coagulum. This condition was traced as far as where the veins emerged from between the convolutions, but between them the veins were natural, as were the arteries at the base of the brain. The left lateral sinus was also plugged up with firm coagulum, but in no case was the clot much softened or disintegrated. The other sinuses and the brain (excepting many puncta in the latter) were in their ordinary condition. The temporal bones were natural, save that the tympanic cavity and the mastoïd cells on the left side were remarkably full of a very limpid reddish fluid.[1] (325.)

CASE CCLXXXVII. *Fibrinous Coagulum and Puriform Fluid in the Superior Longitudinal Sinus, also Arachnitis, following a Scalp-wound. Hemiplegia on the* RIGHT *Side, &c.*.—Thomas M., aged thirty-five, was admitted early in 1855, with two scalp-wounds (the result of a horse's kick), one on either side of the vertex, and exposure of the bone of the skull. He went out much better, and was re-admitted March 23rd, with rigors and a "severe cold," as he called it; rapid pulse, pain in the chest, sordes of the mouth, and pain in the head on coughing. The mouth was drawn to the left, and on the 27th he was semi-comatose. The right arm, and eventually the whole of the right side, became deficient in power, and ptosis of the right upper eyelid came on. Lividity of the face preceded death, which occurred March 30th.

Post-mortem Examination.—Cranium: There was ulceration of the external surface of the right parietal bone (the inner surface being natural) and of the dura mater on the same side, much pus and fibrinous material existing in the arachnoïd cavity on the left side, indenting the surface of the brain in various parts, as between the falx cerebri and left hemisphere, and on the upper part of the tentorium cerebelli. Much fibrinous coagulum and puriform fluid existed in the superior longitudinal sinus. Other parts of the brain were natural. *Thorax and Abdomen:* So-called secondary deposits existed in the lungs, and also pleuritic effusions. (100.)

CASE CCLXXXVIII. *White Deposits in some of the Small Superficial Cerebral Veins. Disease of the Thymus Gland, and Diffuse Inflammation of the Neck and Mediastinum, &c.*—John C., aged six, was admitted May 12th, 1855, with pain in the back of the neck, apparently owing to what appeared to be inflammation of the fibrous tissues surrounding the bones. He took scarlet fever, from which he recovered in the hospital. On the 8th of June a peculiar rash was observed on the body, obstinate vomiting set in, he became very depressed, and sank and died on the 13th.

Post-mortem Examination.—Thorax: A quantity of pus was found in the anterior mediastinum, and in the substance of the thymus gland, extending also up the left side of the neck. The lungs were congested; other organs natural. *Abdomen:* A small quantity of pus was found in the areolar tissue surrounding the kidneys, which were unusually large and firm. *Cranium:* The contents of this cavity were natural, excepting as regards one or two of the superficial veins covering the cerebral convolutions leading into the superior longitudinal sinus. These were found to contain rounded white deposits, of about the size of millet seeds.

Microscopical Examination showed these to consist of an aggregation of pus-like bodies, or white corpuscles (so-called leucocytes), several of which contained large nuclei. Nothing like fibres were met with. (175.)

CASE CCLXXXIX. *Puriform Fluid in the Cerebral Veins and Cranial Sinuses, with Arachnitis, &c., following a Scalp-wound.*—Henry C., aged twenty-eight,

[1] See Hosp. Path. Cat., Series viii. Nos. 118 and 119; also Trans. of Path. Soc., vol. vi. p. 31.

an intemperate man, suffered from a scalp-wound, exposing the bone on the left side of the head. He refused to come into the hospital, and continued to drink largely, but, after a time, was brought in, August 11th, 1855, in a state of incomplete consciousness, pointing to his head as the seat of pain. The wound was discharging much, and the muscles on the right side of the face were paralysed. The pupil of the left eye was dilated, that of the right eye being natural; both were quite insensible to light. In spite of purging and the use of calomel, unconsciousness increased, and his evacuations were passed involuntarily. On the 15th a series of convulsive attacks set in, affecting the muscles of both sides of the body; and on the day after, actual paralysis of the side opposite the injury (the right) was established, the convulsions continuing. The trephine was applied below the wound, and pus was found in the diploë of the bone, and between it and the dura mater, which pulsated naturally. Much improvement, cessation of the convulsions, and partial return to consciousness followed the operation. Three days after, the pericranium beneath the temporal muscle was found to be removed from the bone, and the trephine was again used. The convulsions returned, though the facial muscles became less paralysed, and abscesses formed in the armpit and near the elbow. He sank rapidly, and died August 25th.

Post-mortem Examination.—Cranium: Pus was found between the bone and dura mater, and much cream-like pus in the arachnoïd sac and down the longitudinal fissure, by which the brain-surface was much compressed. Much pus also existed in the sub-arachnoïd tissues. A quantity of puriform fluid was also found in the veins covering the left cerebral hemisphere, and in the sinuses on the left side of the cranium. *Thorax:* So-called secondary pneumonia was found. Other organs were natural. The abscess in the axilla was connected with pus in the shoulder-joint. (245.)

CASE CCXC. *Disintegrating Fibrinous Coagulum and Pus in the Cerebral Veins and Sinuses, and Arachnitis following Fracture of the Skull.*—Frederick W., aged sixteen, was admitted May 17th, 1855, with a lacerated wound (two inches long) over the right eyebrow, owing to the kick of a horse. For two minutes he had been stunned, but soon recovered and spoke intelligibly. A comminuted fracture, with depression of the supra-orbital ridge of the frontal bone, was detected. Soon after admission he became depressed, but there was no loss of power, and the pupils were natural. He vomited soon afterwards, and then was less oppressed. The depressed bone was raised, and a portion of brain escaped through a rent in the dura mater. A tendency to stupor came on, and a twitching of the left arm was noticed. On the 21st the pulse was 100 per minute, and a piece of sloughing brain (as determined by the microscope) protruded at the wound. Much rambling of mind ensued, and on the 24th the evacuations were passed involuntarily, and there were occasional twitchings of the facial muscles. Rambling, delirium, and twitching of the bedclothes came on. In this state he remained three days; several attacks of syncope coming on. Some loss of power of the right arm was noticed. He sank and died on the 18th.

Post-mortem Examination.—Cranium: In addition to the fracture of the bone and laceration of the dura mater, purulent fluid was found in the arachnoïd sac, and much bruising of the brain-substance (the anterior and middle lobe) on the left side. Extravasation of blood had also occurred into the *right optic nerve.* The veins on the surface of the brain on the right side were full of pus, and the superior longitudinal sinus and the right lateral sinus also contained much puriform fluid. *Thorax and Abdomen:* So-called secondary abscesses existed in the lungs, and the spleen was soft and large. Other organs natural. (165.)

CASE CCXCI. *Purulent Deposits in the Superior Longitudinal Sinus and Arachnitis. Secondary Deposits in the Lungs; following an Abscess in the Thigh.*—John S., aged sixteen, was admitted May 2nd, 1855, owing to an abscess in the right thigh, which had been opened. His manner was heavy and stupid, and he was said to have suffered from epileptic fits. A slough formed at the back, and at times he passed evacuations unconsciously. The abscess was again opened, and caries of the fibula recognised. On the 9th of June severe head-ache came on, and pain in the chest and abdomen. He was quite sensible, but dull in manner and difficult to rouse. The pupils were natural. The pulse became weak and evidently sinking, and it was said that he had some convulsive attacks. He died June 11th.

Post-mortem Examination.—Cranium: Pus was found beneath the scalp. The dura mater was very vascular, and pus existed between it and the bone, and recent soft fibrin in the arachnoïd cavity above the anterior lobes on both sides of the brain, and at the base in the sub-arachnoïdean tissues. Much fluid existed in the ventricles. Purulent deposit also existed in the superior longitudinal sinus. *Thorax and Abdomen:* So-called secondary deposits were met with in the lungs. The other organs natural. (167.)

CASE CCXCII. *Pus in the Left Lateral Sinus. Fracture of the Base of the Cranium, Clavicle, and Ribs. "Secondary Deposit" in the Lung. Pleurisy. Absence of Pain in the Head.*—Thomas S., aged sixty-five, was admitted September 17th, 1855, owing to an accident occasioned by the fall of a post upon him. There was bleeding from the left ear and nostril, and comminuted fracture of the left clavicle and some of the ribs. He was only partially sensible and unruly, and had no recollection of the accident. The pulse became irregularly intermitting, and he became very oppressed. A discharge issued from the left ear, and this became purulent and eventually very profuse. After some days he returned to a natural state, no pain being complained of. On the 29th, however, rigors set in, followed by pyæmic symptoms. He rapidly sank, though he continued to think he was improving, and died October 5th.

Post-mortem Examination.—Thorax: Pus and bloody fluid were found in the left pleural sac, and about the broken ends of the clavicle, the vein beneath being quite natural. The left lung was condensed at its lower part, containing a patch of commencing secondary deposit. The heart was natural. *Cranium:* Extensive fracture of the base of the skull existed, and both membranæ tympani were destroyed. The brain was natural, but a slight amount of blood was found extravasated beneath the arachnoïd membrane at the base of the cerebellum and brain. In the left lateral sinus, for about two inches of its extent, a quantity of purulent fluid was met with. (268.)

CASE CCXCIII. *Firm and also Disintegrated Fibrinous Deposits in the Right Lateral Sinus, with Disease of its Walls. Brain rather Soft. Epilepsy. Pyæmic Symptoms before Death after Amputation of the Arm.*—Sarah P., aged thirty, was admitted June 5th, 1856, owing to a burn of the left arm and hand, the result of a fall into the fire during an epileptic fit. She had been long in bad health, and subject to epileptic attacks. Sloughing of the burn came on, and the arm was about to be amputated when rigors set in. Symptoms of pyæmia arose, and she died July 15th.

Post-mortem Examination.—Thorax and Abdomen: The heart was natural, but numbers of purulent collections existed in the lungs. The heart was fatty. *Cranium:* The brain was rather softer than natural, and much fluid oozed out on section. The *right* lateral sinus contained much clot, partly of diffluent and partly of solid fibrin. The lining surface of the sinus was thickened and covered by recent soft fibrin. This condition ceased at the jugular foramen; and the internal jugular vein was quite natural. (165.)

CASE CCXCIV. *Old-standing and Disintegrating Fibrinous Coagulum in the Left Lateral Sinus. Scrofulous Deposits connected with the Cerebral Membranes and in the Ventricles of the Brain.*—Catherine S., aged thirty-one, was admitted April 9th, 1856, with decided symptoms of phthisis. She went on without much change until April 17th, when she complained much of noises in the head, and her manner became somewhat confused. She became weaker, wandered much in mind, and gradually sank and died May 12th.

Post-mortem Examination.—Thorax and Abdomen: The lungs contained numbers of vomicæ, and scrofulous miliary deposits were found on the peritoneum and in the liver and kidneys. *Cranium:* Bones of the skull natural. Numbers of small miliary deposits were found beneath the arachnoïd membrane in the longitudinal fissure of the brain, and at the lower part of the fissure the brain was adherent by means of a mass of scrofulous deposit of the size of a hazel-nut. A similar small deposit existed in connexion with the arachnoïd at the upper part of the cerebellum. The brain-tissue about these deposits was softened and ecchymosed. Two scrofulous masses also existed in the inner wall of each lateral ventricle (the posterior horn); and the ventricles were full of turbid fluid, having their walls softened. The anterior part of the dura mater had some partly-discoloured fibrinous clots attached to its inner surface. In the left lateral sinus was a large amount of old-standing firm fibrinous coagulum, partly softening and undergoing changes. The other vessels at the base of the brain were natural.

Microscopical Examination.—The clot in the vessels was found to consist of much fibrillated structure and granular matter, material having a rounded and irregular corpuscular arrangement, also some rounded granular cells like pus-cells, but, for the most part, of smaller size. Occasional lymph-material arranged in lines with double contours (like minute vessels?) were seen, and at times granular and irregular rounded fatty masses. (95.)

CASE CCXCVII. *Purulent Deposits in both Lateral Sinuses and in the Arachnoïd Cavity on the Right Side. Disease of the Right Ear. Diseased Kidneys.*—David J., aged sixteen, an errand-boy, having been ill three weeks, was admitted July 29th, 1857. His illness began with languor and violent pain in the head, which was worse at night, and made him very deaf. In a few days an offensive discharge made its appearance from the *right* ear, and never ceased. For nine days before admission he had had severe rigors, lasting generally for about two hours. On admission he was very deaf; the skin was hot and dry; the tongue was coated, having red edges; the urine was albuminous and "smoky"-looking, having a sp. gr. of 1007. For two weeks it had been so dark in colour as to be comparable by the patient to blood. Salines and aperients, and subsequently small doses of the tincture of digitalis and the use of leeches, were resorted to. The pain, nevertheless, increased, the ear-discharge became fœtid and was abundant, and he died in great pain August 3rd.

Post-mortem Examination.—Thorax and Abdomen: The lungs were healthy. The kidneys were very large and congested, and on *microscopical examination* their tubes were found choked with blood, and "casts" containing epithelium existed in the urine. *Cranium:* A probe passed through the *right* ear into the tympanum struck against hard bone; and the membrana tympani was in a sloughy condition. The chain of bones of the inner ear was, however, in a natural state. The upper wall of the tympanum was softened and carious, the inner one harder than usual. The cavity was full of soft "lymph." On the *right* side the lateral sinus was filled with offensive pus-like fluid; and to a slight extent also this was the case with the *left* lateral sinus. On the right side the cavity of the arachnoïd was full of a similar fluid, looking like putrid pus and blood; and on this side the grey matter of the brain was stained of a darker colour than natural, and also softened. The other parts of the brain were softened. (190.)

CASE CCLXXXV. *Disintegrated Blood and Fibrinous Coagulum in the Superior Longitudinal Sinus and its Tributary Veins. Extravasation of Blood into the Substance of the Brain and Sub-arachnoïd Tissues. Diseased Kidneys.* —Louisa H., aged thirty-eight, was admitted July 15th, 1857. Five months previously the catamenia had disappeared, and since then there had been retching and vomiting. The powers of vision were rather deficient, and both pupils somewhat dilated. She was emaciated, and complained of pain at the epigastrium. No hepatic enlargement existed. The respiratory murmur of the lungs was natural, and the urine was free from albumen or sugar. A blister was applied to the epigastrium, and hydrocyanic acid, with brandy, was given. An enema produced an evacuation, and diarrhœa came on, but the vomiting was less. On the 26th a convulsive attack occurred, attended by jerking of the hands and rolling of the eyes; and on the day after she was occasionally absent in mind, but not absolutely unconscious, answering questions. On the 28th there was a return of convulsions, the features became distorted, and strabismus came on. On this day she died.

Post-mortem Examination.—Abdomen: The kidneys were much diseased. *Thorax:* Organs natural, excepting slight atheroma of the aorta. *Cranium:* The bones of the skull were natural. On both sides of the brain blood was effused in the meshes of the pia mater, and, correspondently, there was extravasation of blood into the substance of the brain-surface beneath. These extravasations were punctiform in character at their surface, having a decided clot in their centre. The superior longitudinal sinus and also the veins running into it[1] were full of fibrinous clot adherent to the walls of the sinus; and this was, in places, softened and broken down into a suppurating state. The arteries at the base of the brain were atheromatous. (182.)

CASE CCLXXXVI. *Purulent and Fibrinous Deposits in the Lateral Sinus, with Sloughing of its Walls. Disease of the Ear and Temporal Bone. Epileptic Attacks.*—Mary V., aged nineteen, was admitted August 9th, 1858, having for two years had a slight discharge from the right ear. About four years before admission she had had what was termed a "struggling fit," and eight days previously another of these attacks had also occurred, at which time the parts about the right ear were very much swelled and inflamed. On admission there was an abscess behind the right ear, and she was very deaf with that ear, but there was no discharge from it. She was unable to open the mouth very widely, and there was pain at the right side of the throat in swallowing. In the course of two days free purulent discharge took place from the ear, and there was occasional delirium. The abscess was opened; sickness followed, and then coma, after which she sank and died five days after admission.

Post-mortem Examination.—Cranium: The abscess was found to have exposed the squamous part of the temporal bone; and on the inner surface of the bone corresponding was a sloughy opening in the outside of the lateral sinus (at the part where it makes a bend on the temporal bone); the cavity of the sinus being here occupied by blood and foul-looking purulent fluid. The brain was quite healthy. On examining the neck, the jugular vein continuous with the lateral sinus was found to be quite healthy, and the blood within it, when examined by the *microscope,* was found to contain a large number of bodies

[1] In our museum, Preparation No. 68, Series viii., shows a vein in the substance of the dura mater leading to the superior longitudinal sinus, containing a quantity of pus and fibrin from a case in which similar deposits existed between the skull and dura mater. No. 13, in the same series, shows the veins of the arachnoïd tissues (thickened by inflammation) to be full of dark coagulated blood.

like pus-corpuscles, and in this respect differed from the blood found in the heart, which was healthy. *Abdomen and Thorax:* The kidneys were congested; otherwise the various organs were natural. (212.)

CASE CCXCVIII. *Fibrinous Coagulum, Puriform Fluid, and Pus in the various Cranial Sinuses and certain Meningeal Veins. Disease of the Inner Ear. Arachnitis. Convulsions and Coma before Death.*—John F., aged twenty, was admitted December 17th, 1863. Four months previously (having then been two months in weak health) he had lost his voice in a cold, which was followed by a discharge of serum and pus from the *right* ear; and about a month before admission an abscess appeared over the mastoïd part of the temporal bone, and was opened. Pain in the head followed; and a week before admission he was seized with convulsive attacks, leaving impairment of power over the left side of the body. It was said that he often felt drowsy, but this was not so on admission. At that time the left arm was weaker than the right, and the skin of the left leg was numb. Pressure behind the right ear gave pain, but no otorrhœa existed. On the night after admission convulsive attacks came on, which continued until death, on the 25th, before which day complete coma had come on.

Post-mortem Examination.—Cranium: The inner surface of the skull, chiefly along the course of the longitudinal sinus, was vascular, and had on it a superficial deposit of new bone. The arachnoïd cavity on the right side contained a large amount of creamy pus, and a slight amount of the same existed in the sub-arachnoïd tissues on the same side; and the brain generally was unusually vascular. On the right side the whole of the lateral sinus was distended by dark-coloured puriform material, closely adherent to the walls of the vessel, consisting of broken-down fibrinous coagulum, fat-globules, and granular material. The torcular Herophili contained a quantity of similar material, as did the left lateral sinus; and the straight sinus and the posterior part of the superior longitudinal sinus, with a number of veins in the cerebral membranes on the right side, contained a large quantity of genuine pus. The right lateral sinus, where in contact with the temporal bone, was destroyed by ulceration corresponding to a foramen in the bone (which here was roughened, but not softened or in any way carious), which contained solid coagulum, and along with others appeared to be natural venous channels between the sinus and the tympanum. The cavity of the tympanum contained bloody fluid, and its walls were exposed, but the contained ossicles were natural. The other organs of the body were natural.[1] (312.)

CASE CCXCIX. *Purulent Deposit and Fibrinous Coagulum in the Lateral and Cavernous Sinuses and Jugular and Ophthalmic Veins. Abscess in the Orbit. Disease of the Ear. Arachnitis.*—Amelia B., aged twenty-four, was admitted under my care Sept. 14th, 1864, in a state of unconsciousness, having been confined a week previously with a six months' child. It was stated that for some time she had complained of pain in the left side of the face, which was called neuralgia, and that rigors had followed parturition. On admission there was a discharge from the *left* ear. The *left* side of the face was œdematous, and the eyelids much swelled. The pulse was frequent, and the skin hot and dry. Ammoniated salines were given, and milk diet. On the day afterwards there was a blueness of the face and much prominence of the *left* eyeball, and the left side of the face was slightly drawn down. The pulse was very rapid and weak, and at times intermitting. There was much dysphagia; and, in spite of stimulants, the patient died in the afternoon.

Post-mortem Examination.—Cranium: There was much purulent fluid beneath the arachnoïd covering the upper parts of both cerebral hemispheres,

[1] This case has been described in the Path. Soc. Trans., vol. xv. p. 26, by Dr. Dickinson. See also Hospital Path. Cat., Series viii. 175 A; also Series ii. 99 B.

also at the base of the brain and cerebellum, and in both lateral ventricles. The pia mater and brain-substance were very vascular. The left lateral sinus was filled with soft flaky pus, and the wall of this sinus where in contact with the temporal bone was in part destroyed, and at this part the bone was carious. The cavernous sinus on the left side and the ophthalmic vein contained dark sanious matter; and around the latter, quite at the back of the orbit, was an abscess in the areolar tissue, of the size of a hazel-nut. The upper part of the jugular vein, outside the skull, was plugged up with purulent fluid, and below this was a mass of fibrinous coagulum. The caries of the temporal bone in the groove of the lateral sinus (before spoken of) formed a hole of large size; and there was another hole on the anterior aspect of the petrous element of the temporal bone, both communicating with the general tympanic cavity, and the membrana tympani was absent. *Thorax and Abdomen:* The various organs were natural; and the veins connected with the uterus, which was large and open, were natural. (243.)

CASE CCC. *Puriform Fluid in the Superior Longitudinal Sinus. Arachnitis, &c., following a Scalp-wound.*—A man, aged fifty, was brought into the hospital with an extensive scalp-wound, the bone not being, however, exposed. Sloughing followed, and from this he was recovering when symptoms of inflammation of the cerebral membranes came on. Two days before he died he had a rigor, followed by spasm of the right arm; then paralysis of the right leg and coma set in before death.

Post-mortem Examination.—Cranium: Pus was found in the diploë of the cranial bones, on the surface and in the substance of the dura mater. Much recent fibrin existed in the arachnoïd cavity, and under the arachnoïd membrane, chiefly covering the left cerebral hemisphere. Puriform fluid was found in the superior longitudinal sinus.[1]

In connexion with the cases included in the foregoing part of the series, I would allude to the following, which I have examined in the various London museums:

Thus, in King's College Museum, No. 703.1 shows a quantity of fibrinous deposit in the superior longitudinal sinus; and in the Middlesex Hospital Museum, No. 2c. in Series V. shows the same in connexion with "*inflammation of the membranes of the brain.*" In University College Museum, No. 461. Y. 56 is a cast showing hæmorrhage into, and softening of the right cerebral hemisphere, with fibrinous coagulum in the superior longitudinal sinus (the condition of the vein being supposed to be the cause of that of the brain); and 4162. Y. 55 is a preparation which shows softening of the brain of an infant, *owing*, as it is described, to coagulum in the same sinus; whilst 2504. Y. 49 also shows softening of the brain, along with what is termed inflammation of the longitudinal sinus. In the same museum, preparation No. 430. Y. 11 shows inflammation of the dura mater and of the longitudinal sinus; and No. 4103. Y. 8 shows disease of the lateral sinus in connexion with disease of the ear.

In St. Thomas's Hospital Museum, No. 22 in Section N. shows an instance of a cyst formed by fibrin in the longitudinal sinus, about two inches in length.

[1] This case is related by Mr. Hewett in his paper on Injuries of the Head, in the Trans. of the Royal Med.-Chir. Soc., vol. xxxvi. p. 328.

(*To be continued.*)

PART FOURTH.

Chronicle of Medical Science

(CHIEFLY FOREIGN AND CONTEMPORARY).

HALF-YEARLY REPORT ON PHYSIOLOGY.

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I. GENERATION.

1. MILNE-EDWARDS, PROF.: *Lecture delivered before the Faculty of Sciences on Physiology and Comparative Anatomy.* (Résumé contained in the Revue des Cours Scientifiques, No. 1, Dec. 1863.)
2. POUCHET, M.: *Lecture on Spontaneous Generation.* (Idem, No. 21, 1864, p. 265; also a Note in the Comptes Rendus for May 23, 1864, tome lviii. p. 952.)
3. PASTEUR, M.: *Lecture on Spontaneous Generation, delivered at the Scientific Soirées of the Sorbonne.* (Idem, No. 21, 1864.)
4. DONNÉ, M.: *Researches on the Spontaneous Putrefaction of Incubated Eggs, to assist Inquiry into the Doctrine of Spontaneous Generation.*
5. MANTEGAZZA, M.: *Experiments upon Spontaneous Generation.* (Milan, 1864.)

THE following *résumé* of the works cited at the head of this article will put the reader in possession of the chief points in the controversy which has been recently so warmly sustained in France, respecting the doctrine of spontaneous generation—a doctrine that it is curious to see again appearing after having been so long consigned in this country to the tomb of all the Capulets. In the lecture of M. Pouchet, who is a staunch advocate of the frequent occurrence of spontaneous generation amongst the lower classes of plants and animals, it is remarked, that even from the earliest historical periods two opinions have been held in reference to the appearance of animals and plants wheresoever an organic substance is undergoing decomposition. Some, the so-called *pan-spermists,* maintaining that the air everywhere holds in suspension vast numbers of germs, which falling on soil adapted to their growth and development, rapidly spring up and multiply; others, the *heterogenists,* on the contrary, believing that in such cases spontaneous generation takes place. Various means are and have been employed to determine the truth—microscopical investigation, chemical research, and physiological experiment. The extraordinary increase in our powers of vision effected by the discovery and gradual improvement of the microscope, have enabled us to throw aside the frivolous theories of Spallanzani. There is now no difficulty in ascertaining with an approach to absolute certainty the nature of those aërial corpuscles which float around us, or are contained in water, and which may be brought down from the higher regions of the atmosphere, entangled in the crystalline meshwork of the snow-flake. Such particles may easily be collected in the *aeroscope*, or may be procured from the innermost recesses of the respiratory organs of air-breathing animals. M. Pouchet has examined the dust accumulated after the lapse of centuries in solitary recesses of lofty mountains, and in the secluded nooks of old cathedrals; he has examined the deposit obtained from millions of cubic feet of air, and the corpuscles contained in the irregular cavities of the bones of birds, which communicate with their lungs; he has employed the aeroscope, the advantage of which, in experiments of this nature, has been so remarkably shown in the discovery by Dr. Eiselt, of the pus-cells of a contagious ophthalmia floating in the air of an hospital at Prague; but in all instances with one result alone. He has, indeed, found in the air of towns carbonaceous particles, minute fragments of clothing, wool, or cotton, and particles of fecula, often of a brilliant blue tint, and so abundant that from twenty to thirty atoms may frequently be found on the wing of a fly. He has found such particles in the bones of birds, often curiously illustrating their habits of life, as silk and velvet in the peacock, soot in the jackdaw, and silex or woody corpuscles in the denizens of the forest; he has found starch and silex in the dust of the tombs of Thebes, perhaps coeval with the Pharaohs; but, so far as regards the presence of ova, with a uniformly negative result. Those atoms which the pan-spermists declare to be so abundant, so widely distributed, and so constantly present, the spores of vegetable, and the ova of animal organisms, are invariably absent, or at least are indiscoverable. Why should this be? Suppose we take a flask of four inches cubic capacity, containing an infusion capable of furnishing millions of *paramæcia* in a few days. Whence do these proceed? For here we have no evidence of multiplication by fission, nor of the production of ova by true sexual reproduction. According to the pan-spermists, every one of these infusoria must proceed from an aërial egg; if, therefore, four cubic inches of air be filtered through a plug of cotton wool we should be able, were the pan-spermists right, to discover a million eggs of paramæcia; yet a microscopic investigation will not show one, nor can one be perceived, if one hundred times as much air be transmitted, which should yield 100,000,000 eggs.

But the paramæcia are only one out of scores of species of animals and plants which develope in decomposing organic substances, so that, were these all present, the atmosphere would be darkened by them; and it has been calculated that each cubic millimetre ($\frac{1}{25}$th inch) should contain six billion two hundred and fifty millions of spores. Is this credible, asks M. Pouchet, except by a pan-spermist? Moreover, M. Pouchet, in conjunction with MM. Joly and Musset, have obtained abundance of infusory animals in infusions exposed for a short time to the air of the highest peaks of the Pyrenees, where microscopic evidence of the presence of ova or of spores may be looked for in vain. Lastly, he has made an experiment upon a gigantic scale: he has presented to the current of air proceeding from a powerful winnowing-machine, capable, when working at full power, of filling the vast nave of Nôtre Dame in six hours, a series of bottles partially filled with various infusions, whilst others of similar size, and filled with the same liquids, were set aside in a still place. The current of air from the machine being moderated, the first set were exposed to its influence for two hours, the collection of the spores or ova in the vessels being facilitated by the projection from the fluid of portions of wood, &c.; and it was estimated that six million quarts of air were thus introduced into each bottle. These ought, therefore, to have contained an infinitely greater number of animalcules compared with those of the second set; but the result was *nil*, as many showing themselves in the one as in the other.

Again, it has been attempted to obtain decisive results on this question by the aid of chemical research. Spallanzani boiled the infusions of various substances, and afterwards hermetically sealed the vessels, and observed no subsequent appearance of vegetable or animal life. And Schultze obtained a like result on transmitting the air supplied to the infusion through sulphuric acid; but M. Pouchet believes he has proved that the employment of such means by no means prevents the formation of proto-organisms. Schwann, again, passed the air through a red-hot tube, with negative results; but the experiments of Ingenhousz, Mantegazza, and of Joly and Musset have overthrown his conclusions, and shown that organisms still appear, even when the air has been calcined; whilst Wymann, of Cambridge, U.S., has noticed their occurrence, not only when the air had been subjected to a red heat, but when the liquid had been kept boiling for two hours at a pressure of two atmospheres and a half.

But arguments in favour of the spontaneous generation of lowly-organized creatures may be derived from a different source; thus, certain small plants appear only on dead insects, or in insects in diseased states; and if the insect undergo metamorphosis, one may attack the larva, another the chrysalis, and a third the imago. Is it a legitimate conclusion that the spores of these species are ever hovering over the body of an insect or spider, awaiting its death or disease? In one instance, a delicate fungus, the Cordyceps Robertsii, appears only in the intervals of the last two rings of an exotic caterpillar: are we to suppose that thousands of useless spores constantly float in the atmosphere till some happy chance direct them to the precise spot where they can undergo development? Is it not more rational to think that such a growth proceeds only from an alteration of tissue? Again, the Racodium cellari has only been met with on casks in old cellars: where were its spores before vaults were made, when our forefathers used amphoræ for the preservation of their wine? The various kinds of species of yeast are only spores which produce almost as many different organisms as there are fermentations. Are we to consider that these have been in existence from the time of the creation, with the prevision of a new beverage invented in the present day by man? A peculiar vegetable develops around certain salts of baryta, the *Hygrocrocis barytica*. Have these outlived all the various changes to which the world has been subjected, to obtain for the first time their proper soil at the epoch when that body was discovered by Scheele in 1774? Finally, certain physiological experiments have been made by which the nature of the organisms about to grow can be modified. Thus if, as was done by Treviranus, a vessel be filled with a fermentible fluid, a second vessel with another, and a third with a mixture of the two liquids, different organisms will appear in each instance. Can it be argued that there are spores in readiness to germinate in any accidental mixture we may make? But M. Pouchet has made another experiment, on which he lays great stress, believing it to be conclusive. He plunges into boiling wort empty flasks, and instantaneously seals them hermetically; in a few days different kinds of yeast will have made their appearance. Their presence, he maintains, can only be accounted for on the theory of spontaneous generation; and he adds that, in reference to the embryogeny of infusory animalcules, it is perfectly well known in many of the higher species, and has been fully described by Dr. Pineavi. Such are the principal arguments that have been advanced by a confirmed heterogenist.

The opposite opinion of the constant generation of all animals and vegetables from spores or ova, and the non-occurrence of spontaneous generation, is, on the other hand, ably supported by M. Pasteur on the following grounds:— In the first place, admitting with M. Pouchet the general prevalence amongst the ancients of the possibility of matter organizing itself, and of creatures appearing in the world without parents, he points out that this notion has by degrees, and with the gradual spread of truth and knowledge, become more and more restricted in its extent; and that it receives but little accession to its weight as an argument, if we may judge from the vitality of other theories, now well proved to be false, either from the ancient date of its origin, or from the number or the distinction of the names of those who have been believers in it. V. Helmont, writing in the seventeenth century, believed that pure spring water could engender worms, and that from marshy emanations not only plants, but leeches and snails, and even frogs might be developed. He even went so far as to maintain that dirty linen placed in the mouth of a vessel containing a few grains of wheat could, by a mixture of the emanations from each, effect the conversion of the grains into *adult mice!* What value can be accorded to such statements as these? They have followed the course of all false ideas; and, instead of being confirmed and extended by time, they have gradually but constantly become more and more circumscribed in their application. No naturalist now believes in the spontaneous generation of a mollusk or of an insect. The discovery of the microscope at the close of the seventeenth century occasioned the retreat of the defenders of the spontaneous generation theory into the region of the infinitely small and extremely simple organisms. Buffon conceived that organic atoms retained a residuum of life, after the death of the living beings of which they had previously formed a component part; and that by their re-collection and re-construction such lowly organised structures as earthworms and mushrooms might be produced. Even Harvey, after enunciating "Omne vivum ex ovo," added, "or from the dissolved elements of preceding life." It is now, however, clearly recognised that some of the simplest vegetable organisms, as the yeast plant, have their own peculiar and constant mode of reproduction. Pasteur then recounts some of Pouchet's experiments, in which chemically pure oxygen was admitted to an infusion of hay, over mercury that had been exposed to a temperature of 212° Fahr., or more, and yet in which mould soon appeared. The experiment, he says, is irreproachable *so far* as relates to the points to which Pouchet paid attention, but there is a source of error which has passed unsuspected—the presence of germs in the *mercury* itself. That they may thus gain entrance may be shown by dusting any fine powder over the surface of the metal; on then plunging a rod of iron or glass into it, the dust will be seen to disappear in part in the space between the rod and the mercury, leaving the latter with a bright metallic surface. In Pouchet's method of operating it is impossible but that some of the germs floating in the air may in this manner gain admission. In direct contradiction to Pouchet, M. Pasteur maintains that on inspiring for a short time through a tube closed with a little cotton wool, the washings of the latter will exhibit, besides fragments of silk or wool, or inorganic material, other particles clearly possessing an organic structure; and he has devised a mode of experimenting which, while it excludes the use of mercury, shows satisfactorily that these particles are, in some instances at least, germs. He places the infusion in a long-necked vessel, the neck of which, when the fluid is in full ebullition, can be drawn out to a fine point, and looped or twisted. In such vessels no mould or infusory animalcules will make their appearance, even after the lapse of three or four years, even though the mouth of the vessel is open; and this is simply due to the circumstance that the germs conveyed into the vessel by the changes in the heat and weight of the atmosphere fall into the loop of the neck. A point which is at first difficult to explain is, Why should so many different kinds of moulds or infusory animalcules generate in any organic infusion on admission of a small quantity of air? If (say the advocates for spontaneous generation) the ova of all these animals were so abundant as it is requisite to assume to account for the phenomenon, we should be constantly enveloped in a dense fog; but the following experiment shows that the nature of the air admitted into an hermetically closed vessel is not a matter of indifference, which has been heated to the boiling point. If twenty such vessels have their long drawn-out necks broken a hissing sound is heard, and in some the moulds and infusory animalcules will appear, whilst in others they will not; and the greater number of such unaltered infusions will be in those vessels opened in quiet, lofty, or deep places, far from human habitation, where few of such aerial atoms are wafted. In an experiment made on the Mer de Glace, out of twenty thus opened only one developed mould. Amongst twenty others, which from the brilliancy of the sun's light, the faint colour of the spirit-lamp flame, and the wind, he was unable to hermetically seal again after the admission of the air, and which were consequently brought down open to his bedroom at Montauvert, no less than thirteen generated mould. Even urine and blood, if taken quite fresh from the animal, and protected from the accidental admission of the germs of vegetables and animals, may without boiling be kept unaltered for months. Spontaneous generation, then, concludes M. Pasteur, is a chimera.

II. Experimental Physiology.

1. C. Bernard: *On Curara: Lectures on Experimental Physiology, delivered at the College de France, and published in the Revue des Cours Scientifiques.* (1865.)
2. C. Bernard: *On the Physiological Effects of Curarine.* (Comptes Rendus, t. lx. p. 1327, 1865.)
3. M. W. Preyer: *On the Active Principle of Curara.* (Comptes Rendus, t. lx. p. 1346, 1865.)

1. M. Bernard's Lectures on Experimental Physiology are reported in the 'Revue des Cours Scientifiques,' a recently established journal, which may be strongly recommended as containing exceedingly interesting and well-reported accounts of lectures delivered before various learned bodies in France, upon different branches of biology, palæontology, geology, chemistry, &c.

M. Bernard commences by observing that the Woorara, or, as it is more generally termed, *Curara* poison, has been employed from time immemorial amongst the South American tribes for the purpose of tipping the arrows, the fatal effects of the slightest puncture from which is so well known; and though numerous accounts have been published of its mode of preparation, it is remarkable that its exact composition still remains uncertain, and his best efforts to procure the plants from which it is said to be derived have been unavailing. The poison was first brought to Europe by Sir Walter Raleigh in 1595, and his specimens were obtained from Guiana; but little attention was paid to the subject till the experiments and the accounts of the travels of Humboldt and Waterton were published. In 1844 a M. Goudot despatched considerable quantities of well-prepared examples to M. Pelouze, by whom they were transmitted to M. Bernard. In these the appearance presented by the curara is that of a dark-coloured solid, resembling inspissated liquorice juice. It is very hygrometric, and readily dissolves in alcohol and water, communicating to the latter fluid an extremely bitter flavour. It is insoluble in ether, bisulphide of carbon, and turpentine, and is precipitated by tannin. There appear to be several varieties of curara, different, though similar species of plants being employed by various tribes; and from some varieties of curara a crystallizable substance, curarine, may be obtained, possessing in a high degree the active powers of the substance. The plants which, according to Schomburgh, enter as ingredients into the preparation of ordinary curara, are the following:

Urari	(Strychnos toxifera)	2 lbs.
Jakki	(Strychnos Schomburghii) . . .	¼ "
Arimaro . . .	(Strychnos cogens)	¼ "
Tarireng . . .	(?)	¼ "
Wakario . . .	(?)	¼ "
Tararimo . . .	(?)	¼ "
Muramo . . .	A few scales of the bulb.	
Manoca . . .	(A xanthoxylad.)	

As regards the physiological action of curara, the first point of interest respecting it is, that whilst the entry of an extremely minute portion into the blood occasions death, it may be freely introduced into the stomach without injurious effects: hence it can be employed by the hunter as a weapon of deadly energy, whilst the food obtained by its means is perfectly innocuous. The non-absorption of the poison by the mucous membrane of the alimentary canal seems to be an exception to the ordinary law of absorption—an exception which in this instance is shared by the mucous membrane of the conjunctiva and by that of the bladder, and even to some extent by the respiratory mucous surface; for, so long as the poison is confined to the trachea, no absorption occurs, though if it be allowed to penetrate to the smaller bronchi the evidences of its absorption are soon apparent. In all these cases, however, the resistance to the entrance of the poison into the circulation is only a question of degree, since absorption will take place if a large dose of the poison be administered, especially if the animal be fasting; and in birds it will even occur when given with food. M. Bernard then proceeds to discuss and dismiss each of the explanations that have been proposed to explain the different effects produced by curara, whether taken by the mouth or subcutaneously injected—viz.: 1. The statement that, like hydrophobic saliva, the poison of serpents, and other *animal* poisons, curara is only active when brought into direct contact with the blood. This he refutes by observing that, as just noticed, if introduced in *sufficient quantity* into the stomach it will prove fatal, and also by the fact that even if it were true that it was an animal instead of being a vegetable poison, no deduction could be drawn from the fact, since there are several animal poisons, as that of the toad, which are undoubtedly poisonous when introduced into the stomach. 2. The statement that the poison is decomposed by the gastric juice, or by some other fluid poured into the alimentary canal, M. Bernard meets by making a fistulous orifice near the pyloric aperture of the stomach in a dog. On withdrawing some of the chyme towards the close of digestion, and injecting it subcutaneously into other animals, the preservation of the poisonous properties may be readily substantiated. 3. Another view might, he says, be maintained—that curara is unable to pass through animal membranes, and should therefore be classed amongst the "colloids" of Professor Graham; but in experiments undertaken with the express object of determining this point, Bernard has found that it must be included amongst the "crystalloids," since it will penetrate such septa with tolerable facility.

The explanation which M. Bernard is himself disposed to give of the peculiar characteristics of curara in reference to absorption, is this: That it is really absorbed to some extent, though comparatively slowly, during its passage through the alimentary canal, whilst its entrance in small quantities into the blood leads to great activity of the secreting organs, and especially of the kidneys, which eliminate it as fast as it is introduced, unless the dose administered be of overwhelming amount. When once it has gained the bladder it may almost be regarded as being *without* the system, as the mucous membrane of that viscus has but little tendency to absorb it. If this view be correct, nephrotomy, or other means causing suppression of urine, should occasion the accumulation of the poison in the blood and the manifestation of its toxic effects—results which have been fully borne out by experiments made upon dogs.

In regard to the mode of death by curara, animals poisoned by it, after the lapse of a few seconds, tremble and become enfeebled, but are not convulsed, and give no signs of pain. Death soon occurs—i.e., the respiration ceases, but on opening the chest the heart may still be found beating with regularity. The essential physiological action of the poison is on the motor nerves, which can no longer transmit the mandates of the will, though they may still, to a certain extent, react under the stimulus of electricity. The sensory nerves are apparently unaffected by the poison. These facts may be conveniently shown by applying a ligature to the crural artery of one leg in a dog, and then inserting some of the poison beneath the skin of the opposite leg. If now the skin of the leg to which the ligature has been applied be pinched or pricked, or if the same stimuli be applied to any other part of the body, in either case the animal will vigorously retract the ligatured limb and that alone, showing that it has distinctly perceived the stimulus applied, though it is only able to move that member to which the access of the poison has been prevented. This experiment also shows that the motor nerves are poisoned in the first instance at their peripheric extremities, for the centric extremities of the nerves of the ligatured leg are clearly supplied by the poisoned blood, and, consequently, if the action of the poison were exerted on this part the animal ought to be incapacitated from moving its leg. There appears to be some difference in the amount of resistance presented by different nerves to the action of the poison. The nerves of the voluntary muscles of the extremities appear to be most sensitive to its toxic properties, then those of the thoracic muscles, and then, finally, the phrenics. As far as can be seen, there is no chemicophysical action exerted on the nervous tissue, nor any permanent deterioration of its structure, since, if artificial respiration be kept up until a sufficient time has elapsed for the elimination of the whole of the poison by the secretions, the nerves will rapidly resume their former functions. The mode of death in an animal poisoned by curara is essentially by asphyxia; the respirations becoming exceedingly gentle, and the blood everywhere assuming a dark, venous tint. M. Bernard then considers the action of curara upon other motor nerves than those supplied to voluntary muscles, as those distributed to involuntary muscles, to the heart, to the vessels, and to the glands, into which we have no space to follow him. Care should be taken, in making experiments with animals, that fresh subjects are taken, since there is reason for believing that, like opium, the system may become habituated to its influence, and a much larger dose is then required to produce a given effect.

In case of accidental wound, the direct application of bromine, which decomposes the poison, or of iodine or chlorine, or of alcohol, which tans the tissues as it were, and stops absorption physically, are the best means to be employed.

According to Dr. Preyer, the active principle of curara is a substance, the analysis of the chloroplatinate of which gives the formula $\text{C}_{10}H_{15}N, PtCl_2$. M. Bernard found that a milligramme of this substance (curarine), or ·015 of a grain killed a strong rabbit when injected under the skin in a very short space of time.

In comparing the action of curara with strychnine, M. Bernard disputes the statements that have been made by MM. Martin, Magron, and Buisson, who do not, indeed, say that strychnia and curara are the same substance, but that their effects are identical, and present no antagonism in their toxic properties. He points out the more rapid action of curara when introduced subcutaneously, the absence of convulsions, the flaccidity of the muscular system, if the animal dies; or if it recovers, the greater persistence of its effects, as compared with those of strychnia. In frogs, too, after death, the nerves will be found to be completely insensible to electric irritation when curara has been injected; whilst when strychnia has been the cause of death, the muscles can be made to contract still more energetically, though he admits that this is scarcely perceptible in rabbits. The essential difference in the action of the two poisons is, however, always well marked—viz., that strychnia first affects the sensory, and secondarily the motor system of nerves, whilst in curara the motor nerves are primarily, the sensory nerves consecutively affected. Strychnia acts on the nerves at their centric extremities, curara at their peripheric terminations. This is clearly shown by the following experiments by M. Pelikan. The sciatic nerve of one leg is severally divided in two frogs; one of the animals is poisoned by subcutaneous injection of curara, the other with strychnia, and it can immediately be shown that whilst the curara has poisoned the peripheric extremities of the sciatic nerves, the strychnia remains absolutely without action on the nerve. Now, reverse the experiment: tie the vessels of one leg, but leave the nerves intact in two other frogs, and it will soon appear that whilst the curara exerts no action on the peripheric extremities of the nerves of the leg, the strychnia rapidly produces its characteristic effects. It is certain, notwithstanding that the two poisons do not stand in any opposite relation to one another, they are not counter-poisons; rather, a double injection would render the animal's death doubly certain.

We must defer the further consideration of the effects of curara on the sympathetic system, &c., to a future opportunity.

III. Blood, Lymph, Circulation, Spleen.

1. Prof. A. Boettcher: *On the Operation of Chloroform on the Blood, and on the Conditions which are Essential to the Clearing-up and Crystallization of the Blood when Frozen.* (Archiv f. Path. Anat. u. Phys., v. R. Virchow, B. xxxii. 1865, p. 126, and p. 372.)
2. Th. Zawarykin: *On the Analysis of Blood.* (Sitzungsb. d. k. Akad. d. wiss. zu Wien, 1865, Band li. p. 151.)
3. Dr. E. F. W. Pflüger: *On the Amount of Carbonic Acid contained in the Blood.* (Pamphlet, Bonn, 1864.)
4. M. G. Colin: *Experimental Researches on the Pulmonary Circulation, and on the Differences of the Action of the Right and Left Cavities of the Heart.* (Gaz. Méd. de Paris, 1864, p. 776.)
5. MM. Estor and C. Saint-Pierre: *Experiments to Determine the Period at which the Spleen is most Actively Engaged in the Discharge of its Function.* (Robin's Jour. de l'Anat. et de la Phys., March, 1865, p. 190.)

1. Boettcher states that he, several years ago, called attention to the fact that chloroform exercises a very destructive agency on red-blood corpuscles, and at the same time possesses in a high degree the power of effecting the crystallization of hæmatoglobulin; but as his observations have been very generally overlooked, he has taken occasion to repeat, confirm, and extend them. The blood experimented on was invariably that of the dog; it was spread out in a very thin layer, and exposed to the action of chloroform vapour. Under these circumstances the blood immediately began to brighten in colour and become clear, and if, at the same time, the admission of air in moderate quantity was allowed, the clearing and brightening progressed throughout the whole drop; if, however, no air was admitted, the chloroform vapour did not constantly or regularly produce these effects. On examination of the completely transparent drop, it will be found that not a single red corpuscle can be discovered, but that at the edge of the fluid, crystals begin to form, which gradually increase in number and size, the whole process being completed in a few minutes. The simplest mode of performing the experiment is to spread a little blood on a slide and expose it to the mouth of a bottle containing chloroform, and from which the vapour is escaping. He attributes the phenomena in question to the metamorphosis of the blood corpuscles by energetic oxidation, effected by excited or active oxygen (ozone?), and concludes that chloroform must be an excitor of oxygen.

In reference to the effects of cold upon blood, Boettcher observes, that if freshly-drawn and defibrinated blood from a dog be spread out upon a glass tablet in a thin layer, and immediately frozen by exposure to cold, it will be found, upon thawing it, that almost all the corpuscles are destroyed, and that the fluid has become completely transparent and cherry red, and that on the occurrence of this change the formation of crystals commences. Here it would appear that a solution of hæmatoglobulin in serum has taken place, from which the colouring matter crystallizes out; but the case is not one of simple solution, for there is a chemical change dependent upon the oxidation of the red colouring matter of the blood, and taking place the more readily, the more freely the blood has been exposed to the surrounding air. That such exposure to oxygen is requisite may easily be shown by subjecting a tightly-corked flaskful of recently-drawn and defibrinated blood to a freezing temperature, and again thawing it, when it will retain its opacity, however frequently the operation may be repeated. Hence it seems that the mere act of freezing, as maintained by some, does not actually occasion the formation of crystals. When blood which has thus been defibrinated, corked up, and repeatedly frozen and thawed, is examined, it appears that the hæmatoglobulin is not completely but only partially and very gradually dissolved in the serum, the remaining portion being undissolved and forming a sediment which ultimately occupies one-half of the whole column of fluid. This sediment is of a deep and beautiful red colour, and when examined by the microscope is found to consist of small, angular corpuscles of various form and of very small crystals. The latter are rarely perfect, are not clear, and present a brownish colour by transmitted light, distinguishing them from those which form when the fluid is quite clear and bright; however this condition may have been produced, whether by chloroform, ether, or by cold, with exposure to air.

When defibrinated blood has been exposed for a short time to the action of carbonic acid so as to change its tint, and is then subjected to cold and again thawed, a still smaller quantity of colouring matter is dissolved in the serum than in the foregoing instance, whilst the deposit of angular corpuscles and small crystals is both larger in amount and of a deeper colour. In both of the last two instances, however, whilst the deposit remains undissolved in the serum so long as the fluid is protected from the action of oxygen, yet, as soon as this is permitted, speedy solution of the sediment and clearing up of the fluid takes place. Boettcher believes that the portion which is dissolved in the serum, when no air has been allowed to come into contact with the fluid, is due to the chemical change effected on it by the oxygen which is normally present in the blood. He concludes by observing, that further investigations will be requisite to explain why the action of oxygen should be more energetic (as it apparently is) at a low than at a high temperature.

2. M. Zawarykin observes, that in making experiments on the crystallization of the blood, and especially on those kinds of blood which crystallize slowly, the chief difficulty to be encountered is the supervention of putrefaction. He has discovered that, by the addition of a little ether, the formation of crystals is in no way impeded, whilst putrefaction is completely prevented. He has invariably employed the blood of the horse. This was defibrinated, and the corpuscles separated as completely as possible from the serum by subsidence. The corpuscles were then frozen, thawed, and mingled with ether in sufficient quantity to completely cover them. Specimens of blood thus prepared kept a month without change, and a drop examined under the microscope was found to contain numerous blood crystals.

3. M. E. F. W. Pflüger believes that the discrepancies which have occurred in the estimates of the amount of carbonic acid in the blood by Meyer, Setschenow, and others, are due to the incomplete modes of analysis adopted, and especially to the circumstance that attention has not been paid to the removal of the vapour of water contained in the receiver of the air-pump. This he has carefully avoided. He has obtained as much as 50 per cent. of CO_2 from the venous blood of the sheep, which then assumes a black colour. The quantity of combined carbonic acid is difficult to determine. Thus, defibrinated sheep's blood, which had never been in contact with the air, was

divided into two portions, one of which was examined immediately; the other, after the lapse of twenty-four hours, during the whole of which time it had been kept in ice. From the first, he obtained by simple exhaustion 40 per cent. of carbonic acid, and after the addition of phosphoric acid 0·18 per cent. more; whilst in the second, he obtained 41·2 per cent. by exhaustion, and on the addition of carbonate of soda 17 per cent. more, so that on the whole the quantity of free and of combined carbonic acid in the first specimen was 40·18 per cent., and in the second 58·2 per cent. The explanation of this difference, given by Pflüger, is, that under the vacuum of the air-pump carbonate of soda is decomposed, and carbonic acid eliminated, and he thinks that some substance is formed in the corpuscles which affects the decomposition.

4. M. Colin gives the following *résumé* of his conclusions. His experiments were conducted upon the horse:

(1.) The impulsive force exerted by the left ventricle as measured by Colin's manometer, is four times greater than that of the right; that of the former rising as high as from 253 to 264 lbs., that of the latter only to from 64 to 66 lbs.

(2.) The sytolic force of the ventricles varies from one instant to another, under the influence of various conditions; the least influential of which are those connected with inspiration and expiration, whilst the most important are those dependent upon muscular effort and upon obstacles to the passage of the blood. It diminishes in those systoles which are coincident with dilatation of the thorax, and increases in the systoles, occurring during contraction. During violent muscular efforts the force of the left ventricle increases to the amount of one-fourth, or even becomes half as much again as before. That of the right ventricle increases still more, becoming twice or even three times greater than during the period of repose, thus showing that the effects of even the slightest exertion tell more upon the pulmonary than upon the systemic circulation.

(3.) The right auricle is considerably larger and more capacious than the left; and the blood contained in it is not altogether discharged into the right ventricle, being partly regurgitated into the venæ cavæ, and partly retained in its cavity. The contents of the left auricle are almost completely discharged into the left ventricle. The act of expiration which assists the reflux of the blood into the veins of the right side of the heart, is a powerful obstacle to regurgitation on the left side.

(4.) During respiration the right ventricle becomes well filled and propels a full supply of blood into the lungs; but during expiration it does not fill so well, and discharges much less; moreover, it does not then completely evacuate its contents. Its large size is evidently destined to enable it to discharge alternately strong and feeble waves of blood, and to enable it to retain or to keep in reserve fractions of waves which the lungs during the period of contraction of the thorax are not able to receive. Whatever may be the amount of these differences, a perfect compensation is established between the two hearts. If the right ventricle receives and injects more blood than the left during inspiration, the opposite obtains during expiration. This equilibrium can only be interfered with by muscular efforts.

(5.) The pressure of the blood in the pulmonary arterial system is about equal to one-fifth of that of the aortic division. It is remarkably influenced by the movements of the thorax, diminishing during inspiration and increasing during expiration. When violent efforts are made, it may rise so high as to equal one-half of the aortic pressure.

(6.) As regards the rapidity of the pulmonary circulation, it is *less* than that of the systemic, the greatest *trajet* of a wave in the lung being from four to six times shorter than in the general circulation. The play of the thorax alternately accelerates and retards it, and this jetting character of its circulation is greatly exaggerated by movements even of the slightest nature.

5. MM. Estor and St. Pierre, after commenting upon the vagueness of our knowledge of the function of the spleen, remark that only one point is certain, that the spleen undergoes a considerable augmentation in volume in certain physiological conditions, and especially during the act of digestion, whence it has been regarded as simply fulfilling the purpose of a diverticulum. Applying, however, the observations of Bernard, in respect to the change of colour and the quantity of oxygen contained in the venous blood of a quiescent and of an actively secreting gland to the spleen, and from the results of carefully performed analyses, they have arrived at the conclusion that the blood of the splenic vein, during the period of fasting, contains nearly double the proportion of oxygen that is present while gastric digestion is being actively carried on, and consequently that the period of functional activity of the spleen *alternates* with that of the stomach. The mean of six experiments showed that in 100 volumes of *arterial* splenic blood there were contained 14·38 volumes of oxygen, in 100 volumes of the splenic *venous* blood of a fasting animal there were 11·53 volumes of oxygen, and in 100 volumes of the splenic venous blood of an animal in full gastric digestion there were only 5·70 volumes of oxygen.

HALF-YEARLY REPORT ON TOXICOLOGY, FORENSIC MEDICINE, AND HYGIENE.

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I. Toxicology.

The literature of science during the past six months has not been fertile in toxicological communications and discoveries. We have, in fact, failed to find in the numerous papers before us more than six or eight that would bear any lengthy report. For all that, the period has not been without its usefulness, and one essay, to which we shall invite the attention of our readers at some length, is of singular interest. We refer to the first paper upon our list, by Dr. Maclagan, in which it is proved that the habitual practice of eating arsenic is possible, and that the evidence by which the existence of the practice is proved, is now beyond suspicion. The researches of Drs. Mitchell, Keen, and Morehouse, on the antagonism of atropia and morphia, are also most valuable.

On the Arsenic-Eaters of Styria.—In the spring of the present year, Dr. Maclagan and Dr. Joseph Rutter, of London, made a short stay at Gratz, the capital of Styria, in order to obtain correct information in respect to the reputed arsenic-eaters, and in settlement of the question so much debated in this country, and often referred to in these reports—Whether there are men who by habitual practice can eat arsenic, and become tolerant of its action?

Dr. Maclagan first called on Dr. v. Vest, the medicinalrath who supplied him with introductions to Drs. Knappe, Mashar, and Tingler, all men who had special knowledge on the point to be inquired into. The two first of these gentlemen were called upon by Dr. Maclagan, the latter was not called upon.

Dr. Knappe possessed the most correct personal experience on the subject, and, in company with him and Dr. Rutter, Maclagan went to Upper Styria, where he had his first interview with an arsenic eater. This person, named Mathias Schober, was a healthy-looking, fresh-complexioned young man, of the age of twenty-six years, and five feet nine inches high: he was a native of

Liegist, had been employed as a house servant there, and said he had taken Hüttereich for about a year and a half—not, however, white arsenic, but the yellow arsenic, or orpiment. He alleged that he took the arsenic in order to keep strong, though he had never suffered from ill health. He had never experienced any bad effects, even when he first began using it; he had at first taken rather less than one grain a fortnight, he now took it twice a week, and on omitting to take it he felt a longing for it, which was relieved by a repetition of the usual dose. His reason for taking the orpiment instead of the white arsenic, was that it was more easily procured; but having expressed himself quite indifferent whether it were arsenious acid or the sulphuret, Dr. Knappe produced a paper containing the white arsenic, and having asked him to choose out a piece such as he was in the habit of taking, the mass was weighed, and found to be nearly five grains. Dr. Knappe having carefully ground this to powder on a clean piece of paper, it was transferred to a small piece of plain bread, about the size of a man's thumb-nail; and this the doctor put into Schober's mouth. Schober chewed the morsel and swallowed it, and then swallowed another portion of bread immediately after. This was at 9.30 P.M. He stayed a few minutes, but had to return to his work. Two hours afterwards he appeared again and made water, in the presence of Dr. Maclagan, into a vessel carefully cleaned, and the urine was placed in bottles, which he (Dr. Maclagan) had himself washed thoroughly. One of the bottles was broken, but two others on analysis yielded by Reinsch's and Marsh's tests very characteristic arsenical deposits. The following morning Schober called again upon Dr. Maclagan and passed some urine in his presence, which on analysis yielded arsenic freely.

Another case is of even greater interest than the one related above. We will give it in full, in Dr. Maclagan's own words:—

"*Case* 2.—Joseph Flecker, aged forty-six, a muscular, healthy-looking, clear complexioned man, a tailor by occupation, told us that he had taken Hüttereich (generally the orpiment) for a period of fifteen years. He first began to do so on the occasion of the inhabitants of a house in the neighbourhood where he lived being attacked with fever; and when fourteen people had died in it, and no one would enter the premises, he determined to do so, and took, as a prophylactic, about one grain of arsenic daily for three successive days, while going to the infected house, and though he said he had not felt quite well at the time, he was unable now to describe specially what had ailed him; but on being asked if he had ever suffered from vomiting or irritation in the stomach, he said he had not.

"The day before my interview with him he twice—viz., at 10.30 and 3 o'clock, had—in the presence of several of the villagers of Liegist, and on one of those occasions in presence of the bürgermeister, who informed me that he had seen him do it—taken a piece of the sulphuret of arsenic from his pocket, and scraped off a certain quantity of it on a piece of bread and eaten it. He brought with him a small bottle of his urine, which he stated to have been passed eighteen hours after the last of the two doses, and in which I have since found a considerable quantity of arsenic. The reason which he assigned for this public exhibition of his arsenic-eating capacities was, that it became the subject of conversation in the village that two strangers had come a very considerable distance to witness an example of arsenic-eating and inquire into the practice, and that he wished to make an open demonstration of his assertion that he was capable of tolerating a considerable dose of arsenic. When he first came to me he seemed somewhat unwilling to take a dose that day, owing to his previous performance, and seemed to fancy it possible that he might have some slight irritation of the stomach, such as a feeling of warmth accompanied by thirst. He did not appear to be able to give any reason for anticipating this result; perhaps he intended it as a gentle hint that the thirst might require assuaging; at all events, having been informed that he should not want the wherewithal to quench it (he confessed to being by no means abstemious in the matter of alcoholic potations), he, to satisfy our curiosity, picked out a piece of arsenious acid from the same parcel that had been shown to Schober, and which, on being weighed, was found to be as nearly as possible six grains. This he placed entire on a small piece of bread, and taking it into his mouth, crunched it up audibly, and in about two minutes after swallowed six or seven ounces of cold water, stating that he liked to drink immediately after swallowing a dose, and on such occasions preferred water. I then made him open his mouth and inspected it narrowly, but found it quite clear of bread-crumbs or anything else, thus assuring myself that no jugglery could have been practised. After having swallowed the arsenic four minutes he eructated slightly, but till he left us, a quarter of an hour after, he had no symptoms of any bad effect. The six grains were taken at 11.30, and at 12.15 he returned, and passed a small quantity of light-coloured urine. Nearly the whole of this was bottled for exportation, and the twelve ounces thus secured were treated by the process of distillation above described, and also yielded a characteristic deposit of arsenic.

"Flecker gave me the following account of his use of arsenic. He stated that he generally takes about the quantity we saw him swallow once a week, but with variations in the intervals, there being sometimes four days only, sometimes eight days between the doses. That when he has a distance to walk to his work, he takes a larger dose, and is then in good spirits for about eight days. That if he, however, intermits it for fourteen days he feels stiff in the feet, with general lassitude and a craving for another dose. If his victuals are hard of digestion, he takes a dose to assist the stomach, and if he takes a rather full dose he brings a good deal of wind off his stomach, but never vomits. He stated that his father had taken arsenic before him, and in considerable quantity, and that in the immediate neighbourhood of Liegist numbers use it, several taking it daily, and many in larger doses than he. He said that all who take it are healthy; that he never knew of any one vomiting from its use, and he believed that, like the use of tobacco, if the dose is very gradually diminished, an arsenic-eater can break himself of the habit.

"One of the objections which has been made to the acknowledgment of the reality of arsenic-eating is, that the substance swallowed has not been ascertained by chemical examination really to be arsenic. This link in the chain of evidence I am able to supply. The white substance which I saw Schober and Flecker swallow, part of which I have now in my possession, is pure arsenious acid. It sublimes into octahedral crystals, and leaves no appreciable residue. The yellow substance which Schober used is a fair sample of the orpiment of commerce, and contains, as that substance usually does, a considerable portion of free arsenious acid.

"I am, of course, not in a position to give any opinion as to the extent to which arsenic-eating prevails in Styria,—my time would not have permitted me to enter upon such an inquiry, nor would it be easy to get satisfactory information as to a practice which is generally kept secret; confirmation of the fact of its existence is more interesting to us scientifically than its extent; and that it is a fact, my personal observation enables me confidently to affirm. That arsenic-eating in Styria is a universal habit, or one indulged in by even a majority of the male peasantry, I do not for a moment suppose; but the averment 'that the story of the Styrian arsenic-eaters is not only unsupported by adequate testimony, but inconsistent, improbable, and utterly incredible;'[1] or that these are 'absurd and exaggerated statements, utterly inconsistent with all that is known concerning the action of arsenic in this or other countries,

[1] Kesteven, Assoc. Med. Journal, 1856, p. 811.

and but for the fact that they for a time received the literary support of Professor Johnston, and were diffused by him in an amusing book, they would not have required any serious refutation;'[1] or that it is a 'mass of absurdity,' 'a pure fable'[2]—are, although justified by the state of knowledge at the time they were made, no longer tenable; but on the contrary, we can no longer doubt, to use nearly the words of Roscoe, 'that decisive evidence has been brought forward, not only to prove that arsenic is well known and widely distributed in Styria, but that it is likewise regularly eaten in quantities usually considered sufficient to cause immediate death.'

"It is probable that many of the physiological actions attributed to it are fanciful, and that its use is mixed up with a good deal of superstition, as for example, in the case of the poacher who takes it to give him courage to pursue his depredations on ground that is new to him; or that of the ostler, who in giving it to his horses to improve their coats, thinks that it will have no beneficial effect unless he partakes of it at the same time.

"It is evident that the confirmation of the existence of the practice of arsenic-eating must lead us to modify some of the opinions that are entertained with regard to the influence of habit on the action of poisons. It has long been notorious, that by habit the human body may be brought to bear with impunity doses of organic poisons, such as opium, which, to those unaccustomed to them, would certainly prove fatal; but 'it has hitherto been considered by toxicologists that, except within very narrow limits, habit appears to exercise no influence on the action of mineral poisons.'[3] Though the experiment of M. Flandin, by which he proved that he could bring dogs to bear fifteen grains of arsenious acid in powder in twenty-four hours, without injury to their appetite or health, and the practice of administering arsenic to horses, have long been known as pointing rather in the contrary direction,—this has been supposed to be due to some peculiarity in the constitution of the lower animals. The facts which have been ascertained with regard to the Styrian arsenic-eaters, and which the above observations confirm, entitle us to maintain that the modifying effect of habit is not confined to organic poisons, but extends to those of mineral nature, at all events to arsenic."—*Edinburgh Medical Journal*, April, 1865.

Antagonism of Morphia and Atropia.—Drs. Mitchell, Keen, and Morehouse have recently subjected to most perfect observation the actions of morphia and atropia, with a view to determine whether the one of these poisons was antagonistic in effect to the other. Their experiences were all made on the human subject, in cases where, owing to the presence of intense pain, the two powerful agents had to be given in large doses by subcutaneous injection. The conclusions to which the authors have come—and, as we think, most fairly—run as follow:

1. Conia, atropia and daturia have no power to lessen pain when used subdermally.

2. Morphia thus used is of the utmost value to relieve pain, and is most potent in certain forms of neuralgia, the nearer it is applied to the seat of the suffering.

3. Morphia lowers the pulse slightly, or not at all; atropia usually lowers the pulse a few beats within ten minutes, and then raises it twenty to fifty beats within the hour. The pulse finally falls about the tenth hour below the normal number, and regains its healthy rate within twenty-four hours.

4. Morphia has not power to prevent atropia from thus influencing the

[1] Taylor, On Poisons, 2nd edition, p. 92.
[2] Christison, Edin. Med. Journal, 1855-56, pp. 709, 710.
[3] Taylor, On Poisons, p. 89.

pulse, so that, as regards the circulation, they do not counteract one another.

5. During the change of pulse under atropia, the number of respirations is hardly altered at all.

6. As regards the eye, the two agents in question are mutually antagonistic, but atropia continues to act for a much longer time than morphia.

7. The cerebral symptoms caused by either drug are, to a great extent, capable of being overcome by the other, but owing to the different rates at which they move to affect the system, it is not easy to obtain a perfect balance of effects; and this is made the more difficult from the fact already mentioned, that atropia has the greater duration of toxic activity.

8. The dry mouth of atropia is not made less by the coincident or precedent use of morphia. Atropia does not constipate, and may even relax the bowels; morphia has a reverse tendency.

9. The nausea of morphia is not antagonized or prevented by atropia.

10. Both agents cause dysuria in certain cases, nor is the dysuria occasioned by the one agent relieved by the other.

11. Atropia has no ability to alter or lessen the energy with which morphia acts to diminish sensibility, or relieve the pain of neuralgic disease.

12. As regards toxic effects upon the cerebral organs, the two agents are mutually antidotal, but this antagonism does not prevail throughout the whole range of their influence; so that, in some respects, they do not counteract one another; while as concerns one organ, the bladder, both seem to affect in a similar way.—*American Journal of the Medical Sciences, July*, 1865.

[Our readers who are interested in the question brought up in the above communication may refer with advantage to our previous reports, and specially to a paper by Dr. Prestwood Lucas in the 'Medical Times and Gazette' for February the 25th of the present year. In Dr. Lucas's case, a girl, aged eleven years, took an ounce and a half of laudanum by mistake for a black draught. To this child no less than sixteen grains of extract of belladonna were administered, and the recovery was complete. Unfortunately, the treatment of the case was complicated by the use, in addition to the belladonna, of electro-magnetism, and for a time by the act of exciting movements of the body; but the electro-magnetism, which was applied by placing one pole at the upper cervical region and the other over the epigastrium, was useful only as a stimulus under which the little patient was excited to the act of swallowing the medicine it was desired to administer, and the forced movements of the body were soon discontinued. Altogether it seems to us that the antidote had a decisive effect, and that it neutralized the physiological action of the opium. The subject is one of immense importance, to the physiologist, toxicologist, and practising physician, each alike. It opens a field of inquiry in a direction altogether unanticipated, and suggests a therapeutical method the results of which no one can foresee.—B. W. R.]

On Poisoning by the Endermic Use of Atropine.—In relation to the above-named cases, we may add one by Dr. H. Ploss, of Leipsic, in which the pure effects of atropine as a poison are illustrated. A man, aged thirty-three years, was suffering from disease of the larynx, which Dr. Ploss diagnosed as of a syphilitic nature. In course of time the patient consulted another physician, who looked upon the malady as a simple laryngitis, and in the way of cure recommended that a blister should be applied to the neck, and that a dressing should afterwards be used composed of fifteen parts of sulphate of atropine rubbed up in seven hundred parts of lard. Dr. Ploss raised an objection to this line of treatment, but unfortunately his advice was not accepted. The blistered surface having been produced, the ointment was applied. In a few minutes following upon the application, the patient made a violent spring from his chair in great excitement and pain. He rushed about the room frantically, crying out that he was suffocated, that all objects appeared black before his eyes, and that he felt as if he were being strangled. He tore away the dressing, and flung himself on his bed, while his face became crimson and his eyes fixed. The difficulty of breathing and of swallowing grew more intense; convulsive movements of the limbs, resembling those of chorea, set in; the respiration became rapid; the pulse rose to 150 per minute, and at last the power of utterance ceased. A vein was tried to be opened, but, owing to the convulsive movements, the attempt failed, and it was for the same reason difficult to administer remedies by the mouth or by enemeta. The breathing next became intermittent, the pulse fell, and within two hours after the patient had commenced to suffer he died.—*Zeitschrift fur Med. and Chir.*, Band iv., 1864.

On the Reduction of Arsenic from the Sulphide of Arsenic.—Dr J. C. Draper describes a process for the reduction of arsenic from the sulphide. He says, there are a number of methods known to chemists by means of which metallic arsenic can be reduced from its compounds. Of these, the process of Reinsch has great advantages over the others on account of its simplicity; but as it can only be applied to solutions, it has not, as yet, been employed for the examination of the sulphide of arsenic.

Owing to the fact that ammonia will attack metallic copper, and also possesses the power of dissolving sulphide of arsenic, it can be employed as the solvent, through the intervention of which Reinsch's test can be adapted to the reduction of arsenic to its sulphide.

The method to be followed is very simple and easy of application. The sulphide of arsenic, or the mixture containing it, is to be placed in any suitable vessel covered with aqua ammonia, and set aside in a warm place and allowed to digest for a few hours. The sulphide dissolves, and the clear liquid is to be separated from the insoluble portions by filtration; strips of clean, bright copper are then placed in the liquid, and the vessel and its contents gently heated. The copper gradually becomes coated with a covering similar to that deposited in the usual application of Reinsch's test.

When the deposit ceases to form, the copper strips may be washed in a stream of water, and dried by pressing them gently between folds of blotting-paper. Two or three should then be placed in a narrow test-tube, and slowly heated in a spirit or gas flame. Before a red heat is reached, the black coating on the slips sublimes, and being oxidized by the air in the tube, recondenses as arsenious acid, forming the characteristic ring of diamond-like crystals.

In following the above or any other process for detecting arsenic in medico-legal examinations, the greatest care must be taken to ascertain the purity of all the chemicals and apparatus employed. This is most readily accomplished by conducting an analysis in dumb show as it were—that is, going through all the operations in the vessels to be used, and employing the necessary chemicals, but leaving out the materials to be examined. If we fail to discover any traces of arsenic the operation is repeated, the substances to be examined being introduced, when, if arsenic is found, we may feel certain that the substance under examination contained it.

Dr. Draper remarks, that he cannot conclude his paper without drawing attention to a fact which has not been generally known among physicians. It is the presence of arsenic in considerable quantities in some varieties of flour, and in many vegetables employed as food.

During the past ten years, a class of manures known as the superphosphate, have come into very general use among farmers in Europe and in this country. These superphosphates are prepared by the action of sulphuric acid on common phosphate of lime, sulphate of lime and superphosphate of lime being formed.

The sulphuric acid employed is made to a great extent from various classes of pyrites, which often contain arsenic in large quantities, so that arsenic usually exists in the commercial sulphuric acid, and consequently in the superphosphates.

Plants grown in soil manured by such arsenical superphosphates also contain arsenic, as has been shown by analysis, and the man who subsists on such plants, grain, or vegetables, is of course introducing day by day small quantities of arsenic into his system, and we must be prepared to find it in the tissues of such an individual.

From the above, it is evident the discovery of arsenic in the muscular, osseous, and such tissues, cannot prove a murder, and the only case in which the discovery of arsenic can without doubt prove a murder, independently of other evidence, is when it is found in the stomach, intestines, and perhaps in the viscera immediately connected with the digestive apparatus, and does not naturally pre-exist in the flour and other articles of diet before they have been prepared as food.—*New York Journal of Medicine*, April, 1865.

On an Antidote at once for Prussic Acid, Antimony, and Arsenic.—Messrs. T. and H. Smith claim to have discovered a common antidote for prussic acid, antimony, and arsenic. Unfortunately, the description of the process has come to us too late on the present occasion to enable us to enter into details, but we may add the subjoined formulæ as representing practically the summary of the researches of the authors:—

"*Prussic acid antidote.*—Take of liquor of perchloride of iron 37 minims, protosulphate of iron in crystals, as pure as possible, 25 grs.; as much water as will make a solution of a protosesquisalt of iron, measuring about half an ounce. Dissolve, on the other hand, 77 grs. crystallized carbonate of soda in about half an ounce of water. These quantities destroy the poisonous action of between 100 and 200 minims of medicinal prussic acid, officinal strength, on giving first the one liquid and then the other.

"*Antidote for cyanide of potassium.*—The antidote for this compound is the same as for prussic acid, except that the solution of protosesquisalt of iron is to be used without the alkaline solution, the prussic acid being already combined with an alkali; the use of the alkali, however, would not be injurious; a harmless yellow prussiate would be formed. In this case, in consequence of the possible presence of free acid in the stomach, the alkaline liquid should be given first,—the quantities given, as the prussic acid antidote, would decompose 35 grains of cyanide of potassium.

"*Antidote for arsenious acid.*—Measure out 5 fluid drachms and 7 minims of liquor ferri perchloridi into 2 or 3 oz. of water, then add to the liquid a solution of 1 oz. of crystallized carbonate of soda in a few ounces of warm water, stir till effervescence ceases; the resulting mixture destroys about 10 grs. of arsenious acid.

"*Antidote for tartar emetic.*—Mix 5 fluid drachms and 7 minims of liquor ferri perchloridi with a few ounces of water; mix in now a cream formed of 90 grs. of calcined magnesia rubbed up with water in a mortar; stir till, after gelatinizing, the mixture again gets thin; empty the mixture into a calico or muslin cloth, and press out the liquid; remove the mass from the cloth into a clean mortar, and rub it up with a little water into a smooth cream; in this state it can destroy upwards of 20 grs. of tartar emetic. It may also be used as an antidote for arsenious acid, of which it absorbs about 10 grs."

The authors add a note from the distinguished chemist Bunsen, "on account of its value and brevity." The note refers to the application of the hydrated peroxide of iron as an antidote for arsenic. It runs as follows:—

"Göttingen, May 1, 1834.

"It is long since I have been led to the observation that a solution of arsenious acid is precipitated in a manner so complete by the hydrated peroxide of iron recently precipitated and suspended in water, that a current of sulphuretted hydrogen directed through the liquid, filtered and acidulated with a small quantity of hydrochloric acid, no longer presented the least trace of arsenious acid. I have also found that if to this body some drops of ammonia be added, and if it then be digested at a gentle heat with arsenious acid reduced to an impalpable powder, it transforms this last substance very quickly into a basic arsenite of peroxide of iron, which is altogether insoluble. A series of experiments, founded on this observation, has produced in me the firm conviction that this body combines the most favourable conditions as an antidote against the poisonous action of arsenious acid, both in a solid state and in solution. Dr. Berthollet has very willingly, at my request, acted in concert with me in the examination of this subject under all its aspects, and in making it the object of more careful experiments.

"The results of this examination have gone much beyond our expectations, and have confirmed our persuasion that the hydrate of peroxide of iron is a better antidote for arsenious acid, both solid and dissolved, than albumen is for corrosive sublimate.

"Young dogs, less than a foot in height, to which we had given from 4 to 8 grains of arsenious acid reduced into fine powder (and after exhibition of the hydrate, a ligature having been applied to the œsophagus to prevent vomiting), lived more than a week, without presenting, either during life or on dissection, the slightest trace of arsenical poisoning.

"The excrements—which were, as might have been expected from the complete deprivation of both meat and drink, in very small quantity—contained almost the whole of the arsenious acid, in the form of basic arsenite of peroxide of iron, but contained not a trace of free arsenious acid. We have convinced ourselves, by experiments on animals, that a quantity of hydrate of Fe_2O_3, answering to from 2 to 4 drachms of Fe_2O_3, mixed with 16 drops of ammonia, is sufficient to transform in the stomach 8 to 10 grains of well powdered arsenious acid into insoluble basic arsenite.

"It is, besides, easy to see that we might, in cases of poisoning by arsenic, administer this body in proportions much more considerable, with or without ammonia, either by the mouth or by injection, since the hydrate of Fe_2O_3, being a body altogether insoluble in water, exercises absolutely no action on the animal economy."

In commenting upon this note, the Messrs. Smith observe that the ammonia above recommended by Bunsen can be of no use unless there should be acid in the stomach, and if this should be considerable, the small quantity of ammonia that could be given would go but a short way in neutralizing the free acid. It would, in their opinion, be better for the medical man to counteract the interfering action of the free acid by the liberal use of calcined magnesia, or a sufficient excess of the hydrated peroxide of iron. Should vomiting have occurred, the action of the vomited matter on test paper would be a useful guide to the medical man.—*Pharmaceutical Journal*, Oct. 1865.

[We have to express our thanks to the Editors of the 'Pharmaceutical Journal' for supplying us with a proof of the above important communication prior to its publication in their own admirably conducted work.]

When the place was filled with vapour so thick that it was impossible to see in it, a workman entered and remained for seven minutes, with the door closed. He declared, on coming out, that he could have stayed there double the time, a statement which was confirmed by two other men.

M. Guérard mentions an experiment made by M. Galibert—in presence of some Government officials—where, provided with this apparatus, he went into a cellar filled with smoke caused by the combustion of resinous substances, and, after remaining in this mephitic atmosphere for some considerable time, not the slightest trace of suffering was discernible in his countenance. On the 8th of last January, several men, furnished with the apparatus with the air reservoir, entered a room in which damp straw was burning, the smoke from which was so dense and acrid that it was almost impossible to remain in the next room, or near to the door of that in which the experiment was being made, although the door was closed. After witnessing this trial, Dr. Blatin stated that the apparatus of M. Galibert might be safely used in places impregnated with the most deleterious emanations.—*Annales d'Hygiene Publique*, April, 1865.

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E.

I. *On Strangulation of the Testis within the Inguinal Canal.* By M. Velpeau. (Gaz. des Hôp., 21 Mars.)

An interesting case of this kind was presented at M. Velpeau's clinic. A man, twenty-seven years of age, and of robust build, though small in stature, was admitted with a tumour in the right groin, having all the appearances of a strangulated hernia. It had only existed during two hours, and gave rise to the most intense suffering, accompanied by frequent vomiting of brownish matters having a fæcal odour. The patient related that, from birth, the right testis had not descended beyond the root of the penis, the slightest pressure sufficing to cause it to pass back into the abdomen. While standing at his work as a cabinet-maker, he was seized with a violent pain in the abdomen, while a swelling appeared in the groin, which gradually extended to the scrotum of the same side. The patient was placed in a bath for three quarters of an hour, with some relief to the pain. In the groin was a very hard and slightly movable tumour of about the size of an orange, and very sensitive to pressure, the scrotum of that side being distended with fluid. Under the application of ice, the pain and tumour had in a few hours almost entirely disappeared. Next day, two tumours in the scrotum, the size of a walnut, were recognisable; the one consisting of the testis, a good deal atrophied, surrounded by a small quantity of fluid, and the other in the inguinal canal, composed only of fluid. By pressure, the testis could be forced back into the canal, followed by the fluid which surrounded it. The pad of a truss was applied against the external ring, so as to prevent its gaining admission to the canal. For a similar occurrence, two years since, the patient was near undergoing an operation for hernia.

Cases of this kind, M. Velpeau observed, are very rare, and easily misunderstood. Curling, indeed, mentions several cases of strangulation of the testis, but they are generally complicated with hernia, and are developed in quite another manner—viz., from within outwards, the gland contained within the abdomen entering the canal by the internal ring. In other cases the symptoms are due to an orchitis arising either in the abdomen or within the canal. In the present case, however, the testis was habitually placed without the external ring, at the root of the penis; and what renders it so remarkable is, that there was such an entire absence of orchitis that the unenlarged gland could next day be handled without any pain. What took place was this: the testis having entered the canal from without, became compressed, whence the severe pain and a serous exhalation into the canal, the undilatable rings resisting the exit of the gland more and more. The liquid continuing to increase, filtered below into the tunica vaginalis, constituting a second tumour in the scrotum. Compression of the gland gave rise to immense suffering and vomiting, and all the symptoms of strangulated hernia; indeed, to symptoms still more intense, for the subjects of hernia are far from complaining of such severe suffering. The prognosis in such a case is a serious one, if, as often happens, the patient does not take proper precautions. The symptoms may all reappear, and even a real strangulation may compel recourse to an operation; while independently of this, inflammation, the formation of pus, and death itself may occur. But by means of a good truss, and care, all such accidents may be avoided. In the application of this we have not the same difficulty as in cryptorchids, where, in order to prevent a hernia, we are obliged to prevent the possible descent of the testis, as here we have to fix the pad below the ring. It is true that the fibres of the cremaster, very powerful in some subjects, may, during their contraction, compress the gland against the pad, and give rise to some slight signs of strangulation; but this is usually of little consequence.

II. *On Osteomyelitis.* By PROFESSOR FAYRER. (Indian Annals, January.)

This affection, which has excited so much attention of late in Europe, is frequently met with after amputation in India, and Professor Fayrer has made it the subject of some interesting clinical remarks. He observes, that for a long time he was under the impression that the bad sanitary condition of the Indian hospitals was the true cause of its frequency; but he adds: "I am now persuaded that, although unfavourable conditions of this character increase the liability, and may, in some instances, determine the occurrence of a disease which under more favourable circumstances would be absent, yet that these alone are not sufficient to account for a condition which makes its appearance when other cases are doing well, and when other parts of the same wound are perfectly healthy and undergoing vigorous repair. It is not at all unusual to see an amputation in which part of the bone has perished, whilst the soft parts of the stump are healthy, and whilst other surgical cases in the same ward are doing well, the aspect of the cases generally in hospital also being favourable. . . . . With reference to the mode of amputating as a possible cause, I feel satisfied that the disease is not attributable to careless or imperfect division of the periosteum before the bone is sawn across, for I am particularly careful in all cases to divide it thoroughly with a knife, before applying the saw, in order to avoid fraying or stripping it from the end of the bone."

Without going so far as to say that this important affection has been overlooked, Professor Fayrer believes that it has not excited the attention it deserves, especially as promptitude of action on the part of the surgeon may be the means sometimes of saving life. Pyæmia, or septicæmia, is most prone to occur as a result of injuries to bone, and no condition is so certain to induce it as osteomyelitis. In compound fractures any portions of bone, the periosteum or medulla of which has undergone serious injury, should be removed; and although the exact extent of injury calling for this procedure cannot be indicated, it may be stated, in general terms, that denudation of the bone and such crushing or comminution of its cancellated structure as will be likely to give rise to inflammation, render it expedient. "I have no wish to advocate unnecessary removal of bone, but speak of a special condition under peculiar local or endemic disadvantages. I am satisfied that osteomyelitis is liable to follow such accidents insidiously, and am equally satisfied that it is better to anticipate the evil and, with the injured portion of bone, remove the danger. The same principles apply with equal force in amputation where symptoms of medullary suppuration make their appearance. In such a case the sooner re-amputation is had recourse to the greater the prospect of saving the patient's life. . . . . The earliest symptoms of systemic infection should be watched for, and when detected the sooner the affected bone is removed the better; and as the most effective mode of doing this is to amputate at or above the next joint, formidable though the operation may be, it is right, I believe, to do nothing less. I am convinced that I have saved some lives by this treatment, and though it needs firm reliance on the principles on which that treatment is founded to justify one in amputating above the joint when apparently amputation through the shaft of the bone is feasible, and when the patient is suffering from the irritation of incipient blood poisoning, with the pulse at 140, and with evidence of mischief already developed in the lungs, yet I should feel that in doing so I was substituting a chance of life for a certainty of death, and without hesitation I would give the patient that chance. I need not say that the operation must not be too long postponed, or it will be too late to save the patient from the effects of blood contamination. The proper time for amputation is not difficult to determine. It should be as soon as possible after you have ascertained that the bone is affected; and the mode of arriving at this knowledge is simply the passage of a long probe down the medulla. Should it impinge on healthy and bleeding medulla near the surface, you may, if the constitutional symptoms permit, wait and see if nature is about to limit the suppuration and throw off the diseased bone. Such expectations are in my experience rarely realized, and the doubt is generally resolved—not in favour of the bone. However, this is one of the nice points of discrimination in the treatment, and for which no absolute rules can be laid down. The constitutional signs, the state of the pulse, respiration, and temperature, would be important indications of the state of the disease, and they cannot be too carefully studied. A pulse over 120, persistent temperature above 104°, bronchial râles, hurried breathing, and tenderness over the hypochondria, are symptoms that give rise to serious anxiety on their first appearance, and very speedily decide the fate, if not of the patient, of his limb."

III. *On Stone in the Bladder in Children.* By M. Giraldès. (Gaz. des Hôp., April 6.)

Stone in the bladder is a very frequent affection in children, and the influence of sex prevails thus early, as only one girl is found suffering from the disease for twenty-four boys; and in girls, as in women, calculi usually owe their origin to the presence of a foreign body. The symptoms are the same in both sexes, and at the commencement are frequently misunderstood, the children being taken to the medical wards.

Which is the preferable mode of operating in children? Lithotrity, one of the great conquests of modern surgery which daily renders such great services, is not here always of easy application. The bladder, which is highly contractile at this age, expels the water thrown into it, and the instrument has to be manœuvred within the undistended organ. This is not so serious an inconvenience as it might at first seem, if we are to credit some of the English surgeons, who have recently recommended the performance of lithotrity without previous injection, but as the innocuity of this practice has by no means been proved it cannot be recommended. Certain accidents may arise from the performance of lithotrity in children, first among which may be mentioned inflammation of the peritoneum, the connexions of which with the bladder are more intimate than at a later period of life, the organ not having descended into the place it will afterwards occupy. Then, the introduction of instruments of sufficient size to pulverize the stone is difficult, when not impossible; and as the operation cannot be completed in a single sitting, additional irritation arises from the repeated introduction of instruments. The sojourn of rough fragments often also gives rise to severe disturbance of the nervous system.

Awaiting further improvements in lithotrity, it is to lithotomy we must have recourse in children. This furnishes such excellent results that we may have but one death in seventeen, or even in twenty operations, while the results are regarded as favourable in the adult, when only one death occurs in five or six cases. Children also recover more rapidly. Still, when the child is above the age of twelve it will be better to resort to lithotrity, if there be no formal contra-indication present, as a bloody operation is thus avoided, as well as the fatal consequences which so often follow such in French hospitals. As to the form of lithotomy to be preferred, M. Giraldès observes, that although the bilateral operation has so long enjoyed an almost exclusive preference in France, there can be no doubt that as regards children the results of clinical experience are greatly in favour of the lateral operation. In the same way, lateral urethral lithotomy is the preferable operation in girls, in whom there is not the same complicated perineal region to penetrate through as in boys. The only important organ in the track of the incision is the bulb, but it must be carried unnecessarily far to wound this.

IV. *On Sympathetic Ophthalmia.* By MM. GUÉPIN and WECKER. (Annales d'Oculistique, May; Gaz. des Hôp., Aug. 8.)

M. Guépin, sen., of Nantes, believes that reflex ophthalmia would be a preferable appellation for this affection. He states, that in the early period of his career he treated it by mercurial frictions, belladonna, and bleeding, and that many of his patients became blind, although he found the advantage in several cases of traumatic ophthalmia of extracting the cataract and liberating the iris from tension as a means of relieving the temporal and supra-orbital pains which so often precede the internal fluxion. Since 1838, however, he has acquired the conviction that sympathetic ophthalmia is almost always a sign of debility, and that bloodletting does not constitute the best antiphlogistic; and he now finds himself, by the employment of ammoniacal vesicants, cupping at the nape, and the use of mercurials, joined to a careful watching of the progress of the case, always able to prevent the development of the affection. During the twenty-six years in question he has, it is true, frequently practised the ablation of the anterior portion of the eye, extracted cataract even during the acute stage of the inflammation, and performed iridectomy, in order to assuage pain in an organ whose functions were lost or nearly lost; but he avers that he has never so acted under the idea of preventing the supervention of sympathetic ophthalmia, as he has always found this readily yield to the treatment indicated.

We have thought it right to place on record the results of the observation of so experienced a practitioner as M. Guépin, but the practice of M. Wecker will be found more in harmony with that which prevails amongst ourselves. He recently delivered a clinical lecture for the express purpose of impressing upon his auditors the necessity of performing the speedy enucleation of the eye, as the only preservative from sympathetic ophthalmia to be relied upon. In some exceptional cases this remedy may prove of efficacy even after the inflammation has commenced; and he relates an interesting example of this, in which the mischief was arrested with remarkable rapidity. The sympathetic ophthalmia manifested itself under the form of serous iritis in the right eye of a man fifty-nine years of age, whose left eye, struck with a fragment of steel three years since, rapidly atrophied, retaining much morbid sensibility, which was capable of being roused by pressure even at so remote a period. The only effect of a partial ablation of the eye, performed three and a half months after the accident, was the production of prolonged and painful suppurative inflammation in the remaining portion of the organ. On the patient's admission, the pupil was neither irregular nor encumbered with plastic deposits. There were slight diminution of colour and contractility of the iris, some injection of the perikeratic vessels, moderate ciliary pains, and amblyopia somewhat more considerable in proportion to the intensity of the other symptoms. These symptoms were in themselves of little consequence, but considered in connexion with the history of the case, and the efficacy of the rational means of treatment which had been adopted, they indicated a condition of such gravity that enucleation was at once performed. The success which followed was remarkable, for the disease, which had remained stationary during several weeks, now rapidly yielded to ordinary remedies. But all this case teaches is, that under such circumstances we should not absolutely despair, as we may exceptionally succeed, even after inflammation has been set up; but the true manner of regarding enucleation is to view it as a prophylactic, the opportunity for employing which has already passed away when the earliest morbid phenomena have appeared. "Enucleation, in fact, becomes urgent in any case in which an eye injured by a foreign body that induces inflammation and destroys all perception of light, remains after the loss of its functions hard to the touch and spontaneously painful—almost certain signs that the vulnerant body remains within the injured organ. Moreover, it should be practised whenever an eye, whether injured or not, lost to vision, becomes a source of annoyance to its owner by remaining the seat of continuous or intermitting pains of a certain intensity. Not only may we in this way prevent sympathetic ophthalmia, which may take its point of departure from these pains, but we restore to the patient a peace and repose of which he has been sometimes deprived for several years." As to the partial ablation of the organ, which has been recommended as a substitute for enucleation, as affording more facility for the adaptation of an artificial eye, not only is its prophylactic efficacy unestablished, but it too often gives rise to very painful suppurative inflammation. Even after enucleation, too, the divided muscles, retracted though they be, will usually impart a considerable amount of movement. "To sum up: this is the sole method which indubitably secures the patient from sympathetic ophthalmia, and of all the operations which have been proposed to this end it is the most certain, the most easy, and the least dangerous in its consequences. To convey an idea of the importance which I attach to conservative enucleation executed in opportune time, I may be allowed to say that I should prefer performing it ten times without absolute necessity, to neglecting it once in a case of misunderstood urgency."

V. *On Ovariotomy in relation to Disease of both Ovaries.* By Professor von Scanzoni. (Würzburg. Med. Zeit., No. 1, 1865.)

Professor von Scanzoni, while admitting the great progress which has been made of late years in establishing ovariotomy as one of the great recognised surgical operations, calls attention to its inferiority as a means of radically curing a fatal disease when compared with other important operations, as the Cæsarean section, lithotomy, the larger amputations, and the ligature of great vessels. When the immediate danger of these has been triumphed over, the patient has a reasonable expectation of being cured of his disease; but thus much cannot be said of ovariotomy, owing to the probability of the second ovary being diseased. This point has been insufficiently inquired into, and the object of this paper is to call attention to it. At present, great difficulty exists in drawing any conclusion upon the matter, owing to the few accounts which we have of the after-history of those who have been operated upon. Thus, in Dutoit's statistical work, embracing 324 cases of successful ovariotomy, in only 34 instances is the state of the patient declared two years after the operation. No conclusion can be drawn from such insignificant numbers, and Professor von Scanzoni has endeavoured to throw light upon the matter by causing the register of the Würzburg Pathological Institute to be searched. In the course of fourteen years the autopsies of 99 cases of ovarian disease were recorded, and in 48 of these the disease was found existing on one side, in 51 on both sides; and von Scanzoni is convinced that this statement does not represent all the cases of disease of the ovary brought to the Institute, nor a sufficiently high percentage of double disease, this not being noted when slight and incipient. At all events, in one half of the cases recorded the ovary was diseased on both sides; and this point, with the probability of relapse it implies, has been too little regarded by surgeons. These 99 cases are divisible into two groups, accordingly as the subjects had reached their fiftieth year or not; 52 of the number were below and 44 above that age, this point not being indicated in three cases. In the 52 cases both ovaries were diseased 31 times, or 59·6 per cent.; and but one 21 times, or 40·5 per cent. In the 44 cases, in 17 both sides, and 27 one side, were affected, or 38·6 to 67 per cent. A conclusion to be drawn from these figures is that, as double ovarian disease is of so much more frequent occurrence prior to the menopausis, the danger of relapse is much greater before than after that period—a fact to be borne in mind in considering the indications and contra-indications of the operation. It may be said that if, during the operation, both ovaries are found diseased, they may be at once extirpated, and all danger of relapse obviated. In Dutoit's statistics this double operation is said to have been executed in 25 cases, with 11 recoveries and 14 deaths; and it is remarkable that this double operation should have been performed in so small a proportion of cases, seeing, from the statistics already adduced, that disease must have existed much oftener in both sides. Either the diseased condition of the ovary must have been overlooked, or fears were entertained of aggravating the danger of the operation, or hopes were entertained that the disease would not undergo a dangerous development. However, the double extirpation seems to have been followed by bad results in the few cases in which it was undertaken, for there were only 44 per cent. recoveries to 56 per cent. deaths; while the entire number of ovariotomies recorded, 468, furnish 262 recoveries and 206 deaths, or 56 per cent. to 44—the figures being exactly reversed.

Professor von Scanzoni appeals to all those who may have the opportunity, and especially to the English surgeons, for their aid in a thorough examination into the point which he has raised in this paper.

VI. *Summary.*

Acupressure.—Watson's Acupressure as a Hæmostatic. (Edinb. Journal, July.)

Amputation.—Kühn's Practical Observations on Chopart's Operation. (Kuchenmeister's Zeitschrift, Heft 3.)

Anchylosis.—Discussion on Treatment of Anchylosis. (Congrès Medical de France à Lyon, p. 216.)

Aneurysm.—Porter's Case of Popliteal Aneurysm cured by Digital Pressure. (Dublin Journal, August.)—Barlemont, Ibid. (Gaz. Médicale, No. 27.)

Bronchocele.—König's Treatment of Asphyxia from Bronchocele. (Archiv der Heilkunde, No. 3. An interesting case, in which impending suffocation was treated by laryngotomy, a long canula being retained for sixteen months while the treatment of the bronchocele was pursued.)

Dislocation.—Reuss's Dislocation of the Humerus, with Fracture of the Tuberculum majus. (Langenbeck's Archiv, No. 1. A description of some preparations in the Göttingen Museum.)—Nélaton's Reduction of a Complete Dislocation of the Elbow after thirty-eight days. (Gazette des Hôp., No. 79. Accomplished easily by means of Jarvis's apparatus.)

Ear.—Triquet's Exploration of the Ear by the Otoscope. (Gaz. des Hôp., No. 82.)—Lindenbaum's Case of Closure of the Pharyngeal Orifice of the Eustachian Tube. (Archiv für Ohrenheil. No. 4.)

Eye.—Landsberg's Treatment of Muscular Asthenopia. (Archiv für Ophthal., 1. Abtheil.)—Sichel's Co-existence of Blindness with Deafness and Deaf-dumbness. (Annales d'Oculistique, May.)—Wecker's Etiology of Cataract. (Ibid., July.)—Wecker's Extraction of Cataract without Opening the Capsule. (Gazette Hebdomadaire, No. 30.)—Wilson's Retinitis Pigmentosa. (Dublin Journal, August.)

Eyelids.—Mauvezin's Gangrenous Œdema of the Eyelids. (Archives Gén., April and June. Eight cases related of an affection very analogous to malignant pustule.)

Fracture.—Ollier's Operation for Relief of a compressed Radial Nerve after Fracture of the Humerus. (Gaz. Hebdom., No. 33.)

Head.—Alquié's Clinical and Experimental Investigation of Concussion of the Brain. (Gazette Médicale, Nos. 15-32. An elaborate paper, with numerous cases and experiments, but leading to no conclusions of a novel character.)

Keloïd.—Hardy's Clinical Observations on a Case of Keloïd. (Gaz. des Hôp., No. 78.)

Laryngoscope.—Krishaber on the Management of the Laryngoscope. (L'Union Méd., No. 96.)

Military Surgery.—Lucke's Aphorisms in Military Surgery. (Langenbeck's Archiv, No. 1.) Notes on 113 Cases derived from the Schleswig-Holstein War, with observations on them.)

Ophthalmoscope.—Wright's Modifications of Liebreich's Ophthalmoscope. (Dublin Journal, August.)

Paracentesis Abdominis.—Lécard's Local Accidents following Paracentesis. (Rec. de Med. Militaire, May. Cases related in which peritonitis, hæmorrhage, and œdema of the parietes, followed by gangrene and emphysema, ensued upon paracentesis performed in the French mode, in the left flank.)

Paracentesis Thoracis.—Discussion in the Paris Academy of Medicine on the best mode of performing this operation. (Bulletin de l'Académie, No. 20.)

Patella.—Mettenheimer's Fibrous Prepatellary Tumour. (Archiv für Anatomie, No. 1.)

Perforating Ulcer of the Foot.—Cases by Bertrand and Duplessy. (Recueil de Med. Militaire, June.)

Periosteum.—Discussion on the Periosteum, in relation to Surgery. (Congrès Medical de France à Lyon, p. 272.)

Polypus Gilewski.—Case of Removal of Polypus of Larynx. (Wien. Med. Woch, Nos. 51, 52. By a longitudinal incision along the centre of the thyroïd cartilage.)—Rose, Two Cases of Naso-temporal Polypi. (Annalen der Charité, No. 2. Furnishes a summary of ten other cases, in which partial excision of the upper jaw has been also resorted to.)

Ranula.—Giraldès' Clinical Observations on Ranula. (Gazette des Hôpitaux, No. 85.)

Spine.—Guersant on Caries of the Spine in Children. (Bulletin de Therap., June 30.)—M'Donnell, on Case of Fracture of the Spine, with Trephining. (Dublin Journal, August.)

Staphyloraphy.—Trélat on Staphyloraphy. (Gazette des Hôp., Nos. 89, 92. With a discussion at the Société de Chirurgie.)

Strabismus.—Giraud-Teulon, on the Operation for Strabismus. (Gaz. des Hôp., No. 81. Furnishes the results of his modification of the operation as observed in 23 cases.)

Torticollis.—Guersant, on Torticollis in Children. (Bull. de Thérap., May 30.)

Tourniquet.—Puhlmann, on a new Tourniquet. (Berlin, Med. Woch., No. 28.)

Urethrotomy.—Discussion at the Paris Société de Chirurgie. (Gaz. des Hôp., Nos. 77-89.)

Velum Palati.—Paul on Adhesion of the Velum to the Pharynx. (Langenbeck's Archiv, No. 1.)

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D.,

Fellow and Examiner in Midwifery, Royal College of Physicians; Obstetric Physician and Lecturer on Midwifery at St. Thomas's; President of the Obstetrical Society of London.

I. Pregnancy.

1. *On a Case of Acute Liver-Atrophy in a Pregnant Woman.* By Dr. v. Haselberg. (Monatsschr. f. Geburtsk., May, 1865.)
2. *The Various Forms of Hydrorrhœa Gravidarum.* By Graef, of Schlottheim. (Jenaische Zeitschrift. ii. 1865.)

1. Dr. v. Hasselberg relates an interesting case of acute atrophy of the liver in a pregnant woman; it occurred in the lying-in hospital of Berlin in the summer of 1864. The patient was thirty-nine years old, a cook. She had had one child years before. On the 28th of June, being five months pregnant, she exhibited the first slight jaundice; this gradually increased. She was not otherwise distressed, and continued her work till the 2nd of July. On this day she vomited blood, and lost blood from the nose. Next morning she was found half conscious, undressed, the upper part of her body lying in the bed, the feet on the floor, and on the floor a five-months' fœtus, with its placenta. In the bed and on the floor was a considerable quantity of blood. She was removed to the hospital; she was then prostrate, in half sleep; roused, she complained of headache. At times she rallied from her sopor, asked how long she had to live. Pulse small, above 120; skin, conjunctiva, and gums intensely yellow; the whole body, especially the extremities, cool. Pressure on the region of the liver causes so much pain that the patient starts out of sleep, and cries; the whole stomach besides is free from pain; the uterus is strongly contracted. On percussion, the tympanitic resonance is divided from the resonance of the chest only by a small dull zone. The dulness of the liver nowhere passes the arch of the ribs. The little urine drawn by catheter showed, on addition of nitric acid, the colours of biliary matter, but no albumen. Hæmorrhage continuing, cold injections were used; collapse increased; consciousness quite ceased; and the patient died two hours after admission.

Autopsy next day.—Icteric tinge over the whole body; lungs and heart sound; spleen large, flabby, strongly congested; in pelves of both kidneys and in cortical substance small blood extravasations; liver small, weighs scarcely two pounds; it is unusually soft; on its smooth upper surface pale yellow; the gall-bladder contains only a little yellow mucous gall; sections of the liver show a very uniform pale yellow colour, with very small and hard-to-recognise acini. Under the microscope, distinctly defined liver-cells could nowhere be found, but in their places was a copious amount of fine granular fat. Chemical examination revealed abundance of leucine, but no tyrosine.

2. Dr. Graef relates cases illustrating various forms of hydrorrhœa in pregnant women. In Case 1, the patient pregnant for second time, at end of fourth month experienced a watery flow a few days after having tripped in a hole. The discharge took place with light pains. The discharge was repeated; it was always more copious in the recumbent posture, the patient, therefore, refused to keep her bed. Eleven weeks after the first discharge an incessant flow escaped, and the fœtus was expelled at the end of six months' gestation. The membranes were very delicate, and had torn on the edge of the placenta. There was, in addition, a circular opening of three inches diameter, the edges of which, under a magnifying glass, seemed fringed with swollen irregular shreds. In this case the cause of the hydrorrhœa was held to be a rent in the membranes. Case 2, a strong woman had aborted six months before the beginning of her present pregnancy, and since had suffered from leucorrhœa, at times tinged with blood. In her sixth pregnancy, being seven months gone, fixed pain in the sacrum, sleeplessness, and loss of appetite set in. Labour occurred, and, with much discharge of water and blood, a well-nourished fœtus was expelled. She had suffered during the last three months from repeated watery discharge, the uterus rising and falling with the gathering and escape of the fluid. The membranes were thick, without rent; placenta normal; leucorrhœa persistent. The author regards this as a case of catarrhal hydrorrhœa.

II. Labour.

1. *A New Case of Spondylolisthesis.* By Dr. G. Hartmann, of Stuttgart. (Mon. f. Geburtsk., June, 1865.)
2. *A Case of Vagitus Uterinus.* By Dr. S. Kristeller. (Berlin. Klin. Wochenschr., ii. 13, 1865.)
3. *Two Cases of Vagitus Uterinus.* By Dr. Kuby and Dr. Gutherz. (Bayer. Arzth. Intell. Blatt. 22, 1865.)
4. *On Cephalotripsy.* By Ferd. Weber. (Wien. med. Pressc. vi., 1865.)
5. *On Inversion of the Uterus.* By Professor P. Lazzati. (Annali Universali di Med., Milan, July, 1865.)
6. *Case of Spontaneous Inversion of the Uterus immediately after Labour.* By Dr. J. C. Wilson. (Glasgow Med. Journ., 1865.)
7. *Report on the Proceedings of the Charité Lying-in Hospital at Berlin for the Winter-Semester* 1862-63. By Dr. Bocker.
8. *Report of the Proceedings of the Charité Lying-in Hospital at Berlin during the Winter-Semester* 1863-64. By Dr. R. H. Pohl. (Annalen des Charité Krankenhauses, 1865.)

1. Dr. Hartmann's case of spondylotisthesis is a useful addition to our knowledge of this recently-described form of pelvic distortion. The subject of it was twenty-four years of age when she came under observation. When scarcely two years old, she was carrying a sister sitting upon her shoulders, when the sister fell off backwards. She herself suffered great pain in the sacrum, and for several years was bedridden. About her fifth year she was

able to stand up and walk a little, but until her eighth she had to be carried to school. Later she gained more strength and grew in stature. She had a first pregnancy when twenty-one years old. The labour was not difficult, but the child was born dead. She recovered well. On the 26th February, 1865, she was again pregnant, and came under observation.

She was 140 centimetres high; thorax well made; the arch of the ribs on either side so close to the iliac crests that scarcely a finger could be squeezed in between; there is marked lordosis extending from the fifth dorsal vertebra to the basis of the sacrum, and is greatest at the lowest part. The curvature of the sacrum seemed normal, but the direction of the symphysis pubis was more nearly vertical than normal, so that the inclination of the pelvis was diminished. The measurement of Baudelocque's conjugate diameter was 18-20 centimetres. The abdomen was strongly overhanging. On internal examination the finger struck, where the promontory ought to have been, upon a convex surface of bone distant 11 centimetres from the lower border of the symphysis. High above the posterior wall of the pelvis could be felt the beating of the right iliac; the left iliac was also felt, and even the aorta at its bifurcation. It was this discovery that chiefly determined the diagnosis of vertebral dislocation. Although the pelvic contraction was not great, it was resolved to bring on labour, she being about eight months gone. This was done, a living child was born, and the mother did well. The hand being introduced into the pelvis after the expulsion of the child, the posterior wall was plainly felt to be formed by the sunken lumbar vertebræ; the intervertebral substances of the last vertebræ were easily distinguished; the pseudo-conjugata was found to be 11 centimetres. The two iliacs and aorta were felt pulsating upon the sunken bodies of the vertebræ. The promontory was formed by the penultimate lumbar vertebra.

This case is another instance to be added to those of the Reporter (Dr. Barnes), and others, in illustration of the fact that spondylolisthesis is not always of congenital origin.

2. Dr. Kristeller relates the following case of vagitus uterinus. A woman in her third labour had discharged the liquor amnii; the os uteri was open and flaccid; head presenting. An attempt made to bring head into pelvis by forceps failed; on a second attempt, the blades being passed high up, the child was heard to cry distinctly; the cry was repeated as often as the blades were pushed up. Turning was resorted to; during this the cry was heard again. Respiration-movements were plainly felt *in utero;* the cord beating also distinctly. The child was born alive.

3. In Dr. Kuby's case of vagitus uterinus the face presented, the os uteri was open to the size of a dollar when first examined. In half an hour the labour had so far advanced that the mouth, nose, and eyes could be seen, whilst the perineum was still stretched over the chin. The child plainly sighed and groaned. Dr. Kuby rests upon this case as evidence that it is not alone in lingering labours, where manual help is given, that vagitus uterinus occurs.

Dr. Gutherz was called to a case of breech-presentation. He passed his hand into the uterus beyond the breech; the child gave a lively cry, which was soon repeated, attended by movements of the abdominal walls and chest. The legs were brought down. During the liberation of the arms the twitching movements of the body were again felt, and whining cries were plainly repeated.

4. Dr. Ferdinand Weber having made many experiments with different cephalotribes on the bodies of children, states the following results:

(1.) By no instrument could one break the bones of a perforated head; they were always simply bent.

(2.) The bones of a perforated and even excerebrated head can only be bent.

(3.) The cephalotribe shortens the diameter in which it seizes the head; this shortening is compensated by the lengthening of other diameters.

(4.) By no cephalotribe is it possible to excerebrate a perforated skull completely; commonly one only succeeds in removing the lesser half of the brain.

(5.) A perforated and excerebrated head admits of being more compressed than one not excerebrated; in the latter case, the blades even of the strongest instruments are somewhat bent.

(6.) The cephalotribe is essentially an extracting instrument.

5. Professor Lazzati contributes a critical memoir on inversion of the uterus, and relates two cases:

Case 1.—A robust woman had had two premature labours, and three at term. She was delivered easily of her sixth child at term by a midwife. The uterus remained inert after rapid expulsion of the child. Inversion took place and hæmorrhage. The uterus appeared outside the vulva. Dr. Agudio was immediately called. On endeavouring to reinvert the uterus, spasmodic contraction of the neck always prevented. Hæmorrhage continued profusely. Professor Lazzati then saw the patient. There was great prostration. The uterus was returned, and iced water injected into cavity to induce contraction. The patient recovered from a state of extreme anæmia and collapse.

Case 2.—A robust woman, aged twenty-five, had one child at term two years previously, was in second labour at term. The child was expelled suddenly. The placenta was expelled immediately afterwards from the vagina with violence, and great hæmorrhage ensued. The midwife in attendance affirmed that she did not interfere. Great prostration from continued flooding came on. Professor Lazzati saw her three hours after the labour. He found the uterus completely inverted, but inside the vagina, the organ quite flaccid. He succeeded in reinverting it, and then injected cold water to induce contraction. The patient died in an hour from loss of blood and shock.

Amongst the conclusions set forth by the Professor are these:

(1.) An indispensable condition of this accident is, that the uterus shall be in a state of complete and total inertia.

(2.) That the state of inertia is always necessary to enabie the operator to restore the inverted organ.

(3.) If the inverted uterus contracts strongly upon itself, and if there is no success in obtaining relaxation of it, it is impossible and most dangerous to reduce it.

(4.) No case of inversion is known in which the uterus had not been previously distended.

(5.) Three degrees of inversion after labour may be distinguished: (*a*) *Simple depression.* (*b*) *Incomplete inversion*, when the fundus and body issuing from the orifice, and descending more or less into the vagina, the orifice, nevertheless, remains in its original position. (*c*) *Complete inversion*, when issuing or not from the vulva, the uterus is entirely turned inside out, comprising the orifice.

(6.) That spasmodic contraction of the cervix uteri may occur in both incomplete and complete inversion, and oppose reduction.

(7.) In these cases the best practice is to place the whole hand, closed in the form of a fist, on the fundus of the uterus, so as to extend the surface upon which the force of the operation bears.

6. The following is an outline of Dr. Wilson's case of inversion of the uterus. Mrs. W. was delivered normally of her second child. A few minutes after the birth of the child and before the expulsion of the placenta, the patient suddenly complained of severe pains of a bearing-down character, fol-

lowed by sinking and exhaustion bordering on collapse. No more hæmorrhage than usual in natural labour. Large globular tumour projected beyond vulva. Inversion appeared complete. Placenta adherent to inverted fundus. It was necessary to peel off the placenta before re-inverting. The completion of this process was marked by the uterus suddenly starting from the hand "like a bottle of india-rubber when turned inside out." The symptoms of collapse gradually subsided. The patient recovered.

7. The Charité Lying-in Hospital at Berlin is under the direction of Dr. Nagel. During the six winter months 1862-1863, 330 labours were under observation. Of these, 292 were single women, and 181 were primiparæ.

One woman suffered during the latter days of pregnancy from apoplexies of the retina of the left eye, relieved by artificial leeches and acids. The most frequent complication of pregnancy was syphilis, and the most common form constitutional.

Three cases of eclampsia occurred. In one case the patient was a primipara with twins. She died undelivered, the Cæsarian section being performed post-mortem; both children were dead. Urine albuminous. The second case was that of a woman who was picked up senseless in the street. She was bled, and cupped on the back. Urine albuminous. The fits continued; labour set in; delivery was attempted by forceps; then perforation and turning were resorted to. A macerated fœtus was extracted. The patient died an hour afterwards. *Autopsy.* Dura mater showed intense venous injection; it was deeply coloured yellow, and covered on its outer surface with a thin adherent layer of yellow substance. The sinuses were large and held much serous yellow clot. The pia mater was moist; the veins contained much blood in the depending parts, and some fluid at the basis cranii. The ventricles contained much fluid; the plexus was much distended. The volume of the brain and cerebellum was considerable; the cortical substance much unfolded, moist, smooth, anæmic. The pericardium held several ounces of yellow fluid. The heart was very voluminous, especially the left; the right held large thick deep-yellow fibrin-coagula. The walls of the left heart were thick, firm, brownish. The border of the mitral valve was much thickened, crumpled, and covered with a fringe of firm yellow substance, over which the endocardium passed smooth; in it were small blood-extravasations. The lungs were somewhat œdematous. The cavity of the uterus was very large; it contained numerous firm clots. The muscular substance, especially of the lower part, was flaccid; and in its tissue, and also in the Douglasian pouch, were blood-extravasations. The liver was large and heavy. The left kidney was very large; the capsule was hard to peel off; the surface was much injected; the parenchyma very hard; the cortical substance very broad, grey-yellow. The right kidney showed the same condition, but it was more plainly granular.

The third case was also fatal. There was no autopsy.

Operations.—The forceps was used twenty-four times: in thirteen for deficient uterine action, in five for pelvic narrowing, in two on account of descent of funis, in two for eclampsia, in one case of breech, in one case of rigidity of mother's soft parts. The perineum was split in twelve cases. The large or small forceps of Busch was used. In sixteen cases the mother went through puerpery normally; five were transferred to the hospital on account of severe complications.

There were several cases of pelvic narrowing. It is considered interesting to note that in most the measurement of the external conjugate diameter gave manifest indication of the degree of narrowing of the internal conjugate. It measured in these cases from $6\frac{1}{4}$ to $6\frac{3}{4}$ inches.

An interesting case is related of a primipara, aged eighteen, who in her seventh year had suffered extensive ulcerations in the genitals, followed by rigid cicatrices stretching from anus to vagina. When the head came down upon this structure, two deep incisions were made in such a manner as to isolate and protect from laceration the bowel. The forceps was then applied. Another deep incision was, however, still necessary before the head could be drawn out. The child was alive. The incisions were brought together by sutures; the wounds suppurated, but a good recovery ensued.

Descent of the Funis.—The reposition of the prolapsed cord was never attempted; in two cases the forceps was applied. One child was dead; the other was saved.

Laceration of the Perineum occurred forty-four times. The frequency is attributed to the neglect of supporting the perineum by the midwives and students. In twenty-one the rent was insignificant. In twenty-three it exceeded half an inch. In these, sutures were applied; the patients had the knees bound together, and the catheter was used three times daily. Of these, twelve healed by first intention; the rest granulated. When suppuration was foul, chloride of lime was used.

The Puerperal State.—In fifty-eight cases, severe puerperal diseases arose. Of these, forty-six were sent to the inner department, and about half died. Of the fifty-eight, twenty-nine were primiparæ. A remarkable change was observed in the character of the symptoms in December. Up to this time local affections, as metritis or peritonitis, were manifested in almost every instance; but henceforward the symptoms were those of acute blood-poisoning.

8. Dr. Pohl reports the history of the Charité Lying-in Hospital for the winter 1863–64. 369 patients were admitted; 353 were delivered; 224 were primiparæ.

Operations.—Extraction by feet, pelvic presentations, 3; forceps, 15; cephalotripsy, 1; turning, 1; reposition of fallen funis, 1; Cæsarean section (post-mortem), 2; lateral incisions of the labia majora, 11.

Dr. Pohl relates a case of eclampsia from diffuse nephritis (albuminuria). She recovered. He observes that although convulsions occurred in this case, yet in four other cases of nephritis convulsions did not follow. As these cases are of special interest, proving that albuminuria does not necessarily entail convulsions, one is analysed in some detail. The patients are described as partly primiparous, partly multiparous, some of anæmic, others ruddy aspect. In three cases of nephritis, which proceeded without convulsions, universal dropsy was present, in the fourth case there was no dropsy. This case ended fatally during labour. The local disease was, as revealed by section, about three to four weeks old, and was associated with hydronephrosis. The history was as follows: Aged twenty-one, small, of scrofulous habit, primipara; external conjugate diameter six and a half inches, promontory easily reached. Labour tedious and painful. She complained of pain in the region of the kidneys, and had passed very little urine for several days. A little urine mixed with blood was drawn by catheter. Collapse came on. The head did not descend; the face was cyanosed; pulse 120; vomiting. Delivery by forceps was attempted on third day of labour; then cephalotripsy, which also failed; then perforation; the patient died undelivered.

The conjugate diameter was three and a half inches. On dissection, hydronephrosis, diffuse (parenchymatous) nephritis; hæmorrhagic spots in both sides of the bladder.

Chloroform in Turning.—In a case of prolapse of the funis, too large for re position, turning was attempted. The pulsation ceased. Both feet were seized and brought to the os uteri, but version was impossible on account of crampy contraction of the uterus, which was not prevented by chloroform narcosis. The cephalotribe was then applied, and thus was delivery accomplished. The child was very large.

Lacerations of the Perineum occurred forty-five times. As a rule, the rents, which extended through more than half the perineum, were stitched immediately after labour. Of twenty-four stitched lacerations fifteen healed by first intention. The suture was of fine iron-wire, and was left in for four days. Incisions were made into the labia in eleven cases, in order to avert threatening laceration, almost always with good results; for, whilst the perineum was saved, the wounds so cicatrized that after healing no deformity, and generally no trace of the operation, was observed.

The Puerperal State.—Diphtheritic ulcers at the vulva, proceeding from fissures of the mucous membrane and perineal lacerations were very frequent. In many cases, especially in the first half of the half year, when the puerperal fever appeared only sporadically, these ulcers remained as a perfectly local affection, easily healed by camphor-wine, chloride of lime, or potassa fusa. In other cases, and especially in the latter half of the half-year, endo- and parametritis were added to the ulcers; and to these septicæmic symptoms followed. All cases of severe puerperal disease were transferred to the medical department. The result is not mentioned.

A Case of Retroversion of the Uterus after Labour is interesting. A woman, aged twenty, pregnant for first time, was delivered somewhat prematurely. Endometritis with considerable fever followed. Rents of the mucous membrane became ulcerous, and for a time presented a bad appearance. At end of fourteen days she seemed to have recovered, although weak. Eight days after leaving bed—that is, twenty-three days after delivery—it was found she had retroversion of the womb. She complained of sacral pains, difficult defecation, and dysuria. Under rest and nourishment, at the end of fourteen days the retroversion had disappeared.

The titles of the following memoirs are cited, facility of reference to the originals, or want of space, rendering abstracts unnecessary or inconvenient:

Hæmatometra through acquired Atresia of the Os uteri, complicated with extreme Narrowing of the Vagina. By Dr. Angelo Vittadini. (Gazz. Lomb. 35. 1864.)

On Turning by External Manipulation. By Dr. Dismas Kuhn. (Wien. med.-Halle, 1864.) The author relates a case in which turning was performed by external manipulation by Professor Braun.

The String-form Development of the Amnion around the Umbilical Cord—a rare cause of fœtal death. By Professor Gustav Braun. (Oesterr. Ztschr. f. prakt. Heilk. xi., 9, 10, 1865.)

On the Methods of Perineoraphy. By Dr. Deroubaix. (Presse Médicale, 1864.) Dr. Demarquay. (Gaz. de Paris. 1864.) And Dr. L. G. Neugebauer (Königs. Med. Jahrb. III., 1862; Schmidt's Jahrb., 1865, No. 2.)

Ovariotomy: Death from Secondary Hæmorrhage. By Mr. Cheyne. (Australian Med. Journ., December, 1865.)

A Case of Ovariotomy: Recovery. By Dr. Tracy. (Ibid.)

A Radical Operation for Procidentia Uteri. By Dr. Emmet. (New York Med. Journ., April, 1865.)

Tubal Gestation: True Corpus Luteum in Ovary of Opposite Side. Death by Rupture of the Sac. By Michael Sadler, M.D. (Med. Times and Gazette, August, 1865.)

On Superfecundation and Superfœtation. By Dr. B. S. Schultze. (Jen. Ztschtr., ii., 1865.)

Puerperal Tetanus. By Dr. Philipson. (British Medical Journal, Sept. 1865.)

Observations on Uterine Tumours. By Dr. Leishman. (Glasgow Medical Journal, Oct. 1864.)

CONTRIBUTIONS TO MEDICAL LITERARY HISTORY.

ADVERSARIA MEDICO-PHILOLOGICA.

BY W. A. GREENHILL, M.D. OXON.

(*Continued from* vol. xxxv. p. 281.)

ἀνθρακώδης is found in the Hippocratic Collection,[1] applied (together with μέλας) to the menses, and explained by Föes to mean "Carbunculosi, hoc est carbonibus similes et nigri aut adusti." In later writers it is used in quite a different sense, and is applied to πυρετός by Palladius,[2] to ἕλκος by Rufus Ephesius[3] and Galen,[4] and to ἐξανθήματα by Herodotus[5] (not, of course, the historian). In all these instances the word is supposed by some persons to refer to the *small-pox;* and, if the passages are examined, it will be seen that they might very well be supposed to describe this disease, if it were but incontestably proved that it was known to the Greek physicians of the first century after Christ. As, however, this is not the case, it is safer to explain the word simply as "*anthrax-like*," and refer to ἄνθραξ for further details.

ἀνθράκωσις is defined by Paulus Ægineta[6] to be "a malignant ulcer of the sloughy kind, forming sometimes in the ball of the eye, sometimes in the eyelid, as in the other parts of the body" (Adams' translation), which definition agrees with that given by Pseudo-Galen.[7] Joannes Actuarius[8] uses the word in the same sense, and it is probably never simply synonymous with ἄνθραξ.

ἄνθραξ, a word at least as old as Hippocrates, which is interesting, because it has been supposed by Willan[9] and others[10] to signify *small-pox*. The meaning of the word has been fully examined by Willan, by Littré, in his edition of 'Hippocrates,'[11] and by myself in one of the notes to Rhazes,[12] where will be found a reference to the principal passages in which it is used by ancient writers. In this place, therefore, it will not be necessary to do more than state the general result of the enquiry. In Hippocrates there is nothing to indicate the precise meaning attached to the word, but by the most recent translators (Littré, Adams, Daremberg, and Ermerins,) it is rendered *anthrax*, *carbuncle*, and *carbunculus*. The word is frequently used by Galen, and there are several definitions and descriptions of the disease in different parts of his works,[13] which would certainly seem to apply much more to the modern *carbuncle* than to the *small-pox*. The word is sometimes used in the plural, but it need not then necessarily mean several "anthrakes," which appeared on one and the same person (like the pustules of the small-pox), but may equally well signify a single "anthrax," which broke out on several individuals. The word is used by Alexander Trallianus,[14] Leo,[15] and other medical writers.[16]

1 'De Morb. Mul.,' i. 11, tome viii. p. 44, l. 7, ed. Littré.

2 'Comment. in Hippocr. "Epid. VI.,"' in Dietz, 'Schol. in Hippocr. et Gal.' vol. ii. p. 33, l. 3.

3 Quoted by Aëtius, v. 95, p. 91 B. l. 38, ed. Ald.

4 'De Probis et Pravis Alim. Succis,' c. 1, tom. vi. p. 750, l. ult.

5 Quoted by Aëtius, v. 129, p. 96 B. l. 31; the equivalent expression, ἄνθραξι παραπλήσια, occurs in l. 7.

6 iii. 22, p. 35, l. 46, ed. Ald.

7 'Introd.,' c. 16, tom. xiv. p. 777, l. 8.

8 'De Meth. Med.,' ii. 7, p. 184 B. ed. H. Steph.

9 'On the Antiquity of the Small Pox,' &c., in his 'Miscellaneous Works,' 1821.

10 C. F. T. Krause, 'Ueber das Alter der Menschenpocken,' &c.; Hannover, 1825. This work I have not myself seen.

11 Tome v. p. 48, &c.

12 'On the Small Pox and Measles,' p. 146, &c.

13 See Index to Kühn's 'Galen,' under *Carbunculus*.

14 Lib. ii. cap. 7.

15 'Consp. Medic.,' vii. 7, in Ermerins, 'Anecd. Med. Gr.,' p. 209.

16 See Index to the 'Medicæ Artis Principes,' art. "Carbunculus."

Upon the whole, it is probable, 1. that in the ancient medical writers there are many passages in which the word *must* signify an affection resembling carbuncle, or malignant pustule; 2. that there is no passage in which it may not possibly have this meaning; and, 3. that there is no passage in which it must necessarily mean small-pox. On the other hand, it is not improbable that the word may have been popularly used in a different or less precise sense; and, at any rate, it is hardly possible that in the short account of the epidemic disease in the fourth century, given by Eusebius, &c.,[1] it can have signified carbuncle, while it must be confessed that some of the particulars there mentioned much more closely resemble small-pox.[2]

ἀνομοιομερής, *consisting of unlike parts,*[3] applied to those members of the body which by division become different in kind from what they were before. Aristotle gives, as examples,[4] *a hand* and *a face,* which do not by division become two hands or two faces, but something *unlike* (ἀνόμοιον) to what they were before the division took place. The word is directly opposed to ὁμοιομερής,[5] and is apparently almost (if not quite) synonymous with σύνθετος and ὀργανικός, which words are used in passages where we might, perhaps, have expected to find ἀνομοιομερής.[6] The parts called indiscriminately by these three names are made up of the parts called ὁμοιομερῆ,[7] which word will require further explanation.

ἀνόρεκτος, *without appetite,* a comparatively modern term in Galen's time, synonymous with the older ἀπόσιτος,[8] and ἄσιτος,[9] applied sometimes to the stomach.[10]

ἀνορεκτέω, *to be without appetite.*[11]

ἀνορεξία, *complete want of appetite,* distinguished by Galen from δυσορεξία, and from μοχθηρὰ ὄρεξις,[12] synonymous with ἄσιτος or ἀπόσιτος,[13] found sometimes in the plural.[14] There is a chapter on the subject in Alexander Trallianus;[15] see also Paulus Ægineta,[16] and Leo.[17]

ἀντιάς, more frequently found in the plural ἀντιάδες, meaning the *tonsils,*[18] so called from their being situated opposite to each other,[19] ἐξ ἐναντίας

[1] Quoted by Willan, p. 5, &c.

[2] It "spread over the whole bodies of the sufferers . . . . but, by particularly affecting the eyes in most cases, it produced blindness in some thousands of men, women, and children."

[3] Galen, "De Meth. Med.," vii. 6, tom. x. p. 476, l. 6.

[4] "Hist. Anim.," i. 1, init.

[5] Aristotle, *loco cit.*; Galen, "Comment in Hippocr. 'De Alim,'" iii. 1, tom. xv. p. 252, l. 2.

[6] Galen, "De Hipp. et Plat. Decr.," viii. 4, tom. v. p. 673, l. penult.; "De San. Tu.," vi. 2, tom. vi. p. 384, l. 11; "Comment. in. Hippocr. 'De Nat. Hom.'" i. Praef., tom. xv. p. 7, l. 15; p. 9, l. 2; "Comment. in Hipp. 'De Alim.,'" iii. 1, tom. xv. p. 252, l. 8; p. 253, l. 9.

[7] Aristotle, "Hist. Anim.," i. 1, § 2; Galen, *loco cit.*, tom. xv. p. 252, l. 8.

[8] 'Comment. in Hippocr. "Epid. III.,"' iii. 72, tom. xvii. A. p. 743, l. 16.

[9] 'Comment. in Hippocr. "Epid. I.,"' i. 30, tom. xvii. A. p. 74, l. 3.

[10] Theophilus, 'De Puls.,' in Ermerins, 'Anecd. Med. Gr.,' p. 73, l. 16.

[11] Alexander Trallianus, vii. 5, p. 330, l. 26, ed. Basil.

[12] 'De Symptom. Caus.,' i. 7, tom. vii. p. 128, l. 5, &c.

[13] Galen, 'Comment. in Hippocr. "Aphor.,"' iv. 16, tom. xvii. B. p. 677, l. 1.

[14] Galen, 'De Sanit. Tu.,' vi. 9, tom. vi. p. 422, l. 8; 'De Plenit.,' c. 11, tom. vii. p. 577, l. 2.

[15] Lib. vii. cap. 5. [16] Lib. iii. cap. 37.

[17] 'Consp. Medic.,' v. 1, in Ermerins, 'Anecd. Med. Gr.,' p. 169.

[18] Rufus Ephes., p. 28, l. 10; Pseudo-Galen, 'Introd.,' c. 11, tom. xiv. p. 713, l. 6; Julius Pollux, 'Onomast.,' ii. 4, § 201; Leo, 'Consp. Medic.,' in Ermerins, 'Anecd. Med. Gr.,' p. 155.

[19] Rufus Ephes., p. 57, l. 4; Paulus Ægineta, vi. 30, p. 154, ed. Briau.

ἀλλήλων. It also, and probably more generally, signifies inflammation of the tonsils,[1] especially perhaps the subsequent induration.[2] Both in its anatomical and its pathological sense it is generally synonymous with παρίσθμια, though sometimes distinguished from this word, as by Galen (*locis cit*).

ἀντιοτομία, *excision of the tonsils*, a word perhaps found only in Leo,[3] though the operation is described by Celsus,[4] Paulus Ægineta,[5] and other ancient writers.

ἀντικάρδιον is explained by Rufus Ephesius[6] to signify the depression in the throat, πρὸς ταῖς κλεισί, *at the clavicles;* and is said by him to be synonymous with σφαγή, and with the Homeric λαυκανίη, both of which words signify *the throat*. Julius Pollux[7] also says the word is synonymous with σφαγή, but explains it to mean the depression ὑπὸ τὸ στέρνον (not ὑπὸ τῷ στέρνῳ). This is generally translated "sub pectore," *under* the sternum; but it may perhaps mean *at* or *near* the sternum, and then the two definitions may be reconciled. In most dictionaries, the sense given by Julius Pollux is adopted, to the exclusion of the other; and it would certainly appear to be more etymologically correct—viz., over against the καρδία, that is, either the *heart* or the *cardiac extremity* of the stomach. On the other hand, Rufus Ephesius is much the higher authority in all anatomical matters. It is doubtful whether the word is to be found in any other Greek medical writer.

ἀντικνήμιον, a word used by Hippocrates[8] and Aristotle,[9] to signify the *shin*, or front part of the leg, opposed to γαστροκνημία, the *calf* of the leg. It is used in much the same sense by Rufus Ephesius[10] and Galen,[11] and by Oribasius[12] and Meletius,[13] who quote from Galen. Julius Pollux,[14] after giving the above explanation, says that some persons gave the name of ἀντικνήμιον to the *back part* or *calf* of the leg, but the word is probably not used in this sense by any extant Greek medical author.

ἀντίτραγος, the eminence of the external ear, opposite the *tragus*, still called *antitragus*.[15]

ἀντίχειρ, the common name for the *thumb* in Galen's time,[16] so called probably ὅτι ἀντίκειται τοῖς ἄλλοις, because it is placed *opposite* to the other fingers;[17] though some said it was because the thumb is *equal to*, or *takes the*

[1] Galen, 'De Symptom Caus.,' iii. 11; 'De Tumor. praeter Natur.,' cap. 17, tom. vii. p. 263, l. 13; p. 731, l. 13.

[2] Celsus, vii. 12, § 2; Paulus Ægineta, iii. 26, p. 38 B. l. 36, ed. Ald.

[3] 'Consp. Medic.,' iv. 6, in Ermerins, 'Anecd. Med. Gr.,' p. 155.

[4] Lib. vii. cap. 12, § 2. [5] Lib. vi. cap. 30.

[6] 'De Appell. Part. Corp. Hum.,' p. 28, l. 20; p. 50, l. 6, ed. Clinch.

[7] 'Onomast.,' ii. 4, § 165.

[8] 'De Fract.,' § 18, tome iii. pp. 478, 480, ed. Littré.

[9] 'Hist. Anim.,' i. 11, § 3 (15, § 5).

[10] 'De Appell. Part. Corp. Hum.,' p. 33, l. 11; p. 52, l. 19, ed. Clinch.

[11] 'De Anat. Admin.,' iii. 12, tom. ii. p. 409, l. 15; p. 410, l. 2; 'De Oss.,' c. 22, tom. ii. p. 774, l. 15; 'Comment. in Hippocr., "De Fract."' ii. 34, tom. xviii. B. p. 473, l. 11; 'De Musc. Dissect.,' tom. xviii. B. p. 1010, l. 8.

[12] 'Coll. Medic.,' xxv. 21, § 4; 55, §§ 1, 2, tome iii. p. 418, l. 1; p. 474, l. 8; p. 475, l. 2.

[13] 'De Hom. Fabr.,' in Cramer's 'Anecd. Gr.,' vol. iii. p. 128, l. 14.

[14] 'Onomast.,' ii. 4, § 190.

[15] Rufus Ephes. 'De Appell. Part. Corp. Hum.' p. 49, l. 7, ed. Clinch; Julius Pollux, 'Onomast.' ii. 4, § 85.

[16] 'De Usu Part.' i. 22, tom. iii. p. 79, l. 16; 'De Anat. Admin.,' i. 4, tom. ii. p. 239, l. 11; p. 240, ll. 5, 15; 'De Muscul. Dissect.' tom. xviii. B. p. 952, l. 4.

[17] Meletius, 'De Hom. Fabr.,' in Cramer's 'Anecd. Gr.,' vol. iii. p. 121, l. 17.

place of, the hand.[1] The word is found also in Oribasius,[2] (who quotes from Galen,) in Theophilus,[3] and in other authors.

ἀορτή, a word found in the Hippocratic Collection, used in different senses. In the 'Prænotiones Coacæ'[4] (a work supposed to be older than the time of Hippocrates) it is used in the plural number to signify the *bronchia*. In the 'De Corde'[5] (which is later than Hippocrates) it is used in the plural to signify both the *aorta* and the *pulmonary artery*. In the 'De Locis in Homine'[6] (a work probably about contemporary with Hippocrates) the reading is doubtful, but the sense required by the passages is *the bronchia*.[7] This partly agrees with the statement of Erotianus,[8] that, among the commentators on Hippocrates, Baccheius explained the word to mean *the arteries in general*, while Epicles and Lycus the Neapolitan referred it to *the bronchia*. Aristotle applied the word to the *aorta*,[9] and this is the sense in which it has been used ever since his time—at least in the *singular* number, for in the *plural* it was applied both to the *bronchia* and to the *arteries*, even by Rufus Ephesius.[10] It does not appear that Aristotle was the *first* writer who applied the word to the *aorta* (for he himself expressly says ἣν καλοῦσί τινες ἀορτήν), and probably when Galen[11] and Rufus Ephesius and Avicenna[12] speak of this application of the word by Aristotle, they merely mean that he was the most eminent writer who had used the word in that sense.[13] It was long before the name was adopted by Latin writers, as Cælius Aurelianus,[14] when he has occasion to mention the aorta calls it "arteriarum eam quam Græci ἀορτὴν appellant." The aorta was called by various names by the old Greek writers. Praxagoras[15] called it ἀρτηρία παχεῖα, which name is used also by Aretæus;[16] others called it simply ἀρτηρία μεγάλη, or μεγίστη,[17] others ὀρθή, others πνευματική.[18]

The word ἀορτή is manifestly connected with ἀορτέω, *to suspend*, though not derived from it, both words being more probably derived from ἀείρω; which derivation agrees sufficiently well with the two meanings assigned to the word by the ancient writers, as the lungs might be supposed to be *suspended* by the

[1] Pseudo-Galen, 'Introd.,' cap. 10, tom. xiv. p. 704, l. 9. "Sonat enim ἀντίχειρ quasi dicas *manus vicem* gerens." (H. Steph., 'Dict. Med.' p. 552.)

[2] 'Coll. Med.,' xxv. 45, § 2, tome iii. p. 460, l. 5.

[3] 'De Corp. Hum. Fabr.,' i 12, § 1; 20, § 1, p. 27, l. 6; p. 43, l. 9.

[4] § 394 (or § 400), tome v. p. 672, l. 5, ed. Littré.

[5] § 10, tome ix. p. 86, l. ult. ed. Littré.

[6] See the same passages, § 14, in Littré's edition (tome vi. p. 304, l. 1; p. 306, ll. 9, 13, 14), and in that of Ermerins (vol. ii. p. 411, l. 11; p. 412, ll. 24, 31, 32).

[7] It may, perhaps, be useful to say that the word must not be confounded with ἄορτρα (*plural*), which means the *lobes of the lungs*, and is to be found in 'De Morbis,' II. § 54, tome vii. p. 82, ed. Littré.

[8] 'Gloss. in Hippocr.,' p. 66, ed. Franz.

[9] 'Hist. Anim.,' i. 14, § 1; iii. 3, § 1, and elsewhere.

[10] 'De Appell. Part. Corp. Hum.,' p. 42, l. 20; p. 37, l. 18, which latter passage was, perhaps, before Julius Pollux when he wrote his 'Onomasticon,' ii. 4, § 205.

[11] 'De Venar. et Arter. Dissect.,' c. 1, tom. ii. p. 780; 'De Sem.,' i. 8, tom. iv. p. 541.

[12] 'Canon,' lib. i. fen. i. 4, § 2, vol. i. p. 65, ed. Venet, 1608.

[13] Probably, therefore, L. Philipson (quoted by Kraus in his 'Krit.-etym. med. Lex.), in correcting a supposed error of Galen, has committed an oversight himself.

[14] 'Morb. Acut.,' lib. i. cap. 8, p. 22, ed. Amman.

[15] See Rufus Ephes., p. 42.

[16] 'De Caus. Acut. Morb.,' ii. 2; 'De Cur. Acut. Morb.,' ii. 7, p. 31, l. 4; p. 277, l. 13, ed. Kühn.

[17] Pseudo-Hippocr., 'De Corde, § 11, tome ix. p. 90, l. 4; Anonym., 'Introd. Anat.,' cap. 40, p. 76, ed. Bernard; Galen, 'De Anat. Admin.,' vii. 1, tom. ii. p. 590, l. 6; 'De Venar. et Arter. Dissect.,' c. i. tom. ii. p. 780, l. 10.

[18] Galen, *loco cit.*, tom. ii. p. 590; Theophilus, 'De Corp. Hum. Fabr.,' iii. 7, § 2, p. 97, l. 2, ed. Oxon.

bronchia, and the heart by the *arteries* especially by the *aorta.* Some of the other derivations that have been proposed are too foolish to require notice.

ἀπεσχαρωτικὰ φάρμακα are rightly interpreted by M. Briau[1] to signify "remèdes propres à *faire tomber* l'eschare;" and Eustathius explains *ἀπεσχαροῦσθαι* to mean *τὸ ἐσχαρὰς ἐξαιρεῖν.*[2] In Oribasius the word *ἀπεσχαρόω* occurs, and is translated (as the sense requires) by Dr. Daremberg, "medicaments qui *produisent* des escarres."[3] As, however, it is almost inconceivable that the same medical word should be used in two opposite senses, we may fairly suspect some error in the text. Would not *ἐπεσχαρόω* be the better reading in Oribasius? This would be a word legitimately compounded, and used in a legitimate sense; but (so far as I know at present) it is not to be found in any Greek writer. On the other hand, *ἀπεσχαρόω,* in the present text of Oribasius, is used in a sense exactly contrary to that which it bears in (probably) every other passage where it occurs.

τὸ ἀπευθυσμένον, or *τὸ ἀπευθυσμένον ἔντερον,* (probably never *ὁ ἀπευθυσμένος,*) the name given by the Greek anatomists to the last portion of the large intestine on account of its (comparatively) straight direction; for the same reason the Latin name *rectum* was used, and is still retained. The word is found in Galen,[4] Rufus Ephesius,[5] Oribasius,[6] (who transcribes Galen,) Theophilus,[7] and other writers; and answers to the name *εὐθυέντερον,* used by the anonymous author of the "Introductio Anatomica."[8]

ἁπλοτομία, in surgery, a *simple incision.*[9]

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[1] Paulus Ægin., vi. 66, p. 286, l. 10.

[2] 'Comment. in "Odyss.,"' p. 1575, 43.

[3] 'Coll. Medic.,' xiv. 61, tome ii. p. 587, l. 13.

[4] 'De Anat. Admin.,' vi. 9, tom. ii. p. 573, l. 4; 'De Uteri Dissect.,' c. 1, tom. ii. p. 888, l. 6, and elsewhere.

[5] 'De Appell. Part. Corp. Hum.,' p. 38, l. ult.; p. 62, l. 8, ed. Clinch.

[6] 'Coll. Medic., xxiv. 19, § 12, tome iii. p. 349, l. 12; c. 29, § 1, p. 365, ll. 4, 12, and elsewhere.

[7] 'De Corp. Hum. Fabr.,' Index in Oxford ed.; 'Comment. in Hippocr.,' vol. ii. p. 675, l. 3, ed. Dietz, 'Schol. in Hippocr. et Gal.'

[8] Cap. 11, p. 18, l. ult. ed. Bernard.

[9] Pseudo-Galen, 'Introd.,' cap. 19, tom. xiv. p. 781, ll. 8, 10; Leo, 'Consp. Medic.,' iii. 14, in Ermerins, 'Anecd. Med. Gr.,' p. 135.

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