THE LADY'S AND GENTLEMAN'S DIARY,
FOR THE YEAR OF OUR LORD
1865,
Being the first after Bissextile, or Leap Year.

DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF
STUDENTS IN MATHEMATICS:

COMPRISING
MANY USEFUL AND ENTERTAINING PARTICULARS,
INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT.

THE ONE HUNDRED AND SIXTY-SECOND ANNUAL NUMBER.

LONDON:
PRINTED FOR
THE COMPANY OF STATIONERS,
AND SOLD BY J. GREENHILL,
AT THEIR HALL, LUDGATE ST.

J. E. ADLARD, PRINTER, [Price 1s. 4d. stitched.] BARTHOLOMEW CLOSE.
**CHRONOLOGICAL NOTES, &c. IN 1865.**

| Dominical Letter | A | Sundays after Epiphany | 5 | Easter Day | Apr. 16 |
| Golden Number | 4 | Trinity | 24 | Rogation Sunday | May 21 |
| Epact | 3 | Septuages. Sunday | Feb. 12 | Ascension Day | May 25 |
| Solar Cycle | 26 | Shrove Sunday | Feb. 26 | Whit Sunday | June 4 |
| Number of Direction | 8 | 1st Sund. in Lent | Mar. 5 | Trinity Sunday | June 11 |
| Roman Indiction | 8 | Mah.year 1282 beg. | May 27 |
| Julian Period | 6578 | Midlent Sunday | Mar. 26 | Jew. | Sept. 21 |
| Year of the Dionysian | 194 | Good Friday | Apr. 14 | Advent Sunday | Dec. 3 |

**ECLIPSES, &c.**

This year there will be Four eclipses; Two of the Sun, and Two of the Moon.

I. *April 11th.* — *A small partial eclipse of the Moon,* near the western horizon, and partly visible. It begins in the morning at 3h. 45m.; greatest obscuration on the upper limb (2½ digits) at 4h. 38m.; and the Moon sets eclipsed at 5h. 12m.

First contact 11° from the Moon’s vertex towards the left hand.

This eclipse will be visible throughout North and South America, Great Britain, France, Spain, and Italy, and the Atlantic Ocean.

II. *April 25th.* — *A total eclipse of the Sun,* visible only to southern portions of Africa and South America, and on the Great Southern Ocean round the pole.

III. *October 4th.* — *A partial and visible eclipse of the Moon* on the lower limb. It begins in the evening at 9h. 39m.; greatest eclipse (4 digits) at 10h. 40m.; eclipse ends at 11h. 41m.

First contact 153° from the Moon’s vertex towards the right hand.

The eclipse will be visible to the whole of Europe and Africa, part of Asia, and on the Atlantic and Indian Oceans.

IV. *October 19th.* — *An annular eclipse of the Sun,* near the western horizon, and partly visible in this country as a partial eclipse of nearly 4 digits on the lower limb. It begins in the afternoon at 4h. 12m.; and the Sun sets partially eclipsed at 4h. 57m.

First contact 154° from the Sun’s vertex towards the right hand.

For any place in Great Britain, whose north latitude, expressed in degrees, is 50° + L, and west longitude, expressed in minutes of time, is M, the Greenwich time of beginning, and the magnitude of the eclipse, may be easily obtained from the following formulae:

- Time of beginning = 4h. 13m.7 - 1m.22L - 0m.16M
- Magnitude of eclipse = 3 dig. 59'-7.4L - 0.4M

This eclipse will be seen to advantage throughout North America; and its visibility will also extend to Greenland, a western portion of Europe and Africa, a northern section of South America, and over the North Atlantic Ocean.

**Mercury** will be visible in the mornings, before the Sun rises, near the eastern horizon, about January 31, May 30, and September 23; and in the evenings, soon after sunset, near the western horizon, about April 12, August 10, and December 5.

**Venus** will be an Evening Star until May 8; and afterwards a Morning Star to the end of the year. Greatest brilliancy about April 2 and June 13.

**Mars** will be in conjunction with the Sun on November 11, and will therefore be unfavorable for observation during the latter portion of the year. He will, however, be a fine telescopic object during the evenings of January, February, and March.

**Jupiter** will be a Morning Star until June 15; and afterwards an Evening Star.

**Saturn’s Rings** are visible. The planet will be in opposition on April 17, and the most favorable time for telescopic observation will be during the months of March, April, and May.
**JANUARY, 31 DAYS.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1st Sun. alt. Christ.</td>
<td>8th</td>
<td>9h 39m</td>
<td>22° 59'</td>
<td>9h a 3'</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Circum.</td>
<td>8th</td>
<td>84 0</td>
<td>54 10</td>
<td>21 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>8th</td>
<td>84 2</td>
<td>48 11</td>
<td>39 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>8th</td>
<td>84 3</td>
<td>42 morn.</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>8th</td>
<td>84 4</td>
<td>35 0</td>
<td>56 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>8th</td>
<td>74 5</td>
<td>28 2</td>
<td>11 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>8th</td>
<td>74 6</td>
<td>20 3</td>
<td>23 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>8th</td>
<td>74 8</td>
<td>12 4</td>
<td>30 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>8th</td>
<td>64 9</td>
<td>4 5</td>
<td>31 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tu</td>
<td>8th</td>
<td>54 11</td>
<td>55 6</td>
<td>23 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>8th</td>
<td>54 12</td>
<td>45</td>
<td></td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Th</td>
<td>8th</td>
<td>44 13</td>
<td>36 5</td>
<td>a 26</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>8th</td>
<td>34 15</td>
<td>26 6</td>
<td>31 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td>8th</td>
<td>34 16</td>
<td>15 7</td>
<td>36 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>A</td>
<td>8th</td>
<td>24 18</td>
<td>4 8</td>
<td>40 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>8th</td>
<td>14 20</td>
<td>53 9</td>
<td>43 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Tu</td>
<td>8th</td>
<td>0 21</td>
<td>41 10</td>
<td>46 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>W</td>
<td>7th</td>
<td>59 23</td>
<td>29 11</td>
<td>49 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Th</td>
<td>7th</td>
<td>58 24</td>
<td>16</td>
<td>morn.</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>7th</td>
<td>57 26</td>
<td>3 0</td>
<td>54 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>7th</td>
<td>56 28</td>
<td>50 1</td>
<td>58 24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>A</td>
<td>7th</td>
<td>55 30</td>
<td>36 3</td>
<td>1 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>M</td>
<td>7th</td>
<td>53 31</td>
<td>22 4</td>
<td>4 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Tu</td>
<td>7th</td>
<td>52 33</td>
<td>8 5</td>
<td>2 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>7th</td>
<td>51 35</td>
<td>53 5</td>
<td>53 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Th</td>
<td>7th</td>
<td>49 36</td>
<td>38 6</td>
<td>40 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>7th</td>
<td>48 38</td>
<td>22</td>
<td>sets</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>7th</td>
<td>47 40</td>
<td>6 6</td>
<td>a 39</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>A</td>
<td>7th</td>
<td>45 42</td>
<td>50 8</td>
<td>1 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>7th</td>
<td>44 44</td>
<td>34 9</td>
<td>22 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Th</td>
<td>7th</td>
<td>42 45</td>
<td>17 10</td>
<td>43 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Daylight Hours:**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thu 51m.</td>
<td>0 6</td>
<td>6 m 21</td>
<td>6 a 5</td>
<td>4 m 45</td>
<td>4&quot; 0&quot;</td>
<td>16&quot; 18&quot;</td>
</tr>
<tr>
<td>6</td>
<td>58</td>
<td>13</td>
<td>2</td>
<td>10</td>
<td>49</td>
<td>6 16</td>
<td>18</td>
</tr>
<tr>
<td>11</td>
<td>8 7</td>
<td>22</td>
<td>1</td>
<td>16</td>
<td>54</td>
<td>8 20</td>
<td>18</td>
</tr>
<tr>
<td>16</td>
<td>19</td>
<td>34</td>
<td>5</td>
<td>59</td>
<td>22</td>
<td>59</td>
<td>10 10</td>
</tr>
<tr>
<td>21</td>
<td>32</td>
<td>47</td>
<td>55</td>
<td>28</td>
<td>5</td>
<td>11 41</td>
<td>17</td>
</tr>
<tr>
<td>26</td>
<td>47</td>
<td>1</td>
<td>2</td>
<td>50</td>
<td>36</td>
<td>10 12</td>
<td>55</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
# FEBRUARY, 28 DAYS.

1865

<table>
<thead>
<tr>
<th>Date</th>
<th>Sunrises</th>
<th>Susets</th>
<th>Sun's Decline</th>
<th>Crises</th>
<th>C's Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7°41' 4°47' 17°</td>
<td>0°</td>
<td>11°a59' 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7°39' 4°16' 16°</td>
<td>43</td>
<td>morn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7°38' 4°51' 15°</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7°36' 4°53' 14°</td>
<td>7</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7°34' 4°54' 13°</td>
<td>49</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7°33' 4°56' 12°</td>
<td>31</td>
<td>4</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7°31' 4°58' 11°</td>
<td>12</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>7°29' 4°14' 10°</td>
<td>53</td>
<td>5</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>7°27' 4°2</td>
<td>34</td>
<td>6</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>7°26' 4°4</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>7°24' 6°13' 9</td>
<td>5</td>
<td>6</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>7°22' 6°7</td>
<td>35</td>
<td>7</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>7°20' 6°9</td>
<td>15</td>
<td>8</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>7°18' 6°12' 15</td>
<td>54</td>
<td>9</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>7°16' 6°13' 15</td>
<td>34</td>
<td>10</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>7°14' 6°15' 15</td>
<td>13</td>
<td>11</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>7°12' 6°17' 11</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>7°10' 6°18' 11</td>
<td>31</td>
<td>0</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>7°8' 6°20</td>
<td>9</td>
<td>1</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>7°6° 22°10</td>
<td>48</td>
<td>2</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>7°4° 24°26</td>
<td>26</td>
<td>3</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>7°2° 26°4</td>
<td>4</td>
<td>4</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>7°</td>
<td>4°27</td>
<td>9</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>6°5° 29°</td>
<td>20</td>
<td>5</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>6°5° 31°</td>
<td>8</td>
<td>58</td>
<td>sets</td>
<td>N</td>
</tr>
<tr>
<td>26</td>
<td>6°5° 33°</td>
<td>35</td>
<td>6</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>6°5° 34°</td>
<td>13</td>
<td>8</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>6°49° 36°</td>
<td>7</td>
<td>50</td>
<td>9</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day Inc.</th>
<th>D. Breaks</th>
<th>Tw. Ends</th>
<th>Sun East</th>
<th>Ch. of Sun</th>
<th>@Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9°° 6°°</td>
<td>1°° 2°°</td>
<td>5°° 43°°</td>
<td>6°° 45°°</td>
<td>5°° 17°°</td>
<td>13°° 56°°</td>
<td>16°° 16°°</td>
</tr>
<tr>
<td>6</td>
<td>2°°</td>
<td>3°°</td>
<td>3°°</td>
<td>52°°</td>
<td>23°°</td>
<td>14°°</td>
<td>24°°</td>
</tr>
<tr>
<td>11</td>
<td>4°°</td>
<td>5°°</td>
<td>2°°</td>
<td>7°°</td>
<td>0°°</td>
<td>29°°</td>
<td>14°°</td>
</tr>
<tr>
<td>16</td>
<td>10°°</td>
<td>2°°</td>
<td>15°°</td>
<td>20°°</td>
<td>9°°</td>
<td>34°°</td>
<td>14°°</td>
</tr>
<tr>
<td>21</td>
<td>19°°</td>
<td>3°°</td>
<td>4°°</td>
<td>11°°</td>
<td>17°°</td>
<td>40°°</td>
<td>13°°</td>
</tr>
<tr>
<td>26</td>
<td>39°°</td>
<td>5°°</td>
<td>4°°</td>
<td>1°°</td>
<td>28°°</td>
<td>45°°</td>
<td>13°°</td>
</tr>
<tr>
<td>No. 162. MARCH, 31 DAYS.</td>
<td>SUN ENTERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Quarter .... 4th, 19m. past Noon.</td>
<td>20d. 2h. 6m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Moon ....... 12th, 42m. past 10 Morn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last Quarter ...... 20th, 36m. past Noon.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Moon ........ 27th, 28m. past 5 Morn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>Lent beg.: Ash Wed. : 6h 47'</td>
<td>5h 38'</td>
<td>7h 8' 28'</td>
<td>10h 56'</td>
<td>4h 56'</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td>Chad [David] 6 45 5</td>
<td>40</td>
<td></td>
<td>5</td>
<td>morn. 5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>9 49 aftern. 6 43 5</td>
<td>42</td>
<td>6</td>
<td>42</td>
<td>0</td>
<td>10 6</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>6 41 5</td>
<td>43</td>
<td></td>
<td>19</td>
<td>1</td>
<td>17 7</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>1st Sunday in Lent 6 38 5</td>
<td>45</td>
<td>5</td>
<td>55</td>
<td>2</td>
<td>12 8</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>6 36 5</td>
<td>47</td>
<td></td>
<td>32</td>
<td>3</td>
<td>3 9</td>
</tr>
<tr>
<td>7</td>
<td>Tu</td>
<td>Perpetua 6 34 5</td>
<td>48</td>
<td></td>
<td>9</td>
<td>3</td>
<td>45 10</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Ember Week 6 32 5</td>
<td>50</td>
<td>4</td>
<td>46</td>
<td>4</td>
<td>19 11</td>
</tr>
<tr>
<td>9</td>
<td>Th</td>
<td>6</td>
<td>30 5</td>
<td>52</td>
<td>22</td>
<td>4</td>
<td>48 12</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>P. of Wales mar. 1863 6 27 5</td>
<td>54</td>
<td>3</td>
<td>59</td>
<td>5</td>
<td>13 13</td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>6 25 5</td>
<td>55</td>
<td></td>
<td>35</td>
<td>5</td>
<td>37 14</td>
</tr>
<tr>
<td>12</td>
<td>A</td>
<td>2d S. in Lent: Gregory 6 23 5</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>6 20 5</td>
<td>59</td>
<td>2</td>
<td>48</td>
<td>7</td>
<td>18 16</td>
</tr>
<tr>
<td>14</td>
<td>Tu</td>
<td>4 rises 2 25 morn. 6 18 6</td>
<td>1</td>
<td></td>
<td>24</td>
<td>8</td>
<td>31 17</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>6 16 6</td>
<td>2</td>
<td></td>
<td>1</td>
<td>9</td>
<td>35 18</td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>6 14 6</td>
<td>4</td>
<td>1</td>
<td>37</td>
<td>10</td>
<td>38 19</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>St. Patrick [Sax] 6 11 6</td>
<td>6</td>
<td></td>
<td>13</td>
<td>11</td>
<td>38 20</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>Ps.L.b.1848: E.K.W. 6 9 6</td>
<td>7</td>
<td>0</td>
<td>49</td>
<td>morn. 21</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>A</td>
<td>3d Sunday in Lent 6 7 6</td>
<td>9</td>
<td></td>
<td>26</td>
<td>0</td>
<td>35 22</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>Equal day and night 6 5 6</td>
<td>11</td>
<td>0</td>
<td>s</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Tu</td>
<td>Benedict 6 2 6</td>
<td>12</td>
<td>0</td>
<td>N</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>6 1 6</td>
<td>14</td>
<td></td>
<td>45</td>
<td>3</td>
<td>3 25</td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td>5 58 6</td>
<td>16</td>
<td>1</td>
<td>9</td>
<td>3</td>
<td>40 26</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>5 55 6</td>
<td>17</td>
<td></td>
<td>33</td>
<td>4</td>
<td>12 27</td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>Lady Day 5 53 6</td>
<td>19</td>
<td></td>
<td>56</td>
<td>4</td>
<td>43 28</td>
</tr>
<tr>
<td>26</td>
<td>A</td>
<td>4th, or Midl. Sunday 5 51 6</td>
<td>21</td>
<td>2</td>
<td>20</td>
<td>5</td>
<td>12 29</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>5 49 6</td>
<td>23</td>
<td></td>
<td>sets</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Tu</td>
<td>5 46 6</td>
<td>24</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>a 30</td>
</tr>
<tr>
<td>29</td>
<td>W</td>
<td>5 44 6</td>
<td>26</td>
<td></td>
<td>30</td>
<td>9</td>
<td>47 2</td>
</tr>
<tr>
<td>30</td>
<td>Th</td>
<td>5 42 6</td>
<td>27</td>
<td></td>
<td>53</td>
<td>11</td>
<td>0 3</td>
</tr>
<tr>
<td>31</td>
<td>F</td>
<td>5 39 6</td>
<td>29</td>
<td>4</td>
<td>17</td>
<td>morn. 4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10h 59m. 31m.</td>
<td>3</td>
<td>6</td>
<td>4m 54'</td>
<td>7h 31'</td>
<td>3h 5m 49'</td>
<td>12'</td>
<td>32' 16'</td>
</tr>
<tr>
<td>6</td>
<td>11 10</td>
<td>25</td>
<td>43</td>
<td>40</td>
<td>54</td>
<td>11 28</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>45</td>
<td>31</td>
<td>49</td>
<td>59</td>
<td>10 10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>50</td>
<td>4</td>
<td>5</td>
<td>19</td>
<td>58</td>
<td>6 45</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>12</td>
<td>10</td>
<td>25</td>
<td>6</td>
<td>8</td>
<td>8 7</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>30</td>
<td>45</td>
<td>3</td>
<td>53</td>
<td>18</td>
<td>13 5</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td>Day</td>
<td>Length of D. Day Inc.</td>
<td>D. breaks</td>
<td>Tw. ends</td>
<td>Sun East. Cl. bef. Sun.</td>
<td>Semidiameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>----------------------</td>
<td>-----------</td>
<td>----------</td>
<td>------------------------</td>
<td>--------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12h. 54m</td>
<td>5</td>
<td>0</td>
<td>8 a 31 m 19 3'</td>
<td>54&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>28</td>
<td>23</td>
<td>43</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>32</td>
<td>47</td>
<td>8</td>
<td>55</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>52</td>
<td>6</td>
<td>7</td>
<td>52 9 7</td>
<td>330</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>26</td>
<td>36</td>
<td>21</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>44</td>
<td>19</td>
<td>36 42 2</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**A P R I L, 3 0 D A Y S.**

First Quarter ...... 3d, 19m. past 1 Morn.
Full Moon .......... 11th, 27m. past 4 Morn.
Last Quarter ...... 18th, 20m. past 11 Aftern.
New Moon ......... 25th, 13m. past 2 Aftern.

<table>
<thead>
<tr>
<th>D.</th>
<th>W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;C.</th>
<th>rise</th>
<th>set</th>
<th>decl.</th>
<th>Gr. &amp; s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>5°37' 6°31'</td>
<td>4°N</td>
<td>3°</td>
<td>0°m</td>
<td>5°4'</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>5°36' 6°32'</td>
<td>5</td>
<td>0</td>
<td>58</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>5°36' 6°34'</td>
<td>26</td>
<td>1</td>
<td>43</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>5°30' 6°36'</td>
<td>49</td>
<td>2</td>
<td>20</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>5°28' 6°38'</td>
<td>6</td>
<td>11</td>
<td>2</td>
<td>51 9</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>T</td>
<td>5°26' 6°39'</td>
<td>34</td>
<td>3</td>
<td>18</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>5°24' 6°41'</td>
<td>57</td>
<td>3</td>
<td>41</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>5°22' 6°42'</td>
<td>19</td>
<td>4</td>
<td>4</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>A</td>
<td>5°19' 6°44'</td>
<td>41</td>
<td>4</td>
<td>26</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>5°17' 6°46'</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>48 14</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>5°15' 6°47'</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td>5°13' 6°49'</td>
<td>48</td>
<td>8</td>
<td>29</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>5°10' 6°51'</td>
<td>9</td>
<td>9</td>
<td>31</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>5°8' 6°52'</td>
<td>31</td>
<td>10</td>
<td>30</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>E</td>
<td>5°6' 6°54'</td>
<td>52</td>
<td>11</td>
<td>25</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>A</td>
<td>5°4' 6°56'</td>
<td>58</td>
<td>3</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>E</td>
<td>5°2' 6°57'</td>
<td>35</td>
<td>0</td>
<td>15</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>A</td>
<td>5°0' 6°59'</td>
<td>56</td>
<td>1</td>
<td>2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td>5°58' 7°11'</td>
<td>17</td>
<td>1</td>
<td>37</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>T</td>
<td>5°56' 7°2'</td>
<td>27</td>
<td>2</td>
<td>12</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>5°53' 7°4'</td>
<td>58</td>
<td>2</td>
<td>42</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td>5°51' 7°6'</td>
<td>18</td>
<td>3</td>
<td>10</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>A</td>
<td>5°49' 7°7'</td>
<td>38</td>
<td>3</td>
<td>39</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>5°47' 7°9'</td>
<td>58</td>
<td>4</td>
<td>9</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>5°45' 7°11'</td>
<td>57</td>
<td>5</td>
<td>6</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td>5°43' 7°12'</td>
<td>37</td>
<td>8</td>
<td>35</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>T</td>
<td>5°41' 7°14'</td>
<td>56</td>
<td>9</td>
<td>45</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>5°39' 7°16'</td>
<td>15</td>
<td>10</td>
<td>46</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td>5°37' 7°17'</td>
<td>33</td>
<td>11</td>
<td>37</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**PRINTED FOR THE COMPANY OF STATIONERS.**
## MAY, 31 DAYS.

| First Quarter | 2d, 4m. past 4 Aftern. |
| Full Moon | 10th, 23m. past 8 Aftern. |
| Last Quarter | 18th, 39m. past 6 Morn. |
| New Moon | 24th, 49m. past 10 Aftern. |

<table>
<thead>
<tr>
<th>D.</th>
<th>W.</th>
<th>Sun., Sunda., Holid., &amp;c.</th>
<th>☄rise</th>
<th>☄set</th>
<th>☄decl.</th>
<th>Cr. &amp;s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>St. Ph. &amp; Js. : P. Ar.</td>
<td>4h34'</td>
<td>7h20'</td>
<td>15°N</td>
<td>10'</td>
<td>m19'</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>[b. 1850]</td>
<td>4</td>
<td>32</td>
<td>7</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>Invention of the Cross</td>
<td>4</td>
<td>30</td>
<td>7</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>4</td>
<td>Th</td>
<td>♂ sets 4 18 morn.</td>
<td>4</td>
<td>28</td>
<td>7</td>
<td>25</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td></td>
<td>4</td>
<td>26</td>
<td>7</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>John Evan. à P. Lat.</td>
<td>4</td>
<td>24</td>
<td>7</td>
<td>28</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>A 3d Sund. aft. Easter</td>
<td>4</td>
<td>23</td>
<td>7</td>
<td>30</td>
<td>54</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td></td>
<td>4</td>
<td>21</td>
<td>7</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>9</td>
<td>Th</td>
<td>♀ rises 10 44 aftern.</td>
<td>4</td>
<td>19</td>
<td>7</td>
<td>33</td>
<td>26</td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td></td>
<td>4</td>
<td>18</td>
<td>7</td>
<td>35</td>
<td>42</td>
</tr>
<tr>
<td>11</td>
<td>Th</td>
<td>Easter Term ends</td>
<td>4</td>
<td>16</td>
<td>7</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td></td>
<td>4</td>
<td>15</td>
<td>7</td>
<td>38</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>Old May Day</td>
<td>4</td>
<td>13</td>
<td>7</td>
<td>39</td>
<td>27</td>
</tr>
<tr>
<td>14</td>
<td>A 4th Sund. aft. Easter</td>
<td>4</td>
<td>11</td>
<td>7</td>
<td>41</td>
<td>42</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td></td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>42</td>
<td>56</td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>♂ sets 0 26 morn.</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>44</td>
<td>19</td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td>♀ rises 3 20 morn.</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>18</td>
<td>Th</td>
<td></td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>47</td>
<td>37</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>Dunstan</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>48</td>
<td>50</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td></td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>A Rogation Sunday</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>51</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>Cam. Term div. midn.</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>52</td>
<td>27</td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td>Nights all twilight</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>54</td>
<td>38</td>
</tr>
<tr>
<td>24</td>
<td>W</td>
<td>Qu. Victoria b. 1819</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>55</td>
<td>49</td>
</tr>
<tr>
<td>25</td>
<td>Th</td>
<td>Asc. : H. Th. : Ps. Hel.</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>56</td>
<td>21</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>Aug. [b. 1846]: Tr. T. b.</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>58</td>
<td>11</td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td>H. H. b. 1819: Ven. Be.</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>59</td>
<td>21</td>
</tr>
<tr>
<td>28</td>
<td>A Sund. aft. Ascension</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>31</td>
<td>10</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>K. Chas. II. rest. 1660</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>30</td>
<td>Th</td>
<td></td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>49</td>
</tr>
<tr>
<td>31</td>
<td>W</td>
<td>♀ rises 3 9 morn.</td>
<td>3</td>
<td>5</td>
<td>18</td>
<td>3</td>
<td>58</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14h. 47m</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>m</td>
<td>2</td>
<td>9 a 52</td>
<td>6 m 46</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>4</td>
<td>19</td>
<td>1</td>
<td>44</td>
<td>10</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>35</td>
<td>24</td>
<td>29</td>
<td>56</td>
<td>3</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>16</td>
<td>35</td>
<td>50</td>
<td>0</td>
<td>59</td>
<td>53</td>
<td>7</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>49</td>
<td>8</td>
<td>4</td>
<td>25</td>
<td>11</td>
<td>27</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>28</td>
<td>16</td>
<td>2</td>
<td>17</td>
<td>No real night.</td>
<td></td>
<td>8</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Date</td>
<td>Sunday</td>
<td>Holiday</td>
<td>Rise</td>
<td>Set</td>
<td>Declination</td>
<td>Right Ascension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>---------</td>
<td>------</td>
<td>-----</td>
<td>-------------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Th Nicomedes</td>
<td>3h 50m</td>
<td>8h 15m</td>
<td>22°</td>
<td>14° 36°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F Oxford Term ends</td>
<td>3h 50m</td>
<td>6h 0m</td>
<td>22°</td>
<td>0°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S Oxford Term begins</td>
<td>3h 49m</td>
<td>7h 0m</td>
<td>22°</td>
<td>0°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A Whit Sunday</td>
<td>3h 48m</td>
<td>8h 0m</td>
<td>22°</td>
<td>1°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M Wt. Mon.: Boniface</td>
<td>3h 47m</td>
<td>9h 0m</td>
<td>22°</td>
<td>3°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>T Whit Tuesday</td>
<td>3h 47m</td>
<td>10h 0m</td>
<td>22°</td>
<td>5°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>W Ember Week</td>
<td>3h 46m</td>
<td>11h 0m</td>
<td>22°</td>
<td>7°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Th</td>
<td>3h 46m</td>
<td>12h 0m</td>
<td>22°</td>
<td>9°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>3h 46m</td>
<td>12h 0m</td>
<td>22°</td>
<td>11°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td>3h 45m</td>
<td>13h 0m</td>
<td>22°</td>
<td>13°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>A Trin. Sun.: St. Barbara</td>
<td>3h 45m</td>
<td>14h 0m</td>
<td>22°</td>
<td>15°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>3h 45m</td>
<td>15h 0m</td>
<td>22°</td>
<td>17°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Th</td>
<td>3h 44m</td>
<td>16h 0m</td>
<td>22°</td>
<td>19°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>W</td>
<td>3h 44m</td>
<td>17h 0m</td>
<td>22°</td>
<td>21°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Th Corpus Christi: Trin.</td>
<td>3h 44m</td>
<td>18h 0m</td>
<td>22°</td>
<td>23°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>3h 44m</td>
<td>19h 30m</td>
<td>22°</td>
<td>24°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>S St. Alban</td>
<td>3h 44m</td>
<td>19h 0m</td>
<td>22°</td>
<td>26°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>A 1st Sun. aft. Trinity</td>
<td>3h 44m</td>
<td>20h 0m</td>
<td>22°</td>
<td>28°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>M [Cam. Com.]</td>
<td>3h 44m</td>
<td>21h 0m</td>
<td>22°</td>
<td>30°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Th Qu. Victo. acc. 1837</td>
<td>3h 44m</td>
<td>22h 0m</td>
<td>22°</td>
<td>32°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>W Qu. Victo. pro.: Long. day</td>
<td>3h 44m</td>
<td>23h 0m</td>
<td>22°</td>
<td>34°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Th</td>
<td>3h 45m</td>
<td>1h 0m</td>
<td>22°</td>
<td>36°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>F Cambridge Term ends</td>
<td>3h 45m</td>
<td>2h 0m</td>
<td>22°</td>
<td>38°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>S Mid. d.: Nat. J. Bap.</td>
<td>3h 45m</td>
<td>3h 0m</td>
<td>22°</td>
<td>40°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>A 2d Sun. aft. Trinity</td>
<td>3h 45m</td>
<td>4h 0m</td>
<td>22°</td>
<td>42°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>M</td>
<td>3h 46m</td>
<td>5h 0m</td>
<td>22°</td>
<td>44°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Th</td>
<td>3h 47m</td>
<td>6h 0m</td>
<td>22°</td>
<td>46°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>W Qu. Victoria cor. 1838</td>
<td>3h 47m</td>
<td>7h 0m</td>
<td>22°</td>
<td>48°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Th St. Peter</td>
<td>3h 48m</td>
<td>8h 0m</td>
<td>22°</td>
<td>50°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>F</td>
<td>3h 48m</td>
<td>9h 0m</td>
<td>22°</td>
<td>52°</td>
<td>3h 13m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Printed for the Company of Stationers.**
<table>
<thead>
<tr>
<th>No. 162.</th>
<th>JULY, 31 DAYS.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Quarter</strong></td>
<td>1st, 40m. past 1 Morn.</td>
</tr>
<tr>
<td><strong>Full Moon</strong></td>
<td>8th, 27m. past 8 Aftern.</td>
</tr>
<tr>
<td><strong>Last Quarter</strong></td>
<td>15th, 26m. past 4 Aftern.</td>
</tr>
<tr>
<td><strong>New Moon</strong></td>
<td>22d, 29m. past 6 Aftern.</td>
</tr>
<tr>
<td><strong>First Quarter</strong></td>
<td>30th, 9m. past 7 Aftern.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;C.</th>
<th><strong>SUN ENTERS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 S</td>
<td>Pera de Alice mar. 1862</td>
<td>22d. 9h. 40m.</td>
</tr>
<tr>
<td>2 A</td>
<td>35° 50° 8h. 18° 23°</td>
<td></td>
</tr>
<tr>
<td>3 M</td>
<td>Dog days begin</td>
<td></td>
</tr>
<tr>
<td>4 T</td>
<td>Tr. St. Mart. : Oxf. Act</td>
<td></td>
</tr>
<tr>
<td>5 W</td>
<td>3 50° 8h. 17° 22</td>
<td></td>
</tr>
<tr>
<td>6 T</td>
<td>Old Midsummer-day</td>
<td></td>
</tr>
<tr>
<td>7 F</td>
<td>Thomas à Becket</td>
<td></td>
</tr>
<tr>
<td>8 S</td>
<td>Oxford Term ends</td>
<td></td>
</tr>
<tr>
<td>9 A</td>
<td>4th Sun. aft. Trinity</td>
<td></td>
</tr>
<tr>
<td>10 M</td>
<td>3 50° 9h. 15° 39</td>
<td></td>
</tr>
<tr>
<td>11 T</td>
<td>7 sets 11 42 aftern.</td>
<td></td>
</tr>
<tr>
<td>12 W</td>
<td>4 58° 12h. 21</td>
<td></td>
</tr>
<tr>
<td>13 T</td>
<td>4 08° 11</td>
<td></td>
</tr>
<tr>
<td>14 F</td>
<td>4 18° 10</td>
<td></td>
</tr>
<tr>
<td>15 S</td>
<td>St. Swithin</td>
<td></td>
</tr>
<tr>
<td>16 A</td>
<td>5th Sun. aft. Trinity</td>
<td></td>
</tr>
<tr>
<td>17 M</td>
<td>4 58° 10</td>
<td></td>
</tr>
<tr>
<td>18 T</td>
<td>7 sets 9 39 aftern.</td>
<td></td>
</tr>
<tr>
<td>19 W</td>
<td>4 78° 5</td>
<td></td>
</tr>
<tr>
<td>20 T</td>
<td>Margaret</td>
<td></td>
</tr>
<tr>
<td>21 F</td>
<td>4 108° 2</td>
<td></td>
</tr>
<tr>
<td>22 S</td>
<td>Magdalene</td>
<td></td>
</tr>
<tr>
<td>23 A</td>
<td>6th Sun. aft. Trinity</td>
<td></td>
</tr>
<tr>
<td>24 M</td>
<td>4 147° 59° 19</td>
<td></td>
</tr>
<tr>
<td>25 T</td>
<td>St. Jas. : Ds. Camb. b</td>
<td></td>
</tr>
<tr>
<td>26 W</td>
<td>St. Anne</td>
<td></td>
</tr>
<tr>
<td>27 T</td>
<td>6 rises 1 07h. 15° 54</td>
<td></td>
</tr>
<tr>
<td>28 F</td>
<td>7 sets 8 48 aftern.</td>
<td></td>
</tr>
<tr>
<td>29 S</td>
<td>4 21° 51</td>
<td></td>
</tr>
<tr>
<td>30 A</td>
<td>7th Sun. aft. Trinity</td>
<td></td>
</tr>
<tr>
<td>31 M</td>
<td>4 24° 48</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16h. 29m.</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>23</td>
<td>3°</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>11</td>
<td>22</td>
<td>24</td>
<td>25</td>
<td>46</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
<td>19 No real Night.</td>
<td>21</td>
<td>5</td>
<td>10</td>
<td>46</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>29</td>
<td>18</td>
<td>5</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>21</td>
<td>16 53</td>
<td>41° 0° 8° 12 a 4</td>
<td>15</td>
<td>6</td>
<td>5</td>
<td>47</td>
</tr>
<tr>
<td>26</td>
<td>39</td>
<td>55° 1° 1° 11 12</td>
<td>11</td>
<td>6</td>
<td>13</td>
<td>47</td>
</tr>
</tbody>
</table>

*PRINTED FOR THE COMPANY OF STATIONERS.*
<table>
<thead>
<tr>
<th>Day</th>
<th>Lammas-day</th>
<th>4h25'7h47'17&quot;58'11h51'10&quot;</th>
<th>43 morn. 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>W</td>
<td>4 27 7 45</td>
<td>27 0 35 12</td>
</tr>
<tr>
<td>4</td>
<td>2 sets</td>
<td>4 28 7 44</td>
<td>11 1 28 13</td>
</tr>
<tr>
<td>5</td>
<td>[1844: Transfig.</td>
<td>4 31 7 40 16</td>
<td>55 2 29 14</td>
</tr>
<tr>
<td>6</td>
<td>8th S.A.T.: Pr. A.b.</td>
<td>4 33 7 38</td>
<td>39 3 39 15</td>
</tr>
<tr>
<td>7</td>
<td>Name of Jesus</td>
<td>4 35 7 37</td>
<td>22 rises F</td>
</tr>
<tr>
<td>8</td>
<td>Tu</td>
<td>4 36 7 35</td>
<td>7 a 53 17</td>
</tr>
<tr>
<td>9</td>
<td>W (Shooting stars)</td>
<td>4 38 7 33 15</td>
<td>48 8 22 18</td>
</tr>
<tr>
<td>10</td>
<td>Th</td>
<td>4 39 7 31</td>
<td>30 8 50 19</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>4 41 7 29</td>
<td>13 9 20 20</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>4 42 7 27 14</td>
<td>55 9 52 21</td>
</tr>
<tr>
<td>13</td>
<td>9th Sun. aft. Trinity</td>
<td>4 44 7 25</td>
<td>36 10 28 22</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>4 46 7 23</td>
<td>18 11 12 23</td>
</tr>
<tr>
<td>15</td>
<td>Tu</td>
<td>4 47 7 21 13</td>
<td>59 morn. 24</td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td>4 49 7 19</td>
<td>40 0 125</td>
</tr>
<tr>
<td>17</td>
<td>Th</td>
<td>4 50 7 17</td>
<td>21 0 56 26</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>4 52 7 15</td>
<td>2 1 57 27</td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td>4 53 7 13 12</td>
<td>42 3 128</td>
</tr>
<tr>
<td>20</td>
<td>10th Sun. aft. Trinity</td>
<td>4 55 7 11</td>
<td>23 4 7 29</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>4 57 7 9</td>
<td>3 sets N</td>
</tr>
<tr>
<td>22</td>
<td>Tu</td>
<td>4 58 7 7 11</td>
<td>42 7 a 12 1</td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>5 0 7 5</td>
<td>22 7 33 2</td>
</tr>
<tr>
<td>24</td>
<td>Th</td>
<td>5 1 7 3</td>
<td>2 7 56 3</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>5 3 7 10</td>
<td>41 8 20 4</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>5 5 6 59</td>
<td>20 8 46 5</td>
</tr>
<tr>
<td>27</td>
<td>11th Sun. aft. Trinity</td>
<td>5 6 6 57 9</td>
<td>59 9 14 6</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>5 8 6 54</td>
<td>38 9 50 7</td>
</tr>
<tr>
<td>29</td>
<td>Tu</td>
<td>5 9 6 52</td>
<td>17 10 29 8</td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td>5 11 6 50 8</td>
<td>55 11 17 9</td>
</tr>
<tr>
<td>31</td>
<td>Th</td>
<td>5 13 6 48</td>
<td>33 morn. 10</td>
</tr>
</tbody>
</table>
### SEPTEMBER, 30 DAYS.

<table>
<thead>
<tr>
<th>D. W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>☡ rise</th>
<th>☡ set</th>
<th>☡ decl.</th>
<th>Cr. &amp; s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 F</td>
<td>Giles</td>
<td>5h14m</td>
<td>6h46m</td>
<td>8°N12°m13'</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2 S</td>
<td>London bt. 1666, o.s.</td>
<td>5 16</td>
<td>6 43</td>
<td>7</td>
<td>50</td>
<td>1 17 12</td>
</tr>
<tr>
<td>3 A</td>
<td>12th Sun. aft. Trinity</td>
<td>5 17</td>
<td>6 41</td>
<td>28</td>
<td>2 29 13</td>
<td></td>
</tr>
<tr>
<td>4 M</td>
<td>sets 8 11 aftern.</td>
<td>5 19</td>
<td>6 39</td>
<td>6</td>
<td>4 5 14</td>
<td></td>
</tr>
<tr>
<td>5 Th</td>
<td>Old Bartholomew</td>
<td>5 21</td>
<td>6 37</td>
<td>43</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>6 W</td>
<td></td>
<td>5 22</td>
<td>6 34</td>
<td>21</td>
<td>6 a 50 16</td>
<td></td>
</tr>
<tr>
<td>7 Th</td>
<td>Enurchus</td>
<td>5 24</td>
<td>6 32</td>
<td>5</td>
<td>59</td>
<td>7 20 17</td>
</tr>
<tr>
<td>8 F</td>
<td>Nativity V. Mary</td>
<td>5 25</td>
<td>6 30</td>
<td>36</td>
<td>7 52 18</td>
<td></td>
</tr>
<tr>
<td>9 S</td>
<td></td>
<td>5 27</td>
<td>6 28</td>
<td>13</td>
<td>8 29 19</td>
<td></td>
</tr>
<tr>
<td>10 A</td>
<td>13th Sun. aft. Trinity</td>
<td>5 29</td>
<td>6 25</td>
<td>51</td>
<td>9</td>
<td>11 20</td>
</tr>
<tr>
<td>11 M</td>
<td></td>
<td>5 30</td>
<td>6 23</td>
<td>28</td>
<td>9</td>
<td>59 21</td>
</tr>
<tr>
<td>12 Tu</td>
<td>4 sets 9 47 aftern.</td>
<td>5 32</td>
<td>6 21</td>
<td>5</td>
<td>10</td>
<td>53 22</td>
</tr>
<tr>
<td>13 W</td>
<td></td>
<td>5 33</td>
<td>6 18</td>
<td>42</td>
<td>11</td>
<td>52 23</td>
</tr>
<tr>
<td>14 Th</td>
<td>Holy Cross</td>
<td>5 35</td>
<td>6 16</td>
<td>19</td>
<td>morn.</td>
<td>24</td>
</tr>
<tr>
<td>15 F</td>
<td></td>
<td>5 37</td>
<td>6 14</td>
<td>2</td>
<td>56</td>
<td>0 55 25</td>
</tr>
<tr>
<td>16 S</td>
<td>3 sets 6 44 aftern.</td>
<td>5 38</td>
<td>6 12</td>
<td>33</td>
<td>2</td>
<td>0 26</td>
</tr>
<tr>
<td>17 A</td>
<td>14th S. af. Tr.: Lamb.</td>
<td>5 40</td>
<td>6 9</td>
<td>9</td>
<td>3</td>
<td>4 27</td>
</tr>
<tr>
<td>18 M</td>
<td>Geo. I. and H. landed</td>
<td>5 41</td>
<td>6 7</td>
<td>46</td>
<td>4</td>
<td>9 28</td>
</tr>
<tr>
<td>19 Th</td>
<td></td>
<td>5 43</td>
<td>6 5</td>
<td>23</td>
<td>sets N</td>
<td></td>
</tr>
<tr>
<td>20 W</td>
<td>Ember Week</td>
<td>5 44</td>
<td>6 2</td>
<td>59</td>
<td>6 a 2</td>
<td>1 1</td>
</tr>
<tr>
<td>21 Tu</td>
<td>St. Matthew</td>
<td>5 46</td>
<td>6</td>
<td>36</td>
<td>6</td>
<td>25 2</td>
</tr>
<tr>
<td>22 F</td>
<td>Equal day and night</td>
<td>5 48</td>
<td>5 57</td>
<td>0 N 13 6 50 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 S</td>
<td>3 rises 2 19 morn.</td>
<td>5 49</td>
<td>5 55</td>
<td>0 s 11 7 18 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 A</td>
<td>15th Sun. aft. Trinity</td>
<td>5 51</td>
<td>5 53</td>
<td>34</td>
<td>7</td>
<td>50 5</td>
</tr>
<tr>
<td>25 M</td>
<td></td>
<td>5 53</td>
<td>5 51</td>
<td>58</td>
<td>8</td>
<td>27 6</td>
</tr>
<tr>
<td>26 Tu</td>
<td>St. Cyprian</td>
<td>5 54</td>
<td>5 48</td>
<td>21</td>
<td>9</td>
<td>11 7</td>
</tr>
<tr>
<td>27 W</td>
<td></td>
<td>5 56</td>
<td>5 46</td>
<td>44</td>
<td>10</td>
<td>2 8</td>
</tr>
<tr>
<td>28 Th</td>
<td>3 rises 4 19 morn.</td>
<td>5 57</td>
<td>5 44</td>
<td>2</td>
<td>8 11</td>
<td>0 9</td>
</tr>
<tr>
<td>29 F</td>
<td>Michaelmas-day</td>
<td>5 59</td>
<td>5 42</td>
<td>31</td>
<td>morn.</td>
<td>10</td>
</tr>
<tr>
<td>30 S</td>
<td>St. Jerome</td>
<td>6 15</td>
<td>3 39</td>
<td>55</td>
<td>0</td>
<td>7 11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13h. 31m.</td>
<td>3</td>
<td>3</td>
<td>3 m 7</td>
<td>8 a 53</td>
<td>6 m 26</td>
<td>0' a 11'</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>22</td>
<td>19</td>
<td>38</td>
<td>19</td>
<td>1</td>
<td>49</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>53</td>
<td>41</td>
<td>30</td>
<td>23</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>16</td>
<td>33</td>
<td>4</td>
<td>1</td>
<td>40</td>
<td>9</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>20</td>
<td>50</td>
<td>7</td>
<td>56</td>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>26</td>
<td>11</td>
<td>54</td>
<td>40</td>
<td>4</td>
<td>0</td>
<td>43</td>
<td>47</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
<table>
<thead>
<tr>
<th>D. W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>☼rise</th>
<th>☼set</th>
<th>☼decl.</th>
<th>☼r. &amp; s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A 16th S. af. Tr.: Remig.</td>
<td>6h 2° 57' 37&quot;</td>
<td>3° 18' 1° m 17' 12&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M [Camb. T. be.</td>
<td>6 4 5 35</td>
<td>41 2 34 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tb</td>
<td>6 6 5 32</td>
<td>4 4 5 55 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>6 7 5 30</td>
<td>28 rises F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Th</td>
<td>6 9 5 28</td>
<td>51 5 a 49 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>Faith</td>
<td>6 11 5 26</td>
<td>5 14 6 24 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>6 12 5 23</td>
<td>37 7 5 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A 17th Sun. aft. Trinity</td>
<td>6 14 5 21</td>
<td>6 0 7 52 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M St. Denys</td>
<td>6 16 5 19</td>
<td>23 8 45 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tb</td>
<td>Oxford Term begins</td>
<td>6 17 5 17</td>
<td>45 9 44 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>Old Michaelmas Day</td>
<td>6 19 5 15</td>
<td>7 8 10 47 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Th</td>
<td>Least twilight</td>
<td>6 21 5 12</td>
<td>31 11 52 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>Trans. K. Edw. Conf.</td>
<td>6 23 5 10</td>
<td>53 morn. 24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td></td>
<td>6 24 5 8</td>
<td>16 0 57 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>A 18th Sun. aft. Trinity</td>
<td>6 26 5 6</td>
<td>38 2 1 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td></td>
<td>6 28 5 4</td>
<td>9 0 3 42 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Tb</td>
<td>Etheldreda</td>
<td>6 29 5 1</td>
<td>22 4 7 28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>W</td>
<td>St. Luke</td>
<td>6 31 4 59</td>
<td>44 5 10 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Th</td>
<td></td>
<td>6 33 4 57</td>
<td>10 6 sets N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>♀ sets 5 9 aftern.</td>
<td>6 35 4 55</td>
<td>27 5 a 21 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td></td>
<td>6 36 4 53</td>
<td>49 5 51 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>A 19th Sun. aft. Trinity</td>
<td>6 38 4 51</td>
<td>11 10 6 27 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>M</td>
<td></td>
<td>6 40 4 49</td>
<td>31 7 9 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Tb</td>
<td></td>
<td>6 42 4 47</td>
<td>52 7 56 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>Crispin</td>
<td>6 43 4 45</td>
<td>12 13 8 51 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Th</td>
<td>♀ rises 3 54 morn.</td>
<td>6 45 4 43</td>
<td>33 9 53 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td></td>
<td>6 47 4 41</td>
<td>54 11 0 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>St. Simon &amp; St. Jude</td>
<td>6 49 4 39</td>
<td>13 14 morn. 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>A 20th Sun. aft. Trinity</td>
<td>6 50 4 37</td>
<td>34 0 11 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td></td>
<td>6 52 4 35</td>
<td>54 1 27 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Tb</td>
<td>♀ sets 4 43 aftern.</td>
<td>6 54 4 34</td>
<td>14 13 2 45 12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Day. Length of D. Day dec. D. break | Tw. ends Sun East | Cl. aft. Sun. ☼Semidiameter |
|----|-------------------|--------------------|----------------------------|
| 1  | 11° 34° 31° 5 | 0 4 m 9 | 7 a 31 5 m 39 | 12 4° 1° |
| 6  | 15 19 19 18 | 10 32 11 55 | 3 |
| 11 | 10 55 39 28 | 7 24 13 16 | 4 |
| 16 | 36 58 35 6 58 | 17 14 25 | 6 |
| 21 | 17 6 17 43 | 46 10 15 19 | 7 |
| 26 | 9 58 36 51 | 37 3 15 56 | 8 |

PRINTED FOR THE COMPANY OF STATIONERS.
<table>
<thead>
<tr>
<th>D. of W.</th>
<th>Sundays, Holidays, &amp;c.</th>
<th>☉ rise</th>
<th>☉ set</th>
<th>☉ decl.</th>
<th>Cr. &amp; s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W All Saints</td>
<td>6h56'</td>
<td>4h32'</td>
<td>14°32'</td>
<td>4h56'</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Th All Souls: Mich. T. b.</td>
<td>6</td>
<td>58</td>
<td>30</td>
<td>51</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>F 7th rises 6 12 morn.</td>
<td>6</td>
<td>59</td>
<td>28</td>
<td>10</td>
<td>F</td>
</tr>
<tr>
<td>4</td>
<td>S [1605: K.W.III.lld.]</td>
<td>7</td>
<td>14</td>
<td>26</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>A 21st S. af. T.: Gn. Pl.</td>
<td>7</td>
<td>34</td>
<td>25</td>
<td>47</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>M Leonard</td>
<td>7</td>
<td>54</td>
<td>23</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Th</td>
<td>7</td>
<td>64</td>
<td>21</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>W Cam. Term div. noon</td>
<td>7</td>
<td>84</td>
<td>20</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Th Pr. Walesb. 1841: Ld.</td>
<td>7</td>
<td>104</td>
<td>18</td>
<td>58</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>F [Mayor's day]</td>
<td>7</td>
<td>12</td>
<td>16</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>S St. Martin: Sh. stars</td>
<td>7</td>
<td>14</td>
<td>15</td>
<td>31</td>
<td>morn.</td>
</tr>
<tr>
<td>12</td>
<td>A 22nd Sun. aft. Trinity</td>
<td>7</td>
<td>15</td>
<td>13</td>
<td>48</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>M Britius</td>
<td>7</td>
<td>17</td>
<td>12</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Tu 2 sets 6 18 aftern.</td>
<td>7</td>
<td>19</td>
<td>11</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>W Machutus</td>
<td>7</td>
<td>21</td>
<td>9</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>7</td>
<td>22</td>
<td>8</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>F Hugh Bp. of Lincoln</td>
<td>7</td>
<td>24</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>7</td>
<td>26</td>
<td>5</td>
<td>19</td>
<td>sets</td>
</tr>
<tr>
<td>19</td>
<td>A 23rd Sun. af. Trinity</td>
<td>7</td>
<td>27</td>
<td>4</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>M Edm. King &amp; Martyr</td>
<td>7</td>
<td>29</td>
<td>3</td>
<td>47</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Th Crown Prs. Prussia b</td>
<td>7</td>
<td>31</td>
<td>4</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>22</td>
<td>W St. Cecilia [1840]</td>
<td>7</td>
<td>32</td>
<td>0</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td>7</td>
<td>34</td>
<td>59</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>24</td>
<td>F 7th rises 7 14 morn.</td>
<td>7</td>
<td>36</td>
<td>58</td>
<td>38</td>
<td>9</td>
</tr>
<tr>
<td>25</td>
<td>S Mich. Termends: Cath.</td>
<td>7</td>
<td>37</td>
<td>57</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>26</td>
<td>A 24th Sun. aft. Trin.</td>
<td>7</td>
<td>39</td>
<td>56</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>7</td>
<td>40</td>
<td>55</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>Tu 7th rises 5 37 morn.</td>
<td>7</td>
<td>42</td>
<td>55</td>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>W 8th sets 4 49 aftern.</td>
<td>7</td>
<td>43</td>
<td>54</td>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>30</td>
<td>Th St. Andrew</td>
<td>7</td>
<td>45</td>
<td>53</td>
<td>43</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day dec.</th>
<th>D. breaks</th>
<th>Tw. ends</th>
<th>Sun East.</th>
<th>Cl. aft. Sun.</th>
<th>♦ Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9h. 36m.</td>
<td>6</td>
<td>58</td>
<td>5m 1</td>
<td>6 a 26 m</td>
<td>4 m 56</td>
<td>16' 17''</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>7</td>
<td>16</td>
<td>8</td>
<td>19</td>
<td>51</td>
<td>16 13</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>33</td>
<td>16</td>
<td>13</td>
<td>46</td>
<td>15</td>
<td>48</td>
</tr>
<tr>
<td>16</td>
<td>8 45</td>
<td>49</td>
<td>23</td>
<td>7</td>
<td>42</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>8</td>
<td>3</td>
<td>30</td>
<td>2</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>26</td>
<td>18</td>
<td>10</td>
<td>39</td>
<td>5 59</td>
<td>37</td>
<td>12</td>
<td>26</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
### DECEMBER, 31 DAYS. 1865

<table>
<thead>
<tr>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>0° rise</th>
<th>0° set</th>
<th>0° decl.</th>
<th>Cr. &amp; s.</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 F Prss. Wales b. 1844</td>
<td>7°46'</td>
<td>3°53'</td>
<td>21°55'</td>
<td>5°m38'</td>
<td>13</td>
</tr>
<tr>
<td>2 S</td>
<td>7°48'</td>
<td>3°52'</td>
<td>1</td>
<td>rises</td>
<td>F</td>
</tr>
<tr>
<td>3 A Advent Sunday</td>
<td>7°50'</td>
<td>51</td>
<td>10</td>
<td>5 a 9</td>
<td>15</td>
</tr>
<tr>
<td>4 M h rises 4 29 morn.</td>
<td>7°52'</td>
<td>50</td>
<td>16</td>
<td>5 a 9</td>
<td>15</td>
</tr>
<tr>
<td>5 Tb</td>
<td>7°54'</td>
<td>50</td>
<td>18</td>
<td>6 12</td>
<td>16</td>
</tr>
<tr>
<td>6 W Nicholas</td>
<td>7°56'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>7 Th</td>
<td>7°58'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>8 F Conception V. Mary</td>
<td>7°59'</td>
<td>49</td>
<td>1</td>
<td>10 42</td>
<td>20</td>
</tr>
<tr>
<td>9 S</td>
<td>7°58'</td>
<td>49</td>
<td>22</td>
<td>10 42</td>
<td>20</td>
</tr>
<tr>
<td>10 A 2d Sunday in Advent</td>
<td>7°57'</td>
<td>49</td>
<td>22</td>
<td>10 42</td>
<td>20</td>
</tr>
<tr>
<td>11 M</td>
<td>7°54'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>12 Tb 2 sets 4 54 aftern.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>13 W Lucy</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>14 Tt</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>15 F</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>16 S Cam. T. ends: 01 Sup.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>17 A 3d Sunday in Advent</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>18 M Oxford Term ends</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>19 Tt 2 rises 7 14 morn.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>20 W Ember Week</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>21 Tt St. Thos.: Short. day</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>22 F</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>23 S 2 rises 6 51 morn.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>24 A 4th Sunday in Advent</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>25 M Christmas-day</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>26 Tt St. Stephen</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>27 W St. John Evangelist</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>28 Tt Innocents</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>29 F 3 rises 6 52 morn.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>30 S [vester]</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
<tr>
<td>31 A 1st S. aft. Chr.: Sil.</td>
<td>7°53'</td>
<td>49</td>
<td>20</td>
<td>9 34</td>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D. Day</th>
<th>D. breaks</th>
<th>T. ends</th>
<th>Sun East.</th>
<th>Ch. aft.</th>
<th>Sun</th>
<th>0° Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6h. 9m. 8</td>
<td>28</td>
<td>5 m 42</td>
<td>5 a 58</td>
<td>4 m 35</td>
<td>10°</td>
<td>40°</td>
</tr>
<tr>
<td>6</td>
<td>7 67</td>
<td>37</td>
<td>48</td>
<td>55</td>
<td>34</td>
<td>39°</td>
<td>17</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>44</td>
<td>52</td>
<td>55</td>
<td>34</td>
<td>39°</td>
<td>17</td>
</tr>
<tr>
<td>16</td>
<td>46</td>
<td>48</td>
<td>56</td>
<td>56</td>
<td>36</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>21</td>
<td>44</td>
<td>50</td>
<td>58</td>
<td>58</td>
<td>38</td>
<td>32</td>
<td>18</td>
</tr>
<tr>
<td>26</td>
<td>45</td>
<td>0 inc. 1</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>41</td>
<td>0 be. 58</td>
</tr>
</tbody>
</table>
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Girdle.

1. To Miss Mary Smith. By Miss Helen Ogden, Shaw.

Dear lady, may I through the pages of Di
    Acknowledge your favours so kind;
And humbly entreat you may yearly repeat
    Your off’rings so neatly entwined.
And should you incline to bend at her shrine,
    Her vot’ries would greet with a smile,
And strive to rehearse your musical verse,
    Each one’s labour and care to beguile.
Engirdled her hand unitedly stand,
    Dictated by fancy each muse;
Producing at leisure a pastime of pleasure
    In mystical numbers profuse.
Though ancient her name, antiquated her fame,
    For one hundred and sixty-one years,
She has lifted her head information to spread,
    Along with a host of compeers.


Hail, mighty science! hail, electric spark!
How have the bygone ages grop’d in dark,
Save when bright Shakspeare to high thoughts gave birth,
And “put a girdle round about the earth
In forty minutes!”* Lo! some coming age
Will realise th’ imaginative page
Of that great bard whom England’s sons admire,
When earth is girded with th’ electric wire.

3. By Mr. Joseph Hutchinson, near Halifax.

Does our friend Mr. Hope his own talents mistrust?
    It would almost appear so, however unjust;
Or why, when his skill such a girdle can furnish,
    Refer to a gilder, to give it a burnish?

4. By Mr. James Hewitt, Hexham, Northumberland.

Hope binds on his girdle for duty once more,
And weaves a magnificent riddle,—
A dexterous gilder in classical lore,—
Though his girdle looks much like a griddle.

* “Puck—I’ll put a girdle round about the earth
In forty minutes.”
    Shakspeare’s “ Midsummer Night’s Dream,” Act ii, scene 2.
5. By Mr. James Herdson, Edinburgh.
For prize, Hope gives a golden girdle,
But change, makes even milk to curdle,
And, that he may not more bewilder,
The golden girdle's chang'd to gilder.

6. An Acrostic; by Mr. J. Sootheran, Ampleforth.
Girdled by the surging ocean,
In her pride fair Albion stands;
Round her rolls in wild commotion
Dire alarms from other lands;
Long may peace, with gentle reign,
Ever firm her sway maintain.

7. A Toast. By the Cawkley's Laddie,
The nymphs of fair Dia, may they e'er be found
By girdles of friendship together close bound.

8. By Mr. Frederick Burrington, of Exeter.
Hope's necromantic muse around us draws
A dark and mystic girdle to confuse us:
Presto! 'tis chang'd by magic's potent laws,
And, brightening, shows a gilder to amuse us.

Of a girdle or a gilder it's but little I can say,
Yet accept this friendly notice of them both, sir, by the way.

10. Acrostic. By Mr. Joseph Furniss, Lois Weedon.
Good Mr. Hope, of prize enigma fame,
In depths of classic lore how great his name!
Round as each year comes circling, still his lays
Early delight us, and demand our praise.
Long may he live, and when at last he dies,
Eternal joys be his beyond the skies.

11. Acrostic. By Mr. Septimus Tebay, Rivington.
Glory, the boast of worldly fame, the sound
Invokes the manes of the dead, who rise—
Rise, and proclaim from out the shades profound,
"D eciful vision! vain and bootless prize!
Life has no glory;—'tis beyond the grave,
Eternal glory waits the truly brave."

Our Hogarth in the elder days
Drew, for the eyes of those unborn,
His "Line of Beauty and of Grace,"
The attribute of rounded form,
True form of woman's loveliness
Did embonpoint, he said, express.

As Nature all, to Hogarth's eye
(Whose thousand tints in one combine),
Is, union in variety,
Like his own curved and waving line,
A simple curve, which, on inspection,
Has no two points in one direction.
In "prize enigmas" friend Hope shines,
Through mazy dells his muse now wand'ring
In beautiful and graceful lines,
Like the artistic curve meand'ring;
Figures diverse his lay are seen in,
Varied, in quick succession blent,
While single is one hidden meaning
In all this sweet bewilderment;
To artist's eye, as child's, unworn,
His girdle fails not to adorn.

13. By Mr. Robert Clemetson, of Morpeth.
The "virgin zone" in ancient days,
To shield the fair from insults base,
Effectively was used!
The modest maid, while thus attired,
How much by amorous swains admired,
Their sordid love refused!
Not so the "Venus-Girdle" bright,
Emblem of love's attractive might
To ardent, joyous, youth!
Its magic power effects produced,
Reverse of those just introduced,
As history seals the truth!

Three heavenly graces round us stand,
Their blessings shower on every hand,
For those who seek their aid:
Bright Faith, with beaming upward eye,
Points out a home beyond the sky,
Where all their cares unlade.
Hope smiles:—the darkest hours grow bright,
Seem gilded o'er with heavenly light,
Beneath her magic sway.
Sweet Charity, as with a girdle, binds the whole;
Strengthens our feet to reach the destined goal
Of everlasting day.
(See also, as an answer, Acts xxii, 11.)

Illustrious poet! Dia's fav'rite son!
Her laureate honours you have nobly won;
With garlands crown'd you seek a counterpart,
A girdle deck'd with all the gilder's art.

16. By B., of Barum.
Hope's girdle he limn'd with such very dark hues,
He was sure the mind's eye to bewilder;
So, resolv'd he would o'er it some brilliance diffuse,
He call'd in the aid of a gilder.
17. By Amanda, Greenwich.
The wizard of this magic age par excellence is Di;
In paradox and puzzles rare not one with her can vie;
This year she shows consummate skill, which greatly doth bewilder;
From her fam’d girdle she extracts (most strange, yet true) a gilder.

18. To my First-born. By Mr. James Charlton, Gateshead.
Girdle of joy! symbol of purest love!
Let me thy birth record on Dia’s page;
And mayest thou be a blessing from above,
From infant years to youth, from youth to age.

19. To the Editor. By Clio, of Hexham.
Dear sir, let me tell you—but mum—
It must be a secret between us—
Our worthy friend Hope has become
Possess of the girdle of Venus.
For each line that he writes with beauty shines bright,
And gives to Diarians purest delight.

20. By Mr. Stephen Watson, Haydonbridge.
Just give me four lines of your space, I pray,
In which to answer your prize; and to say,
That if the letters be rightly arrang’d,
Girdle to gilder is instantly chang’d.

As girdle gilder, Hope much art has shown;
In truth his great acquirements all must own;
As bard, one worthy of the highest praise,
Who oft invested is with Dia’s bays.

22. By Mr. R. Elliott, Choplington, near Morpeth.
Friend Hope has delighted the ladies this year,
By sending them beautiful girdles to wear.

23. By Mr. John Elliott, West Croft, Stanhope.
I ponder’d long upon the prize,
The answer to discover;
At length a girdle met my eyes,
And then my doubts were over.

Though clad in very deep disguise,
A girdle surely is the prize.

25. By Mr. Thomas Wray, Market Weighton.
To girdle the waist of Dia so chaste,
Friend Hope, doubtless, thought it a duty;
Yet the flash and the glare of things gilded and rare
Are thrown into shade, and instantly fade,
In the presence of inherent beauty.
GENERAL ANSWERS TO THE ENIGMAS.

1.  Cell.  4.  Cut.  7.  Sleeper.  10.  (Prize.)


Diarian bards, can such a place be found
As England is, in all the spacious earth?
We surely are with many blessings crowned,
In having gained her as our place of birth.
Italia boasts of brighter shining skies,
And Spain of orange trees and fruitful vines;
But England, though less glowing, much supplies,
Which me to her more pow'rfully inclines.
We look upon her hills, her vales, and plains;
What rich variety they still present!
The laws are excellent which she contains,—
With them her sons are gen'rally content.
The choice of workmen owns in many arts,
In some of which all nations she excels;
Their mind acute a genius bright imparts,
Which 'midst the kingdoms her importance swells.
With rivers she abounds, with floods and lakes,
In which the fisher plies both net and line;
Where, too, the swimmer healthy pleasure takes—
A pleasure which, O sleeper, is not thine.
Those whose abodes are on her winding coasts
Behold the smack in open sea to glide;
For more than other nations England boasts
Of gallant steamers, men of war beside.
'Tis true her mountains are of lesser range
Than some that rise in distant foreign states;
But near them stand full many a hall and grange,
Free from the fear the avalanche creates.
With crested waves old England's girdled round,
On all her shores the brine of Neptune beats;
But yet in this her greatest safety's found,—
Her confidence is in her matchless fleets.
Thus praise we England, she's a golden land,
With her not even France can well compare;
She sheds upon her sons, with lavish hand,
A thousand blessings which they duly share.

PRINTED FOR THE COMPANY OF STATIONERS.
2. Yesterday. By Miss Helen Ogden, Shaw.

Oh! say, yesterday, whatever was thine,
Of weal or of woe, to bear on thy wing,
For ever now past, but who can divine
What cause or effect from thy transit might spring?

Brief period of time, how rapid thy flight,
How quickly thy footsteps retir'd from our view;
Thy dawn scarcely hailed ere shadowy night
Bowed a sure and a final adieu.

No matter how vast and important the power
Of the varied events that sprung from thy hand,
Or simplest trifles engaging each hour;
Now useless and vain their return to command.

Yet fondly remember'd where pleasure and joy
Their tents of attraction spread closely around;
Thy innermost cell dispensed no alloy,
Our lines in the places most pleasant all found.

And deeply impressive thy transient sway,
Where love like a girdle encircled the heart,
And sweet kindred feelings beguiled with their ray
Each darkening vein that care could impart.

And may not reflection revert with its eye
To tempests of sorrow that broke on the head,
As floods from the mountains, exalted on high,
In their course devastation and ruin may spread.

The limited span of thy onward career,
Might bear to the future a treasure untold,
Of wisdom and knowledge instructive and clear,
More precious than rubies or brilliant gold.

While bless'd with to-day, then, may we improve
Each talent entrusted alike to our care,
Nor shrink from the task as onward we move,
If the gifts of the past we fondly would share.

Let grave recollection each sleeper awake,
And urge him along while yet in his power;
The path of improvement remains him to take,
To crown with delight blest futurity's hour.

Rememb'ring to-day is still gliding as fast
As sure and as certain its footsteps will be;
And oh! may we seize, ere yet they are past,
The moments so precious permitted to see.
3. "The Morning Spread on the Mountains." By Cantab, M.A.,
formerly of Sevenoaks.

Sleaper, arise! and leave your tent or cell;—
With girdle bright, Aurora greets you well!
Scale yonder mountain; venture not to stop
Till you have, panting, reach'd its highest top:
Then, when the mists disperse, a radiant sight—
A flood of glory dazzles all your sight!
However well his golden work is done,
No gilder can compare with thee, bright Sun!
How pleasant, when the wandering artist sees
The oaks, and cork-trees,—yee, and all the trees
Superbly lighted up! How grand the sight!
How rapturously he loves the Sun's warm light!
Look, now, at yonder railway;—many a cut
There looks no larger than a waggon-rut:
O! through our land,—through many a lonely spot,
The straight-line has its beauty;—doubt it not.
Or, look to sea-wards; lo! that fishing-smack
Leaves on the waves a tiny, foaming track;
Like some wild-drake which skims its lonely pond,
Then rises, screaming, o'er the hills beyond.

4. To Jane of Rydale. By Mr. James Hewitt, Hexham.

Dear Jane, from the depths of affliction,
I heard your melliloquent strain,
And in spite of my gloomy dejection,
Endeavoured to answer again.

But my Muse, overwhelmed with sorrow,
Could scarcely squint out of her cell,
But pleaded delay till the morrow,—
Till fresh hopes her bosom might swell.

Intent on the themes of her sadness,—
Like a cork on the turbulent stream,—
She, rushing from pleasures or gladness,
But lived in a troublous dream.

Cut down were the friends that had cheered her,
Swept away by Time's swift-rolling flood;
Ever ready to praise—never jeered her—
In evil report, or in good.

Gone beyond the dark line of division,
Whence no traveller ever returns,
The limit of man's clouded vision,
Which to penetrate even he burns.
The wisest, most tender of mothers,
Was scarcely with Death’s sleepers laid,
When the truest, most loving of brothers
Was struck down by his pitiless blade.
Struck mute, on the rack, all despairing,
What wonder I could not reply,
Though wishing, yea striving, my fair one,
To wish you and Edwin much joy?
Time soothes the most sensitive feeling,
And hope mounts again on the wing;
The mind’s wounds are seldom past healing,
And fresh resolves duty can bring.
So I girdle my loins up, resolving
To work while ’tis called “to-day,”
Since, at most, a few more suns revolving
Must summon me hence and away.
So may you, your bright talents employing,
Still Dia’s loved votaries delight;
And be you and your Edwin enjoying
Felicity cloudless and bright.

5. To Memory. By Miss Mary Smith, Ampleforth.

Oh Memory, mysterious power,
Recalling back each fleeting hour,
Joy, hope, and youth’s belfrey time;
What dreams of confidence are thine,
Thou mirror of departed years:
Now smiles—now dim with floods of tears.
The felon woo’s thee in his cell.
He thinks when all went with him well,
The soldier in the tented field,
Who soon the glittering sword will wield,—
Bright visions flit before his mind
Of friends and kindred left behind.
The hardy fisher, in his smack,
With line, and net, and cork looks back,
By thee, and thinks of perils past:
That stormy night—that cutting blast.
The lonely mountain shepherds see
At night the home of youth through thee,
Or wife—or infant sleeper in its cot,
And think how blest was then their lot.
Both old and young can wander o’er
The scenes which they have trod before,
And by thy power can weave at will
A girdle of bright fancy still.

PAINTED FOR THE COMPANY OF STATIONERS.
6. The Summer Day. By Mr. Frederick Burrington, Exeter.
The morning vapours from the misty vale
Hung like a girdle round the mountain's brow;
The dew-drop—sleeper on the primrose pale—
Jewelled the leaf and glittered on the bough.
All robed in gold the sun marched up the sky,
And mounted like a king his zenith throne;
A flood of light streamed from his flaming eye,
Making the horizon's line a hazy zone.
The white-sailed smack moved slowly on the sea,
Her keel so gently cut its liquid grave;
The little boats lay cork-like, buoyantly,
Dotting with tiny spots the lazy wave.
The gypsy's swarthy children in the dell
Played round the tent, beneath the full-leafed oak,
And like the hermit, tenant of the cell,
Drank the pure water of the running brook.
But now day's burning fever slowly wanes,
The wakened winds of evening gently play;
The rustic lovers linger in the lanes,
And parting notes are heard from every spray.
The sun descending pales his glowing fires,
Enter his grand pavilion of the west,
And, wrapped in gold-embroidered clouds, retires,
Leaving the world to silence, thought, and rest.

In days of yore, as we are wont to read,
Scotia had many forests, dense indeed,
Where lines of lofty oak, and beech, and pine,
Their leafy branches thickly did entwine;
Where, in seclusion, the rude hermit's cell,
In shade was sheltered; where secure could dwell
The woodman in his tent; but now we search
In vain for oak, or pine, or beech, or birch;
Cut down by woodman's axe, or length of years,
The wood begirdled forest disappears;
A mountain range, devoid of lofty wood,
A scene of rock, and rivulet, and flood,
The modern so-call'd forests now appear,
The haunt of grouse, the pasturage of deer.
   Ah! had the wand'ring babes that went astray
Into this Highland Forest found their way,
The red-breast there might sing his dirge-like song;
But when they perish'd in these wilds among,
The pious bird, indeed, in vain might crave
One leaf to place upon the sleepers' grave!
8. To the Editor. By the Rev. Anderson Drysdale, Glasgow.

Dear Sir, these lines without pretention state
A grave occurrence that took place of late;
A fact, not fiction, is what I impart;
The narrative may pain our Dia’s heart.
The ship Vitura, with selected band
Of seamen, leaves New York for Britain’s strand;
Th’ Atlantic flood she breast with well-filled sail,
The wavy ridge she mounts or seeks the vale.
She moves in triumph, like a thing of life,
And seems prepared for elemental strife;
No harm she dreads; gigantic is her strength,
Her destined port she hopes to reach at length.
Alas! the hope is vain, the practised eye
Perceives that danger sleeps in yonder sky.
The ship soon feels the rising hurricane,
And greatly labours in the tossing main.
Her sails are torn to pieces, and anon
She springs a leak; the rudder’s power is gone.
The seamen dread the nearing rocky shore;
Oh! now she strikes and braves the storm no more.
The fatal shock is felt from stern to prow;
The grieving crew declare their purpose now
To leave her; lo, a cord is thrown to land,
And caught by peasants with a willing hand.
Of safety all on board feel well assured;
Sufficient cable is with speed secured;
And yet the peasants pull with dire intent,—
A wicked scheme their hardened hearts invent.
The selfish villains! demons in their zeal,
They did not come to save, they came to steal.
The pseudo-saviours rush through foam and spray
To cut the cable and bear all away.
The wrecked, however, live; they reach the land
Through other means, and as a grateful band
Acknowledge that an arm Divine can save
From human fiends and from a liquid grave.


Mount up, O muse, sweet Dia waits
Thy yearly offering small;
It is not thine, I’m sure, to be
A sleeper when she calls on thee—
For that is duty’s call;
O pen her down a line or two, and put her
Into belief you never mean to cut her!

The critic world may frown at will,
From London down to York;
Or bottle up its wrath till when
Some slip or other of the pen
Compels it to uncork;
E’en then, poor muse, whether they jeer or chaff at,
Their flood of fury will but serve to

PRINTED FOR THE COMPANY OF STATIONERS.
There is a charm in writing rhymes,
As those who write them know;
No matter whether "poet-born,"
Or poetaster all forlorn,
The thing must onward flow
Wherewith broadcast ones mingled
Thoughts to scatter,
Smack though they may of "stuff" or
dired matter.
O would the press were all as kind
As is our Lady Di,
And give a corner up to those
Who little bits of verse compose—
For instance, such as I;

Dear Di admits us 'mongst her choicest
treasures,
For which we wish she knew but half
our pleasures.
Contented then with her we'll stay,
And more instruction gain;
For celebrated learned lore,
Is Dia's now—as 'twas of yore—
And so it will remain;
Queen of her class for dignity and
honour,
Girdles triumphant still shall be upon
her.


From town and turmoil far remote,
At yonder *mountain's* base,
I pass'd one day a sacred spot—
The village burial-place;
Where, in their quiet *cells*, they lay
Their dear ones when they pass away.
No sounds contentious e'er are heard
Within its *lines* of wall,
But music of the minstrel-bird
That has "a dying fall:"
And there, along its gentle slope,
Sweet violets bloom, the flowers of hope.
And 'round are smiling fields and plains,
With herds and flocks o'erspread;
And homesteads of the rural swains,
The children of the dead;
And, in the distance far, the sea,
*Girdled* with deep serenity.
And o'er that *flood* one little *smack,*
So volatile and free,
Bounds onward in its unmark'd track,
With *cork*-like buoyancy;
Like youth, when pleasure fills its sail—
As gay, as wayward, and as frail.
*Rest, weary sleeper!* calmly rest
Beneath your grassy mound;
No *cutting* blasts, no storms molest
Your slumbers underground;
But there, in faith and hope and love,
Ye 'wait the final mandate from above.
11. By Oedipus.
The first, a friend says, is a drop, but a cell
Responds to the points I conceive quite as well.
The next, beyond all peradventure, is meant
To set forth in its mystical trappings, a tent.
In the third, Mr. Edwards puts forth all his skill
To unfold all the uses which cork can fulfil.
And then, whilst our eyelids he'd willingly shut,
Mr. Furniss politely would give us the cut.
To the fifth, Mr. Herdson comes on with a flood,
Which is ever, of course, most "voracious for food."
In the sixth, many intricate paths we pursue,
But a line is at hand e'er to give us the clue.
The seventh, whilst plunging yet deeper and deeper,
Seems to dread lest at last it awaken the sleeper.
Next Cantab comes on with his smack, I opine:
At least, that's a leading opinion of mine.
And Miss Ogden succeeds, with her feminine grace,
The bold mountain scenes of fair nature to trace;
Whilst Hope with his girdle brings all to a close,
Which minus his gilder sufficiently glows.

Again I shall sing thee, my dear native vale,
Where summer buds first fill with fragrance the gale,
Where kingcups and violets and primroses pale
   Bloom on each green bank as we stray.
Where Rye's crystal flood verdant pastures among
Embanked and begirded slow murmurs along,
Where early is heard the sweet milkmaiden's song,
   When brushing the dewdrops away.
Where blushing Aurora, with beauties untold,
Illumes the far east with rich crimson and gold,
Tips all the rich woodlands, the hills, and the wolds
   With smiles for to hail the new day.
There, mounting, the lark early heavenward soars,
And in her ascent cheering melody pours;
Come, sleepers, arouse ye. Here's Ryedale's green bowers;
   Inviting, they ask you to stray.
The blithe cheery workman proceeds to his toil,
The balm of contentment his cares doth beguile,
It gladdens his heart when adorned with a smile,
   The face of fair nature looks gay.
Thy beauties enchant me; how splendid the scene—
Thy woodlands, thy waters, thy fields rich and green:
Fair valley, thy equal I've never yet seen
   Through travels of many a day.
GENERAL ANSWERS TO THE REBUSES AND CHARADES.


Say, is there in war any real enjoyment?
Does it to contentment of mind ever lead?
The gentleman thinks it an honoured employment,
A thing calculated ambition to feed.
Alas! it is worse than the lava that, streaming
From active volcanoes, runs hastily down,
By which ev'ry thing that it meets with is steaming,
And lives often lost all its ravages crown!

Diarians gen'rally, Bartram including,
Hate warfare, and wish that its horrors may cease;
The corkscrew and wine, a thing often deluding,
Are sparingly used in their parties of peace.

Whilst sons of the army are anxiously smoking
Cigars in their tents, and are musing on war,
Diarians, from Campbell enjoyment evoking,
Are glad that their home is from fightings afar.

The melody's harsh where the cannons are roaring;
From rostrums, O leaders, for peace speak aloud;
Let Denemark, all matters of warfare ignoring,
Declare by her warrant that friendship's avowed.

The Bear of the north seems for conflict preparing;
By him, alas! Poland's a trodden-down state;
But Europe, for her with kind sympathy caring,
Would willingly all her sad evils abate.

But what shall we say, looking o'er the Atlantic?
Sure there than in Europe the case is much worse;
 Destruction's a rage, and the people quite frantic,—
Ah! what can be done to avert such a curse?

The model republic is rent quite asunder;
Rebellion has torn it, ambition now strives
Again to unite it; alas! would it ponder
The cost of so doing—a million of lives!

The year '63 is not yet fully ended,
Whilst these few poetical stanzas are penned;
With what in the future states may be attended
We know not;—may Providence amity send!

PRINTED FOR THE COMPANY OF STATIONERS.
2. To the Editor. By Mr. James Hewitt, Hexham.

Dear sir, your gentlemanly letter—
I own it—filled me with delight,
Although I rather doubt you flatter,
When such encomiums you write.

Like extinct volcanoes, my muse
Had in her ashes gone to sleep;
Not even Barthram's harp could rouse
Her lyre, she but waked to weep!

But bring the corkscrew and cigars,
I'll mount Apollo's fleet quadriga;
And, spite of Dano-German wars,
Who knows but I may land at Riga?

O for a gleam of Campbell's "Hope!"
Or else a glass of Lethe's stream,
I'll give my pegasus full scope,
Although an ass should be my theme!

A lemon, melon, mole, or mule,—
Might form both victuals and conveyance!
A poet may break loose from rule,
And common sense hold in abeyance.

May his rostrum choose a cloud!
Invoke "the gods," to suit occasion,
Or lecture lords for "dressing loud"—
To wit, "the lords of the creation."

But truce to all extravaganzas,
Lest you should think I'm gone demented—
I'll finish with a sober stanza,
On ills that might have been prevented.

A sigh for Denmark's noble brave,
Who firmly German hosts withstood;
Undaunted sought a soldier's grave.—
Or sailor's, in the briny flood.

The warrant of her foemen power—
Who justice crush by ruthless might,
May heaven avert her evil hour!
And ever, "God defend the right!"

Be Dia still exempt from broils,
Her votaries free from outward fears;
While you revise—reward—their toils,
Through many smooth-revolving years.


In gloomy November, when winter is near,
How pleasant is converse with those we hold dear!
Inclining to fret, we await the salute
Of Dia, who fails not to bring us some fruit.
The articles found in her basket so chaste
Are prudently varied to gratify taste;
Her problems, enigmas, and queries to boot,
Give pleasure to students of diverse pursuit.
Of rebus mixed with charades there is store;
Some like them so well they would gladly have more;
However, she thinks it far better to raise
Than pall a good appetite, much to her praise.
The figure we drop;—of charades we have nine,
Of rebus three, and their answers combine,
By singular accident, triads to make—
The following whimsical order they take.
That Campbell and Barthram with gentlemanly
Associate well, it is easy to see;
But corkscrew and lemon, united with glass,
The bounds of decorum too often surpass.
That cloud and cigar with volcanoes should sit
In smoky alliance, you surely admit;

PRINTED FOR THE COMPANY OF STATIONERS.
While rostrum and Denmark with warrant agree
In boldly proclaiming their right to be free.
These triads when taken in order transverse
Quaternions yield, both expressive and terse,
Inviting attention; and more we might say.
Enough, for we touch the beginning of May.

4. By Mr. Joseph Hutchinson, near Halifax.

How gentlemanly Dia's page,
Where shafts of wit may fly,
Unlike volcanoes' fires that rage,
To blacken and destroy!
How kindly Mr. Edwards treats
Friend Barthram from afar,
Whom Herdson with a corkscrew greets,
And offers a cigar.
While Clemitson of Campbell sings,
And then the Greenwich maid,
To welcome Mr. Furniss, brings
A glass of lemonade.
And though a rostrum is allow'd,
No one will there proclaim
A sentiment that would becloud
Or dim another's fame.
E'en Denmark's fair one need not fear
Such company to meet in;
And if she ever does appear,
I'll warrant her a greeting.

5. Alexandra. By Mr. James Herdson, Edinburgh.

Had I a gentlemanly skill,
Or the volcanos' fire
Of Campbell's sweet poetic quill,
Or Barthram's pleasing lyre;
Had I the rostrum's eloquence,
Or corkscrew's lever power;
With sweet cigar I would dispense,
And with the lemon sour;
And then, I'll warrant, I'd proclaim
Aloud, to all that pass,
The praise of Alexandra's name,—
Brave Denmark's loving lass.


O would it not a pleasure be
Should all the tribes of Di agree
For once to have a meeting?
I'll warrant there would be a fuss
And make-to-do 'mongst some of us;
While all but very near a busk
Would give the ladies greeting.
"How gentlemanly so-and-so,
How poet-like from top to toe,"
The whispers would be running;
"Mark you Miss Jane and Mary too,
With Helen coming into view,—
And Messrs. H. and W.
Look, like their riddles, cunning.
And then the bottles (two or three
Would do) must on the table be.
With corkscrew for "extraction;"
Sherry, or port, or lemonade—
A brimming glass for man and maid,
The all of whom are here to aid,
And ripe for ready action.
Now some old Campbell mounts on high
The rostrum which is standing by
With evergreens to crown it;—
"Ladies and gentlemen," quothe he,
"This day's a happy one to me—"
But here we lose the speech d'ye see,
For loud applause dawned it.
The speech is finished though, and then
Another of the gentlemen,
Barthram, or Master Function,
Jumps up as lively as the day,
And, holding forth, goes on to say
Volcanos must have blocked the way
To miss this sweet conjunction.
And then the ladies, one by one,
Have each to speak, which having done,
Great acclamations follow!—
Just one cigar for gents who puff,
And just a pinch for those who snuff—
Thus part Di's poets, proud enough,
They beat all others hollow.

PRINTED FOR THE COMPANY OF STATIONERS.
7. The Fast Young Man. By Mr. Frederick Burrington, Exeter.

The muse, now armed with pointed shafts,
In this fast age to scan
Fast boats, fast trains, and telegraphs,
Thus hits the fast young man:—

In gay hotels his evenings pass,
And there he shines a star.
Laughs, sings, and quaffs his lemon'd glass,
And puffs his best cigar.

He sees the Prince of Denmark played,
That philosophic gem;
With clouded brains he talks aloud
Which Barthram would condemn.

He prates with gentlemanly zest,
Of sporting, gambling lore;

The rostrum makes a ribald jest,
And Campbell votes a bore.
He drives to Epsom gaily dressed,
Veiled like a fair-faced belle;
Warrants his sherry of the best,
And piles the corkscrew well.

His heart no kindly feelings stir,
No home affections prized;
His father is "the governor,"
His mother's love despised.

Know, thoughtless youth, a course of sin
Feeds passion's low desires,
Torments the mind and burns within,
Like fierce volcanoes' fires.

8. By the Cawkley's Laddie.

Fair Dia her annual feast did prepare,
And bade all her mirth-loving friends welcome there;
The south and the north, and the west and the east,
Each deputed member to honour the feast.

Of such gentlemanly there present then were,
Drysdale, Hope, and Hutchinson, Campbell and Carr;
Furniss, Wray, and Edwards, Burrington, Barthram,
And Cantab, who hails from the flowery Cam.

Of beauty's fair daughters, too, present that day,
Was witty Miss Ogden, Miss Smith, and Miss Grey;
Fair Rosa from Denmark, blythe Jane of Rydale,
And blooming Miss Mary, the Cornish female.

Such rich and rare dainties the table did grace,
Turtle, game, and venison there had a place,
From roast and from boil'd of the sumptuous supply
Perfumes, rich and savoury, steaming did rise.

Then custards and jellies, lemon cake and tart,
With ripe mellow fruits follow'd as a dessert.
Substantials and dainties, when cleared away,
The corkscrew was then freely brought into play;
And glasses were sparkling with rich mellow wines,
From the primest vintage and choicest of vines.

They gave loyal toasts, sung of love and of wars,
Were joyous and gay, while from fragrant cigars
The white curling clouds in large circles arose,
Like smoke that issues from burning volcanoes.

An intellectual feast's prepared,
And though no effort has been spared
In order to disguise it;
A gentleman of Barthlam's skill,
Another Campbell, if you will,
Can relish it, and prize it.
Then let him be our host awhile,
I know he'd gladly make us smile
At rostrum—call it pulpit;

Before they take to camp and horse,
To crush rebellion by force,
By earthworks, rams, and Armstrong guns,
Forgetting that all men are sons.
But on this theme I will not dwell,
The words I've left won't suit so well;
So I must e'en the topic change,
Or else the subject re-arrange.
To show our wants in peace or war,
I'll name a corkscrew and cigar,
A glass, a pipe, a word to each,
A plum, a melon, or a peach.

LIST OF POETICAL ANSWERS.

Almond, Robert, Conside, near Gateshead, ans. all.

Amanda, of Greenwich, ans. all.

A., of Barum, ans. Enigmas.

Bainbridge, Thomas, of Stanhope, ans. all.

Barrington, Frederick, 2, Sydney Place, St. Thomas, Exeter, ans. all.

Cantab, M.A., formerly of Sevenoaks, ans. Enigmas.

Carr, Cuthbert Rodham, jun., Carr's Villa, Carr's Hill, near Gateshead, ans. all.

Cawley's Laddie, ans. all.

Charlton, James, 8, Albert Street, Gateshead-on-Tyne, ans. all.

Clemiston, Robert, of Morpeth, ans. Prize Enigma.

Clio, of Hexham, ans. Enigmas.

Craggs, Thomas, West Cramlington, Northumberland, ans. all.

Dodgson, John, jun., Kirkymills, near Kirkymoorside, Yorkshire, ans. Prize Enigma.

Drysdale, the Rev. Anderson, 73, John Street, Glasgow, ans. all.
Eddy, Miss Eliza H., St. Just, Cornwall, ans. Rebuses and Charades.
Eddy, Miss Elizabeth A. H., St. Just, Cornwall, ans. Prize Enigma.
Eddy, William Hocking, Truthwall, St. Just, Cornwall, ans. all.
Edwards, Thomas, Lois Weedon, ans. all.
Elliot, John, West Croft, Stanhope, ans. all.
Elliot, R., Choppington, near Morpeth, Northumberland, ans. all.
Farn, William Henry, 149, Windmill Street, Gravesend, ans. Prize Enigma.
Furniss, Mrs., Lois Weedon, ans. Prize Enigma.
Furniss, Joseph, Lois Weedon, ans. all.
Garbutt, William, jun., Ann Street, Sunderland, ans. all.
Grey, Miss Jane, Leadgate, near Shotley Bridge, Durham, ans. Enigmas.
Grey, John, Westgate, Stanhope, ans. all.
Grice, George (Gardener), Wold Newton Hall, Ganton, York, ans. all.
Hattam, Thomas, Beachy Head Lighthouse, Eastbourne, Sussex, ans. all.
Hattam, Mary, Beachy Head Lighthouse (late "Miss Mary, West of Corn-
wall"), ans. all.
Herdsman, James, The Grange, Edinburgh, ans. all.
Heslop, T. G., Allendale, Northumberland, ans. all.
Heslop, William, Clifton Street, Brighton, ans. Prize Enigma.
Hewitt, James, of Hexham, Northumberland, ans. all.
Hope, the Rev. John, Stapleton Rectory, Carlisle, Cumberland, ans. all.
Hughes, Thomas, 2, Grove Terrace, Chester, ans. all.
Hutchinson, Joseph, near Halifax, ans. Rebuses, Charades, and Prize Enigma.
Jackson, J., Retford Place, Sheffield, ans. all.
Jane, of Ryedale, ans. all.
Jerrard, John, Charmouth, Dorsetshire, ans. all.
L. S., Ampleforth, near York, ans. Prize Enigma.
Lawry, Miss Mary, St. Just, Cornwall, ans. Enigmas.
Lester, J. H., late of Woodhouse, ans. Enigmas.
Milbourne, Thomas, Riding Mill, Newcastle-upon-Tyne, ans. all.
Nodwons, J., Murrah, ans. all.
"Edipus," ans. all.
Ogden, Miss Helen, Shaw, near Oldham, ans. all.
Procter, Christopher, Millbank Forge, Hartlepool, ans. all.
Ridley, William, Allendale Town, Northumberland, ans. all.
Rutherford, Dr., late of the Royal Military Academy, Woolwich, ans. Prize
Enigma.
Rutter, Edward, 15, D'Arcy Terrace, Sunderland, ans. all.
Ryley, R. jun., Mickley, Derbyshire, ans. all.
Sadler, Miss L. M., 51, Oakley Road, Islington (N.), ans. all.
Scorer, Alexander, Wallsend, near Newcastle-upon-Tyne, ans. all.
Smith, Miss Mary, Ampleforth, near York, ans. Enigmas.
Somerscales, Thomas, Hull, ans. all.
Somerscales, Thomas J., H.M.S. Cumberland, Sheerness, ans. all.
Sootheran, J., Ampleforth, ans. Rebuses, Charades, and Prize Enigma.
Tebay, Septimus, Rivington, ans. Prize Enigma.
Watson, Stephen, Grammar School, Haydonbridge, Northumberland, ans. Prize
Enigma.
Wray, Thomas, Market Weighton, ans. all.
N° 162.

NEW ENIGMAS.

1. Enigma (1471); by Mr. Wm. Garbutt, Jun., Sunderland.

I am a very curious thing,
Thro' me an Echo oft may ring;
I'm unconfin'd by bounds or space,
In me Almighty power you trace.
I'm also placed below the ground,
And there for spirits room is found:
Yet oft in me the dead are placed
With many trophies deck'd and graced.
In forests seldom trod by man
You there my form may surely scan;
But throwing off this death-like shroud,
I'm also known to please a crowd,
Who're oft attracted by a show
Or circus, where I make my bow.

II. Enigma (1472); by Mr. Thomas Edwards, Lois Weedon.

What prologue need I here to introduce
Myself to you, a thing of common use;
Indeed my usefulness I here must own—
To prince, and peer, and peasant I am known.
But should you ask me here to date my birth,
Or when my form at first appear'd on earth,
'Twould be no task the secret to disclose,
Since history authentic clearly shows.
When one of old went forth his bride to meet,
Doubtless I then was press'd with eager feet,
And from that period to the present time
I've thus been served in every age and clime.
Perhaps you deem me now of little use,
As I am subject to such sad abuse.
The sturdy farmer, he well knows my worth,
He loves to see me spring from mother earth,
My fragile form he views with anxious eye,
On me perhaps his future hopes rely.
But if you view me as a work of art,
In warlike scenes I take an active part;
Perhaps you look on me with bated breath,
As I become an instrument of death.
Another hint before I close my song:
You'll find me, doubtless, midst the bustling throng;
Or take a stroll along the busy street,
My very self, perchance, you then will meet.
Possessed of talents rare and bright, I may
Be here described as brisk or fierce or gay.
Once more, no worthy matron, maid, or dame,
Will bear the appellation of my name.

PRINTED FOR THE COMPANY OF STATIONERS. § 2
III. Enigma (1473); by Mr. Thomas Craggs, West Cramlington.

If here in mystic verse I may appear
To tease the young, the curious, or the wise,
Ye bards and wits, without disguise and clear,
I now present myself before your eyes.
Yes, I am here, and every page of Di
Would seem chaotic were it not for me;
The sailor, as he scans the midnight sky,
Well knows my value on the pathless sea.

On land and sea and in the starry sky
I have a place; nay, I am in the sun;
Though long and broad and massive to the eye,
Yet length, or breadth, or thickness I have none.

Take out your watch, and see what is the time,
The hour and minute plainly I declare;
Now take up Hood, and read his witty rhyme,
’Tis almost certain you will find me there.

In Parliament and in the courts of law
Often and long contested I have been;
I pain inflict, and blood I sometimes draw;
On Scotia’s coast my form is often seen.

And now, dear friends and votaries of Di,
If I am not already much too clear,
When next upon the railway, keep your eye
Upon the rails,—I’ll there to you appear.

IV. Enigma (1474); by Mr. Joseph Furniss, Lois Weedon.

Of all the subjects which, as time comes round,
In mystic guise on Di’s fair page are found,
Whether of earth, or air, or sea, or sky,
None surely come less wished-for than do I!
I know not, ladies, how to show my face,
Or come before you with becoming grace;
So much I feel myself intruding here—
In fact, I’m never welcome anywhere.

And yet I fain would hope that each and all
Of Dia’s vot’ries, be they great or small,
So as concerns their happiness, are free
From “ills that flesh is heir to” and from me;
Ah me, indeed! too few, alas, but know
A little of my nature as a foe;
For sleepless nights I bring, and racking pain
Full oft to mind and body, head, and brain;
A very “worm i’ the bud” from day to day
When cheeks grow wan as fade the flowers away.
But stay: you’ll think from this ’tis surely time
On such unworthiness to close the rhyme;
That such a queer, tormenting tiresome thing
Can never good from so much evil bring.
Yet I redeeming qualities may claim,
Too numerous, indeed, for me to name;
And most important, erring ones might stray
From wisdom's "paths of peace" how far away,
But I prevent and hold the much-loved child
Firm to religion "pure and undefiled."
And if 'tis mine to save from such a fall,
Who would condemn or spurn me after all?

V. ENIGMA (1475); by Mr. James Herdson, Edinburgh.

In vain (in Holy Writ we've read and heard)
The net is laid in sight of any bird;
Vain, too, and futile will be this attempt
To keep my hero from your ken exempt.
In Eden's blissful bowers, ere Adam fell,
'Midst scenes of unrestraint, I could not dwell;
There heaven-born liberty each creature bless'd,
And, truly, independence they possess'd.
Hail, sacred Liberty! at sight of thee,
The iron fetters break,—the captive's free;
Thou dost unbar the prison door to all
Whom bondage dire and servitude enthral.
But why should I of freedom sing? when, lo!
Of liberty I am the constant foe.
E'er since transgression overran the earth,
From that far period may I date my birth;
Though passive is my influence, yet, be sure,
I am a terror to the evil-doer;
And e'en the good and innocent, we see,
Were punish'd, as John Bunyan shows, by me.

My substance varies, I must freely own,
I'm made of wood, of metal, or of stone,
Or any substances you may select,
That suit my builder and his architect;
Sometimes I'm beautified by Art, with grace,
And in your sitting-room obtain a place;
From me sweet music, and melodious tones
At times proceed;—or howls, and cries and groans.
'Tis useless further to prolong my verse,
Since no more properties I need rehearse;
My name you've guess'd, e'er this, without a pause,
And seen me through the flimsy veil of gauze;
But, to make surety sure, if you're in doubt,
Another hint, to close, may help you out;
Then change the scene,—I, in these modern times,
Assistance lend to work the deepest mines.
VI. ENIGMA (1476); by Mr. FREDERICK BURREN DING, Exeter.

Diarns, ye have laboured well, with enigmatic skill,
Nor left a subject new, to stir the muse's mystic quill;
So, if in this extremity a common theme she takes,
Her first appearance mildly judge, nor note the faults she makes,
For common things abound in life, on nature's ample field,
And common things, although despised, a thousand blessings yield.
Long ages that have passed untold, assisted at my birth,
Ere man, creation's paragon, walked monarch of the earth;
He found me near the briny beach where ocean's waters roar, [soar:
And saw me on the "cloud-capped" cliff where screaming sea-birds
I furnished altars where he bowed, and owned th' Eternal Cause,
And kept with sacred reverence the record of His laws,
But as his generations passed and weal or woe befell,
He left me like a silent voice his history to tell.
For sceptred kings, and mitred priests, and serfs who tread the clods,
I furnish palaces and cots, and temples for their gods;
My rude appearance art refines when lofty genius calls,
And into beauty changes me to grace imperial halls.

Behold me now arrayed in richest dyes,
Cradled in gold and watched with anxious care;
Now seen with admiration's glowing eyes,
And to the bosom clasped by ladies fair.
Underneath the summer sky
In a luscious bed I lie,
And the curtains round me seen,
Yellow, crimson, pink, and green.

What strange reverses mark life's chequered state,
From wealth to poverty, from love to hate;
My story now your pity will enforce,
While I relate its sad and cruel course.
Man, armed by science with resistless power,
Steals on my quiet in a fatal hour,
Darts his quick-blasting lightning through my veins,
And so subdues me to his selfish gains.

When prostrate and with upturned face,
I'm lying at his feet,
Humility, that Christian grace,
Protects me not a whit;
For in his pathway, from my place
He spurns me in the street.

Though by a fierce and fiery ordeal riven,
My ashes scattered in the face of heaven;
Yet as the bird of fire eternal springs,
So let me live and mount with lofty things,
On Haytor's hoary head behold me rise,
T'wards summer's fair and winter's stormy skies;
Now tread its rugged steep, the summit gain,
Nor toil to find my mystery in vain.
VII. Enigma (1477); by Miss Helen Ogden, Shaw.

Should novelty be deem'd a treat, may I
For once appear upon the page of Di,
Nor meet your frown, dear ladies, since from me
Arise unnumb'red beauties that you see.
Search Holy Writ, since its inspiring page
Relates how I did woman's thoughts engage:
While mighty Hector on the field of strife
In parting from the partner of his life,
To household duties urged her constant mind,
Nor me forgot in his injunctions kind.
Offspring of art, but whose inventive skill
Me first produc'd my wonted part to fill,
The page of history hath not ventur'd forth
To tell his name, his genus, or his worth.
Perhaps my infant origin might be
Simple and rude to what you now may see,
For in the march of vast improvement, I
Have not escaped man's scrutinising eye.
From time to time his energetic skill
Has modelled me according to his will,
That 'mid competive int'rests I might claim
Distinction, and my useful parts maintain;
But, such my nature, I must here contend
A watchful guardian doth on me attend;
Together bear the burdens of the day,
Where useful toil and industry bear sway.
Together found where hum and ceaseless noise,
Seem bent to keep a constant counterpoise;
Together moving in our humble sphere,
That poverty in comfort may appear;
Together daily we perform our task,
That youth and beauty may in splendour bask:
Such constant services may surely claim
Some secret corner in the niche of fame.
If scenes of lowly life should fail to please,
Or fancy beckon to the realms of ease,
To ease and comfort you may truly say
My powerful aid has onward paved the way.
In crowded courts, where rank and fashion meet,
To pay their homage at a monarch's feet;
Amid the pomp and pageantry of state,
And all the gaudy trappings of the great,
Th' imperial purple, gorgeous to the eye,
The ermin'd mantle with its sanguine dye,
Cannot deny that unto me they owe
The matchless beauty they around may show.
Look not, then, down on me, or with disdain
Regard my complex form or humble name.

Printed for the Company of Stationers.
VIII. Enigma (1478); by Cantab, M.A., formerly of Sevenoaks.
Let foppish coxcombs boast of ancient birth,
We all proceed alike from "mother-earth!"
I, too, could boast, if I were pert and vain,
For I was an old friend of Tubal Cain.
In this bad world, brute force will have its sway,
So—rough and ready—I, too, make my way.
But think not I am always rough and rude—
In noiseless modes I know how to intrude;
I'm long or short,—too often, I am long;
I'm false or true; I'm weak, or I am strong;
At certain intervals I oft appear,
And oft am view'd with diffidence and fear;
Extravagance I bring to light; and sin
Is oft exposed when I my claim put in.
Some say I am a man; some call me "friend;"—
Perhaps they only wish to gain their end;
Believe or not,—you know sweet flatter'y's powers;
Nicknames pervade this naughty world of ours.
But, how am I a man? Why, men don't fly!
I skim the currents of the azure sky;
I rise majestic in the middle air,
I shine, I glisten; I am fine and fair.
But ah! beware of me in anger's hour,
Sharp is my force, and vengeful is my power!
Beware of me in every earthly shape;
If I o'ertake you, how will you escape?
In many forms your senses I may cheat,—
A slip of paper, or an iron sheet.
Beware of me, for I will have my due
From every man and woman,—e'en from you!
In law and lawyers I can take delight;
With them I often make a pretty sight!
Or rather, keenly they delight in me,
And dress me nicely,—to a fine degree!
But now, lest tame or prosy I should seem,
The British Parliament's our noblest theme!
All love and all admire the House of Peers!—
There have I, also, had a seat for years!
Fast by the table often found am I,
When lordlings, gay and rude, come pushing by;
Then contests rise I full oft I hold my own,
But sometimes rudely out of doors am thrown.
But O! the lower House I value most!—
The House of Commons used of me to boast:
There once I held an undivided sway,
But "every dog," 'tis said, must have "his day."
I plainly now present myself to you;
Then, courteous Reader, give me all my due.
IX. Enigma (1479); by the Rev. John Hope, Stapleton.
Diarian nymphs, I'm owned by almost all
The sons of men upon this earthly ball;
I am a blessing by all-gracious Heaven
To men and animated natures given;
No doubt I vary, I'm in some more keen
Than I'm in others, so I've ever been;
Since you possess me, read what here I say,
And give attention to my mystic lay.
Tho' I belong to man, I am more old
Perhaps than he by centuries untold;
Before him many creatures me possest,
Ev'n monsters now extinct with me were blest;
I them enabled nature's face to view,
Their food to gain, and pleasure to pursue:
They had their day, but still I yet remain,
Enjoyment by me ev'ry day you gain;
The sweets of nature come within my field;
The distant mountains are by me revealed;
The starry sky, and hoary Neptune's main,
Do not exceed the limits of my chain;
Yea, I lay open ev'rything around,
In which the source of pleasantness is found.
I sometimes in the dead of night appear;
Alike when tempests rage, and all is clear;
A kind of phantom, oft I seem to glow
With graceful beauty seldom seen below;
My presence an enchanting pleasure yields,
All-glowing as the fair Elysian fields,
A kind of paradise where all around
Is with the fairest flow'rets gaily crowned,
A Peri's dream in which each thing is fine,
Wrought to perfection by a hand Divine:
But, ah! not always cheering to behold,—
At times I damp the boldest of the bold;
I bring to view the bloody fields of war,
O'er which Bellona drives her crimsoned car;
Most horrifying sights in me arise,
Which even fancy scarcely can devise:
Nay, demons, serpents, graves, in me appear,
With many other objects dark and drear!
Yet hear me further,—sacred records say,
A sheet of me once gave a full display;
Also a man urged on by much zeal;
Nay, angels from above, a rolling wheel,
With other strange appearances, you find
Upon the page of Holy Writ designed:
Three letters of each kind my name compose,—
Now further hints the mystic muse foregoes.

Printed for the company of Stationers.
X. Prize Enigma (1480); by Mr. James Hewitt, Hexham.

When terra firma first from chaos rose,
Say, did I then my glories first disclose?
Or dread convulsions of the candent earth
Serve to complete the "story of my birth?"
'Twere vain to say, and useless to inquire,
Or whether born of water, air, or fire.
Some cynic wrote, in cool sarcastic scorn,
"The mountain laboured and a mouse was born;"
But be it known, at my portentous birth
Not mountains travelled, but old "mother earth"
Was racked, and tortured by convulsive thrones,
While towering smoke to Heaven's portals rose,
And quaking, quivering, with motions wild,
The trembling mother owned her mountain child.
So much for birth, Diarists; need I tell
Such esauists learned that 'tis my lot to dwell
Far from the scenes of monetary strife,
Where struggling millions daily toil for life,
Where only pilgrim feet are wont to roam,
Or curious wanderers thread my devious home,—
Go search the Alps, if you'd explore my ways,
The ice-capped Andes, or the Himalays,
Where snow-clad vales and glaciers abound,
And ponderous wreaths frown threatening around,
Or in the deep, dark, dank, and lonesome dell,
Where cataracts dash, or angry rivers swell,
And hideous rocks hang toppling to their fall,
Whose aspect grim the stoutest might appal!—
Or wimping brook pursues its gurgling way,
Or raging torrents rushing into day,—
Impatient of restraint, writhe to be free,
And leave the gorge to solitude and me;
My measures narrow—dubious my route,
And oft 'tis but the skilled can trace me out;
Yet sought in peace, oft seized, and prized in war,—
The key of an impenetrable bar.
The student loves my lineaments to trace,
And scan the furrows of my rugged face;
The weary traveller, grateful for my aid,
Deems in my service all his toils repaid,
Though gold or silver, thanks, are nought to me,
I my assistance lend without a fee.
Yet in these iron times I may be bought,
Or given, but by the privileged only, sought;
Take note of this, when travelling by the train,
The stranger pays, the favoured I sustain.
One closing hint—search Holy Writ, and see
What great events have often come to me.
NEW CHARADES, REBUSES, &c.


Ladies, I'm showy, in appearance bright,
But I'm by many treated with contempt;
Transposed, I'm hushed as is the noon of night,
When men from toil and labour are exempt.
Transposed again, alas! some heedless youth
To do me strong persuasives sometimes lead;
Perhaps he soon repents, but then, in truth,
Fast he is bound, he cannot freedom plead!
Transposed once more, to Neptune we belong,
We are his arms with which he grasps the land;
We are observed the winding shores among,—
By us men large advantages command.

2. Charade; by Miss Mary Smith, Amplesforth.

My first on the shore may be found,
My second you see without end,
My third is the boast of this county,
And esteem'd a rich treat for a friend.
At my whole dwell a happy pair,
Young, handsome, and lovely and fair.

3. Charade; by Cantab, M.A., formerly of Sevenoaks.

He came—the foreign warrior came,—
My second sure was he:
He boasted he was still my first
To all, of high degree!
He came—the Spanish warrior came,—
To set the pris'ners free:
And grandly he pronounc'd my whole
To all of each degree!

4. Charade; by Mr. Thomas Hughes, Chester.

Suppose that a certain young lady and I
Should be caught while enjoying my second sly walk
On the banks of my whole,—though we might not feel shy,
Yet, wouldn't impertinent gossips then talk!

5. Charade; by Mr. James Hewitt, Hexham.

Just take an interjection—
As the Commons say—"divide,"
And place yourself within it,
Rather to the left hand side:
'Twill name a yearly visitor,
As Dia claims to be,
As you, "or any other man,"
May very plainly see.
6. Charade; by Ædipus.

My first is a mythical monarch, I own,
Yet oft met with on classical pages:
My next is a flower, which in autumn's oft shown
By our horticultural sages.
From folly and carelessness springeth my whole,
Which oft brings alarm and dismay to the soul.

7. Charade; by Mr. James Herdson, Edinburgh.

Ladies, if for soft music you've a thirst,
Use, at your instruments, my gentle first;
The painter knows me,—take this passing hint,
I on his canvas add the magic tint.
My next is rough and coarse till smooth'd by art;
Of many fruits, I'm known to form a part.
If, then, my parts you rightly now have guess'd,
My whole will be the trying proof and test.

8. Charade; by Mr. Joseph Hutchinson, near Halifax.

My first is useful for the feet,
My next adorns the head; And with my whole you often meet,
When you retire to bed.

9. Charade; by the Cawkley's Laddie.

My primal very oft has burst,
And of a tribe my next is first; A boon companion and friend;
My third to many aid does lend,
Which is but little after all.

10. Rebus; by Amanda, Greenwich.

Accept this trile from a friend,
Who'll straightway prove it true:
O'er me three vowels you must expend,
Transposed I claim but two;
Yet strange to say no change is seen,
What I am now I've always been.

11. Charade; by Mr. Joseph Furniss, Lois Weeton.

My first is often valued high,
Befitting lord or king,
Yet do the poor but deem it as
A little common thing.
My next is said to be a root
Which bears nor plant nor tree;
I leave to others to decide,
However that may be.
My whole, dear ladies,—that's the rub,—
The muse would sing out gruff,
Were she to ascertain with truth
You didn't have enough.

12. Charade; by Mr. Thos. Wray, Market Weighton.

Belinda thought she'd buy a gown;
Before all points were reckon'd,
My primal stood oppos'd to hope,
And so she tried my second.
Now if Belinda, free from guile,
Possess a noble soul,
Modest, and matronly, and wise,
She doubtless is my whole.
ANSWERS TO THE QUERIES.

I. QUERY; by Mr. J. White, Lozells, Birmingham.

When, and why, was the surname of a female changed at marriage to that of her husband?

Answered by Cantab, M.A., formerly of Sevenoaks.

I cannot give the precise date; but I have found the following interesting allusion to the circumstance in the "learned" Camden's "Remains," of which I have a copy: it is the seventh edition of the work, and bears date 1674. (Camden himself was born, A.D., 1551.) Camden says, when speaking of surnames,—

"Here I might note that women with us, at their marriage, change their surnames, and pass into their husband's names, and justly, for that then 'Non sunt duo, sed caro una':" and yet, in France and the Netherlands, the better sort of women will still retain their own name with their husband's, as, if Mary daughter of Villevill be married to A. Vavill, she will write herself Mary Vavill Villevill. But I fear husbands will not like this note, for that some of their dames may be ambitiously over-pert, and too-too forward to imitate it."

Again, by Mr. James Herdson, Edinburgh.

In the primitive state of society, as soon as men were so far advanced as to find the convenience of having a verbal denotation of the individuals who composed a tribe, the rule was, "one man, one word;" we see this in the ease of uncivilized tribes. In the Hebrew genealogies, which ascend much higher than any which possess the slightest claim to our respect in any other nation, we find a single word, as Abraham, Moses, David, Solomon, the only designation of the persons whom these words call up before us. As nations advanced to refinement, the names of the individuals comprising them became more complex. Hence a new form of personal nomenclature became necessary; of the particular family to which the individual belonged, we call the two, name and surname. When the surname of a female was first changed at marriage to that of her husband is, I presume, as ancient as the law of marriage itself; and the reason why, appears to be a very natural and necessary one, since the common law treats the wife as subject to her husband; it looks upon the husband and wife as one person, having only one mind, or will, which is exercised by the husband, so that a wife cannot sue separately from her husband for injuries done to her or to her property, or be sued alone for debts. Hence a female's surname, at marriage, lapses into that of her husband, her former surname being now no longer necessary to her, either for identification or any legal purpose.

Third Answer, by Mr. Thomas Hattam, Beachy Head Lighthouse.

The custom of changing the surname of a female at marriage is of very ancient date, as may be inferred from Isaiah iv, 1.—"And in that day seven women shall take hold of one man, saying, We will eat our own bread, and wear our own apparel, only let us be called by thy name, to take away our reproach." Commentators assert this to have been about the year A.M. 3244, or B.C. 760 years. The reason why the name was changed the text supplies, viz., "to take away our reproach."

During the past year I have had the happiness of changing a lady's name to that of my own by marriage.

* "They are not two, but one flesh."

PRINTED FOR THE COMPANY OF STATIONERS.
II. Query; by Mr. Thomas Edwards, Lois Weedon.

Is there any word in the English language that will rhyme with the word orange?

Answered by Mr. Thomas Edwards, the Proposer.

If there be any word that will rhyme with orange, I have no doubt but some of Dr's talented correspondents will succeed in tracing it out. For my own part, I have not been able to accomplish the feat to the satisfaction of myself or of competent judges; yet I find, in an article before me, a young lady suggests,—

That any child that can eat porridge,
Could find a word to rhyme with orange.

"Porridge," the young lady says, is the proper form of porridge, and the root from which porringer, still in use for porridge-pot, is derived. Another, it appears, attempts to overcome an additional difficulty in finding a rhyme to both month and orange, as in the following—

"Let mem'ry through the chronicles of war range,
Ascending time's great stream that swiftly runn'th,
Let us recall how William Prince of Orange
Resisted Louis many a weary month."

In the article referred to, I find the word porringer is not in use, and Mr. Pope the elder would consider "war range" as a very bad rhyme to orange. It would therefore appear that a word to rhyme to orange is still to seek.

Again, by Cantab, M.A., formerly of Sevenoaks.

There is no word, I think, in the English Dictionary which will rhyme with the word "orange." This word, in Walker's Dictionary, is pronounced as if written "or'inge."

But I have known some respectable families in Sussex bearing the name of Gorringe. I could easily, therefore, find a rhyme for the word "orange," as in the following distich:—

"Present, my friend! this juicy orange
To our most worthy neighbour Gorringe."

Or, by exerting a little ingenuity, a rhyme might be produced artificially thus (in Hudibrastic verse)—

"Be sure to place an orange, or
A lemon, in the porringer."

III. Query; by the Rev. John Hope, Stapleton.

The word slave only appears twice in our English Bible;—can any reason be assigned why ÿ and σουλας are, with these exceptions, always translated servant? Is there not a marked difference between slave and servant?

Answered by the Rev. John Hope, the Proposer.

In attempting to answer this query, it is necessary to say something respecting slavery. Slavery is very ancient. Originally prisoners taken in war were generally slaughtered; this cruel custom, however, in course of time was laid aside, and prisoners were either enslaved by those who took them, or were sold for slaves to
others; which latter became a profitable speculation, and an incentive to adventurers in warfare. Thus slavery gained a footing in the world. The condition of the slaves of the Greeks and Romans, with slight modifications in particular districts, was that of absolute bondage; they were the living chattels of their owners; they could punish them as they pleased, and sometimes even put them to death without being amenable to any law. Slavery existed in the patriarchal age; Abraham had 318 "home-born" slaves, of course his own indisputable property; and the sons of Jacob sold their brother Joseph for a slave. The descendants of Abraham were made slaves in Egypt. Under the law of Moses the Jews purchased slaves from heathen nations, or enslaved such prisoners as they took in foreign wars. They were not allowed to enslave their own kind longer than six years; in the seventh they were free, or they might be redeemed sooner if they had friends to pay their ransom. Slaves have existed under various conditions at different ages and in different parts of the earth, under the several names of בָּנֹי, δοῦλος, servilia, mancipia, famuli, serfs, villeins, &c. These were generally either the absolute disposable property of their owners, or attached in a certain way to the estates which they cultivated. The slaves under Christian masters have generally been kidnapped from Africa, to labour for the most part in Brazil, the West Indies, or the onee United States of America. In the last-mentioned place there are said to be about four millions. Thanks to Christianity, with a few exceptions, most nations have now abolished slavery. What the effect of the American civil war may be, or the proclamation of President Lincoln, remains yet to be seen.

Thus a slave is a bond-servant, having no power, and generally no property of his own, entirely subject to the will and caprice of his owner; a servant, as we now understand the word, is a freeman, who labours for hire; and who, if he engage himself for certain periods, is free at the expiration of such periods. A slave is bound for life, and receives no wages. The translators of the Bible probably adopted the general name servant to prevent confusion from the frequent recurrence of the word meaning slave or servant; yet I have no doubt this general term sometimes leads the unlearned to wrong conclusions. For instance, when St. Paul saith, "Art thou called being a servant (δοῦλος), care not for it!" in this and many other passages, slave would have been a preferable word. But I am admonished of the limits of the Diary, and must stop.

IV. Query; by Mr. James Herdson, Edinburgh.

It is said that gunpowder, which will readily take fire with a spark, will not fire with the flame of a candle; on the other hand, spirits of wine will flame with a candle, but not with a spark. If true, what is the cause of this difference?

Answered by Mr. Thomas Craggs, West Cramlington.

Gunpowder will fire with the flame of a candle. Three or four years ago, while a miner in this place was making shots in his attic by candle-light, the flame of the candle came in contact with the gunpowder, when the whole exploded, and carried off the roof of his house.

I suppose the reason why spirits of wine will not inflame with a spark is, that a red heat is not sufficient.
Again, by Mr. Thomas Hattam, Beachy Head Lighthouse.

It is not strictly correct that gunpowder will not fire with the flame of a candle; yet by the following experiment gunpowder may be placed in the middle of the flame of a candle without its being ignited. The candle must be first snuffed evenly so as to leave as little of the burnt part of the wick as possible; a small glass tube is then passed through the flame to the top of the wick, through which, on a small piece of tin, pass a grain of gunpowder into the middle of the flame, and there it will remain until the heat of the glass tube explodes it. Spirit is ignited by a candle and not by a spark, because the spirit is carbon, and the flame of the candle oxygen and hydrogen, which have an affinity for the oxygen and hydrogen of the spirit.

V. Query; by Mr. William Steevenson, Derby.

It is inferred that the moon has no atmosphere, from the laws of refraction in connection with her occultation of luminous bodies. Required the reason why the moon should have no atmosphere?

Answered by Mr. William Steevenson, the Proposer.

When different bodies chemically combine to form themselves into a compound mass, if any of the combining bodies be in excess of the chemical or combining equivalents, the excess is thrown off by the generated heat in the gaseous form. Hence we may conclude, that when our earth, the moon, and the heavenly bodies generally, first began to condense into their globular form, gaseous matter in excess of the combining elements would be evolved by the great heat, which must necessarily have been generated by the act of condensation. Heat is obviously a condition, and is induced by the action of calorie on ordinary matter. Gravitation is clearly a condition of heat; the inducing principle being simply difference of temperature: both forces depend the one upon the other, and in a globe or planet are equivalent to each other, and act in opposite directions. It would be extremely improbable to suppose that the different kinds of matter contained in a planetary body should have existed in exact chemical combining proportions when a conglomeration of heterogenous matter was in a state of transition. We may hence reasonably conclude that the moon had an atmosphere when it first began to condense into its present shape.

But when we take into account the low specific gravity of gaseous matter on the moon’s surface, the attractive power that caloric has for all kinds of matter, and the radiating or attractive force which would naturally be induced between the moon and earth by the difference of temperature between them, the conviction presents itself that the moon’s atmosphere would radiate with its combined caloric beyond the centre of gravity between the earth and moon, and thus fall into our own atmosphere. The decomposing electro-magnetic currents induced by difference of temperature between the equatorial and polar regions of our earth, and which are discharged about the polar regions through the atmosphere as seen in the Aurora Borealis, manifest in their radiation into the higher regions of space the very high altitudes gaseous (atmospheric) matter radiates. Similar decomposing electro-magnetic currents, doubtless, exist in the moon.

Oxygen, nitrogen, and carbon are the elements in excess in our atmosphere. The hydrogen (1) very naturally combined with the atom (8) of oxygen, and formed a combining atom (9) of water; and thus formed the water of our globe, and left the excess behind in the gaseous form, as is manifest in our atmosphere. It might be readily shown that vapour on the moon’s surface would be of a
lower temperature than that on the earth's surface, and consequently in the positive electrical state as compared with our atmosphere; and the radiating effect of matter in the two electrical states to combine is well known.

VI. RIDDLE; by the FATHER of the "Fifteen Young Ladies."

Tom crossed, to the fair, a halfpenny ferry;
And company there made Tom too merry.
Tom came back unsteady to Mersey's shore,
Where the last boat was ready in three minutes more.
As he fumbled about in his rags for the fare,
The mystified lout gave a groan of despair:
No money had Tom in the world, I declare,
Nor claim for a copper on mortal there.
But in one minute more, without fraud, without jest,
Tom stood on the shore, of a halfpenny possess'd,
And paying good coin, he crossed o'er with the rest.
Tom begged not, nor borrowed, nor cheated, nor stole;
None lent him, nor gave him aught, credit, nor dole;
That halfpenny he earned not, nor won it, nor found;
Not a halfpenny was paid him by any around;
No traffic had Tom, afloat or on ground,
Nor to creature for counsel or help was he bound.
So find out the funny way Tom got the money.

The Rev. Thomas P. Kirkman, the proposer of this riddle, does not desire to claim the entire credit of its invention, and he requests us to state that it is founded on one that has been long current by some unknown author, the case being so stated that the answer is "Tom had a farthing, and he borrowed a farthing." In the very puzzling form in which the riddle is here given, the answer as communicated by the ingenious proposer is, "Tom found a farthing on the ground, and then being a capitalist (!) he had a right to toss with Jack for a farthing, which Tom won."

The following answers are inserted, although it will be seen that they do not strictly conform to all the conditions of the riddle as enunciated.

Answered by J. NODWONS, Murah.

Tom was a merry lively lad,
And soon strong liquor made him glad,
As any little rover;
When at the ferry he arriv'd,
Found that he had not contriv'd
A halfpenny to get over.
It struck him then, so quick is thought,
Of the new coat he'd lately bought,
By a near relation;
And with neat buttons it was set,
Made of new halfpennies he did get,
As natal commemoration.
So out his knife he quickly took,
And gave to one a gentle hook,
Which soon was in his hand;
Then of all trouble he was bereft,
For without loan, or fraud, or theft,
Tom paid the ferry-man.

Second Answer, by Mr. SKEPTIMUS TEBAY, Risvington.

The last boat was ready, Tom stood on the shore
With just one halfpenny; in one minute more
Tom paid for his passage, with others crossed o'er.
In two minutes after the stupified wight
Stood fumbling and feeling, and mystified, quite
Forgot that his money was paid and all right.
Thus making three minutes in all, and not four,
As 'twould seem from three minutes and one minute more.

PRINTED FOR THE COMPANY OF STATIONERS.
The Lady's and Gentleman's Diary. 1865

Third Answer, by L. S., Ampleforth.

Now Tom, it appears, was a hearty good fellow,
Who at fair, race, or market, was sure to get mellow;
When he cross'd in the morn full of frolic and fun,
He inquired of a dealer the price of a bun.
"A penny for one, but if you take three,"
Says he, "you can have them for two pence ha'penny."
So Tom took the three buns, and threw down half-a-crown,
And in change got a florin, a bit, and a brown.
A fine, well-dress'd boy, looking on at the time,—
With girdle so bright, and a vest superfine,
Says to Tom "I have twopence, and if you'll lend me
The odd brown to make it up twopence ha'penny,
I'll to each of these two poor ragg'd girls give a bun,
And the other I'll take to my mother at home."
So Tom lent him the coin, and delighted was he
To think for a brown he'd pleased all the three;
And he munched up his buns till he came to an inn,
And dispos'd of the bit for a noggin of gin,
He then had another, which soon he made less,
What became of the florin I leave you to guess.
When at tea, to her boy mamma said, "But you must
Know 'tis good to be generous, and right to be just,
Take this, and be sure the good man you repay,
Who lent you the cash in the morn of this day."
So he ran to the beach, and to Tom so forlorn,
Return'd in the eve what he borrowed at morn.
So Tom from that day has eschew'd inebriety,
But he never would join the teetotal society.
He, when he is dry, or the frost nips his chin,
Takes a glass of mild ale, or just one drop of gin;
Resolved for the future, no more to get merry,
And then trust to chance for the pay of the ferry.

I. Query; by the Rev. A. Drysdale, Glasgow.

What is the origin of the word sublime, and wherein consists the sublime as distinguished from the beautiful?

II. Query; by Cantab, M.A., formerly of Sevenoaks.

Is the study of profane learning necessary to the education of a Christian gentleman? or is it at all derogatory to the character of a Christian?

III. Query; by the Rev. John Hope, Stapleton.

How is Genesis ii, 19 to be understood

IV. Query; by the Rev. John Hope, Stapleton.

In several old towns of England the word finkle or fenkle is found as the name of a street or lane,—what is its meaning, or whence derived?

V. Query; by Mr. James Herdson, Edinburgh.

Geology exhibits many fossil specimens of extinct animals: have any fossil specimens of extinct species of plants ever been discovered?

VI. Query; by Mr. William Steevenson, Derby.

Required the rationale why the planets decrease in density the farther they are from the sun?

Printed for the Company of Stationers.
ANSWERS TO THE MATHEMATICAL QUESTIONS
PROPOSED LAST YEAR.

I. QUEST. (2019); by Mr. B. YATES, Bolton.

Determine the sides of triangles in integers, such that the area and perimeter shall be equal.

Solution by Mr. B. YATES, the Proposer; and similarly by Mr. WALTER A. BORRADAILE, Stoke’s Hall, Ham, Surrey.

Let \[ \sin A = \frac{2ab}{a^2 + b^2}, \quad \sin B = \frac{2cd}{c^2 + d^2}; \]

\[ \therefore \cos A = \frac{a^2 - b^2}{a^2 + b^2}, \quad \cos B = \frac{c^2 - d^2}{c^2 + d^2}; \]

\[ \sin C = \sin (A + B) = \frac{2(ac + bd) (ac - bd)}{(a^2 + b^2) (c^2 + d^2)}. \]

Now the sides of the triangle are proportional to \( \sin A, \sin B, \sin C \). Therefore in integers we may take \( ab(c^2 + d^2), cd(a^2 + b^2), (ad + bc)(ac - bd) \), dividing out, if necessary, any common measure they may happen to contain.

\[ \therefore \text{Area} = \frac{1}{2}ab(c^2 + d^2) \quad cd(a^2 + b^2) \sin C \]
\[ = abcd(ad + bc)(ac - bd). \]

Perimeter = \( 2ac(bc + ad) \).

If the assumed sides have a common measure, let this be \( n \);

\[ \frac{2ac(bc + ad)}{n} = \frac{abcd(ad + bc)(ac - bd)}{n^2} \]
\[ \therefore bd(ac - bd) = 2n. \]

Let \( n = 1 \). \[ \therefore bd(ac - bd) = 2. \]

Take \( bd = 2 \), then \( ac = 3 \);

\[ \therefore ac = 3.1, \quad bd = 2.1, \quad \text{the sides} = 5, 12, 13, \text{and area} = 30; \]

\[ ac = 3.1, \quad bd = 1.2, \quad \text{the sides} = 7, 15, 20, \text{and area} = 42. \]

Take \( bd = 1, \quad ac = 3. \)

\[ \therefore ac = 3.1, \quad bd = 1.1, \quad \text{the sides} = 6, 8, 10, \text{and area} = 24. \]
Let \( n = 2 \). \[ \therefore bd(ac - bd) = 4. \]

Take \( bd = 4, \ ac = 5. \)
\[ \therefore ac = 5.1, \ bd = 2.2, \text{the sides} = 0, 25, 29, \text{and area} = 60. \]

Let \( n = 8 \).
\[ \therefore bd(ac - bd) = 16. \]

Take \( bd = 4, \ ac = 8. \)
\[ \therefore ac = 8.1, \ bd = 2.2, \text{the sides} = 9, 10, 17, \text{and area} = 36. \]


Denoting by \( l, m, n \), the segments into which the sides \( a, b, c \) of the triangle are divided at the points of contact of the inscribed circle, we have,
\[ l + m = a; \ l + n = b; \ m + n = c \ldots \ldots \ldots \ldots (1) \]

By the given condition, \( rs = 2s, \therefore r = 2. \)

Also \( rs^2 = s(s-a)(s-b)(s-c) = s.l.m.n, \)
\[ \therefore 4(l + m + n) = l.m.n \ldots \ldots \ldots \ldots (2) \]

The least side must be greater than \( 2r \), or \( 4 \); \therefore we may assume \( a = l + m = 5 \); hence, if \( l = 2 \), and \( m = 3 \), equation (2) gives \( n = 10. \)

By giving the successive values \( 6, 7, 8, \&c. \), to \( a \), and suitable values to \( l \) and \( m \) so as to produce integers, we get for the sets of integral sides required, arranged vertically,
\[
\begin{array}{c|c|c|c|c}
    a & 5 & 6 & 6 & 7 & 9 \\
    b & 12 & 25 & 8 & 15 & 10 \\
    c & 13 & 29 & 10 & 20 & 17 \\
\end{array}
\]

II. QUEST. (2020); by M. Moëbius; communicated by Mr. T. T. Wilkinson, Burnley.

ABCD is a parallelogram; \( (O), (O_1), (O_2) \) circles upon \( AB, BC, \) and the diagonal \( BD \), respectively. Draw \( Be, \) cutting \( (O), (O_1), (O_2) \) in \( a, b, c; \) and prove that \( Ba + Bb = Bc. \)

Answered by Dr. Rutherford, late of the Royal Military Academy, Woolwich.

From \( B \) draw any line at pleasure, and from \( A, C, D \) draw \( Aa, Cb, Dc \) at right angles to it, and draw also \( DH \) perpendicular to \( Aa, \)
or parallel to $Bb_0$. Then $a, b, c$ are the points where the arbitrary line $Bc$ intersects the circles $(O)$, $(O_1), (O_2)$, because $AB, BC$, and $BD$ are the diameters of these circles respectively, and the angles in the several semicircles are right angles. Now the triangles $ADH$ and $BCb$ are equal, since $AD$ is equal and parallel to $BC$, and $AH, HD$ are parallel to $Cb$ and $Bb$; therefore $Bb = DH = ac$ (these lines being in fact the orthographic projections of $BC$ and $AD$), and adding $Ba$ to these equals we have $Ba + Bb = Bc$.

The numerous solutions of other correspondents were the same in substance as the above.

**III. QUEST (2021); by Petrarch.**

The values of $x, y, z$ are rational in the equations

$$yz = a + a_1y + a_2z$$
$$xz = b + b_1z + b_2x$$
$$xy = c + c_1x + c_2y$$

if $ab_1c_2 = bc + a_1b_1c + a_2bc_2$.

*Answered by Mr. William Godward, Chelsea; and Messrs. Brooks, Buttery, "Conic," Hall, Milbourn, Rutherford, and Rutter.*

Eliminating $y$ and $z$ from the given equations we obtain

$$(b_2c_1 - a_1c_1 - a_2b_2 - a) z^2$$
$$+ (bc_1 + b_2c + ab_1 + ac_2 - a_1c - a_2b + a_1b_1c_1 + a_2b_2c_2) x$$
$$+ bc - ab_1c_2 + a_1b_1c + a_2bc_2 = 0.$$ 

If $ab_1c_2 = bc + a_1b_1c + a_2bc_2$, the absolute term of this equation will be zero, and the values of $x, y, z$ evidently rational.

By eliminating $x$ and $z$ from the given equations, we shall find that if $a_1bc = ac + ab_1c + a_2bc$, the values of $x, y, z$ will be rational; and if we eliminate $x$ and $y$ from the three equations, the condition that the roots may be rational will be found to be $b_1c_2 = ab + a_1bc_1 + ab_2c_2$.

The solutions by Mr. T. Somerscales, and Messrs. Barlow, Borradaile, Dale, and Escott, were also similar to the preceding.
General Solution, by Mr. Samuel Bills, of Hawton.

From the last two of the given equations we have

\[ y = \frac{c_1 x + c}{x - c_2} \quad \text{and} \quad z = \frac{b_2 x + b}{x - b_1}; \]

which values being substituted in the first of them we have

\[ \frac{(c_1 x + c)(b_2 x + b)}{(x - c_2)(x - b_1)} = a + \frac{a_1(c_1 x + c)}{x - c_2} + \frac{a_2(b_2 x + b)}{x - b_1}, \]

which reduces to

\[ (A) \]

\[ (a + a_1 c_1 + a_2 b_2 - b_2 c_1) x^2 \]

\[ (A_1) \]

\[ -[a(b_1 + c_2) + a_1 b_1 c_1 + a_2 b_2 c_2 + (b_1 c_1 + b_2 c_2) - (a_1 c_1 + a_2 b_2)] x \]

\[ (A_2) \]

\[ -(bc + a_1 b_1 c + a_2 b_2 c_2 - ab_1 c_2) = 0 \]

In a precisely similar manner we obtain

\[ (B) \]

\[ (b + a_1 b_1 + b_2 c_2 - a_1 c_2) y^2 \]

\[ (B_1) \]

\[ -[b(c_1 + a_2) + a_1 b_1 c_1 + a_2 b_2 c_2 + (ac_2 + a_1 c) - (ab_1 + b_2 c)] y \]

\[ (B_2) \]

\[ -(ac + ab_1 c_1 + a_2 b_2 c_2 - a_2 b_1 c_1) = 0 \]

\[ (C) \]

\[ (c + b_1 c_1 + a_2 c_2 - a_2 b_1) z^2 \]

\[ (C_1) \]

\[ -[c(a_1 + b_2) + a_1 b_1 c_1 + a_2 b_2 c_2 + (ab_1 + a_2 c) - (bc_1 + ac_2)] z \]

\[ (C_2) \]

\[ -(ab + a_1 b_1 c_1 + ab_2 c_2 - a_1 b_2 c) = 0 \]

Now it is obvious that when any one of the quantities \(x, y,\) or \(z\) is rational the others will be so; and it is evident from (1), (2), (3), that this will be the case when any one of the following nine relations obtain amongst the coefficients of the given equations, viz.:

\[
\begin{align*}
A &= 0 & A_2 &= 0 & A_1^2 + 4AA_2 &= 0 \\
B &= 0 & B_2 &= 0 & B_1^2 + 4BB_2 &= 0 \\
C &= 0 & C_2 &= 0 & C_1^2 + 4CC_2 &= 0.
\end{align*}
\]

I may further observe, with respect to the conditions in the last
column, that $x, y, z$ are rational not only when either $A_1^2 + 4AA_2 = 0$, $B_1^2 + 4BB_2 = 0$, or $C_1^2 + 4CC_2 = 0$, but also when any of these three functions is equal to a square number.

The particular relation in the question is $A_2 = 0$.

The solutions by Professor Arendt, Mr. Thomas Dobson, and Mr. Stephen Watson, resembled the preceding.

IV. QUEST. (2022); by Mr. Thomas Dobson, B.A., Hexham.

If $a, b, c$ be the sides, and $r_1, r_2, r_3$ the escribed radii of any plane triangle, prove that

$$\left( \frac{a}{r_1} + \frac{b}{r_2} + \frac{c}{r_3} \right) \left( \frac{a + b + c}{r_1 + r_2 + r_3} \right) = 4.$$

Answered by Mr. Thomas Dobson, the Proposer.

Equating well-known expressions for the area of the triangle,

$$rs = r_1(s - a) = r_2(s - b) = r_3(s - c);$$

hence, $r_1r_2(s - a)(s - b) = r_2s^2 = s(s - a)(s - b)(s - c);$ 

$$\therefore r_1r_2 = s(s - c); \quad r_1r_3 = s(s - b), \text{ and } r_2r_3 = s(s - a);$$

$$\therefore r_1(r_2 + r_3) = s(2s - b - c) = sa.$$

Similarly, $r_2(r_1 + r_3) = sb$, and $r_3(r_1 + r_2) = sc.$

$$\therefore \frac{a}{r_1} + \frac{b}{r_2} + \frac{c}{r_3} = \frac{4(r_1 + r_2 + r_3)}{2s}$$

or, $$\left( \frac{a}{r_1} + \frac{b}{r_2} + \frac{c}{r_3} \right) \left( \frac{a + b + c}{r_1 + r_2 + r_3} \right) = 4.$$

It was nearly thus answered by Messrs. Arendt, Barlow, Bills, Borradaile, Brooks, “Conic,” Coutts, Eastman, Escott, Godward, Hall, Lester, Somerscales, Turnbull, and Watson.


By ‘Diary,’ 1848, p. 84,

$$sa = r_1(r_2 + r_3),$$
$$sb = r_2(r_1 + r_3),$$
$$sc = r_3(r_1 + r_2);$$

$$\therefore \frac{a}{r_1} + \frac{b}{r_2} + \frac{c}{r_3} = \frac{2(r_1 + r_2 + r_3)}{s} = \frac{4(r_1 + r_2 + r_3)}{a + b + c}$$

$$\therefore \left( \frac{a}{r_1} + \frac{b}{r_2} + \frac{c}{r_3} \right) \left( \frac{a + b + c}{r_1 + r_2 + r_3} \right) = 4.$$
V. QUEST. (2023); by Mr. Septimus Tebay, Rivington.

A beam (length $2a$) is supported in a horizontal position by three persons; A, B at its extremities, and C at a distance $b$ from the middle of the beam towards A. First A and C support equal weights ($P$), and then B and C support equal weights ($Q$). Show that

$$\frac{P}{Q} = \frac{3a - b}{3a + b}.$$

Solution by "Conic," of St. John's College, Cambridge; Mr. Chas. F. Coutts, Dr. Rutherford, and Messrs. Escott, Milburn, Rutter, Somerscales, and Watson.

Let $W$ be the weight of the beam. First, A and C support equal weights $P$; therefore, taking moments about B,

$$W \cdot a = P \cdot 2a + P \cdot (a + b) = P(3a + b).$$

Secondly, B and C support equal weights $Q$; therefore, taking moments about A,

$$W \cdot a = Q \cdot 2a + Q(a - b) = Q(3a - b),$$

$$\therefore P(3a + b) = Q(3a - b)$$

or,

$$\frac{P}{Q} = \frac{3a - b}{3a + b}.$$

Again, by Mr. William Godward, Chelsea.

Let $W$ be the weight of the beam; then if A and C each support a weight $P$, B will support a weight $W - 2P$; and if B and C each support a weight $Q$, A will support a weight $W - 2Q$. Hence taking the moments in each case, about the centre of the beam, we have

$$P(a + b) = (W - 2P)a,$$

$$Qb + (W - 2Q)a = Qa.$$

Eliminating $W$ from these two equations, there results

$$\frac{P}{Q} = \frac{3a - b}{3a + b}.$$

It was also thus answered by Prof. Arendt, and Messrs. Atkinson, Barlow, Bills, Borradaile, Brooks, Buttery, Dale, Dobson, Eastman, and Hall.
VI. QUEST. (2024); by Mr. C. H. Brooks, C.E., Port Louis, Mauritius.

The base being given, find the locus of the vertex of a spherical triangle of constant area.

Answered by Mr. Thomas Dobson, Hesham; Dr. Rutherford, Mr. John Buttery, Mr. Albert Escott, and Mr. Stephen Watson.

The area being given, the sum $A + B + C$ of the angles is known. On a great circle BCDE take an arc BC equal to the given base; make $\angle CDO = \frac{1}{2}(A + B + C) = \angle BEO$; with O as pole, and OD or OE as spherical radius describe a small circle; and through any point A of this circle draw the great circles DAB, EAC. Then the spherical triangle ABC shall have the given area; and therefore the small circle EAD is the locus of the vertex A.

For, $\angle BAC = \angle EAD = \angle EAO + \angle DAO = \angle AEO + \angle ADO$;
and $\angle ACB = \angle AEB$, $\angle ABC = \angle ADC$;

$\therefore \angle ABC + \angle ACB + \angle BAC = \angle BEO + \angle CDO = A + B + C$, by construction;

and BC is the given base.

Another Solution, by Dr. Rutherford.

Let A be the vertex, and BC the base of the spherical triangle ABC; then in the polar triangle $A'B'C'$ we have given the angle $A'$, and the sum of the sides. Produce the sides $A'B'$, $A'C'$ to meet in D, and in the triangle DB'C' inscribe the circle PQR; then since $A'P = A'Q$, $B'P = B'R$, $C'Q = C'R$, it is obvious that $A'P$ and $A'Q$ are each equal to the semi-perimeter of the polar triangle $A'B'C'$, and the positions of the points of contact P and Q are therefore given; consequently the less circle PQR is given in position and magnitude, and as the base $B'C'$ of the polar triangle in its various positions always touches the fixed and given circle PQR, this circle is the envelope of the base $B'C'$ of the polar triangle. Hence, it follows, by the
principle of spherical reciprocity that the locus of the vertex A of the spherical triangle ABC is a less circle of the sphere equal and opposite to the circle PQR.

Again, by Mr. William Godward, Chelsea.

If the base and area of a spherical triangle are given, the locus of the vertex is a small circle of the sphere. Legendre gives a solution of this property in his 'Geometry' (Brewster's 'Translation,' p. 260), and adds that this beautiful theorem is due to Lexell. The late Mr. John Lowry, at p. 154, vol. i, Leybourn's 'Mathematical Repository,' and Mulcaby, at p. 147, of his 'Modern Geometry,' have treated the problem geometrically. Analytical solutions are given in Hymer's and Todhunter's 'Spherical Trigonometries,' and in vol. xii of the 'Edinburgh Transactions,' by the late Mr. T. S. Davies.

Mr. Woolhouse, under the signature "β," has shown in the 'Gentleman's Diary' for 1836, that the angle which the locus makes with the base is equal to half the spherical excess.

The solutions here referred to are all excellent, and do not appear to admit of any material improvement.

Good analytical solutions were also given by Prof. Arendt, and Messrs. Brooks, "Conic," Dale, Eastwood, Eastman, Grey, Hall, Milbourn, and Rutter.

VII. QUEST. (2025); by Geometricus, Chelsea.

Let the magnitudes of three spheres placed at the three angles of a plane triangle be proportional to \(a(\omega - \alpha)^2\), \(b(\omega - \beta)^2\), \(c(\omega - \gamma)^2\), then, whatever be the value of \(\omega\), the locus of their common centre of gravity will be a conic inscribed in the triangle. (See 'Earnshaw's Statics,' page 284, quest. 34).

Solution by Mr. Wm. Godward, Chelsea; and Dr. Rutherford.

Let \(A, B, C\) be the centres of the three spheres whose weights are proportional to \(a(\omega - \alpha)^2\), \(b(\omega - \beta)^2\), \(c(\omega - \gamma)^2\), and put

\[ p = \frac{b(\omega - \beta)^2}{a(\omega - \alpha)^2} \quad \text{and} \quad q = \frac{c(\omega - \gamma)^2}{a(\omega - \alpha)^2} \]

Eliminating \(\omega\) from these, we obtain:

\[(\alpha - \beta) \left(\frac{qa}{c}\right)^2 + (\beta - \gamma) + (\gamma - \alpha) \left(\frac{a}{b}\right)^2 = 0 \quad \text{..........................} \quad (1)\]

Now if a weight represented by unity be placed at \(A\), another by \(p\) at \(B\), and a third by \(q\) at \(C\), they will evidently be proportional to the proposed weights of the three spheres at the said angles. Hence taking \(AB, AC\) as axes, the coordinates of their common centre of gravity are
\[ x = \frac{pc}{1 + p + q} \quad \text{and} \quad y = \frac{qb}{1 + p + q}; \]

from which we deduce

\[ p = \frac{bx}{bc - bx - cy} \quad \text{and} \quad q = \frac{cy}{bc - bx - cy}. \]

Substituting these values of \( p \) and \( q \) in (1), we have

\[(a - \beta)(ay)^\frac{1}{2} + (\beta - \gamma)(bc - bx - cy)^\frac{1}{2} + (\gamma - a)(ax)^\frac{1}{2} = 0,
\]

for the \textit{locus}, which is evidently a \textit{conic}, and is inscribed in the triangle \( ABC \), since each of the sides \( x = 0, y = 0, \) and \( x + y - 1 = 0 \), touches it only in one point.

Mr. Godward afterwards adds the following:

\textit{Cor.} Let \( x_1, y_1 \) be the coordinates of the centre and \( r \) the radius of the inscribed circle, then

\[ r = \frac{2bc \sin A}{a + b + c}. \]

Hence \( x_1 = y_1 = \frac{r}{\sin A} \)

\[ = \frac{2bc}{a + b + c}, \]

which satisfy the equation to the conic and show that it passes through the centre of the inscribed circle, a neat property, which was suggested to me by my old and valued friend the Editor.

\textit{Again, by "Conic," of St. John's College, Cambridge; and in like manner by Messrs. Brooks, Buttery, Dale, Dobson, Escott, Hall, Milbourn and Watson.}

Let \( xyz \) be the trilinear coordinates of the centre of gravity of the spheres, and let \( A, B, C \) denote their masses. Then since \( A \) and \( B \) may be collected at the point in \( AB \) given by \( ax : by = A : B \); and similarly with each pair of spheres, the coordinates of the common centre of gravity are given by

\[ \frac{ax}{A} = \frac{by}{B} = \frac{cz}{C}; \]

\[ \frac{x}{(\omega - \alpha)^2} = \frac{y}{(\omega - \beta)^2} = \frac{z}{(\omega - \gamma)^2}; \]

or \[ \frac{\sqrt{x}}{\omega - \alpha} = \frac{\sqrt{y}}{\omega - \beta} = \frac{\sqrt{z}}{\omega - \gamma}; \]

or \[ \frac{\sqrt{x} - \sqrt{y}}{\alpha - \beta} = \frac{\sqrt{y} - \sqrt{z}}{\beta - \gamma}; \]

\textit{Printed for the Company of Stationers.}
\[ \sqrt{x(y - \gamma)} + \sqrt{y(z - \alpha)} + \sqrt{z(x - \beta)} = 0, \]

the equation to a conic inscribed in the given triangle.

[Note.—The trilinear equation here found clearly shows that the inscribed conic passes through the centre of the inscribed circle, for which \( x = y = z \).—

EDITOR.]

VIII. QUEST. (2026) ; by “CONFOCAL CONIC,” of St. John’s College, Cambridge.

The diameter parallel to the tangent at \( P \), any point on a given conic, intersects in \( E \) the tangent drawn through \( P \) to a given interior confocal conic. Prove geometrically that \( PE \) is constant.

Answered by “CONIC,” of St. John’s College, Cambridge; and “CONFOCAL CONIC,” the Proposer.

Let \( CA, CB \) denote the semi-axes of the interior; \( Ca, C\beta \), those of the exterior conic.

Let \( SP, S'P \) meet the diameter \( CAE \) in \( H, H' \); then \( EF \) by a well-known properties geometrically proved in Taylor’s ‘Conics’ and elsewhere, \( PE, PE' \) are equally inclined to \( EE' \), as also are \( PH, PH' \); and \( PH = PH' = Ca \).

Draw \( Ee \) perpendicular to \( PH \), and complete the figure with the usual notation.

Then by similar triangles,

\[
\begin{align*}
PE : Ee &= PS : Sy \\
Ee : EH &= PF : PH \\
\therefore PE : EH &= PS,PF : Sy,PH \\
\therefore PE^2 : EH.EH' &= PS,PS',PF^2 : Sy,S'y',PH^2 \\
PE^2 : EF^2 - PH^2 &= Ca^2,C\beta^2 : CB^2,Ca^2 \\
or PE^2 : PE^2 - PH^2 &= C\beta^2 : CB^2 \\
\text{and } PE^2 : Ca^2 &= C\beta^2 : C\beta^2 - CB^2 \\
\therefore PE \text{ is constant } &= \frac{Ca.C\beta}{\sqrt{(C\beta^2 - CB^2)}}.
\end{align*}
\]

A like solution was given by Mr. James Dale, of Aberdeen.
Second Solution, by Mr. William Godward, Chelsea; and in like manner by Messrs. Brooks, Dobson, and Watson.

Let CA, CB (a, b) and CA₁, CB₁ (a₁, b₁) be the principal semi-axes of two confocal conics, and let PQ, a tangent to the interior conic, meet CE, a parallel to the tangent at P, in E. Then the equations to the conics APB, A₁QB₁, are

\[ \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad \text{(1)}, \]

\[ \frac{x^2}{a₁^2} + \frac{y^2}{b₁^2} = 1 \quad \text{(2)}, \]

subject, since the conics are confocal, to the condition

\[ a^2 - a₁^2 = b^2 - b₁^2 \quad \text{(3)}. \]

Let \( m \) be the tangent of the angle which PQ makes with CA; then the equation to the tangent PQ (Todhunter’s ‘Conics,’ art. 171) is

\[ y = mx + \sqrt{(a^2 m^2 + b^2)} \quad \text{(4)}. \]

If \( x₁, y₁ \) be the coordinates of P, we shall find from (1), (3), (4), and making \( (1 + m^2)(a^2 - a₁^2) = c^2 \), that

\[ x₁ = \frac{a}{a^2 m^2 + b^2} \{ -am \sqrt{(a^2 m^2 + b^2)} \pm bc \}, \]

and \[ y₁ = \frac{b}{a^2 m^2 + b^2} \{ b \sqrt{(a^2 m^2 + b^2)} \pm amc \}, \]

and thence the equation to the tangent PR

\[ a \{ b \sqrt{(a^2 m^2 + b^2)} \pm amc \} y + b \{ -am \sqrt{(a^2 m^2 + b^2)} \pm bc \} x = ab(a^2 m^2 + b^2) \quad \text{(5)}, \]

the upper signs appertaining to the unaccented and the lower to the accented letters in the diagram.

Draw CR parallel to PQ meeting the tangent PR in R; then the equation to CR is \( y = mx \ldots \) (6). Let the coordinates of R be \( x₂, y₂ \), then from (5) and (6) we obtain

\[ x₂ = \frac{ab}{c} ; \quad \text{and} \quad y₂ = \frac{mab}{c} ; \]

\[ \therefore \quad PE = CR = \sqrt{(x₂^2 + y₂^2)} = \frac{ab \sqrt{(1 + m^2)}}{c} = \frac{ab}{\sqrt{(a^2 - a₁^2)}}. \]

The question hence admits of the following neat enunciation:

If from any point P in the exterior of two confocal conics two tangents be drawn, one PR to the exterior and the other PQ to the
interior conic, also CR from the centre C parallel to PQ and meeting PR in R, the locus of R is a given circle concentric with the two conics.

IX. QUEST. (2027); by Mr. Thomas Dobson,Hexham.

From the middle point of each side of a quadrilateral in a circle a perpendicular is drawn to the opposite side, and from the middle point of each diagonal to the other diagonal. Prove that the six perpendiculars pass through one point.

Solution by Mr. Thomas Dobson, the Proposer.

From the centre Q of the circumscribing circle draw perpendiculars QA, QB, QC, QD, on the sides DA, AB, BC, CD; and perpendiculars QE, QF, on the diagonals AC, DB, of the quadrilateral. The lines ab, cd are parallel to BD; and ad, bc to AC; therefore the diagonals ac, bd of the parallelogram abcd bisect each other in a point O.

Let the perpendiculars from a and c on the opposite sides meet in P. Then aQcP is a parallelogram of which aOc is one diagonal, and therefore PQ passes through and is bisected in O.

Join Pb, Pd. Because PQ, and bd are bisected in O, bQdp is a parallelogram; therefore dP is perpendicular to CD, and dP to AB.

Join Pf, Pe. Since df and be are parallel to BC, and each equal to half BC, bdef is a parallelogram, and Pf is parallel to Qe, and therefore perpendicular to AC. Also Pe is parallel to Qf, and therefore perpendicular to BD. Hence all the perpendiculars pass through the point P.

Cor. Let PA, PB, PC, PD be drawn; then, O being the centre of gravity of the quadrilateral, and P, Q being equidistant from this point,

\[ PA^2 + PB^2 + PC^2 + PD^2 = QA^2 + QB^2 + QC^2 + QD^2 \]

\[ = 4QA^2 = (\text{diameter of circle})^2. \]

Similar demonstrations were given by Messrs. Atkinson, Buttery, Dale, Milbourn, Rutherford, Somerscales and Watson.

Second Solution, by "Conic."

Let the centre of the circle be the origin, and let its radius be unity.

PRINTED FOR THE COMPANY OF STATIONERS.
Let the four angular points of the quadrilateral have for their coordinates the values

\[(\cos \alpha_1, \sin \alpha_1), (\cos \alpha_2, \sin \alpha_2), (\cos \alpha_3, \sin \alpha_3), (\cos \alpha_4, \sin \alpha_4)\];

then the middle point of the line joining the first two is given by

\[x = \frac{\cos \alpha_1 + \cos \alpha_2}{2}, \quad y = \frac{\sin \alpha_1 + \sin \alpha_2}{2};\]

and therefore the equation to the perpendicular from this point on the line joining the other two, is

\[\left( x - \frac{\cos \alpha_1 + \cos \alpha_2}{2} \right) (\cos \alpha_3 - \cos \alpha_4) + \left( y - \frac{\sin \alpha_1 + \sin \alpha_2}{2} \right) (\sin \alpha_3 - \sin \alpha_4) = 0.\]

Now if we substitute in this equation the values

\[x = \frac{\cos \alpha_1 + \cos \alpha_2 + \cos \alpha_3 + \cos \alpha_4}{2},\]

\[y = \frac{\sin \alpha_1 + \sin \alpha_2 + \sin \alpha_3 + \sin \alpha_4}{2}\]

it reduces to the identity

\[\frac{\cos^2 \alpha_3 - \cos^2 \alpha_4}{2} + \frac{\sin^2 \alpha_3 - \sin^2 \alpha_4}{2} = 0.\]

Hence the line passes through the point given by \((\alpha)\). But the values \((\alpha)\) are symmetrical with respect to \(\alpha_1, \alpha_2, \alpha_3, \alpha_4\); therefore the perpendicular from the middle point between any two of the given points, upon the line joining the other two passes through the point given by \((\alpha)\). That is, all the lines intersect in \((\alpha)\).

**General Solution, by Mr. A. Hall, Goshen, Connecticut, United States.**

Let ABCD be any quadrilateral; the rectangular coordinates of the points ABCD being respectively \(x_1y_1, x_2y_2, x_3y_3, x_4y_4\). The equations of the perpendiculars drawn as required through the middle points of the sides and diagonals, will be as follows:

\[2(y_4 - y_3) y + 2(x_4 - x_3) x - (y_4y_4 + y_2y_4 - y_1y_2 - y_2y_3) - (x_1x_4 + x_2x_4 - x_1x_3 - x_2x_3) = 0\]  \(\ldots\) \((1)\)

\[2(y_1 - y_4) y + 2(x_1 - x_4) x - (y_1y_1 + y_3y_1 - y_2y_1 - y_3y_4) - (x_1x_2 + x_2x_1 - x_2x_4 - x_3x_4) = 0\]  \(\ldots\) \((2)\)

\[2(y_2 - y_1) y + 2(x_2 - x_1) x - (y_3y_1 + y_2y_1 - y_1y_3 - y_3y_1) - (x_2x_3 + x_3x_2 - x_3x_1 - x_3x_4) = 0\]  \(\ldots\) \((3)\)

\[2(y_3 - y_2) y + 2(x_3 - x_2) x - (y_3y_3 + y_4y_3 - y_1y_3 - y_3y_4) - (x_1x_3 + x_3x_1 - x_1x_4 - x_3x_4) = 0\]  \(\ldots\) \((4)\)
\[2(y_4 - y_2) y + 2(x_4 - x_2) x - (y_1 y_3 + y_3 y_4 - y_1 y_2 - y_2 y_4)
- (x_1 x_4 + x_3 x_2 - x_1 x_3 - x_3 x_2) = 0 \ldots (5)\]
\[2(y_3 - y_1) y + 2(x_3 - x_1) x - (y_2 y_3 + y_3 y_4 - y_1 y_2 - y_1 y_4)
- (x_2 x_3 + x_3 x_4 - x_1 x_2 - x_1 x_4) = 0 \ldots (6).\]

From these equations we see that in general the six perpendiculars meet three and three in four points. The groups of lines meeting in a point are \((1), (2), (6) : (2), (3), (5) : (1), (4), (5) : (3), (4), (6)\); since in each case the sum of these equations is identically zero. We now seek the condition that all the six perpendiculars may meet in a point; or that \((3)\) may pass through the intersection of \((1)\) and \((2)\). After proper reduction the equation of condition is found to be
\[
(x_1^2 + y_1^2) (x_2 y_3 - x_3 y_2 + x_3 y_4 - x_2 y_4) + (x_2^2 + y_2^2) (x_3 y_1 - x_1 y_3 + x_1 y_4 - x_3 y_4) + (x_3^2 + y_3^2) (x_1 y_2 + x_2 y_1 - x_2 y_3 - x_1 y_4) + (x_1^2 + y_1^2) (x_2 y_1 + x_1 y_2 - x_3 y_3 - x_2 y_4) = 0.
\]

This general and symmetrical equation of condition is satisfied if we assume \(x_1^2 + y_1^2 = x_2^2 + y_2^2 = x_3^2 + y_3^2 = a^2\); since it then becomes divisible by \(a^2\), and the remaining terms destroy each other. Therefore if the points \(A, B, C, D\) are on the circumference of a circle the six perpendiculars meet in a point.

Other analytical solutions were given by Messrs. Barlow, Borrowdale, Brooks, Escott, Godward, and Turnbull.

X. QUEST. (2028) ; by Mr. W. H. Levy, Shalbourne.

Let \(AD, BE, CF\) be the perpendiculars, and \(AG, BH, CI\) the bisectors of the angles of a triangle \(ABC\). Draw \(GG_2, HH_2, HH_3, II_3, H_1, I_1\), the perpendiculars from \(G, H, I\) upon \(AB, AC, BC\). Then prove the convergence of each of the triads of straight lines \(AB, DE, I_1 I_2; AC, DF, H_1 H_2;\) and \(BC, EF, G_1 G_2\).

Solution, by Mr. Thomas Dobson, Hexham ; Mr. Levy, the Proposer; and Messrs. Dale, Milbourne, Rutherford, and Watson.

Let the bisector \(BH\) of the angle \(B\) cut \(H_1 H_2\) in \(K\) and \(DF\) in \(L\), and join \(H_1 L, H_2 L\). The right-angled triangles \(BH H_1, BH H_2\) are identically equal; therefore \(H_1 H_2\) is perpendicular to \(BH\), and \(H_1 K = H_2 K\).

By Euclid vi, 2 and 3,
\[
\begin{align*}
\frac{AH_2}{FH_2} &= \frac{AH}{CH} = \frac{AB}{BC} = \frac{BD}{DF} = \frac{DL}{FL};
\end{align*}
\]
therefore \(LH_2\) is parallel to \(AD\) and \(HH_2\); and the equiangular triangles \(HH_1, LKH_2\) are identically equal; hence \(H_1 H_2 L\) is a rhombus, and \(KH = KL\).

PRINTED FOR THE COMPANY OF STATIONERS.
The triangles CHB, FLB are equiangular, and \( \angle AHB = C + \frac{1}{2}B \) = \( \angle FLH \); therefore \( KH_1 \) is a portion of the perpendicular, and HA, LF portions of the equal sides of an isosceles triangle HPL. Hence \( CA_1, H_1, H_2 \) and DF converge to a point P. Similarly may be established the convergency of the other triads.

Cor. Draw BM perpendicular to DF. Then \( 2 \angle EBH = A - C \) = \( 2 \angle LBM = 2 \angle KPL \).
Therefore the points E, K, M lie in a circle on the diameter BP.

Analytical Solution, by Mr. Thomas Dobson; and similarly by Messrs. Barlow, Borradaile, Brooks, Butter, Escott, Godward, and Hall.

If \( \alpha\beta\gamma \) be the trilinear coordinates of a point referred to the triangle \( ABC \), the equation to DE is easily found to be

\[
\alpha \cos A + \beta \cos B - \gamma \cos C = 0 \quad \ldots \ldots \ldots (1)
\]

Let the equation to \( I_1I_2 \) be \( l\alpha + m\beta + n\gamma = 0 \).
Since CI bisects the \( \angle C \),

\[(a + b) CI_1 = (a + b) CI_2 = 2rs.\]

At \( I_1 \), \( x = 0, \beta = II_1 (1 + \cos C), \gamma = II_1 \cos B; \)

\[\therefore \quad \frac{m}{n} = -\frac{\gamma}{\beta} = \frac{-\cos B}{1 + \cos C}.\]

At \( I_2 \), \( \beta = 0, \quad \frac{l}{n} = -\frac{\gamma}{\alpha} = \frac{-\cos A}{1 + \cos C}.\)

Therefore the equation to \( I_1I_2 \) is

\[
\alpha \cos A + \beta \cos B - \gamma \cos C - \gamma = 0 \quad \ldots \ldots \ldots (2)
\]

Combining equations (1) and (2) we have, \( \gamma = 0 \), the equation to AB. Therefore DE and \( I_1I_2 \) meet in a point in AB.
Similarly the convergency of the other triads may be shown.

XI. QUEST. (2020); by Mr. William Godward, Chelsea.

If \( \alpha\beta\gamma \) and \( \alpha\beta\gamma_1 \) be the trilinear coordinates of the points of intersection of the lines joining the vertices of a triangle with the points of contact of the inscribed and of the escribed circles respectively, then

\[
\frac{1}{\sqrt{\alpha a_1}} + \frac{1}{\sqrt{\beta b_1}} + \frac{1}{\sqrt{\gamma c_1}} = \frac{r_1 + r_2 + r_3}{r_s}.\]

PRINTED FOR THE COMPANY OF STATIONERS.
Solution, by Mr. William Godward, the Proposer.

Let D, E, F and G, H, K be the points of contact of the inscribed and escribed circles with the sides of the triangle ABC; then since

\[ AE = AF = BK = CH = s - a = s_1, \]
\[ BF = BD = CG = AK = s - b = s_2, \]
\[ CD = CE = AH = BG = s - c = s_3, \]

we have the coordinates of

\[ A \ldots p_1, 0, 0 \]
\[ B \ldots 0, p_2, 0 \]
\[ C \ldots 0, 0, p_3 \]
\[ D \ldots 0, s_3 \sin C, s_2 \sin B \]
\[ E \ldots s_3 \sin C, 0, s_1 \sin A \]
\[ F \ldots s_2 \sin B, s_1 \sin A, 0 \]
\[ G \ldots 0, s_3 \sin C, s_3 \sin B \]
\[ H \ldots s_1 \sin C, 0, s_3 \sin A \]
\[ K \ldots s_1 \sin B, s_3 \sin A, 0 \]

From these coordinates we readily find the equations of the following lines, viz.: 

\[ AD \ldots bs_2 \beta - cs_3 \gamma = 0 \ldots (1) \]
\[ BE \ldots as_1 \alpha - cs_3 \gamma = 0 \ldots (2) \]
\[ CF \ldots as_1 \alpha - bs_2 \beta = 0 \ldots (3) \]
\[ AG \ldots \frac{s_3}{c} \beta - \frac{s_2}{b} \gamma = 0 \ldots (4) \]
\[ BH \ldots \frac{s_3}{c} \alpha - \frac{s_1}{a} \gamma = 0 \ldots (5) \]
\[ CK \ldots \frac{s_2}{b} \alpha - \frac{s_1}{a} \beta = 0 \ldots (6) \]

As any one of the equations (1), (2), (3) may be derived from the other two; and similarly as to (4), (5), (6), it follows that each of the triads (AD, BE, CF), (AG, BH, CK) intersects in a point.

Again, any two of the equations (1), (2), (3) together with the fundamental relation

\[ a \alpha + b \beta + c \gamma = 2 \Delta \]

give, for the point P,

\[ a = \frac{p_1 s_2 s_3}{s_1 s_2 + s_2 s_3 + s_3 s_1}, \quad \beta = \frac{p_2 s_3 s_1}{s_1 s_2 + s_2 s_3 + s_3 s_1}, \quad \gamma = \frac{p_3 s_1 s_2}{s_1 s_2 + s_2 s_3 + s_3 s_1} \]

Also any two of the equations (4), (5), (6) with (7), give, for the point Q,

\[ a_1 = \frac{p_1 s_1}{s}, \quad \beta_1 = \frac{p_2 s_2}{s}, \quad \gamma_1 = \frac{p_3 s_3}{s} \]

Printed for the Company of Stationers.
Or, in the terms of the radii,

\[ a = \frac{p_1 r_1}{r_1 + r_2 + r_3}, \quad \beta = \frac{p_2 r_2}{r_1 + r_2 + r_3}, \quad \gamma = \frac{p_3 r_3}{r_1 + r_2 + r_3} \]

\[ a_1 = \frac{p_1 r}{r_1}, \quad \beta_1 = \frac{p_2 r}{r_2}, \quad \gamma_1 = \frac{p_3 r}{r_3} \]

\[ \frac{1}{\alpha a_1} = \frac{1}{p_1^2} \left( \frac{r_1 + r_2 + r_3}{r} \right), \quad \frac{1}{\beta \beta_1} = \frac{1}{p_2^2} \left( \frac{r_1 + r_2 + r_3}{r} \right), \]

\[ \frac{1}{\gamma \gamma_1} = \frac{1}{p_3^2} \left( \frac{r_1 + r_2 + r_3}{r} \right) \]

\[ \frac{1}{\sqrt{\alpha a_1}} + \frac{1}{\sqrt{\beta \beta_1}} + \frac{1}{\sqrt{\gamma \gamma_1}} = \left( \frac{1}{p_1} + \frac{1}{p_2} + \frac{1}{p_3} \right) \sqrt{\frac{r_1 + r_2 + r_3}{r}} \]

Similar investigations were given by Messrs. Brooks, Buttery, Hall, Rutherford, Turnbull, and Watson.

Again, by "Conic;" and in like manner by Messrs. Dale, Dobson, Escott, and Milbourn.

The two points are evidently given by

\[ \frac{aa}{s-a} = \frac{b\beta}{s-b} = \frac{c\gamma}{s-c} = \frac{2\Delta}{s} \]

\[ aa_1(s-a) = b\beta_1(s-b) = c\gamma_1(s-c) = \frac{2\Delta}{s-a} + \frac{1}{s-b} + \frac{1}{s-c} \]

\[ \therefore a\sqrt{\alpha a_1} = b\sqrt{\beta \beta_1} = c\sqrt{\gamma \gamma_1} = \frac{2\Delta}{\sqrt{s-a} + \sqrt{s-b} + \sqrt{s-c}} \]

also \[ \frac{s}{s-a} + \frac{s}{s-b} + \frac{s}{s-c} = \frac{r_1}{r} + \frac{r_2}{r} + \frac{r_3}{r} \]

and \[ 2\Delta = (a + b + c)r ; \]

\[ \therefore \frac{1}{a\sqrt{\alpha a_1}} = \frac{1}{b\sqrt{\beta \beta_1}} = \frac{1}{c\sqrt{\gamma \gamma_1}} = \frac{1}{a + b + c} \sqrt{\frac{r_1 + r_2 + r_3}{r^3}} \]

and \[ \frac{1}{\sqrt{\alpha a_1}} + \frac{1}{\sqrt{\beta \beta_1}} + \frac{1}{\sqrt{\gamma \gamma_1}} = \sqrt{\frac{r_1 + r_2 + r_3}{r^3}} \]
XII. QUEST. (2030); by Mr. STEPHEN FENWICK, of the Royal Military Academy, Woolwich.

A parallelepiped, the edges of which are $a$, $b$, $c$ is just sustained with its face $be$ on a rough inclined plane, slightly covered by mortar, by a force $p_1$, making a given angle with the plane. Assuming that the tangential force of resistance between the surfaces in contact, consists of two parts, the one proportional to the pressure (statical friction), and the other proportional to the surface in contact (cohesion), show that:

$$a(b - c)p_1 + b(c - a)p_2 + c(a - b)p_3 = 0,$$

$p_2$, $p_3$, being the corresponding forces to $p_1$, when the faces $ac$, $ab$ coincide respectively with the plane.

Solution, by Mr. STEPHEN FENWICK, the Proposer; Mr. JOHN BUTTERY, H. M. Dockyard, Chatham; and "Conic," of St. John's College, Cambridge.

Let $\alpha$ be the inclination of the plane,

$i$ the inclination of $p_1$ to the plane,

$R$ the reaction of the plane,

$W$ the weight of the parallelepiped, and

$m$, $\mu$, two constants.

Then resolving along and perpendicular to the plane we have

$$p_1 \cos i + \mu R + mbc = W \sin \alpha,$$

$$R + p_1 \sin i = W \cos \alpha;$$

$be$ being the face in contact with the plane.

Eliminating $R$ between these equations, we get

$$p_1 \cos i + \mu W \cos \alpha - \mu p_1 \sin i + mbc = W \sin \alpha;$$

that is

$$mbc = W(\sin \alpha - \mu \cos \alpha) + p_1(\mu \sin i - \cos i) \ldots \ldots \ldots (1)$$

Similarly,

$$mac = W(\sin \alpha - \mu \cos \alpha) + p_2(\mu \sin i - \cos i) \ldots \ldots \ldots (2)$$

$$mab = W(\sin \alpha - \mu \cos \alpha) + p_3(\mu \sin i - \cos i) \ldots \ldots \ldots (3)$$

Wherefore by (1), (2), and (3),

$$\frac{W \sin \alpha - \mu \cos \alpha}{\mu \sin i - \cos i} = \frac{bp_2 - ap_1}{a - b} = \frac{cp_3 - bp_2}{b - c} = \frac{ap_1 - cp_3}{c - a},$$

which gives the relation in the question.

Again, by Mr. THOMAS DOBSON, B.A., Hexham; Mr. WILLIAM GODWARD, Chelsea; Dr. RUTHERFORD, Woolwich; Mr. STEPHEN WATSON, of Haydonbridge; and in like manner by Messrs. BROOKS, COUTTS, ESCOTT, HALL, and MIBOURN.

The whole force with which the body originally tends to move down
the plane, and the pressure upon the plane, are the same in each of the three cases. Let \( \mu \) be the coefficient of cohesion; then, since the whole tangential force remains unaltered,

\[
p_1 + \mu bc = p_2 + \mu ca = p_3 + \mu ab
\]

\[
\therefore \mu = \frac{p_1 - p_2}{(a - b)c} = \frac{p_2 - p_3}{(b - c)a} = \frac{p_3 - p_1}{(c - a)b}
\]

\[
\therefore (b - c)p_1 + (c - a)p_2 + (a - b)p_3 = 0.
\]

Mr. Godward also adds the following:

Cor.—From the preceding equations we also have

\[
\frac{p_2 - p_3}{a} = \mu(b - c), \quad \frac{p_3 - p_1}{b} = \mu(c - a), \quad \frac{p_1 - p_2}{c} = \mu(a - b)
\]

\[
\therefore \frac{p_2 - p_3}{a} + \frac{p_3 - p_1}{b} + \frac{p_1 - p_2}{c} = 0,
\]

which furnishes a solution to an identical question proposed at the Senate House examination in 1846.

**XIII. QUEST. (2031); by Dr. Rutherford, late of the Royal Military Academy, Woolwich.**

From the extremity \( A \) of the major axis of an ellipse draw any chord \( AP \); through \( P \) draw lines parallel to the axes, and on these lines take \( PQ, PQ', PR, PR' \), each equal to the chord \( AP \). Determine the equations and areas of the several curves traced out by \( Q, Q', R, R' \).

**Solution by Dr. Rutherford, the Proposer; and similarly by Messrs. Brooks, Dale, Escott, Godward, Hall, and Milbourn.**

Draw the radii vectores \( AQ, AQ', AR, AR' \), and let \( AP = r \), the angle \( PAB = \theta \); then since \( AP = PQ = PQ' = PR \), we have

\[
QAB = \frac{\theta}{2}, \quad Q'AB = \frac{\pi}{2} + \frac{\theta}{2}
\]

and \( RAB = \frac{\pi}{4} + \frac{\theta}{2} \). The polar equation to the ellipse, the extremity of the major axis being the pole, is

\[
r = \frac{2ah^2 \cos \theta}{a^2 \sin^2 \theta + b^2 \cos^2 \theta}
\]

\[
= \frac{2h^2}{a} \cdot \frac{\cos \theta}{1 - \varepsilon^2 \cos^2 \theta}
\]

and therefore the equations to the several curves traced out by \( Q, Q' \),

**PRINTED FOR THE COMPANY OF STATIONERS.**
and \( R \) are respectively

\[ r_1 = 2r \cos \frac{\theta}{2}; \quad r_2 = 2r \sin \frac{\theta}{2}; \quad r_3 = 2r \cos \left( \frac{\pi}{4} - \frac{\theta}{2} \right). \]

When \( \theta = 0 \), \( r_1 = 4a = AC = 2AB \); when \( \theta = \frac{\pi}{2} \), \( r = 0 \), and thence \( r_1 = r_2 = r_3 = 0 \); while therefore \( P \) traces the ellipse the points \( Q \) and \( Q' \) trace the curves AQCA, AQ'F'AG; and the points \( R \) and \( R' \) trace the curves ARD and AR'E, which latter are equal to each other. When \( \theta = \frac{\pi}{2} \), \( QAB = \frac{\pi}{4} \), and the curves traced by \( Q \) and \( Q' \) intersect the axis at \( A \) in angles of \( \frac{\pi}{4} \) and \( \frac{3\pi}{4} \), and therefore the tangents at \( A \), viz., \( AT \), \( AT' \) will be perpendicular to each other, making angles of \( \frac{\pi}{4} \) with the axis or axis produced.

To find where the curve AQC cuts the ellipse, the point \( Q \) will be in both curves; hence we must have

\[ \frac{2ab^2 \cos \frac{\theta}{2}}{a^2 \sin^2 \frac{\theta}{2} + b^2 \cos^2 \frac{\theta}{2}} = \frac{2ab^2 \cos \theta}{a^2 \sin^2 \theta + b^2 \cos^2 \theta} \times 2 \cos \frac{\theta}{2}; \]

consequently, by an easy reduction, \( \cos \theta = \frac{a^2}{a^2 + b^2} \), which determines the point of intersection of the ellipse and curve AQC.

To determine the areas of the several curves, since the polar angles are \( \theta_1 = \frac{\theta}{2}, \theta_2 = \frac{\pi}{4} + \frac{\theta}{2}, \theta_3 = \frac{\pi}{4} + \frac{\theta}{2} \), we have

\[ \frac{1}{2} r_1^2 \theta_1 = r^2 \cos^2 \frac{\theta}{2} \theta_1 = \frac{1}{2} r^2 (1 + \cos \theta) \theta_1 \]
\[ \frac{1}{2} r_2^2 \theta_2 = r^2 \sin^2 \frac{\theta}{2} \theta_2 = \frac{1}{2} r^2 (1 - \cos \theta) \theta_2 \]
\[ \frac{1}{2} r_3^2 \theta_3 = r^2 \cos^2 \left( \frac{\pi}{4} - \frac{\theta}{2} \right) \theta_3 = \frac{1}{2} r^2 (1 + \sin \theta) \theta_3. \]

Integrating these equations, observing that \( \int_0^\frac{\theta}{2} r^2 \, d\theta \) = area of ellipse

\[ \text{Area AQCA} = \pi ab + \int_0^\frac{\pi}{4} r^2 \sin \theta \]

Printed for the Company of Stationers.
Area AF and AG = \pi ab - \int_{\frac{1}{2}}^{1} r^2 d \sin \theta \\
Area AD or AE = \pi ab - \int_{\frac{1}{2}}^{1} r^2 d \cos \theta \\

But \\
\int_{\frac{1}{2}}^{1} r^2 d \sin \theta = \frac{b^3 \sin \theta}{e^2 (1 - e^2 \cos^2 \theta)} + \frac{b (a^2 - 2b^2)}{ae^3} \tan^{-1} \frac{ae \sin \theta}{b} \\
\int_{\frac{1}{2}}^{1} r^2 d \cos \theta = -\frac{b^4 \cos \theta}{a^2 e^2 (1 - e^2 \cos^2 \theta)} + \frac{b^4}{2a^2 e^2} \log \frac{1 + e \cos \theta}{1 - e \cos \theta}.

Hence, as the complete limits of \theta are \frac{-\pi}{2} and \frac{\pi}{2}, the areas of the curves described by Q, Q' and R or R', are \\
(Q) = \pi ab + \frac{2b^2}{e^2} + \frac{2b(a^2 - 2b^2)}{ae^3} \phi \\
(Q') = \pi ab - \frac{2b^2}{e^2} - \frac{2b(a^2 - 2b^2)}{ae^3} \phi \\
(R) = (R') = \pi ab;

where \phi = \tan^{-1} \frac{ae}{b} = \sin^{-1} e is the excentric angle of the ellipse.

The diagram, curiously enough, resembles a bee on the wing, or in full flight.

Mr. Brooks adds the following geometrical description:

Let the right lines Q'Q, R'R meet the curves again in F and f; then since FQ'Q'F and FPFP it follows that FQ' + FQ = 2PP, and, as these lines are parallel to AC they must pass over equivalent areas, so that the segments cut off from the curves (Q') and (Q) by a vertical line F'Q are together equal to double the segment cut off from the ellipse. Therefore the two complete loops described by Q' and that described by Q are together double the area of the ellipse.

In like manner since PR = AP = Ap = pr \therefore rR = pP; and hence the horizontal line PR cuts off equal segments from the curves (R'), (R) and the ellipse, and the complete area of each of those loops is equal to the area of the ellipse.

These observations of Mr. Brooks evidently apply generally when APB is any closed curve.

Mr. John Butterly favoured us with a comprehensive solution by polar coordinates, showing that the results are true for any closed curve.

Mr. Stephen Watson generalises the problem for the ellipse by supposing the four equal lines to make given angles with the axis, but unfortunately we have not space for his solution.
XIV. QUEST. (2032); by Mr. William Godward, Chelsea.

Prove that in any plane triangle each of the four triads formed by joining the centres of three of the circles of contact with the respective points of contact of the fourth circle intersect in a point; and determine the sums of the reciprocals of the distances of all the four points of intersection from the several sides in terms of the radii.

Solution by Mr. William Godward, the Proposer.

The usual diagram and notation for a triangle and its four circles of contact being adopted, it may be remarked at the outset that circles of the same kind should have contacts of the same kind, and vice versa.

Commencing with the triad (O₁D, O₂E, O₃F), we know that

\[ AE = AF = s - a = s₁, BF = BD = s - b = s₂, \text{ and } CD = CE = s - c = s₃. \]

Hence we have the coordinates of

\[ D \ldots 0, \quad s₃ \sin C, \quad s₂ \sin B \]
\[ E \ldots s₃ \sin C, \quad 0, \quad s₁ \sin A \]
\[ F \ldots s₂ \sin B, \quad s₁ \sin A, \quad 0 \]
\[ O₁ \ldots -r₁, \quad r₁, \quad r₁ \]
\[ O₂ \ldots r₂, \quad -r₂, \quad r₂ \]
\[ O₃ \ldots r₃, \quad r₃, \quad -r₃ \]

From these we readily obtain the equations of

\[ O₁D \ldots (b - c) s₁ a = b s₂ β + c s₃ γ = 0 \ldots \ldots \ldots (1) \]
\[ O₂E \ldots as₁ a + (c - a) s₂ β = c s₃ γ = 0 \ldots \ldots \ldots (2) \]
\[ O₃F \ldots -as₁ a + b s₂ β + (a - b) s₃ γ = 0 \ldots \ldots \ldots (3) \]

But the determinant

\[
\begin{vmatrix}
  b - c & -b & c \\
  a & c - a & -c \\
  -a & b & a - b \\
\end{vmatrix} = 0,
\]

which is the necessary condition that (1), (2), and (3) should intersect in a point. Hence the triad (O₁D, O₂E, O₃F) intersects in a point, which point is represented by i in the diagram.

Eliminating \( γ \) between (1) and (2), and \( β \) from (1) and (3) we have

\[ s₁ a = s₂ β = s₃ γ, \text{ or } \frac{a}{r₁} = \frac{β}{r₂} = \frac{γ}{r₃}. \]
Hence by means of the equation \( aa + b\beta + c\gamma = 2\Delta \) we obtain

\[
\frac{r_1}{a} = \frac{r_2}{\beta} = \frac{r_3}{\gamma} = \frac{ar_1 + br_2 + cr_3}{2\Delta} = \frac{2R - r}{r}.
\]

Next taking the triads \((OD_1, O_3E_1, O_2F_1), (O_3D_3, OE_2, O_1F_2),\) and \((O_2D_2, O_1E_2, OF_3),\) in order, it may be likewise shown that they each intersect in a point. The three points of their intersection are indicated by \(i_1, i_2, i_3\) in the diagram, and if their coordinates be designated by \((a_1\beta_1\gamma_1), (a_2\beta_2\gamma_2), (a_3\beta_3\gamma_3),\) we shall find that,

\[
\begin{align*}
\frac{r}{a_1} &= \frac{r_3}{\beta_3} = \frac{r_2}{\gamma_1} = \frac{ar_1 + br_2 + cr_3}{2\Delta} = \frac{2R + r_1}{r_1}, \\
\frac{r_3}{a_2} &= \frac{r}{\beta_2} = \frac{r_1}{\gamma_2} = \frac{ar_1 + br + cr_1}{2\Delta} = \frac{2R + r_2}{r_2}, \\
\frac{r_2}{a_3} &= \frac{r_1}{\beta_3} = \frac{r}{\gamma_3} = \frac{ar_2 + br_1 + cr}{2\Delta} = \frac{2R + r_3}{r_3}.
\end{align*}
\]

\[
\therefore \sum \frac{1}{a} = 4R \left( \frac{1}{rr_1} + \frac{1}{rr_3} \right) + 2 \frac{2}{r}.
\]

\[
\sum \frac{1}{\beta} = 4R \left( \frac{1}{rr_2} + \frac{1}{rr_3} \right) + 2 \frac{2}{r}.
\]

\[
\sum \frac{1}{\gamma} = 4R \left( \frac{1}{rr_3} + \frac{1}{rr_2} \right) + 2 \frac{2}{r}.
\]

\[
\Sigma \left( \frac{1}{a} + \frac{1}{\beta} + \frac{1}{\gamma} \right) = \frac{4(R + r)}{r^2} + 4R \left( \frac{1}{rr_1} + \frac{1}{rr_2} + \frac{1}{rr_3} \right) + \frac{4}{rr_1rr_2rr_3}.
\]

Solutions like the preceding were also given by Messrs. Barlow, Brooks, Buxton, Dale, Dobson, Escott, Hall, Milbourn, Rutherford, Turnbull, and Watson.

Dr. Rutherford adds the following:

Cor. — Since \( abc = 4R \Delta, \) and \( ab + bc + ac = rr_1 + rr_2 + rr_3 + r_1r_2 + r_2r_3 + r_3r_1 + r_1r_2r_3 (Horst Geometrica, Prop. xxiii, 'Diary,' 1836, p. 52),\) the resulting formula may be expressed in terms of the sides of the triangle; thus,

\[
\Sigma \left( \frac{1}{a} + \frac{1}{\beta} + \frac{1}{\gamma} \right) = \frac{abc(ab + bc + ac)}{\Delta^3} + \frac{2(a + b + c)}{\Delta}.
\]
Mr. Stephen Watson also annexes the following interesting properties relating to lines which may be readily supplied in the diagram:

Cor. 1.—The product of the four perpendiculums is the same for each side of the triangle, viz.:

\[ \alpha a_1 a_2 a_3 = \beta b_1 b_2 b_3 = \gamma \gamma_1 \gamma_2 \gamma_3. \]

Cor. 2.—The equations of the lines, \( i_2 i_3, i_3 i_1, i_1 i_2 \) are,

\[
(r_1^2 - r^2) \alpha + (rr_3 - r_1 r_2) \beta + (rr_2 - r_1 r_3) \gamma = 0
\]

\[
(rr_3 - r_1 r_2) \alpha + (r_3^2 - r^2) \beta + (rr_1 - r_2 r_3) \gamma = 0
\]

\[
(rr_2 - r_1 r_3) \alpha + (rr_1 - r_2 r_3) \beta + (r_3^2 - r^2) \gamma = 0
\]

and these meet the sides BC, CA, AB in three points lying in the right line

\[
\frac{\alpha}{rr_1 - r_2 r_3} + \frac{\beta}{rr_2 - r_3 r_1} + \frac{\gamma}{rr_3 - r_1 r_2} = 0 \ldots \ldots (l).
\]

Cor. 3.—Let \( ii_1, ii_2, ii_3 \) meet BC, CA, AB respectively in \( g, h, k \); then the equations of \( hh, kg, gh \) are,

\[
\frac{\alpha}{rr_1 - r_2 r_3} + \frac{\beta}{rr_2 - r_3 r_1} + \frac{\gamma}{rr_3 - r_1 r_2} = 0
\]

\[
\frac{\alpha}{rr_1 - r_2 r_3} - \frac{\beta}{rr_2 - r_3 r_1} + \frac{\gamma}{rr_3 - r_1 r_2} = 0
\]

\[
\frac{\alpha}{rr_1 - r_2 r_3} + \frac{\beta}{rr_2 - r_3 r_1} - \frac{\gamma}{rr_3 - r_1 r_2} = 0.
\]

Hence the triads of lines BC, \( i_2 i_3, hh \); CA, \( i_3 i_1, kg \); AB, \( i_1 i_2, gh \) meet in three points lying on the line \((l)\).

Cor. 4.—If the line \((l)\) meet BC, CA, AB in \( g', h', k' \); then \{A. BgC'g\} is an harmonic pencil, whose equations are

\[ \beta = 0, \gamma = 0, \text{and} \ (rr_3 - r_1 r_2) \beta \pm (rr_2 - r_1 r_3) \gamma = 0. \]

Similarly \{B. ChAh'\} and \{C. AhBk'\} are harmonic pencils.

Geometrical Note, by the Editor.

The requisite lines being supposed to be inserted in the diagram it will appear that the triangles \( O_1 O_2 O_3 \), DEF have their sides respectively parallel, being severally at right angles with the bisectors of the angles A, B, C; and therefore that the lines \( OD, O_2 E, O_3 F \), drawn through the corresponding angular points, which are the lines stated in the question, meet in a point \( t \), which must evidently be a pole of similitude with respect to the circles which circumscribe the two triangles. In like manner the triangles \( OO_2 O_3, D_1 E_1 F_1 \) have their sides respectively parallel, and therefore the lines \( OD_1, O_3 E_1, O_2 F_1 \) intersect in a point \( i_1 \), which is the interior pole of similitude of the circles which circumscribe those triangles; and similarly with the other cases. Now
in each case one of the two circles is a circle of contact, and the other, which passes through the centres of the other three circles of contact, is known to have a radius equal to $2R$. Also the line joining the centres of these circles, always passes through and is bisected by the centre of the circumscribing circle of the primitive triangle. Hence if we conceive $Q$ to be the centre of the circle circumscribing $ABC$, we readily conclude that the four points $i_1, i_2, i_3$ are respectively posited upon the lines $QO, QO_1, QO_2, QO_3$, and are determined by the ratios

- $QO : Qi = 2R - r : 2R + r$
- $QO_1 : Qi_1 = 2R + r_1 : 2R - r_1$
- $QO_2 : Qi_2 = 2R + r_2 : 2R - r_2$
- $QO_3 : Qi_3 = 2R + r_3 : 2R - r_3$.

XV. PRIZE QUEST. (2033); by the Rev. Wm. Mason, Normanton

Straight lines drawn from the angles of a triangle to the vertices of equilateral triangles described on the sides opposite, intersect three and three, in two points. It is required to prove that the sum of the squares of the sides of the triangle formed by joining these points and the centre of the circumscribing circle, is equal to twice the square of the radius of the circle.

Answered by the Rev. William Mason, the Proposer.

Let $a\beta\gamma$ be the exterior and $a'\beta'\gamma'$ the interior vertices of the equi-

lateral triangles, and let the several lines be drawn as in the diagram.
Then, using the ordinary triangular notation,
\[ Aa^2 = c^2 + a^2 - 2ac \cos (60^\circ + B) \]
\[ = c^2 + a^2 - 2ac \left( \frac{1}{2} \cos B - \frac{1}{2} \sqrt{3} \sin B \right) \]
\[ = c^2 + a^2 - \frac{1}{2} (a^2 + c^2 - b^2) + \sqrt{3} \frac{abc}{2R} \]

Or
\[ Aa^2 (= B\beta^2) = Cy^2 = \frac{a^2 + b^2 + c^2}{2} + \frac{3abc}{2R \sqrt{3}} \]

Similarly,
\[ Aa'^2 (= B\beta'^2 = C\gamma^2) = \frac{a^2 + b^2 + c^2}{2} - \frac{3abc}{2R \sqrt{3}} \]

Also
\[ AP = AB \frac{\sin AB\beta}{\sin 120^\circ} = \frac{2c}{\sqrt{3}} \sin (A + 60^\circ) \frac{b}{B\beta}. \]
\[ AP' = AB \frac{\sin AB\beta'}{\sin 60^\circ} = \frac{2c}{\sqrt{3}} \sin (A - 60^\circ) \frac{b}{B\beta}. \]

\[ \therefore Aa \cdot AP = \frac{abc}{2R \sqrt{3}} + \frac{b^2 + c^2 - a^2}{2} \]
\[ \frac{abc}{2R \sqrt{3}} - \frac{b^2 + c^2 - a^2}{2}. \]

and 
\[ -2Aa \cdot Aa' \cos PA \cdot P \cdot P' = Aa^2 + Aa'^2 - a^2 \]
\[ = a^2 + b^2 + c^2 - 3a^2 \]
\[ = b^2 + c^2 - 2a^2. \]

\[ \therefore Aa^2 \cdot Aa'^2 \cdot PP' = (Aa \cdot AP)^2 Aa^2 + (Aa' \cdot AP)^2 Aa^2 \]
\[ + (Aa \cdot AP) (Aa' \cdot AP) (b^2 + c^2 - 2a^2) \]
\[ = 3a^2 b^2 c^2 - \frac{a^2 b^2 c^2}{3R^2} (a^2 + b^2 + c^2). \]

Again,
\[ 2Aa \cdot A0 \cos O \cdot A \cdot O = Aa^2 + AO^2 - Oa^2 \]
\[ = Aa^2 + R^2 - \left( R \cos A + \frac{\sqrt{3} a}{2} \right)^2 \]
\[ = \frac{b^2 + c^2}{2} + \sqrt{3} \frac{abc}{2R} - R \sqrt{3} a \cos A. \]

\[ \therefore Aa^2 \cdot OP^2 = Aa^2 (AO^2 + AP^2 - 2AO \cdot AP \cos O \cdot A) \]
\[ = Aa^2 \cdot R^2 + Aa \cdot AP (Aa \cdot AP - 2Aa \cdot AO \cos O \cdot A) \]

PRINTED FOR THE COMPANY OF STATIONERS.
\[ A\alpha^2 \cdot R^2 + \left( b^2 + c^2 - \frac{a^2}{2} + \frac{abc}{2R\sqrt{3}} \right) \times \left( R\sqrt{3} \cdot a \cdot \frac{b^2 + c^2 - a^2}{2bc} - \frac{a^3}{2} - \frac{abc}{R\sqrt{3}} \right) \]

\[ = R^2 \frac{a^2 + b^2 + c^2}{2} - \frac{a^2b^2c^2}{6R^2} + \frac{R\sqrt{3}}{2} abc \frac{(b^2 + c^2 - a^2)^2}{2bc} - \frac{abc}{2R\sqrt{3}} (b + c^2 - \frac{1}{2}a^2) \]

But \( R\sqrt{3} abc \frac{(b^2 + c^2 - a^2)^2}{2bc} = R\sqrt{3} abc \left( 1 - \frac{a^2}{4R^2} \right) \)

\[ \therefore A\alpha^2, OP^2 = R^2 \frac{a^2 + b^2 + c^2}{2} - \frac{a^2b^2c^2}{6R^2} + \frac{3R\sqrt{3}}{2abc} \frac{abc}{R\sqrt{3}} \frac{a^2 + b^2 + c^2}{2} \]

\[ = R^2 \frac{a^2 + b^2 + c^2}{2} - \frac{a^2b^2c^2}{6R^2} + \frac{R\sqrt{3}}{2abc} A\alpha^2, A\alpha^2, PP^2. \]

Similarly,

\[ A\alpha^2, OP^2 = R^2 \frac{a^2 + b^2 + c^2}{2} - \frac{a^2b^2c^2}{6R^2} - \frac{R\sqrt{3}}{2abc} A\alpha^2, A\alpha^2, PP^2. \]

Multiplying these last two equalities respectively by \( A\alpha^2, A\alpha^2 \) and adding, observing that \( A\alpha^2 + A\alpha^2 = a^2 + b^2 + c^2 \) and \( A\alpha^2 = A\alpha^2 \)

\[ \frac{3abc}{R\sqrt{3}}, \text{ we get} \]

\[ A\alpha^2, A\alpha^2 (OP^2 + OP^2) = \frac{1}{2} R^2 (a^2 + b^2 + c^2)^2 \]

\[ = \frac{1}{2} R^2 (a^2 + b^2 + c^2)^2 - (a^2 + b^2 + c^2) \frac{a^2b^2c^2}{6R^2} - \frac{3}{2} A\alpha^2, A\alpha^2, PP^2. \]

\[ \therefore A\alpha^2, A\alpha^2 (OP^2 + OP^2 + PP^2) \]

\[ = \frac{1}{2} R^2 (a^2 + b^2 + c^2)^2 - \frac{3}{2} a^2b^2c^2 \]

\[ = R^2 2A\alpha^2, A\alpha^2 \]

\[ \therefore OP^2 + OP^2 + PP^2 = 2R^2. \]

OTHERWISE.

Produce \( A\beta' \) to meet \( Ba \) in \( E \); then since the angles \( CAE, CBE \)

PRINTED FOR THE COMPANY OF STATIONERS.
are each of them 60°, the point E is on the circumference of the circumscribing circle. Also the value of a perpendicular from B on AE is

\[
BE \sin C = B\beta' \sin A\beta' P' = B\beta' \frac{AP' \sin 60°}{A\beta'}
\]

\[
\therefore BE = A\alpha'.AP' \frac{a \sqrt{3}}{2ab \sin C} = \frac{Aa'.AP'}{Aa^2 - Aa'^2} \cdot 3a
\]

Now, if D be the intersection of Aa with the circumference, \(Aa.aD = Bx.aE\); that is,

\[
Aa^2 - Aa.AP - Aa.PD = a^2 - \frac{Aa'.AP'}{Aa^2 - Aa'^2} \cdot 3a^2
\]

But, \(Aa^2 - Aa.AP\)

\[
=a^2 + Aa.AP + Aa'.AP'
\]

\[
\therefore Aa.PD = Aa.AP + Aa'.AP' + \frac{Aa'.AP'}{Aa^2 - Aa'^2} \cdot 3a^2
\]

\[
\therefore AO^2 - OP^2 = AP.PD = \frac{AP}{Aa}.Aa.PD
\]

\[= AP^2 + \frac{Aa'.AP'.AP}{Aa} + \frac{Aa.AP.AP'}{Aa^2 - Aa'^2} \cdot \frac{3a^2}{Aa'}
\]

Similarly, by changing accents for the point P',

\[
AC^2 - OP'^2 = AP'^2 + \frac{Aa.AP.AP'}{Aa} - \frac{Aa.AP.AP'}{Aa^2 - Aa'^2} \cdot \frac{3a^2}{Aa'}
\]

\[\therefore (AO^2 - OP^2) + (AC^2 - OP'^2)
\]

\[= AP^2 + AP'^2 + AP.AP' \frac{Aa^2 + Aa'^2 - \alpha^2}{Aa.Aa'}
\]

\[= AP^2 + AP'^2 - 2AP.AP' \cos PAP'
\]

\[= PP'^2
\]

\[\therefore OP^2 + OP'^2 + PP'^2 = 2AO^2.
\]

Second Solution, by Mr. Stephen Watson, Haydonbridge; and in like manner by Mr. Samuel Bills, of Hauton; Mr. C. H. Brooks, C.E., Port Louis, Mauritius; Mr. Thomas Dobson, B.A., Hexham; Mr. William Godward, Chelsea; Mr. Thomas Milburn, Riding Mill, Newcastle-upon-Tyne; and Mr. John Turnbull, of Bedlington.

The lines \(Aa, B\beta, C\gamma\) joining the angular points A, B, C to the vertices of the external equilateral triangles on BC, CA, AB will all meet in a point P on the circumference of the circle about the triangle BCD. For let Aa, B\beta cut in P; then the triangles AaC, B\betaC are obviously equal in all respects, therefore \(\angle CaP = \angle CBP\), \(\angle CAP = \angle C\beta P\), and each of the four points B, P, C, a; C, P, A, \(B\) lie in

Printed for the Company of Stationers.
the circumference of a circle; also \( \angle BPC = \angle CPA = \angle APB = 120^\circ \). Hence by symmetry it is evident that \( C \gamma \) must pass through \( P \). In like manner the lines joining \( A, B, C \) to the vertices of internal equilateral triangles on \( BC, CA, AB \) all pass through \( P' \), the intersection of \( Aa' \) with the circle about \( Ba'C \), the internal equilateral triangle on \( BC \).

Join \( a'a' \) bisecting \( BC \) in \( L \), and take \( LC \), \( La' \) as axes of coordinates; denote \( O \) (the circumscribing centre), \( P \) and \( P' \) by \((0, y_1)\), \((x_2 y_2)\), and \((x_3 y_3)\) and the angles \( \Delta a \), \( \Delta a' \) by \( \theta, \theta' \). Then

\[
\tan \theta = \frac{\frac{1}{2}a - b \cos C}{\frac{1}{2}a\sqrt{3} + b \sin C}, \quad \tan \theta' = \frac{\frac{1}{2}a - b \cos C}{\frac{1}{2}a\sqrt{3} - b \sin C}
\]

\[
\sin \theta = \frac{\frac{1}{2}a - b \cos C}{\sqrt{\left(s + ab \sin C \sqrt{3}\right)}}, \quad \sin \theta' = \frac{\frac{1}{2}a - b \cos C}{\sqrt{\left(s - ab \sin C \sqrt{3}\right)}}
\]

\[
\cos \theta = \frac{\frac{1}{2}a\sqrt{3} + b \sin C}{\sqrt{\left(s + ab \sin C \sqrt{3}\right)}}, \quad \cos \theta' = \frac{\frac{1}{2}a\sqrt{3} - b \sin C}{\sqrt{\left(s - ab \sin C \sqrt{3}\right)}}
\]

where \( s = \frac{1}{4}(a^2 + b^2 + c^2) \) and \( \frac{1}{2}a - b \cos C = \frac{c^2 - b^2}{2a} \).

Also, \( y_1 = \sqrt{(R^2 - \frac{1}{4}a^2)} = \frac{1}{2}a \cot A \), \( p' = 4p'L = \frac{2a}{\sqrt{3}} \)

\[
x_2 = \frac{2a}{\sqrt{3}} \sin \theta \cos \theta, \quad y_2 = \frac{2a}{\sqrt{3}} (\frac{1}{2} - \sin^2 \theta)
\]

\[
x_3 = \frac{2a}{\sqrt{3}} \sin \theta' \cos \theta', \quad y_3 = \frac{2a}{\sqrt{3}} (\sin^2 \theta' - \frac{1}{4})
\]

\[
\therefore \ OP^2 = x_2^2 + (y_2 - y_1)^2
\]

\[
= R^2 - \frac{a^2}{6} + \frac{2a^2}{3} \sin^2 \theta - \frac{2a^2}{\sqrt{3}} (\frac{1}{2} - \sin^2 \theta) \cot A
\]

\[
OP'^2 = x_3^2 + (y_3 - y_1)^2
\]

\[
= R^2 - \frac{a^2}{6} + \frac{2a^2}{3} \sin^2 \theta' - \frac{2a^2}{\sqrt{3}} (\sin^2 \theta' - \frac{1}{4}) \cot A
\]

\[
PP'^2 = (x_3 - x_2)^2 + (y_3 - y_2)^2
\]

\[
= - \frac{7a^2}{3} + \frac{8a^2}{3} (\sin^2 \theta + \sin^2 \theta')
\]

\[
+ \frac{5a^2}{3} \cos \theta \cos \theta' \cos (\theta + \theta')
\]

* This preliminary property is a particular case of a more general theorem proposed as Quest. (1930) by Mr. Samuel Bills (see 'Diary,' 1859, page 50).
\[ \therefore OP^2 + OP'^2 + PP'^2 = 2R^2 - \frac{8a^2}{3} + \frac{10a^2}{3} (\sin^2 \theta + \sin^2 \theta') \]
\[ - \frac{2a^2}{\sqrt{3}} (\sin^2 \theta' - \sin^2 \theta) \cot \Lambda + \frac{8a^2}{3} \cos \theta \cos \theta' \cos (\theta + \theta'). \]

After substituting the foregoing values in this expression it finally reduces down to the proposed relation, viz.:

\[ OP^2 + OP'^2 + PP'^2 = 2R^2. \]

Mr. Stephen Watson adds the following elegant corollary.

Corr. The area of the triangle OPP' is
\[ \frac{1}{2} \{ x_3(y_2 - y_1) + (x_2 - x_3)(y_3 - y_2) - x_2(y_3 - y_1) \} \]
\[ = \frac{1}{2} \{ y_3(x_2 - x_3) + x_3y_2 - x_2y_3 \} \]
\[ = \frac{a^2}{2} \left\{ \frac{\cot \Lambda}{\sqrt{3}} (\sin \theta \cos \theta - \sin \theta' \cos \theta') - (\sin \theta \cos \theta + \sin \theta' \cos \theta') \right. \]
\[ + \frac{4}{3} \frac{4}{3} \cos \theta \cos \theta' (\cos \theta \sin \theta' + \sin \theta \cos \theta') \right\} \]
\[ = \frac{1}{\sqrt{3}} \frac{(a^2 - b^2)(b^2 - c^2)(c^2 - a^2)}{(a^2 - b^2)^2 + (b^2 - c^2)^2 + (c^2 - a^2)^2}. \]

Mr. Dobson notices the property that "the internal equilateral triangle, described on any side, cuts a side of each of the external equilateral triangles on the other two sides in the circumference of the circumscribing circle." This neat relation it will be seen is also made use of in the alternative solution given by the proposer.

Mr. Turnbull likewise observes that "the six triangles \( \Delta \gamma' \beta, \Delta \gamma \beta', \gamma \beta a', \gamma' \beta a, \beta' a C, \beta a' C \) are severally in all respects equal to the triangle ABC, and that the centres of their circumscribing circles all lie in the circumference of the circle (O) which circumscribes ABC."

Third Solution, by Dr. Rutherford, late of the Royal Military Academy, Woolwich.

Let ABC be a plane triangle, O the centre of the circumscribing circle; BaC, Ba'C equilateral triangles on the base BC, and BaCp', Ba'Cp circles described about them, having their centres \( p, p' \) in the points of trisection of \( ax' \). Draw \( \Delta a \) intersecting the circle BaC in \( P \); then \( P \) is the point of intersection of the lines drawn from the angular points of the triangle ABC to the vertices of the equilateral triangles described exteriorly on the sides of the triangle ('Gentleman's Diary,' 1830, p. 36. Scholium). At the point \( P \) the sides of the triangle ABC subtend equal angles ApB, BpC, CPA.
No 162. Questions Answered.

In a similar manner, if $AA'$ be drawn and produced to meet the circle $Ba'C$ in $P'$, then $P'$ is the point of intersection of the lines drawn from the angular points of the triangle $ABC$ to the vertices of the equilateral triangles described interiorly, on the sides of the triangle, and the angle $AP'C$ is equal to the angle $APC$.

Draw the several lines as in the diagram, and let the angle $OaP = \theta$ $Oa'P' = \theta'$, $ap = pp' = \rho' = 2n$, and the distance of $O$ from the base of the triangle, viz. $OL = m$. Then $Lp = Lp' = n$; $ap' = a\rho' = 4n$, and the angles $aPp$ and $a'P'p$ are right angles; hence $pp' = ap' \sin Pp' = 4n \sin \theta$, $Op' = n - m$ and the angle $Pp'O = \frac{1}{2} \pi - \theta$; therefore,


\[ = (m - n)^2 + 8n(m + n) \sin^2 \theta \]

(1)

Similarly, $P'p = \alpha'p \sin P'a'p = 4n \sin \theta'$, $Op = m + n$, and the angle $P'pO = \frac{1}{2} \pi - \theta'$; hence

\[ OP' = (m + n)^2 - 8n(m - n) \sin^2 \theta' \]

(2)

Again, in the triangle $PpP'$ we have $Pp = 2n$, $P'p = 4n \sin \theta'$, and the angle $PpP = \frac{1}{2} \pi - \theta' - 2\theta$; therefore

\[ PP'^2 = 4n^2 + 16n^2 \sin^2 \theta' - 16n^2 \sin \theta' \sin (2\theta + \theta') \]

\[ = 4n^2 - 32n^2 \sin \theta \sin \theta' \cos (\theta + \theta') \]

(3)

Lastly, since $AO = Oc$, we have the condition

\[ LC^2 + LO^2 = Aa'^2 + a'O^2 - 2Aa'.a'O \cos Aa'O. \]

But $LC^2 = aL.Lp' = 3n^2$, $a'O = 3n - m$; and since the angle $a'Aa = \pi - (\theta + \theta')$, we have

\[ Aa' = \frac{\alpha' \sin \theta}{\sin (\theta + \theta')} = \frac{6n \sin \theta}{\sin (\theta + \theta')} \]

Substituting these values in the preceding condition it becomes

\[ 3n^2 + m^2 = (3n - m)^2 + \frac{36n^2 \sin^2 \theta}{\sin^2 (\theta + \theta')} - 12n(3n - m) \frac{\sin \theta \cos \theta'}{\sin (\theta + \theta')} \]

which, since $2 \sin \theta \cos \theta' = \sin (\theta + \theta') + \sin (\theta - \theta')$

\[ \sin^2 (\theta + \theta') = \sin^2 \theta + \sin^2 \theta' + 2 \sin \theta \sin \theta' \cos (\theta + \theta') \]

reduces to

\[ (m - n) \sin^2 \theta' - (m + n) \sin^2 \theta + 4n \sin \theta \sin \theta' \cos (\theta + \theta') = 0. \]

Multiplying by $8n$ we get

\[ 0 = 8n(m - n) \sin^3 \theta' - 8n(m + n) \sin^2 \theta \]

\[ + 32n^2 \sin \theta \sin \theta' \cos (\theta + \theta') \]

(4)

The sum of equations (1), (2), (3), (4) gives

\[ OP^2 + OP'^2 + PP'^2 = (m - n)^2 + (m + n)^2 + 4n^2 \]

\[ = 2(m^2 + n^2) = 2OC^2. \]
Fourth Solution, by Professor C. W. Pritchett, Fayette, Missouri, United States.

Let A be the origin of rectangular axes, the side AB the axis of abscissae, OA the radius of the circumscribing circle, = R, O the centre, and P and P' the points of intersection. The coordinates of O are \( \xi = \frac{1}{2}c, \eta = \sqrt{R^2 - \frac{1}{4}c^2} \). To find the coordinates of P and P', find by analytic geometry, the equations of the straight lines \( \beta \beta' \) and \( \alpha \alpha' \) which pass respectively through the two points \( \beta, B \) and \( \alpha, A \); their intersection fixes P. Again find the equations of the two lines \( \beta \beta' \) and \( \alpha \alpha' \), passing through \( \beta', B \) and \( \alpha', A \); their intersection fixes P'. The coordinates of \( \beta, B, \alpha, A, \beta', \alpha' \), for every position are respectively

\[
\left\{ \begin{array}{l} b \sin (A + 60^\circ) = m \\ b \cos (A + 60^\circ) = n \end{array} \right\} \quad \left\{ \begin{array}{l} a \sin (B + 60^\circ) = m' \\ a \cos (B + 60^\circ) = n' \end{array} \right\}
\]

and

\[
\left\{ \begin{array}{l} b \sin (A - 60^\circ) = s \\ b \cos (A - 60^\circ) = k \end{array} \right\}
\]

Performing the operations with the abridged notation adopted, and using the formula \( O^2 = (\eta_1 - \eta)^2 + (\xi_1 - \xi)^2 \), \( OP^2 = (\eta_2 - \eta)^2 + (\xi_2 - \xi)^2 \), \( PP^2 = (\eta_1 - \eta_2)^2 + (\xi_1 - \xi_2)^2 \), we readily find \( OP^2 + OP'^2 + PP'^2 = 2R^2 \)

\[
+ 2c^2 \frac{s^2(k^2 + s^2)}{sk' - s'(k - c)}
\]

\[
+ 2c^2 \frac{m^2(n^2 + m'^2)}{mn' - m'(n - c)}
\]

\[
- c^2 \frac{sk'}{sk' - s'(k - c)}
\]

\[
- 2c^2 \frac{ms(n'k' + m's')}{sk' - s'(k - c) mn' - m'(n - c)}
\]

\[
- c \frac{mn'}{mn' - m'(n - c)}
\]

\[
- 2c \sqrt{R^2 - \frac{1}{4}c^2} \left\{ \frac{ss'}{k's - s'(k - c)} + \frac{mm'}{mn' - m'(n - c)} \right\}
\]

If the last six terms are equal to zero, \( OP^2 + OP'^2 + PP'^2 = 2R^2 \). But the labour of showing this is immense, since \( m, n, m', n', s, s' \), \( k', k \), expressed in terms of the sides are of the forms

\[
m = \frac{4 \Delta + \sqrt{3}(b^2 + c^2 - a^2)}{4c}, \quad \text{&c., } n' = \frac{3c^2 + b^2 - a^2 + 4 \Delta \sqrt{3}}{4c}, \quad \text{&c.}
\]

PRINTED FOR THE COMPANY OF STATIONERS.
where \( \Delta = \sqrt{s(s-a)(s-b)(s-c)} \), the area of ABC.

By Professor Arendt’s reduction nearly 2000 terms arise.

Solutions by trilinear coordinates involving complicated reductions were also
given by Mr. John Buttery, H.M. Dockyard, Chatham; Mr. James Dale,
Aberdeen; and Mr. A. Hall, Goshen, Connecticut, United States.

Mr. W. J. Miller investigates the subject with areal coordinates.
A talented, neatly drawn out, and elaborated solution by rectangular coordi-
nates was also given by Mr. John Brown, of Whitwell Colliery, Durham.

Investigation of other remarkable properties. By the Editor.

On further investigation we have discovered many curious and in-
teresting properties in relation to the diagram of this question. To
avoid unnecessary repetition we shall make free use of the expressions
obtained in the excellent solution by the Rev. William Mason, the
proposer.

From the values of \( Aa^2, Aa'^2 \), we get

\[
Aa^2.Aa'^2 = \left( \frac{a^2 + b^2 + c^2}{2} \right)^2 - \frac{3}{4} \cdot \frac{a^2b^2c^2}{R^2}
\]

\[
= \frac{1}{4}(a^4 + b^4 + c^4 + 2a^2b^2 + 2b^2c^2 + 2a^2c^2)
\]

\[- \frac{3}{2}(-a^4 - b^4 - c^4 + 2a^2b^2 + 2b^2c^2 + 2a^2c^2) \]

\[
= a^4 + b^4 + c^4 - a^2b^2 - b^2c^2 - a^2c^2
\]

\[
= (a^2 - b^2)(a^2 - c^2) + (b^2 - a^2)(b^2 - c^2)
\]

\[
+ (c^2 - a^2)(c^2 - b^2)
\]

\[
= (a^2 - b^2)(a^2 - c^2) + (b^2 - c^2)^2.
\]

Since

\[
Aa.AP = \frac{b^2 + c^2 - a^2}{2} \quad \frac{abc}{2R\sqrt{3}}
\]

\[
Aa'.AP' = \frac{b^2 + c^2 - a^2}{2} \quad \frac{abc}{2R\sqrt{3}}
\]

\[
\therefore Aa(AP + BP + CP) = \frac{a^2 + b^2 + c^2}{2} + \frac{3abc}{2R\sqrt{3}} = Aa^2
\]

\[
Aa'(AP' + BP' + CP') = \frac{a^2 + b^2 + c^2}{2} - \frac{3abc}{2R\sqrt{3}} = Aa'^2
\]

\[
\therefore AP + BP + CP = Aa \}
\]

\[
AP' + BP' + CP' = Aa' \}
\]  .. (1)

In these relations one of the three lines, in some cases, has a negative
algebraic sign; and they indicate that the points \( P, P' \) are respectively

PRINTED FOR THE COMPANY OF STATIONERS.

4 5
in the circumferences of the circles which circumscribe the exterior
and interior equilateral triangles.

Again,

\[ Aa^2 \cdot AP^2 = \left( \frac{b^2 + c^2 - a^2}{2} + \frac{abc}{2R\sqrt{3}} \right)^2 \]
\[ = \frac{(b^2 + c^2 - a^2)^2}{4} + \frac{4b^2c^2 - (b^2 + c^2 - a^2)^2}{12} \]
\[ + \frac{b^2 + c^2 - a^2}{2} \cdot \frac{abc}{R\sqrt{3}} \]
\[ = \frac{b^2c^2}{3} + \frac{b^2 + c^2 - a^2}{3} \left( \frac{b^2 + c^2 - a^2}{2} + \frac{3abc}{2R\sqrt{3}} \right) \]
\[ = \frac{b^2c^2}{3} + \frac{b^2 + c^2 - a^2}{3} \left( Aa^2 - a^2 \right) \]
\[ = \frac{b^2 + c^2 - a^2}{3} \cdot \frac{Aa^2}{3} + \frac{(a^2 - b^2)(a^2 - c^2)}{3} \]
\[ \therefore AP^2 = \frac{b^2 + c^2 - a^2}{3} + \frac{(a^2 - b^2)(a^2 - c^2)}{3Aa^2} \]
\[ = \frac{b^2 + c^2 - a^2}{3} + \frac{(a^2 - b^2)(a^2 - c^2)}{(a^2 - b^2)(a^2 - c^2) + (b^2 - c^2)^2} \cdot \frac{Aa^2}{3} \]

Similarly,

\[ AP'^2 = \frac{b^2 + c^2 - a^2}{3} + \frac{(a^2 - b^2)(a^2 - c^2)}{(a^2 - b^2)(a^2 - c^2) + (b^2 - c^2)^2} \cdot \frac{Aa^2}{3} \]

Hence, as \((a^2 - b^2)(a^2 - c^2) + (b^2 - a^2)(b^2 - c^2) + (c^2 - a^2)(c^2 - b^2)\)
\[ = (a^2 - b^2)(a^2 - c^2) + (b^2 - c^2)^2, \]
\[ AP^2 + BP^2 + CP^2 = \frac{a^2 + b^2 + c^2}{3} + \frac{Aa^2}{3} = \frac{a^2 + b^2 + c^2}{2} + \frac{abc}{2R\sqrt{3}} \]
\[ AP'^2 + BP'^2 + CP'^2 = \frac{a^2 + b^2 + c^2}{3} + \frac{Aa^2}{3} = \frac{a^2 + b^2 + c^2}{2} + \frac{abc}{2R\sqrt{3}} \]
\[ AP^2 + BP^2 + CP^2 + AP'^2 + BP'^2 + CP'^2 = a^2 + b^2 + c^2. \]

Let now G be the centre of gravity of the triangle ABC; then,

\[ GA^2 + GB^2 + GC^2 = \frac{a^2 + b^2 + c^2}{3} \]
\[ 3GP^2 = (AP^2 + BP^2 + CP^2) - (GA^2 + GB^2 + GC^2) \]
\[ = \frac{a^2 + b^2 + c^2}{6} - \frac{abc}{2R\sqrt{3}} \]
\[ \therefore GP^2 = \frac{a^2 + b^2 + c^2}{18} - \frac{abc}{6R\sqrt{3}} = \frac{Aa'^2}{9} \]

Similarly,
\[ GP'^2 = \frac{a^2 + b^2 + c^2}{18} + \frac{abc}{6R\sqrt{3}} = \frac{Aa^2}{9} \]
\[ \therefore GP = \frac{1}{3}Aa' \text{ and } GP' = \frac{1}{3}Aa \ldots \ldots \ldots \ldots (4) \]

In like manner,
\[ 3GO^2 = (AO^2 + BO^2 + CO^2) - (GA^2 + GB^2 + GC^2) \]
\[ = 3R^2 - \frac{a^2 + b^2 + c^2}{3} \]
\[ \therefore GO^2 = R^2 - \frac{a^2 + b^2 + c^2}{9} \text{ and } GO^2 + GP^2 + GP'^2 = R^2 \ldots \ldots (5) \]

Again, conceive \( g \) to be the centre of gravity of the triangle \( OPP' \),
then
\[ 3Gg^2 = (GO^2 + GP^2 + GP'^2) - (gO^2 + gP^2 + gP'^2) \]
\[ = R^2 - \frac{1}{3}(OP^2 + OP'^2 + PP'^2) \]
\[ = R^2 - \frac{2}{3}R^2 = \frac{1}{3}R^2 ; \therefore Gg = \frac{1}{3}R \ldots \ldots \ldots \ldots (6) \]

We now proceed to find the values of \( OP^2, OP'^2, PP'^2 \) in terms of \( GO, GP, GP' \).

\[ Aa^2, Aa'^2, PP'^2 = \frac{3a^2b^2c^2}{R^2} \left( R^2 - \frac{a^2 + b^2 + c^2}{9} \right) \]
\[ = (Aa^2 - Aa'^2)^2 \cdot GO^2 \]
\[ \therefore PP' = \frac{Aa^2 - Aa'^2}{Aa, Aa'} \cdot GO = \left( \frac{GP'}{GP} - \frac{GP}{GP'} \right) \cdot GO \ldots \ldots \ldots \ldots (7) \]

\[ Aa^2 \cdot OP^2 = \frac{R^2}{2} \left( \frac{a^2 + b^2 + c^2}{6R^2} + \frac{3R\sqrt{3}}{2} abc - \frac{abc}{R\sqrt{3}} \cdot \frac{a^2 + b^2 + c^2}{2} \right) \]
\[ = \left( R^2 - \frac{abc}{3R\sqrt{3}} \right) \left( \frac{a^2 + b^2 + c^2}{2} + \frac{3abc}{2R\sqrt{3}} \right) \]
\[ + \frac{3abc}{R\sqrt{3}} \left( R^2 - \frac{a^2 + b^2 + c^2}{9} \right) \]
\[ = \left( R^2 - \frac{abc}{3R\sqrt{3}} \right) Aa^2 + \frac{R\sqrt{3}}{3abc} Aa^2 \cdot Aa'^2 \cdot PP'^2 \]
\[ \therefore \text{OP}^2 = \frac{abc}{3abc} + \frac{R \sqrt{3}}{3abc} \Delta \quad \text{PP}^2 \]
\[ = R^2 - (GP^2 - GP^2) + \frac{GP^2}{GP^2 - GP^2} \cdot \text{PP}^2 \]
\[ = R^2 + GP^2 - GP^2 + GO^2 \frac{GP^2 - GP^2}{GP^2} \]
Or, since \( GO^2 + GP^2 + GP^2 = R^2 \),
\[ \text{OP}^2 = 2(GO^2 + GP^2) - GO^2 \frac{GP^2}{GP^2} \]
Similarly,
\[ \text{OP}^2 = 2(GO^2 + GP^2) - GO^2 \frac{GP^2}{GP^2} \]
Also, by (7),
\[ \text{PP}^2 = GO^2 \left( \frac{GP^2}{GP^2} + \frac{GP''^2}{GP^2} - 2 \right) \]
\[ \therefore \text{OP}^2 + \text{OP}''^2 + \text{PP}^2 = 2(GO^2 + GP^2 + GP''^2) = 2R^2, \]
which is verified by the proposed theorem.

In the annexed diagram, which, to avoid complication, represents only the portion of the figure under consideration, let I be the point of intersection of the perpendiculars of the triangle ABC. Then I, G, O are known to be in a right line; and IG = 2GO. Let M be the middle point of IG, so that IM = MG = GO; then
\[ \text{OP}^2 = 2(GO^2 + GP^2) - \text{MP}^2 \]
\[ \text{OP}''^2 = 2(GO^2 + GP''^2) - \text{MP}''^2 \]
\[ \therefore \text{by (8) MP} = \text{GO} \frac{GP}{GP'} \]
\[ \text{MP'} = \text{GO} \frac{GP'}{GP} \]
\[ \therefore \text{by (7) PP'} = \text{MP' - MP} \]
Hence M, P, P' are in a straight line, and
\[ \text{MP} \cdot \text{MP'} = \text{GO}^2 = \text{MG}^2 \]
Also, since \( \text{MP} : \text{MG} = \text{MG} : \text{MP'} \), the triangles MPG, MGP' are similar; and therefore if Gn bisect the angle PGP', the angle MGN = MGP + PGn = MP'G + P'Gn = MnG. \( \therefore \text{Mn} = \text{MG} \). And as \( \text{MP} : \text{MI} = \text{MI} : \text{MP'} \), the line In, bisecting the angle PIP', will meet PP' in the same point n; and \( \text{GPI} + \text{GP'I} = \text{two right angles...} \)
With the three points I, P, P' complete the parallelogram PIP'R, and the diagonal IR will bisect PP' in m; also join Gm, Om, OR.

Conceive m' to be the middle point of MG, then

\[ OR^2 = 4m'm^2 \]
\[ = 2Gm^2 + 2Mm^2 - MG^2 \]
\[ = 2Gm^2 + 2Mm^2 + 2(Mm - Pm)(Mm + Pm) - MG^2 \]
\[ = GP^2 + GP'^2 + 2MP.MP' - GO^2 \]
\[ = GP^2 + GP'^2 + GO^2 = R^2 \]

\[ \therefore OR = R, \text{ and the point } R \text{ is on the circumference of the } \]
\[ \text{circumscribing circle } \]

(12)

The position of the point R is further determined by

\[ GR = 2Mm = MP + MP' = GO \left( \frac{GP}{GP'} + \frac{GP'}{GP} \right) \]

Suppose GR to be produced to meet the circle again in R'; then

\[ GR.GR' = R^2 - GO^2 = GP^2 + GP'^2 \]

\[ \therefore GR' = \frac{GP.GP'}{GO} \]

(13).

A neat expression for the value of PP'^2 in terms of the sides may be obtained in the following manner.

\[ Aa^2.Aa'^2.PP'^2 \]
\[ = 3a^2b^2c^2 - \frac{a^2b^2c^2}{3R^2} (a^2 + b^2 + c^2) \]
\[ = 3a^2b^2c^2 - \frac{a^2 + b^2 + c^2}{3} (2a^2b^2 + 2b^2c^2 + 2a^2c^2 - a^4 - b^4 - c^4) \]
\[ = 3a^2b^2c^2 - \frac{a^2 + b^2 + c^2}{3} \{(a^2 + b^2 + c^2)^2 - 2a^4 - 2b^4 - 2c^4\} \]

Let \( \frac{1}{3}(a^2 + b^2 + c^2) = S, \quad a^2 = S + \alpha \)
\[ b^2 = S + \beta \]
\[ c^2 = S + \gamma \]
then \[ Aa^2.Aa'^2.PP'^2 \]
\[ = 3(S + \alpha)(S + \beta)(S + \gamma) - 3S^3 - 3S^3(\alpha + \beta + \gamma) + 3S(\alpha \beta + \beta \gamma + \alpha \gamma) + 3\alpha \beta \gamma \]
\[ - 3S^3 + 4S^3(\alpha + \beta + \gamma) + 2S(\alpha^2 + \beta^2 + \gamma^2) \]

But \( \alpha + \beta + \gamma = 0 \) and \( \therefore \) also \( \alpha \beta + \beta \gamma + \alpha \gamma = -\frac{1}{3}(\alpha^2 + \beta^2 + \gamma^2) \)

\[ \therefore Aa^2.Aa'^2.PP'^2 = \frac{1}{3}S(\alpha^2 + \beta^2 + \gamma^2) + 3\alpha \beta \gamma. \]
Also
\[ Aa^2 = a^4 + b^4 + c^4 - a^2b^2 - b^2c^2 - a^2c^2 \]
\[ = \frac{3}{8}(a^4 + b^4 + c^4) - \frac{1}{4}(a^2 + b^2 + c^2)^2 \]
\[ = \frac{3}{8}(a^4 + b^4 + c^4) - \frac{1}{4}(a^2 + b^2 + c^2)^2 \]
\[ = \frac{3}{8}(a + \beta + \gamma) + a^2 + b^2 + c^2 \]
\[ CP^2 = \frac{S}{3} + \frac{2a\beta\gamma}{a^2 + b^2 + c^2} \]

This and the values of \( AP^2, BP^2, CP^2, AP'^2, BP'^2, CP'^2 \) according to the formulae (2) serve to determine the position of the points \( P, P' \) when the triangle \( ABC \) is equilateral or nearly so. When the triangle \( ABC \) is absolutely equilateral the point \( P' \) is anywhere in the circumference of the circumscribing circle; but if the sides differ but by even the smallest quantities its position becomes determinate.

Some interesting geometrical relations may also be deduced in connexion with the centres of the equilateral triangles. Referring to the diagram on page 73, let \( p, q, r \) be the centres of those which are external to the triangle \( ABC \). Then, since \( BC = pC \sqrt{3}, C\beta = Cq \sqrt{3} \), and the angle \( BC\beta = pCq \); the triangles \( BC\beta, pCq \) are similar, and \( B\beta = pq \sqrt{3}; \) therefore, \( \frac{1}{2}Aa^2 = pq^2 = qr^2 = pr^2 \), and the triangle \( pqr \) is equilateral. In like manner, if \( p', q', r' \) be conceived to be the centres of the internal equilateral triangles, it may be shown that \( \frac{1}{2}Aa'^2 = p'q'^2 = qr'^2 = pr'^2 \), and the triangle \( p'q'r' \) is also equilateral. This neat property was originally proposed by Dr. Rutherford as quest. (1436), 'Ladies' Diary,' 1825.

Again, since \( pq^2 = \frac{1}{2}Aa^2 = 3GP^2, p'q'^2 = \frac{1}{2}Aa^2 = 3GP^2 \), it follows that \( GP, GP' \) are the respective radii of the circles which circumscribe the equilateral triangles \( pqr, p'q'r' \).

To find the position of the centres of these circles, or centres of gravity of the triangles, the values of the perpendiculars from \( p, q, r \) upon \( BC \) are \( \frac{a}{\sqrt{3}}, \frac{b}{\sqrt{2}}, \frac{c}{\sqrt{3}} \cos C, \frac{1}{2}AH + \frac{b}{\sqrt{2}} \cos C, \frac{1}{2}AH + \frac{c}{\sqrt{3}} \cos B \); therefore, as \( b \cos C + c \cos B = a \), the sum of these perpendiculars \( = AH \), so that the perpendiculars on \( BC \) from the centre of gravity of \( pqr \) \( = \frac{1}{2}AH \). Hence it appears that the equilateral triangles \( pqr, p'q'r' \) have each of them a common centre of gravity \( (G) \) with that of the triangle \( ABC \), and that the points \( P', P' \) are respectively in the circumferences of the circles which circumscribe these triangles. (15).

This last property may be otherwise proved thus. Since the angle \( AP'B = 60^\circ \), the point \( P' \) is in the circumference of the circle about the equilateral triangle \( y'AB \), and as \( y'r \) is a diameter of this circle, the angle \( y'P'r \) is a right angle. Similarly, \( \beta'P'q \) is a right angle; therefore the angle \( qP'r = \beta'P'y' = BP'C = qpr \), and hence \( P' \) is in the circumference of the circle circumscribing \( pqr \). And similarly it

PRINTED FOR THE COMPANY OF STATIONERS.
may be shown that the point P in is the circumference of the circle which circumscribes $p'q'r'$.

Space will not permit us to pursue the subject any further, and we must therefore conclude with the observation that, although the geometrical properties (6), (9), (10) and (12) are so very simple, it will remain to be determined hereafter whether they admit of a satisfactory geometrical proof. It will indeed be remarkable if results so elegant and free from complication can only be arrived at through the medium of a lengthy process.

---

**LIST OF MATHEMATICAL ANSWERS.**

*Arendt, Prof. R. C., Fayette, Missouri, United States, ans. 1 to 6, Prize.*

*Atkinson, John, Warden, Northumberland, ans. 2, 5, 9.*

*Barlow, William, 48, Edwardes Square, Kensington, ans. 1 to 5, 9, 10, 14, Prize.*

*Bills, Samuel, Hawton, near Newark-upon-Trent, ans. 1, 3, 4, 5, Prize.*

*Bolam, John, 23, Brown's Lane, Spitalfields, ans. 1, 2, 3, 4.*

*Borradaile, Walter A., Stoke's Hall, Ham, Surrey, ans. 1 to 5, 9, 10.*

*Brooks, C. H., C.E., Port Louis, Mauritius, ans. all the Questions.*

*Brown, John, Whitwell Colliery, Durham, ans. Prize.*

*Butterly, John, H.M. Dockyard, Chatham, ans. all the Questions.*


"Conic," of St. John's College, Cambridge, ans. 1 to 12.

*Coutts, Charles, London, ans. 2, 4, 5, 12.*

*Dale, James, of 13, Craigie Street, Aberdeen, ans. all the Questions.*

*Dobson, Thomas, B.A., Hexham, ans. all the Questions.*

*Eastman, John R., Andover, New Hampshire, United States, ans. 1, 2, 4, 5, 6, 14.*

*Eastwood, George, Cambridge, Massachusetts, United States, ans. 6.*

*Eland, Thomas J., 76, Bridgman Street, Bolton, ans. 4.*

*Escott, Albert, F.R.A.S., Royal Hospital School, Greenwich, ans. 1 to 7, 9 to 12.*

*Fenwick, Stephen, of the Royal Military Academy, Woolwich, ans. 12.*

"Geometricus," Chelsea, ans. 7.

*Godward, William, 30, Margareta Terrace, Chelsea, ans. all the Questions.*

*Grey, John, Westgate, Stanhope, ans. 2, 6, 9.*

*Hall, A., Goshen, Connecticut, United States, ans. all the Questions.*

*Lester, J. H., late of Woodhouse, ans. 4.*

*Levy, W. H., Shalbourne, near Hungerford, Berkshire, ans. 10, Prize.*

*Mason, the Rev. William, Normanton, ans. Prize.*

*Milburn, Thomas, Riding Mill, Newcastle-on-Tyne, ans. 1 to 7, 9 to 14, Prize.*

*Miller, W. J., B.A., Huddersfield College, ans. Prize.*

"Petrarch," ans. 3.

*Pritchett, Professor C. W., Fayette, Missouri, United States, ans. 2, Prize.*

*Rutherford, Dr., Woolwich, ans. all the Questions.*

*Rutter, Edward, 15, D'Arcy Terrace, Sunderland, ans. 2, 3, 4, 5, 6, 9.*

*Somerscales, Thomas, 5, Hope Street, Charlot Street, Hull, ans. 1 to 5, 9.*


*Tebay, Septimus, Rivington, ans. 1, 5.*

*Turnbull, John, Bedlington, ans. 1, 2, 4, 9, 11, 14, Prize.*

*Watson, Stephen, Haydonbridge, Northumberland, ans. all the Questions.*

*Wilkinson, T. T., Grammar School, Burnley, Lancashire, ans. 2.*

*Yates, B., Bolton, Lancashire, ans. 1.*

---

PRINTED FOR THE COMPANY OF STATIONERS.
Our correspondents will please to bear in mind, that the arranging of the matter for the printer is greatly facilitated when they obligingly write out their contributions, intended for insertion, on one side of the paper only, or so that each distinct answer or subject may admit of an easy separation from other matter, without the necessity of having it re-written.

The following New Publications have been received:

1. 'School Class Book of Arithmetic.' Part I. By Barnard Smith, M.A. (Macmillan and Co.)
   This small volume is chiefly intended for national and elementary schools and is admirably adapted to the purpose. Part I embraces the four fundamental rules of addition, subtraction, multiplication, and division, simple and compound, with bills of parcels and accounts. Immediately after each rule the author states, in a popular manner, the reason for the process; and he has introduced the French or Metric tables as well as the English.

2. 'The Oxford, Cambridge, and Dublin Messenger of Mathematics.' (Macmillan and Co.)
   This valuable and interesting mathematical periodical is published every Term. The last number appeared in April, and a new number is on the eve of publication.

3. 'The Educational Times.' (C. F. Hodgson, Gough Square, Fleet Street.)
   This monthly journal is partly appropriated to mathematical questions and solutions; and the mathematical department under the able editorship of Mr. W. J. Miller, B.A., has drawn to it a host of valuable contributors.
   Some of our mathematical readers may be glad to know that a "Reprint of the Mathematics of the Educational Times," also edited by our valued correspondent W. J. Miller, B.A., of Huddersfield College, is now issued in half-yearly volumes, which contain not only the solutions given in the Journal, but also, in addition, a large amount of new matter which could not otherwise appear. The first volume is already published.

The several Prizes are allotted as follows:

For answers to the Prize Question, to Mr. Samuel Bills, of Hawton, and Mr. John Turnbull, Bedlington, each twelve Diaries.

For General Mathematical Answers, to Mr. Stephen Watson, Haydonbridge, and Mr. John Buttery, Chatham, each ten Diaries.

For Poetical Answers to the Prize Enigma, to Mr. Septimus Tebay, Rivington, and Mr. John Grey, Stanhope, each ten Diaries.

For General Answers to the Enigmas, to "B. of Barum," and Mr. James Herdson, Edinburgh, each ten Diaries.

For answers to the Rebus and Charades, to the Rev. Anderson Drysdale, Glasgow, and Mr. Joseph Furniss, Loth Weedon, each eight Diaries.

They will please to send (or write, post-paid) for their respective Prizes to Mr. Joseph Greenhill, Stationers' Hall, London.

All letters must, as usual, be directed "To the Editor of the Lady's and Gentleman's Diary, Stationers' Hall, London." They must likewise be post-paid, and arrive before May 1st, 1865, excepting letters from the United States, which will be received up to June 1st.
NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2034); by Mr. Thomas Milbourn, Riding Mill.
Determine the loci of the centres of the circles of contact of a plane triangle of given base, when the sum of the two sides is constant.

II. QUEST. (2035); by Geometricus. Chelsea.
The sum of the areas of the three triangles of which the vertices are the points of contact of each of the three escribed circles with the sides of a plane triangle, diminished by the area of the triangle of which the vertices are the points of contact of the inscribed circle, is equal to twice the area of the primitive triangle.

III. QUEST. (2036); by the Editor.
Let the point (I) of intersection of the perpendiculars of a plane triangle be joined with the centre (O) of the circumscribing circle, and also with the centres (O) of the four circles of contact, and show that

\[ 2 \cdot r^2 - 10 \cdot r^2 = 2 \cdot r^2 - 10 \cdot r^2 = 2 \cdot r^2 - 10 \cdot r^2. \]

IV. QUEST. (2037); by Mr. William Godward, Chelsea.
Let AB be the transverse axis of an ellipse, and SY, HZ perpendiculars from the foci S, H upon the tangent at any point P. Find the locus of P, the intersection of AZ, BY; of P, the intersection of AY, BZ; of P, the intersection of SZ, HY; and of O the centre of the circle through Y, Z and the centre C.

V. QUEST. (2038); by Mr. Thomas Dobson, B.A., Hexham.
The tangents to the circumscribing circle at each vertex of a plane triangle is produced to meet the right line, opposite to that vertex, through the middle points of the escribed triangle; and the corresponding sides of these two triangles are also produced to meet. Prove that the six points of intersection lie in one right line.

VI. QUEST. (2039); by Mr. Stephen Watson, Haydonbridge.
Show that three rectangles can be inscribed in any triangle, so that they may severally have a side coincident in direction with the respective sides of the triangle, and their diagonals all intersecting in the same point. Also show that one circle will circumscribe all the three rectangles, and find its radius.

VII. QUEST. (2040); by Mr. Thomas Dobson, B.A., Hexham.
Determine the condition of projection of a hoop in a vertical plane, so that when it reaches the ground it may roll backwards.

VIII. QUEST. (2041); by Mr. Matthew Collins, A.B., Dublin.
Can the common difference of three rational square numbers, in arithmetical progression, ever be 17?
IX. QUEST. (2042); by the Editor.

In the year 1818, Easter Day was on the 22nd of March, the earliest date on which it can happen. When will it be so again?

X. QUEST. (2013); by Mr. John Buttery, Chatham.

An elliptic lamina has one point in its perimeter fixed, and is struck by a blow perpendicular to the plane of the lamina at the extremity of the diameter conjugate to that through the fixed point. Find the impulse on the fixed point, and the initial axis of rotation.

XI. QUEST. (2014); by Mr. Septimus Tebay, Rivington.

If the sides and area of a triangle be integers, the area is divisible by 6; prove this, and show that every multiple of 6 is not the area of a triangle whose sides are integers.

XII. QUEST. (2015); by Mr. William Godward, Chelsea.

Let DD₁, EE₁, FF₁, be the diameters of the circumscribed circle bisecting the sides BC, CA, AB of the triangle ABC, and G₁, H₁, K the points of contact of the inscribed circle; prove that each of the triads DG₁, EH₁, FK and D₁G₁, E₁H₁, F₁K are concurrent. Also prove that if \( a_1 \beta_1 \gamma_1 \) and \( a_2 \beta_2 \gamma_2 \) be the trilinear coordinates of the points of intersection of these concurrent lines, \( \Delta \) the area of the triangle, and \( R \) and \( r \) the radii of the circumscribed and inscribed circles then

\[
\sqrt{a_1a_2} + \sqrt{\beta_1 \beta_2} + \sqrt{\gamma_1 \gamma_2} = \frac{\Delta}{\sqrt{R^2 - r^2}}.
\]

XIII. QUEST. (2016); by Mr. William Gibson, Hexham.

If a quadrilateral in a circle be completed, and \( \rho \) be the radius of the circle through the centres of the circles \( r_1 \), \( r_2 \), \( r_3 \), \( r_4 \) about the four component triangles, and \( 2r = r_1 + r_2 + r_3 + r_4 \); prove that

\[
16\rho^2 = \frac{(r_1r_2 + r_2r_3)(r_1r_3 + r_2r_4)(r_1r_4 + r_2r_3)}{(r - r_1)(r - r_2)(r - r_3)(r - r_4)}.
\]

XIV. QUEST. (2017); by Mr. Stephen Watson, Haydonbridge.

Through each two of the angles of a triangle ABC, any circles are described cutting the sides again in D, E; F, G; H, I; and at each of those pairs of points tangents are drawn to the circles, meeting in P, Q, R. Show that the loci of P, Q, R are conies passing respectively through the angles of the triangle, and intersecting the two contiguous sides, in each case, in two points D', E'; F', G'; H', I'; also show that the tangents to those conies at the angles, and the lines D'E', F'G', H'I' all pass through one point.

XV. PRIZE QUEST. (2018); by Mr. C. H. Brooks, C.E., Port Louis, Mauritius.

Determine the numerical value of the definite integral

\[
u = \int_{0}^{1} \frac{\pi}{\sin \theta + \cos \theta + \tan \theta + \cot \theta + \sec \theta + \csc \theta} d\theta.
\]
To find the number of combinations of $N$ things taken $p$ together so that any pair which may occur in any one combination may not occur again in any other.

Let $N = p \cdot n + k (p - 1) + r$

in which $n$ is in general the quotient arising from dividing $N$ by $p \cdot p - 1$; but when $N$ is exactly divisible by $p \cdot p - 1$, $n$ is the quotient diminished by unity. Let $R$ be the remainder which in the excepted case $= p \cdot p - 1$.

$k$ is in general the quotient arising from dividing $R$ by $p - 1$; but when $p - 1$ divides $R$ exactly, $k$ is the quotient diminished by unity, and $r$ is the remainder which in the excepted case $= p - 1$.

$n$ is unrestricted in value, but $k$ and $r$ cannot exceed $p - 1$.

The number of combinations required will then be

I. When $k < p - 1$

\[ [C_{N,p}] = Nn + k\{(p - 1)n + 1\} \]

II. When $k = p - 1$

\[ [C_{N,p}] = Nn + (p - 1)\{(p - 1)n + r\} \]

Let $P$ be the number of pairs necessarily excluded from combination;

\[ P = \frac{N(N - 1)}{2} - \frac{p \cdot (p - 1)}{2} [C_{N,p}] \]

\[ = C_{N,2} - C_{p,2} [C_{N,p}] \]

**Example 1.** Let $N = 13, p = 3$

\[ \frac{13}{3} = 2 + \frac{1}{3} \ldots n = 2; \quad \frac{1}{2} = 0 + \frac{1}{2} \ldots k = 0, r = 1 \]

Hence, by Form. 1, $[C_{13,3}] = 13 \times 2 = 26$.

**Example 2.** Let $N = 15, p = 3$

\[ \frac{15}{6} = 2 + \frac{3}{6} \ldots n = 2; \quad \frac{3}{2} = 1 + \frac{1}{2} \ldots k = 1, r = 1. \]

* Communicated by Mr. Godward.
Hence, by Form. 1, \( [C_{15,3}] = 15 \times 2 + \{2 \times 2 + 1\} = 35 \).

By Form. 3, \( P_{13,3} = \frac{13 \times 12}{2} - \frac{3 \times 2}{2} \times 26 = 0 \)

\[
P_{15,3} = \frac{15 \times 14}{2} - \frac{3 \times 2}{2} \times 35 = 0.
\]

**Example 3.** Let \( N = 18, \ p = 4 \)

\[
\frac{16}{12} = 1 + \frac{4}{12} \therefore n = 1; \quad \frac{4}{3} = 1 + \frac{1}{3} \therefore k = 1, r = 1
\]

Hence, by Form. 1, \( [C_{16,4}] = 16 + \{3 + 1\} = 20 \)

\[
P_{16,4} = \frac{16 \times 15}{2} - \frac{4 \times 3}{2} \times 20 = 0.
\]

We ought therefore to find that 16 things can be combined 4 and 4 without any pair recurring, and that all the binary combinations are employed.

Let \( abcdefghijklmnop \) be the 16 things; the combinations are

\[
\begin{align*}
abgm & \quad bcip & \quad ceoq & \quad ghpq \\
achn & \quad bdkg & \quad cfkm & \quad gkno \\
adio & \quad beln & \quad dchn & \quad ikkl \\
aekp & \quad bfho & \quad dfnp & \quad imnq \\
alfg & \quad cdgl & \quad egpi & \quad lmoq
\end{align*}
\]

where every symbol is found in 5 combinations.

**Example 4.** Let \( N = 360, \ p = 10 \)

\[
\frac{360}{90} = 4 \therefore n = 3; \quad \frac{90}{9} = 10 \therefore k = 9, r = 9
\]

By Form 2, \( [C_{360,10}] = 360 \times 3 + 9\{9 \times 3 + 9\} = 1404 \)

\[
P_{360,10} = \frac{360 \times 359}{2} - \frac{10 \times 9}{2} \times 1404 = 1440.
\]

**Example 5.** Let \( N = 11, \ p = 4 \)

\[
\frac{11}{12} = 0 + \frac{11}{12} \therefore n = 0; \quad \frac{11}{3} = 3 + \frac{2}{3} \therefore k = 3, r = 2
\]

By Form. 2, \( [C_{11,4}] = 6 \)

\[
P_{11,4} = \frac{11 \times 10}{2} - \frac{4 \times 3}{2} \times 6 = 19.
\]
In this case, if \(abcdefghikl\) represent the 11 things, the combinations are

\[
\begin{align*}
abeh & \quad bcgl \\
acfi & \quad deil \\
adgk & \quad fhkl
\end{align*}
\]

And excluded pairs

\[
\begin{align*}
ab & \quad bg \\
ac & \quad bi \\
dh & \quad ef \\
bd & \quad ef \\
bc & \quad eg \\
ck & \quad fd
\end{align*}
\]

Example 6. Let \(N = 1000, \ p = 20\)

\[n = 2, \ k = 12, \ r = 12\]

By Form. 1, \([C_{1000,20}] = 2000 + 12(19 \times 2 + 1) = 2468\).

Example 7. Let \(N = 1001, \ p = 20\)

\[n = 2, \ k = 12, \ r = 13\]

\([C_{1001,20}] = 2002 + 12(19 \times 2 + 1) = 2470\).

Example 8. Let \(N = 2^{18} - 1 = 1023\ and \ p = 3\)

\[n = 170, \ k = 1, \ r = 1\]

By Form. 1, \(C_{1023,3} = 1023 \times 170 + \{2 \times 170 + 1\} = 174251\)

\[P_{1023,3} = \frac{1023 \times 1022}{2} - 3 \times 174251 = 0.\]

Example 9. Let \(N = 2^{10} = 1024\ and \ p = 3\)

\[n = 170, \ k = 1, \ r = 2\]

\(C_{1024,3} = 174421\)

\(P_{1024,3} = 513.\)

My dear Godward,—With reference to the general combination problem, I am now enabled to state the following:

When \(N\) is of either of the forms

\[N = n.p \ \overline{p-1}.(p-2)\ldots(p-q+1) + p\]

or \(N = n.p \ \overline{p-1}.(p-2)\ldots(p-q+1) + q - 1\)

all the combinations taken \(q\) together are found in the combinations \(p\) together, subject to the condition that the same \(q\) things may not recur; and that for such forms the number is consequently

\[
\frac{N(N-1)(N-2)\ldots\ldots\ldots(N-q+1)}{p(p-1)(p-2)\ldots\ldots\ldots(p-q+1)}
\]

Printed for the Company of Stationers.
Moreover, that when \( N \) is of the form

\[
np - 1, p - 2, \ldots, p - q + 1 + p - 1
\]

the number of combinations is

\[
\frac{N(N - 1)(N - 2) \ldots (N - q + 2)(N - p + 1)}{p(p - 1)(p - 2) \ldots (p - q + 1)}.
\]

I also send you the following as confirmatory of the formulae I have already given you for non-recurring pairs, \( p \) being \( > 3 \).

By my formulae the combinations of 16 things, taken 4 together, so that the same pair may not recur, are 20, and every pair employed.

Table of the combinations; symbols from \( a \) to \( q \).

\[
\begin{align*}
ab & cd & aemq & afio & agln & ahkp \\
bk & lp & bek n & bhmo & bgiq & \\
cg & ko & chlq & ceip & efmn & \\
dh & in & dgmp & dfkq & delo & \\
efg & h & iklm & nopq &
\end{align*}
\]

Table of combinations of 25 things, taken 5 and 5; symbols from \( a \) to \( z \), excluding \( j \).

\[
\begin{align*}
abcde & fg & hik & lmnop & qr & stu & vwxyz \\
a & fpsx & a & l & rhv & a & qkmy & ag & nuw & aiotz \\
b & g & lty & b & msiw & b & rfsu & b & hoq & b & kpuv \\
c & h & muz & c & nkx & e & sgov & c & ipr & c & fl & qw \\
d & inq & d & o & u & y & d & thp & d & klsz & d & gm & rx \\
e & korw & e & pq & gz & e & uilx & e & f & m & tv & e & hn & sy \\
\end{align*}
\]

These are 30 in number.

It will be observed that the above numbers are squares, and that my formulae give for \( p^2 \) things, taken \( p \) together, combinations \( = p^2 + p \)

or \( p^2(p^2 - 1) \), thus shewing that when \( p^2 \) things are taken \( p \) together

all pairs will necessarily appear.

Royal Military College, 20th May, 1847.

**Note on Combinations. By the Editor.**

About three years ago, at the end of an article on Triads, inserted in the ‘Philosophical Magazine’ (vol. xxii), we proposed the following curious problem in the partition and arrangement of combinations:

“Sixteen symbols may be arranged five times in the form of a square, so that every pair of symbols shall appear once both in a horizontal and a vertical line.”

We are not aware that any solution of this problem has been accomplished or attempted, and therefore take this opportunity of briefly

PRINTED FOR THE COMPANY OF STATIONERS.
stating the process and result, as an appendage to the interesting paper just given.

Twenty combinations of four, or five diversified arrangements of the sixteen symbols, as proposed, will obviously involve all the 120 pairs, provided that no repetition occurs amongst them. Now, as 5 is here the cyclical period, and the four indices 2, 3, 4, 5 admit of being partitioned in only two non-equidistant pairs, viz., 2, 5 and 3, 4, it is evident that there will be no repetition of pairs in the horizontal lines if we take as a primitive arrangement of sixteen the following notation and form:

\[
\begin{align*}
& h \ a_1 b_1 c_1 \\
& a_2 \ b_2 b_4 \\
& b_2 b_3 c_3 \\
& c_2 c_3 a_4 \\
& h \ a_1 b_1 c_1 \\
& a_2 b_2 b_4 \\
& b_2 b_3 c_3 \\
& c_2 c_3 a_4 \\
\end{align*}
\]

In the second of these the symbols are so distributed horizontally that the vertical columns may contain the non-equidistant pairs of indices 1, 3 and 4, 5, thus precluding, for a like reason, the repetition of pairs in these columns. Hence, developing this initial form by passing the several indices through the cycle, we obtain the following cyclical system of squares fulfilling the required conditions:

\[
\begin{align*}
& h \ a_1 b_1 c_1 \\
& a_2 b_2 b_4 a_5 \\
& b_2 b_3 c_3 c_4 \\
& c_2 c_3 a_4 c_5 \\
& h \ a_1 b_1 c_1 \\
& a_2 b_2 b_4 a_5 \\
& b_2 b_3 c_3 c_4 \\
& c_2 c_3 a_4 c_5 \\
\end{align*}
\]

On examining the local derivation of each of these squares as drawn from the preceding one, the relationship will be found to be remarkably simple. The four horizontal lines are, in fact, the vertical columns of the preceding square taken direct and reverse and commencing midway with the third and fourth columns, so that, remembering this, they may thus be written out with the greatest facility, under any form of notation.

Hearn's combinations, when thus grouped and arranged, are annexed as examples:

\[
\begin{align*}
& \text{abmg} \quad \text{achn} \quad \text{adoi} \quad \text{afql} \quad \text{aekp} \\
& \text{cqoe} \quad \text{dkqb} \quad \text{fmkc} \quad \text{ehmd} \quad \text{bho}f \\
& \text{hkli} \quad \text{ompt} \quad \text{ghgp} \quad \text{kong} \quad \text{mqin} \\
& \text{ndpf} \quad \text{ifge} \quad \text{lenb} \quad \text{pobic} \quad \text{gcd.} \\
& \text{abdc} \quad \text{aemg} \quad \text{aphk} \quad \text{aof}i \quad \text{agln} \\
& \text{efhg} \quad \text{plfb} \quad \text{odle} \quad \text{ymdp} \quad \text{bho}m \\
& \text{mlik} \quad \text{hdni} \quad \text{fmcn} \quad \text{lhqc} \quad \text{dfkq} \\
& \text{gqno} \quad \text{kocg} \quad \text{igqb} \quad \text{nbe}k \quad \text{eeip.} \\
\end{align*}
\]
Note on Prop. 8.

Lord Brougham's General Theorems.*

By William Godward, Chelsea.

"Prop. 8. Porism.—Two straight lines AB, AP, not parallel, being given in position, a conic parabola MN may be found, such that if, from any point of it M, a perpendicular MP be drawn to the one of the given lines nearest the curve, and this perpendicular be produced till it meets the other line in B, and if from B a line be drawn to a given point C; then MP shall have to PB together with CB, a given ratio."

The late Mr. T. S. Davies, so far as the writer of this note is aware, was the first to notice that the above proposition is not a porism, but a local theorem, "and the wrong locus too, accidentally assigned" ('Mathematician,' vol. i, p. 43), but he does not state what the correct locus should be; and the late Mr. Thomas Thompson, in his solution to this proposition ('Newcastle Magazine,' December, 1828), without adverting to its non-porismatic character, shows that the locus is an hyperbola, but not the right hyperbola. The following solution is in method the same as Mr. Thompson's, given a little more in detail, with the error corrected.

Draw CD perpendicular to AB; let \( PM = n \cdot (PB + BC), \) and \( BP = t \cdot AP; \) in \( PM \) take \( PL = nPB = \ldots = nAP, \) and join AL meeting DI at a parallel to BM in I; then I is evidently a given point, and \( LM = PM - nPB = nBC. \)

Whence \( LM^2 = n^2 \cdot BC^2 = n^2 \cdot (CD^2 + BD^2) \)

or \( LM^2 - n^2 \cdot CD^2 = n^2 \cdot BD^2 \)

\[
= n^2 \frac{AB^2}{AL^2} \cdot IL^2
\]

\[
= n^2 \left( \frac{AP^2 + PB^2}{AP^2 + PL^2} \right) \cdot IL^2
\]

\[
= n^2 \frac{1 + \varepsilon^2}{1 + n^2 \varepsilon^2} \cdot IL^2
\]

\[
\therefore \frac{LM^2}{n^2 \cdot CD^2} = \frac{IL^2}{1 + n^2 \varepsilon^2} \cdot \frac{1}{1 + \varepsilon^2} \cdot CD^2 = 1,
\]

which is the equation to an hyperbola whose centre is I and semi-diameters, in the directions IR and IL, are \( n \cdot CD \) and \( \sqrt{\frac{1 + n^2 \varepsilon^2}{1 + \varepsilon^2}} \cdot CD \) respectively.

* 'Phil. Trans.,' 1736; 'Mathematical and Physical Tracts,' 1860.
THE LADY'S AND GENTLEMAN'S DIARY,
FOR THE YEAR OF OUR LORD
1866,
Being the second after Bissextile, or Leap Year.

DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF
STUDENTS IN MATHEMATICS:

COMPRISING
MANY USEFUL AND ENTERTAINING PARTICULARS,
INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT.

THE ONE HUNDRED AND SIXTY-THIRD ANNUAL NUMBER.

LONDON:
PRINTED FOR
THE COMPANY
OF STATIONERS,
AND SOLD BY J. GREENHILL,
AT THEIR HALL, LUDGATE ST.

J. E. ADLARD, PRINTER,
[Price 1s. 4d. stitched.] BARTHOLOMEW CLOSE.
Chronological Notes, &c. in 1866.

<table>
<thead>
<tr>
<th>Dominical Letter</th>
<th>G</th>
<th>Sundays after Epiphany</th>
<th>3</th>
<th>Easter Day</th>
<th>Apr. 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden Number</td>
<td>5</td>
<td>„ „ Trinity</td>
<td>26</td>
<td>Rogation Sunday</td>
<td>May 6</td>
</tr>
<tr>
<td>Epact</td>
<td>14</td>
<td>Septuages. Sunday Jan. 28</td>
<td>Ascension Day</td>
<td>May 10</td>
<td></td>
</tr>
<tr>
<td>Solar Cycle</td>
<td>27</td>
<td>Shrove Sunday</td>
<td>Feb. 11</td>
<td>Whit Sunday</td>
<td>May 20</td>
</tr>
<tr>
<td>Number of Direction</td>
<td>11</td>
<td>Lent begins</td>
<td>Feb. 14</td>
<td>Trinity Sunday</td>
<td>May 27</td>
</tr>
<tr>
<td>Roman Indiction</td>
<td>9</td>
<td>1st Sund. in Lent</td>
<td>Feb. 18</td>
<td>Mah. year 1283 beg.</td>
<td>May 16</td>
</tr>
<tr>
<td>Julian Period</td>
<td>6379</td>
<td>Midlent Sunday</td>
<td>Mar. 11</td>
<td>Jew. „ 5627 „ Sept. 10</td>
<td></td>
</tr>
<tr>
<td>Year of the Dionysian</td>
<td>195</td>
<td>Good Friday</td>
<td>Mar. 30</td>
<td>Advent Sunday</td>
<td>Dec. 2</td>
</tr>
</tbody>
</table>

Eclipses, &c.

This year there will be five eclipses; three of the Sun, and two of the Moon.

I. March 16th.—A partial eclipse of the Sun, visible only in Kamtschatka, the more eastern parts of Chinese Tartary and Siberia, and in the Arctic Sea towards the North Pole.

II. March 31st.—A total eclipse of the Moon, near the western horizon, and partly visible. It begins in the morning at 2h. 38m.; the total eclipse begins at 3h. 44m.; middle at 4h. 33m.; total eclipse ends at 5h. 22m.; the Moon sets partially eclipsed at 5h. 42m.; eclipse ends below the horizon at 6h. 29m.

First contact 72° from the Moon’s vertex towards the left hand.

This eclipse will be visible throughout North and South America, a western portion of Africa, and over a large surface of the Atlantic and Pacific Oceans in both hemispheres.

III. April 15th.—A partial eclipse of the Sun, visible only to a southern section of about one half of Australia, and over a portion of the Southern Ocean.

IV. September 24th.—A total eclipse of the Moon, not visible in this country. The visibility will include the whole of Asia, Australia, and various important islands near the same localities, as well as over a large portion of the Pacific Ocean.

V. October 8th.—A partial eclipse of the Sun, near the western horizon, and only partly visible. It begins in the afternoon at 4h. 26m.; greatest obscuration (5 1/2 digits on the upper limb) at 5h. 26m.; but the Sun previously sets eclipsed at 5h. 22m.

First contact 78° from the Sun’s vertex towards the right hand.

For any place in Great Britain, whose north latitude, expressed in degrees, is 50° + L, and west longitude, expressed in minutes of time, is M, the correct Greenwich time of beginning, and the magnitude of the eclipse, may be easily obtained from the following formulae:

Time of beginning = 4h. 29m. 4 - 2m. 37 (L + 06M)

Magnitude of eclipse = 5 dig. 16° 6 + 7° 0 (L - 03M).

The eclipse will be visible over an extensive tract of the Atlantic Ocean, including nearly the whole of the British possessions in North America, Greenland, and Iceland; it will also be partly visible throughout Great Britain, France, Portugal, Spain, and Morocco.

Mercury will be visible in the mornings, before the Sun rises, near the eastern horizon, about January 13, May 12, September 6, and December 26; and in the evenings, soon after sunset, near the western horizon, about March 26, July 24, and November 18.

Venus will be a Morning Star until February 26; then an Evening Star until December 11; and afterwards a Morning Star to the end of the year. Greatest brilliancy about November 5.

Mars will be favorable for observation towards the end of the year, when he will approach his next opposition, and again become a most conspicuous and interesting object.

Jupiter will be a Morning Star until July 20; and afterwards an Evening Star to the end of the year.

Saturn’s rings continue to be visible, and the major and minor axes have now acquired the ratio of about 3 to 1. The planet will be in opposition on April 29, and the most favorable time of the year for telescopic observation will be during the months of April and May. The rings are not yet opened to their full extent.
<table>
<thead>
<tr>
<th>No 163.</th>
<th>JANUARY, 31 DAYS.</th>
<th>SUN ENTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st, 48m. past 6 Morn.</td>
<td>19d. 17th. 26m.</td>
</tr>
<tr>
<td></td>
<td>8th, 37m. past 9 Aftern.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16th, 37m. past 8 Aftern.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23rd, 54m. past 8 Aftern.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30th, 29m. past 8 Aftern.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>Circumcision</td>
<td>8h</td>
<td>9h</td>
<td>59°</td>
<td>23° 8</td>
<td>0° 4h 56' 14''</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td></td>
<td>8</td>
<td>8</td>
<td>22°</td>
<td>55°</td>
<td>6° 5' 15''</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td></td>
<td>8</td>
<td>8</td>
<td>4°</td>
<td>49°</td>
<td>7° 14' 16''</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td></td>
<td>8</td>
<td>8</td>
<td>4°</td>
<td>43°</td>
<td>8° 22' 17''</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td></td>
<td>8</td>
<td>8</td>
<td>4°</td>
<td>37°</td>
<td>9° 30' 18''</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>Epiphany: 12th day</td>
<td>8</td>
<td>7</td>
<td>4°</td>
<td>30°</td>
<td>10° 33' 19''</td>
</tr>
<tr>
<td>7</td>
<td>G</td>
<td>1st Sun. aft. Epiph.</td>
<td>8</td>
<td>7</td>
<td>4°</td>
<td>22°</td>
<td>11° 39' 20''</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>Plough Mond.: Lucian</td>
<td>8</td>
<td>7</td>
<td>4°</td>
<td>14°</td>
<td>7° 21' 21''</td>
</tr>
<tr>
<td>9</td>
<td>T</td>
<td></td>
<td>8</td>
<td>6</td>
<td>4°</td>
<td>6°</td>
<td>0° 41' 22''</td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td></td>
<td>8</td>
<td>6</td>
<td>4°</td>
<td>57°</td>
<td>1° 43' 23''</td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>Hilary Term begins</td>
<td>8</td>
<td>5</td>
<td>4°</td>
<td>48°</td>
<td>2° 43' 24''</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td></td>
<td>8</td>
<td>4</td>
<td>4°</td>
<td>38°</td>
<td>3° 45' 25''</td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>Hilary: Camb. T. beg.</td>
<td>8</td>
<td>4</td>
<td>4°</td>
<td>28°</td>
<td>4° 43' 26''</td>
</tr>
<tr>
<td>14</td>
<td>G</td>
<td>2d Sun. aft. Epiphany</td>
<td>8</td>
<td>3</td>
<td>4°</td>
<td>18°</td>
<td>5° 38' 27''</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>Oxford Term begins</td>
<td>8</td>
<td>2</td>
<td>4°</td>
<td>7°</td>
<td>6° 27' 28''</td>
</tr>
<tr>
<td>16</td>
<td>T</td>
<td></td>
<td>8</td>
<td>1</td>
<td>4°</td>
<td>55°</td>
<td>2° 36' 1''</td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td></td>
<td>8</td>
<td>0</td>
<td>4°</td>
<td>44°</td>
<td>5° 36' 1''</td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>Prisca</td>
<td>7</td>
<td>5</td>
<td>9°</td>
<td>32°</td>
<td>6° 48' 2''</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td></td>
<td>7</td>
<td>5</td>
<td>8°</td>
<td>19°</td>
<td>8° 2' 3''</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>Fabian</td>
<td>7</td>
<td>5</td>
<td>7°</td>
<td>6°</td>
<td>9° 17' 4''</td>
</tr>
<tr>
<td>21</td>
<td>G</td>
<td>3d Sun. aft. Epiph.:</td>
<td>7</td>
<td>5</td>
<td>6°</td>
<td>53°</td>
<td>10° 32' 5''</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>Vincent [Agnes]</td>
<td>7</td>
<td>5</td>
<td>5°</td>
<td>39°</td>
<td>11° 49' 6''</td>
</tr>
<tr>
<td>23</td>
<td>T</td>
<td></td>
<td>7</td>
<td>5</td>
<td>4°</td>
<td>25°</td>
<td>7° 7''</td>
</tr>
<tr>
<td>24</td>
<td>W</td>
<td></td>
<td>7</td>
<td>5</td>
<td>2°</td>
<td>11°</td>
<td>1° 4' 8''</td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>Ps. B. m. 1858: Con.</td>
<td>7</td>
<td>5</td>
<td>1°</td>
<td>56°</td>
<td>2° 18' 9''</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>[St. Paul]</td>
<td>7</td>
<td>5</td>
<td>0°</td>
<td>41°</td>
<td>3° 28' 10''</td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td></td>
<td>7</td>
<td>4</td>
<td>9°</td>
<td>26°</td>
<td>4° 32' 11''</td>
</tr>
<tr>
<td>28</td>
<td>G</td>
<td>Septuages. Sunday</td>
<td>7</td>
<td>4</td>
<td>7°</td>
<td>10°</td>
<td>5° 27' 12''</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td></td>
<td>7</td>
<td>4</td>
<td>6°</td>
<td>54°</td>
<td>6° 14' 13''</td>
</tr>
<tr>
<td>30</td>
<td>T</td>
<td>K. Chas. I. mart. 1649</td>
<td>7</td>
<td>4</td>
<td>4°</td>
<td>38°</td>
<td>5° 11' 38''</td>
</tr>
<tr>
<td>31</td>
<td>W</td>
<td>Hilary Term ends</td>
<td>7</td>
<td>4</td>
<td>3°</td>
<td>21°</td>
<td>6° 2' 15''</td>
</tr>
</tbody>
</table>

Day. | Length of Day | Day's Inc. | D. breaks | Tw. ends | Sun East | Cl. of Sun. | @Semidiameter |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7h. 50m.</td>
<td>0</td>
<td>6</td>
<td>6 m 2</td>
<td>6 a 5</td>
<td>4 m 45</td>
<td>3' 52''</td>
</tr>
<tr>
<td>6</td>
<td>58</td>
<td>14</td>
<td>2</td>
<td>10</td>
<td>49</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>7</td>
<td>23</td>
<td>1</td>
<td>15</td>
<td>54</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>18</td>
<td>34</td>
<td>59</td>
<td>21</td>
<td>50</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>47</td>
<td>55</td>
<td>25</td>
<td>5</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td>28</td>
<td>46</td>
<td>1</td>
<td>2</td>
<td>50</td>
<td>35</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
## FEBRUARY, 28 DAYS. 1866

Last Quarter ...... 7th, 39m. past 7 Aftern.
New Moon ...... 15th, 13m. past 10 Morn.
First Quarter...... 22nd, 48m. past 4 Morn.

<table>
<thead>
<tr>
<th>M.</th>
<th>D.</th>
<th>Sundays, Holidays, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Sun’s declin.</th>
<th>Crises &amp; sets</th>
<th>C’s age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Th</td>
<td>purification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 F</td>
<td>Purif.: Candel.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 S</td>
<td>Blase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 S</td>
<td>Sexagesima</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 M</td>
<td>Agatha</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 S</td>
<td>Qu. Vict. mar. 1840</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 G</td>
<td>Shrode Sunday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 T</td>
<td>Shrode Tuesday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 W</td>
<td>Lent beg.: Ash Wed.:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 T</td>
<td>[Valentine]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 F</td>
<td>Camb. Term div. mid.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 G</td>
<td>1st Sunday in Lent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 W</td>
<td>Ember Week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 S</td>
<td>St. Matthias</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 G</td>
<td>2d Sunday in Lent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day Inc.</th>
<th>D. breaks</th>
<th>Tw. ends</th>
<th>Sun East</th>
<th>Ch. bef. Sun</th>
<th>☉Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9h. 5m.</td>
<td>1</td>
<td>21</td>
<td>5m 44</td>
<td>6a 44</td>
<td>5m 17</td>
<td>13' 53</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>23</td>
<td>39</td>
<td>37</td>
<td>52</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>41</td>
<td>57</td>
<td>29</td>
<td>7</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>10</td>
<td>2</td>
<td>16</td>
<td>20</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>19</td>
<td>35</td>
<td>11</td>
<td>17</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>38</td>
<td>54</td>
<td>1</td>
<td>25</td>
<td>45</td>
<td>13</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
### N° 163. MARCH, 31 DAYS.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Time (h:m)</th>
<th>Decl. (°)</th>
<th>Rise</th>
<th>Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 F</td>
<td>Tis</td>
<td>David: Least twilight</td>
<td>6:48</td>
<td>7°33'</td>
<td>10:7h 8:15</td>
</tr>
<tr>
<td>2 F</td>
<td>Chad</td>
<td>6:46</td>
<td>41</td>
<td>6:47</td>
<td>12:16</td>
</tr>
<tr>
<td>3 S</td>
<td>3° Sunday in Lent</td>
<td>6:41</td>
<td>54</td>
<td>24</td>
<td>9:15</td>
</tr>
<tr>
<td>4 M</td>
<td>Tu</td>
<td>6:39</td>
<td>45</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>5 W</td>
<td>Perpetua</td>
<td>6:35</td>
<td>48</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>6 Th</td>
<td>6:35</td>
<td>50</td>
<td>4</td>
<td>51</td>
<td>18:21</td>
</tr>
<tr>
<td>7 F</td>
<td>6:30</td>
<td>51</td>
<td></td>
<td>28</td>
<td>14:22</td>
</tr>
<tr>
<td>8 S</td>
<td>P. of Wales mar. 1863</td>
<td>6:28</td>
<td>53</td>
<td></td>
<td>4:2</td>
</tr>
<tr>
<td>9 G</td>
<td>4th, or Midl. Sunday</td>
<td>6:26</td>
<td>55</td>
<td>3</td>
<td>54:24</td>
</tr>
<tr>
<td>10 M</td>
<td>Gregory</td>
<td>6:23</td>
<td>57</td>
<td>17</td>
<td>3:38</td>
</tr>
<tr>
<td>11 L</td>
<td>6:21</td>
<td>58</td>
<td>2</td>
<td>54</td>
<td>17:26</td>
</tr>
<tr>
<td>12 S</td>
<td>6:19</td>
<td>60</td>
<td>1</td>
<td>30</td>
<td>51:27</td>
</tr>
<tr>
<td>13 T</td>
<td>6:17</td>
<td>2</td>
<td></td>
<td>6:5</td>
<td>23:28</td>
</tr>
<tr>
<td>14 F</td>
<td>6:14</td>
<td>4</td>
<td>1</td>
<td>43</td>
<td>11:15</td>
</tr>
<tr>
<td>15 S</td>
<td>St. Patrick</td>
<td>6:12</td>
<td>5</td>
<td></td>
<td>7a 11</td>
</tr>
<tr>
<td>16 G</td>
<td>6:10</td>
<td>7</td>
<td>0</td>
<td>55</td>
<td>31:2</td>
</tr>
<tr>
<td>17 M</td>
<td>6:08</td>
<td>9</td>
<td></td>
<td>32</td>
<td>9:30</td>
</tr>
<tr>
<td>18 L</td>
<td>Equal day and night</td>
<td>6:06</td>
<td>10</td>
<td>8</td>
<td>6:4</td>
</tr>
<tr>
<td>19 W</td>
<td>Benedict</td>
<td>6:36</td>
<td>12</td>
<td>0</td>
<td>16:5</td>
</tr>
<tr>
<td>20 S</td>
<td>6:34</td>
<td>14</td>
<td></td>
<td>40</td>
<td>16:6</td>
</tr>
<tr>
<td>21 T</td>
<td>6:32</td>
<td>16</td>
<td>1</td>
<td>40</td>
<td>16:6</td>
</tr>
<tr>
<td>22 F</td>
<td>Cambridge Term ends</td>
<td>5:58</td>
<td>15</td>
<td>1</td>
<td>31:7</td>
</tr>
<tr>
<td>23 S</td>
<td>Oxford Term ends</td>
<td>5:56</td>
<td>17</td>
<td>27</td>
<td>2:9</td>
</tr>
<tr>
<td>24 G</td>
<td>Palm Sun.:Lady Day</td>
<td>5:54</td>
<td>19</td>
<td>50</td>
<td>2:53</td>
</tr>
<tr>
<td>25 M</td>
<td>5:52</td>
<td>20</td>
<td>2</td>
<td>14</td>
<td>3:10</td>
</tr>
<tr>
<td>26 T</td>
<td>5:50</td>
<td>22</td>
<td>3</td>
<td>37</td>
<td>4:11</td>
</tr>
<tr>
<td>27 F</td>
<td>5:48</td>
<td>24</td>
<td>4</td>
<td>29</td>
<td>6:12</td>
</tr>
<tr>
<td>28 S</td>
<td>Maundy Thursday</td>
<td>5:46</td>
<td>25</td>
<td>24</td>
<td>5:13</td>
</tr>
<tr>
<td>29 T</td>
<td>Good Friday</td>
<td>5:44</td>
<td>27</td>
<td>48</td>
<td>5:14</td>
</tr>
</tbody>
</table>

**Day.** Length of D. Day Inc. D. breaks Tw. ends Sun. East. Cl. bef. Sun. @Semidiameter

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10h 50m</td>
<td>3</td>
<td>6</td>
<td>4m 55s</td>
<td>7a 30</td>
<td>5m 48</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>9</td>
<td>25</td>
<td>44</td>
<td>39</td>
<td>53</td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>45</td>
<td>32</td>
<td>48</td>
<td>58</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>49</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>58</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>12</td>
<td>9</td>
<td>25</td>
<td>7</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>45</td>
<td>3</td>
<td>54</td>
<td>18</td>
<td>13</td>
</tr>
</tbody>
</table>

**PRINTED FOR THE COMPANY OF STATIONERS.**
<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Easter Sunday</td>
</tr>
<tr>
<td>2</td>
<td>Easter Monday</td>
</tr>
<tr>
<td>3</td>
<td>East C: Rich Bp Ch</td>
</tr>
<tr>
<td>4</td>
<td>St Ambrose: Oxf T b</td>
</tr>
<tr>
<td>5</td>
<td>1st, or Low Sunday</td>
</tr>
<tr>
<td>6</td>
<td>Old L D: Cam T beg</td>
</tr>
<tr>
<td>7</td>
<td>Pr Leopold b: 1853</td>
</tr>
<tr>
<td>8</td>
<td>2d Sun a East: East</td>
</tr>
<tr>
<td>9</td>
<td>[Term beg]</td>
</tr>
<tr>
<td>10</td>
<td>☉ rises 8 12 aftern</td>
</tr>
<tr>
<td>11</td>
<td>☉ rises 2 38 morn</td>
</tr>
<tr>
<td>12</td>
<td>☉ rises 4 2 morn</td>
</tr>
<tr>
<td>13</td>
<td>☉ sets 8 22 aftern</td>
</tr>
<tr>
<td>14</td>
<td>3d Sund aft Easter</td>
</tr>
<tr>
<td>15</td>
<td>St George</td>
</tr>
<tr>
<td>16</td>
<td>☉ rises 4 15 morn</td>
</tr>
<tr>
<td>17</td>
<td>☉ rises 4 12 aftern</td>
</tr>
</tbody>
</table>

**April, 30 Days. 1866**

- **Last Quarter:** 8th, 42m past 8 Morn.
- **New Moon:** 15th, 3m past 7 Morn.
- **First Quarter:** 21st, 31m past 10 Aftern.
- **Full Moon:** 29th, 23m past 9 Aftern.

<table>
<thead>
<tr>
<th>Day</th>
<th>Sun Enters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5&quot; 38' 6&quot; 30'</td>
</tr>
<tr>
<td>2</td>
<td>5 36 32</td>
</tr>
<tr>
<td>3</td>
<td>5 33 34</td>
</tr>
<tr>
<td>4</td>
<td>5 31 35</td>
</tr>
<tr>
<td>5</td>
<td>5 29 37</td>
</tr>
<tr>
<td>6</td>
<td>5 27 39</td>
</tr>
<tr>
<td>7</td>
<td>5 24 40</td>
</tr>
<tr>
<td>8</td>
<td>5 22 42</td>
</tr>
<tr>
<td>9</td>
<td>5 20 44</td>
</tr>
<tr>
<td>10</td>
<td>5 18 45</td>
</tr>
<tr>
<td>11</td>
<td>5 15 47</td>
</tr>
<tr>
<td>12</td>
<td>5 13 49</td>
</tr>
<tr>
<td>13</td>
<td>5 11 50</td>
</tr>
<tr>
<td>14</td>
<td>5 9 52</td>
</tr>
<tr>
<td>15</td>
<td>5 7 54</td>
</tr>
<tr>
<td>16</td>
<td>5 5 10</td>
</tr>
<tr>
<td>17</td>
<td>5 2 57</td>
</tr>
<tr>
<td>18</td>
<td>5 0 59</td>
</tr>
<tr>
<td>19</td>
<td>4 58 7</td>
</tr>
<tr>
<td>20</td>
<td>4 56 7</td>
</tr>
<tr>
<td>21</td>
<td>4 54 7</td>
</tr>
<tr>
<td>22</td>
<td>4 52 7</td>
</tr>
<tr>
<td>23</td>
<td>4 50 7</td>
</tr>
<tr>
<td>24</td>
<td>4 48 7</td>
</tr>
<tr>
<td>25</td>
<td>4 46 10</td>
</tr>
<tr>
<td>26</td>
<td>4 44 7</td>
</tr>
<tr>
<td>27</td>
<td>4 42 7</td>
</tr>
<tr>
<td>28</td>
<td>4 40 7</td>
</tr>
<tr>
<td>29</td>
<td>4 38 7</td>
</tr>
<tr>
<td>30</td>
<td>4 36 7</td>
</tr>
</tbody>
</table>

**Keplerian Elements:**

<table>
<thead>
<tr>
<th>Day</th>
<th>Rise</th>
<th>Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8° 31' 6&quot; 18' 3&quot; 58&quot;</td>
<td>16° 2&quot;</td>
</tr>
<tr>
<td>6</td>
<td>13 28 23 42 23 28 0</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>31 47 8 54 28 1 14 50</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>51 7 2 53 7 32 0 aft 13 58</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>14 26 37 20 37 1 20 58</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>28 41 21 35 42 2 17 55</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Sundays, Holidays, &amp;c.</td>
<td>( \text{rise} )</td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>1</td>
<td>Tu</td>
<td>St. Ph. &amp; Is.</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>b. 1850</td>
</tr>
<tr>
<td>3</td>
<td>Th</td>
<td>Invention of the Cross</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>( \text{h sets} ) 4 44 morn.</td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>G</td>
<td>Roga. Sun.: Jn. Ev. à</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>( \text{P. Lat.} )</td>
</tr>
<tr>
<td>8</td>
<td>Tu</td>
<td>Easter Term ends</td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Th</td>
<td>Ase.: Holy Thursday</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>( \text{y rises} ) 0 48 morn.</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>Cam. Term div. midn.</td>
</tr>
<tr>
<td>15</td>
<td>Tu</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td>( \text{y rises} ) 2 44 morn.</td>
</tr>
<tr>
<td>17</td>
<td>Th</td>
<td>( \text{h sets} ) 9 40 aft. 3</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>Oxford Term ends</td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td>Oxf. Tm. be.: Dunstan</td>
</tr>
<tr>
<td>20</td>
<td>G</td>
<td>Whit Sunday</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>Whit Monday</td>
</tr>
<tr>
<td>22</td>
<td>Tu</td>
<td>Whit Tu.: Tr. T. beg.</td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>Em. Week: Nts. at twi.</td>
</tr>
<tr>
<td>24</td>
<td>Th</td>
<td>Qu. Victoria b. 1819</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>Prs. Helena b. 1846</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>Augustin</td>
</tr>
<tr>
<td>27</td>
<td>G</td>
<td>Trin. Sun.: R. H. b.</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>[1819: Ven. Bede]</td>
</tr>
<tr>
<td>29</td>
<td>Tu</td>
<td>K. Chas. II. rest. 1660</td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td>( \text{y rises} ) 3 14 morn.</td>
</tr>
<tr>
<td>31</td>
<td>Th</td>
<td>Corpus Christi</td>
</tr>
</tbody>
</table>
## JUNE, 30 DAYS.

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day Inc.</th>
<th>D. breaks</th>
<th>Tw. end</th>
<th>Sun East.</th>
<th>Cl. at. Sun.</th>
<th>Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16h. 14m.</td>
<td>8 30</td>
<td>7 m 13</td>
<td>2° 31&quot;</td>
<td>15° 48&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>39</td>
<td>No real Night</td>
<td>16 1 42</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>45</td>
<td>but constant</td>
<td>19 0 44</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>33</td>
<td>49</td>
<td>Day, or Twi-</td>
<td>21 0 bef.19</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>34</td>
<td>50</td>
<td>light.</td>
<td>22 1 23</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>33</td>
<td>0 dec. 1</td>
<td></td>
<td>23 2 27</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. W.</td>
<td>SUNDAYS, HOLIDAYS, &amp;C.</td>
<td>☉rise</td>
<td>☉set</td>
<td>☉decl.</td>
<td>Cr. &amp; S.</td>
<td>Ca</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------------------------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
<td>---------</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>1 G</td>
<td>5th S. af. Tr. : Ds. Al.</td>
<td>3°49'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>2 M</td>
<td>Vis. V.M. [mar. 1862]</td>
<td>3°49'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>3 Tn</td>
<td>Dog days bc. : Oxf. Act.</td>
<td>3°50'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>4 W</td>
<td>Trans. St. Martin</td>
<td>3°51'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>5 Tn</td>
<td>Old Midsummer-day</td>
<td>3°52'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>7 S</td>
<td>Th. à Beck. : Oxf. Ends</td>
<td>3°53'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>8 G</td>
<td>6th Sun. aft. Trinity</td>
<td>3°54'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>9 M</td>
<td></td>
<td>3°55'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>10 Tn</td>
<td></td>
<td>3°56'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>11 W</td>
<td></td>
<td>3°57'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>12 Th</td>
<td>4 rises 8 31 aftern.</td>
<td>3°58'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>13 F</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>14 S</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>15 G</td>
<td>7th Sun. aft. Tr. : St.</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>16 M</td>
<td>[Swithin]</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>17 Th</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>18 W</td>
<td>8 rises 0 7 morn.</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>19 Th</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>20 F</td>
<td>Margaret</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>21 S</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>22 G</td>
<td>8th Sun. aft. Trinity</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>23 M</td>
<td>[Magdalene]</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>24 Th</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>25 W</td>
<td>St. Jas. : Ds. Camb. b.</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>26 Th</td>
<td>St. Anne [1797]</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>27 F</td>
<td>9 sets 9 20 aftern.</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>28 S</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>29 G</td>
<td>9th Sun. aft. Trinity</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>30 M</td>
<td></td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>31 Th</td>
<td>9 sets 8 26 aftern.</td>
<td>3°59'18''</td>
<td>23°N</td>
<td>7''</td>
<td>9°a57''</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

1     | 16° 29'20"   | 0°       | 0°        | 6°      | 2°        | 15°       | 46°         |
6     | 23           | 11       | 11        | 6°      | 2°        | 15°       | 46°         |
11    | 15           | 19       | No real Night. | 6°      | 2°        | 15°       | 46°         |
16    | 5            | 29       | 29        | 6°      | 2°        | 15°       | 46°         |
21    | 15           | 53       | 53        | 6°      | 2°        | 15°       | 46°         |
26    | 40           | 54°      | 54°       | 6°      | 2°        | 15°       | 46°         |

PRINTED FOR THE COMPANY OF STATIONERS.
### AUGUST, 31 DAYS.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>4:25</td>
<td>7:47</td>
<td>18°N</td>
<td>2</td>
<td>9°a 53'</td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>4:28</td>
<td>7:44</td>
<td>31°</td>
<td>10</td>
<td>55°22</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>4:29</td>
<td>7:42</td>
<td>15</td>
<td>11</td>
<td>33°23</td>
</tr>
<tr>
<td>5</td>
<td>G</td>
<td>4:31</td>
<td>7:41</td>
<td>59</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>4:33</td>
<td>7:39</td>
<td>43</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>7</td>
<td>Th</td>
<td>4:34</td>
<td>7:37</td>
<td>26</td>
<td>1</td>
<td>13°26</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>4:36</td>
<td>7:35</td>
<td>9</td>
<td>2</td>
<td>14°27</td>
</tr>
<tr>
<td>9</td>
<td>Th</td>
<td>4:37</td>
<td>7:33</td>
<td>52</td>
<td>3</td>
<td>21°28</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>4:39</td>
<td>7:32</td>
<td>4</td>
<td>7</td>
<td>36°1</td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>4:40</td>
<td>7:30</td>
<td>17</td>
<td>7</td>
<td>36°1</td>
</tr>
<tr>
<td>12</td>
<td>G</td>
<td>4:42</td>
<td>7:28</td>
<td>38</td>
<td>8</td>
<td>2°</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>4:43</td>
<td>7:26</td>
<td>2</td>
<td>41</td>
<td>27°3</td>
</tr>
<tr>
<td>14</td>
<td>Th</td>
<td>4:45</td>
<td>7:24</td>
<td>22</td>
<td>8</td>
<td>52°4</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>4:47</td>
<td>7:22</td>
<td>4</td>
<td>9</td>
<td>17°5</td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>4:48</td>
<td>7:20</td>
<td>45</td>
<td>9</td>
<td>43°6</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>4:50</td>
<td>7:18</td>
<td>26</td>
<td>10</td>
<td>13°7</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>4:51</td>
<td>7:16</td>
<td>7</td>
<td>10</td>
<td>46°8</td>
</tr>
<tr>
<td>19</td>
<td>G</td>
<td>4:53</td>
<td>7:14</td>
<td>47</td>
<td>11</td>
<td>23°9</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>4:55</td>
<td>7:12</td>
<td>9</td>
<td>12</td>
<td>27°10</td>
</tr>
<tr>
<td>21</td>
<td>Th</td>
<td>4:56</td>
<td>7:10</td>
<td>0</td>
<td>8</td>
<td>11°</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>4:58</td>
<td>7:08</td>
<td>47</td>
<td>0</td>
<td>59°12</td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td>5:07</td>
<td>7:06</td>
<td>27</td>
<td>1</td>
<td>56°13</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>5:17</td>
<td>7:04</td>
<td>7</td>
<td>2</td>
<td>59°14</td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>5:33</td>
<td>7:08</td>
<td>46</td>
<td>4</td>
<td>19°15</td>
</tr>
<tr>
<td>26</td>
<td>G</td>
<td>5:46</td>
<td>7:12</td>
<td>25</td>
<td>6</td>
<td>13°F</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>5:67</td>
<td>7:16</td>
<td>4</td>
<td>7</td>
<td>28°17</td>
</tr>
<tr>
<td>28</td>
<td>Th</td>
<td>5:76</td>
<td>7:25</td>
<td>9</td>
<td>43</td>
<td>56°18</td>
</tr>
<tr>
<td>29</td>
<td>W</td>
<td>5:96</td>
<td>7:33</td>
<td>22</td>
<td>8</td>
<td>26°19</td>
</tr>
<tr>
<td>30</td>
<td>Th</td>
<td>5:11</td>
<td>7:31</td>
<td>0</td>
<td>8</td>
<td>59°29</td>
</tr>
<tr>
<td>31</td>
<td>F</td>
<td>5:12</td>
<td>7:32</td>
<td>38</td>
<td>9</td>
<td>36°21</td>
</tr>
</tbody>
</table>

**Note:**
- **15°:** 48°
- **10°:** 6° 2°
- **9°:** 5° 5°
- **8°:** 5° 5°
- **7°:** 4° 4°
- **6°:** 4° 4°
- **5°:** 4° 4°
- **4°:** 4° 4°
- **3°:** 4° 4°
- **2°:** 4° 4°
- **1°:** 4° 4°
- **0°:** 4° 4°

**SUN ENTERS**

**22d. 22h. 3m.**

---

**Printed for the Company of Stationers**
<table>
<thead>
<tr>
<th>No. 163. SEPTEMBER, 30 DAYS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last Quarter ....... 1st, 9m. past 12 Midn.</td>
</tr>
<tr>
<td>New Moon .......... 9th, 14m. past 2 Morn.</td>
</tr>
<tr>
<td>First Quarter ....... 17th, 28m. past 3 Morn.</td>
</tr>
<tr>
<td>Full Moon ......... 24th, 5m. past 2 Aft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sund., Holidays, &amp;c.</th>
<th>♢rise</th>
<th>♣set</th>
<th>♦decl.</th>
<th>♣nr. and ♣s.</th>
<th>♦ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 S Giles</td>
<td>5°14'</td>
<td>6°46'</td>
<td>8°N</td>
<td>17°10b a18°22</td>
<td></td>
</tr>
<tr>
<td>2 G 14th S. af. Tr.: Lond.</td>
<td>5°15°</td>
<td>6°44°</td>
<td>7</td>
<td>55°11' 7°23</td>
<td></td>
</tr>
<tr>
<td>3 M [bt. 1666, o.s.]</td>
<td>5°17°</td>
<td>6°42°</td>
<td>33 morn.</td>
<td>24°</td>
<td></td>
</tr>
<tr>
<td>4 Tt</td>
<td>5°19°</td>
<td>6°40°</td>
<td>11</td>
<td>0</td>
<td>5°25</td>
</tr>
<tr>
<td>5 W Old Bartholomew</td>
<td>5°20°</td>
<td>6°37°</td>
<td>49</td>
<td>1 9°26</td>
<td></td>
</tr>
<tr>
<td>6 Th</td>
<td>5°22°</td>
<td>6°35°</td>
<td>27</td>
<td>2 18°27</td>
<td></td>
</tr>
<tr>
<td>7 F Enurchus</td>
<td>5°23°</td>
<td>6°33°</td>
<td>4</td>
<td>3 28°28</td>
<td></td>
</tr>
<tr>
<td>8 S Nativity V. Mary</td>
<td>5°25°</td>
<td>6°30°</td>
<td>42</td>
<td>4 37°29</td>
<td></td>
</tr>
<tr>
<td>9 G 15th Sun. aft. Trinity</td>
<td>5°27°</td>
<td>6°28°</td>
<td>19 sets</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>10 M</td>
<td>5°28°</td>
<td>6°26°</td>
<td>56</td>
<td>6 a 55°1</td>
<td></td>
</tr>
<tr>
<td>11 Tt</td>
<td>5°30°</td>
<td>6°24°</td>
<td>33</td>
<td>7 20°2</td>
<td></td>
</tr>
<tr>
<td>12 W</td>
<td>5°31°</td>
<td>6°21°</td>
<td>10</td>
<td>7 46°3</td>
<td></td>
</tr>
<tr>
<td>13 Th</td>
<td>5°33°</td>
<td>6°19°</td>
<td>3</td>
<td>47 8 13°4</td>
<td></td>
</tr>
<tr>
<td>14 F Holy Cross</td>
<td>5°35°</td>
<td>6°17°</td>
<td>24</td>
<td>8 44°5</td>
<td></td>
</tr>
<tr>
<td>15 S</td>
<td>5°36°</td>
<td>6°14°</td>
<td>1</td>
<td>9 20°6</td>
<td></td>
</tr>
<tr>
<td>16 G 16th Sun. aft. Trinity</td>
<td>5°38°</td>
<td>6°12°</td>
<td>3</td>
<td>8 10°17</td>
<td></td>
</tr>
<tr>
<td>17 M Lambert</td>
<td>5°39°</td>
<td>6°10°</td>
<td>15</td>
<td>10 48°8</td>
<td></td>
</tr>
<tr>
<td>18 Tt</td>
<td>5°41°</td>
<td>6°8°</td>
<td>52</td>
<td>11 43°9</td>
<td></td>
</tr>
<tr>
<td>19 W Ember Week</td>
<td>5°42°</td>
<td>6°5°</td>
<td>28</td>
<td>morn. 10</td>
<td></td>
</tr>
<tr>
<td>20 Th</td>
<td>5°44°</td>
<td>6°3°</td>
<td>5</td>
<td>0 42°11</td>
<td></td>
</tr>
<tr>
<td>21 F St. Matthew</td>
<td>5°46°</td>
<td>6°1°</td>
<td>42</td>
<td>1 48°12</td>
<td></td>
</tr>
<tr>
<td>22 S</td>
<td>5°47°</td>
<td>6°55°</td>
<td>5</td>
<td>4 57°13</td>
<td></td>
</tr>
<tr>
<td>23 G 17th S. af. Tr.: Equal</td>
<td>5°49°</td>
<td>6°56°</td>
<td>0</td>
<td>10°14</td>
<td></td>
</tr>
<tr>
<td>24 M</td>
<td>5°51°</td>
<td>6°54°</td>
<td>1</td>
<td>42 5°14</td>
<td></td>
</tr>
<tr>
<td>25 Tt</td>
<td>5°52°</td>
<td>6°51°</td>
<td>52</td>
<td>6 a 26°16</td>
<td></td>
</tr>
<tr>
<td>26 W St. Cyprian</td>
<td>5°54°</td>
<td>6°49°</td>
<td>1</td>
<td>15 6 58°17</td>
<td></td>
</tr>
<tr>
<td>27 Th</td>
<td>5°55°</td>
<td>6°47°</td>
<td>39</td>
<td>7 34°18</td>
<td></td>
</tr>
<tr>
<td>28 F</td>
<td>5°57°</td>
<td>6°44°</td>
<td>2</td>
<td>28 15°19</td>
<td></td>
</tr>
<tr>
<td>29 S Michaelmas-day</td>
<td>5°59°</td>
<td>6°42°</td>
<td>25</td>
<td>9 520</td>
<td></td>
</tr>
<tr>
<td>30 G 18th S. a. Tr.: St. Jer.</td>
<td>6°0°</td>
<td>6°40°</td>
<td>49</td>
<td>10 0°21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>13h.</th>
<th>32m.</th>
<th>3</th>
<th>2</th>
<th>3</th>
<th>m</th>
<th>6</th>
<th>8</th>
<th>a</th>
<th>53</th>
<th>6</th>
<th>m</th>
<th>27</th>
<th>0°'</th>
<th>7°</th>
<th>15°</th>
<th>54°</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>32</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>m</td>
<td>6</td>
<td>8</td>
<td>a</td>
<td>53</td>
<td>6</td>
<td>m</td>
<td>27</td>
<td>0°</td>
<td>7°</td>
<td>15°</td>
<td>54°</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>54</td>
<td>40</td>
<td>29</td>
<td>24</td>
<td>11</td>
<td>3</td>
<td>26</td>
<td>56</td>
<td>57</td>
<td>56</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>59</td>
<td>44</td>
<td>48</td>
<td>8</td>
<td>41</td>
<td>16</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
### October, 31 Days, 1866

<table>
<thead>
<tr>
<th>Day</th>
<th>M</th>
<th>Remigius: Camb. Tm.</th>
<th>6h 2’5’37”</th>
<th>3° s 12’</th>
<th>11’ a 3’22”</th>
<th>W</th>
<th>Faith</th>
<th>6h 10’5’26”</th>
<th>5</th>
<th>8</th>
<th>34°27”</th>
<th>S</th>
<th>19th Sun. aft. Trinity</th>
<th>6h 12’5’24”</th>
<th>3</th>
<th>4</th>
<th>42°28”</th>
<th>M</th>
<th>St. Denys</th>
<th>6h 15’5’20”</th>
<th>6</th>
<th>17</th>
<th>5 a 47’1”</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Th</td>
<td>[begins]</td>
<td>6h 4’5’35”</td>
<td>35</td>
<td>morn. 23</td>
<td>W</td>
<td>sets 6</td>
<td>6h 5’33”</td>
<td>59</td>
<td>0</td>
<td>10°24</td>
<td>W</td>
<td>Oxford Term begins</td>
<td>6h 17’5’17”</td>
<td>40</td>
<td>6</td>
<td>14°2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td></td>
<td>6h 7’31’4”</td>
<td>4</td>
<td>22</td>
<td>1</td>
<td>18°25</td>
<td></td>
<td>6h 9’5’28”</td>
<td>45</td>
<td>2</td>
<td>27°26</td>
<td>T</td>
<td>Old Michaelmas Day</td>
<td>6h 19’5’15”</td>
<td>7</td>
<td>3</td>
<td>45°3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Th</td>
<td></td>
<td>6h 9’5’28”</td>
<td>45</td>
<td>2</td>
<td>1</td>
<td>18°25</td>
<td></td>
<td>6h 9’5’28”</td>
<td>45</td>
<td>2</td>
<td>27°26</td>
<td>F</td>
<td>Least twilight</td>
<td>6h 20’5’13”</td>
<td>25</td>
<td>7</td>
<td>18°4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td></td>
<td>6h 10’5’26”</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>34°27</td>
<td></td>
<td>6h 10’5’26”</td>
<td>5</td>
<td>8</td>
<td>34°27</td>
<td>S</td>
<td>Trans. K. Edw. Conf.</td>
<td>6h 22’5’11”</td>
<td>48</td>
<td>7</td>
<td>57°5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td></td>
<td>6h 12’5’24”</td>
<td>31</td>
<td>4</td>
<td>4</td>
<td>42°28</td>
<td></td>
<td>6h 14’5’22”</td>
<td>54</td>
<td>sets</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Th</td>
<td></td>
<td>6h 14’5’22”</td>
<td>54</td>
<td>sets</td>
<td>N</td>
<td></td>
<td>6h 15’5’20”</td>
<td>6</td>
<td>17</td>
<td>5 a 47’1”</td>
<td>W</td>
<td>Etheldreda</td>
<td>6h 17’5’17”</td>
<td>40</td>
<td>6</td>
<td>14°2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>T</td>
<td></td>
<td>6h 17’5’17”</td>
<td>40</td>
<td>6</td>
<td>14°2</td>
<td></td>
<td></td>
<td>6h 19’5’15”</td>
<td>7</td>
<td>3</td>
<td>45°3</td>
<td>W</td>
<td>St. Luke</td>
<td>6h 31’5’0”</td>
<td>39</td>
<td>morn.</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td></td>
<td>6h 32’5’10”</td>
<td>77</td>
<td>4</td>
<td>22°1</td>
<td>45°12</td>
<td></td>
<td>6h 34’5’56”</td>
<td>22</td>
<td>1</td>
<td>45°12</td>
<td>S</td>
<td>St. Michael</td>
<td>6h 36’4’54”</td>
<td>43</td>
<td>2</td>
<td>59°13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td></td>
<td>6h 38’5’11”</td>
<td>54</td>
<td>4</td>
<td>22°1</td>
<td>45°12</td>
<td></td>
<td>6h 40’5’52”</td>
<td>54</td>
<td>2</td>
<td>33°15</td>
<td>M</td>
<td>21st Sun. aft. Trinity</td>
<td>6h 40’5’52”</td>
<td>54</td>
<td>2</td>
<td>33°15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td></td>
<td>6h 40’5’52”</td>
<td>54</td>
<td>2</td>
<td>33°15</td>
<td></td>
<td></td>
<td>6h 42’5’48”</td>
<td>47</td>
<td>rises</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td></td>
<td>6h 43’4’46”</td>
<td>8</td>
<td>6 a 9’17”</td>
<td>47</td>
<td>rises</td>
<td>F</td>
<td>6h 45’4’44”</td>
<td>28</td>
<td>6</td>
<td>57°18</td>
<td>S</td>
<td>Crispin</td>
<td>6h 47’4’42”</td>
<td>49</td>
<td>7</td>
<td>52°19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td></td>
<td>6h 47’4’42”</td>
<td>49</td>
<td>7</td>
<td>52°19</td>
<td></td>
<td></td>
<td>6h 49’4’38”</td>
<td>29</td>
<td>10</td>
<td>0°21</td>
<td>W</td>
<td>22d S. aft. Trin. : St.</td>
<td>6h 49’4’38”</td>
<td>29</td>
<td>10</td>
<td>0°21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>T</td>
<td></td>
<td>6h 50’4’38”</td>
<td>29</td>
<td>10</td>
<td>0°21</td>
<td></td>
<td></td>
<td>6h 52’4’36”</td>
<td>49</td>
<td>11</td>
<td>10°22</td>
<td>M</td>
<td>St. Iuda</td>
<td>6h 54’4’34”</td>
<td>49</td>
<td>11</td>
<td>10°22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td></td>
<td>6h 54’4’34”</td>
<td>49</td>
<td>11</td>
<td>10°22</td>
<td></td>
<td></td>
<td>6h 56’4’32”</td>
<td>51</td>
<td>15</td>
<td>56°8</td>
<td>S</td>
<td>23rd Sun. aft. Trinity</td>
<td>6h 56’4’32”</td>
<td>51</td>
<td>15</td>
<td>56°8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| 1   | 11h 35m. | 4 50 | 4 8m 8 | 7 a 31 | 5m 40 | 10’20° | 16°1’ |
| 6   | 16 5 18  | 17 | 19 | 32 | 11 | 51 | 3 |
| 11  | 10 56 | 38 | 26 | 8 | 25 | 13 | 12 | 4 |
| 16  | 37 5 | 57 | 34 | 6 57 | 17 | 14 | 22 | 5 |
| 21  | 18 6 18 | 43 | 47 | 10 | 15 | 17 | 7 |</p>
<table>
<thead>
<tr>
<th>26</th>
<th>9 59</th>
<th>35</th>
<th>51</th>
<th>38</th>
<th>4</th>
<th>15</th>
<th>58</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 m 37 m</td>
<td>6 57</td>
<td>5 0 m</td>
<td>6 a 28 m</td>
<td>4 m 37 m</td>
<td>16 15 m 18 m</td>
<td>10 10 m</td>
<td>10 10 m</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>7 15</td>
<td>8</td>
<td>20</td>
<td>51</td>
<td>16</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>32</td>
<td>15</td>
<td>13</td>
<td>46</td>
<td>15</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>8 46</td>
<td>48</td>
<td>23</td>
<td>7</td>
<td>42</td>
<td>15</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>8 3</td>
<td>30</td>
<td>2</td>
<td>39</td>
<td>13</td>
<td>58</td>
<td>14</td>
</tr>
<tr>
<td>26</td>
<td>18</td>
<td>16</td>
<td>36 5 59</td>
<td>37</td>
<td>12</td>
<td>32</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

**NOVEMBER, 30 DAYS.**

New Moon .......... 7th, 25m. past 10 Morn.
First Quarter..... 15th, 7m. past 2 Aftern.
Full Moon........... 22nd, 15m. past 10 Morn.
Last Quarter ...... 29th, 5m. past 3 Morn.

21st, 23h. 58m.

SUN ENTERS
**DECEMBER, 31 DAYS. 1866**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8h. 7m.</td>
<td>8 27 5 m 42</td>
<td>5 a 57</td>
<td>4 m 35</td>
<td>10'</td>
<td>47&quot;</td>
<td>16' 16&quot;</td>
</tr>
<tr>
<td>6</td>
<td>7 58 36</td>
<td>47 55</td>
<td>34 8</td>
<td>46</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>51 43</td>
<td>52 55</td>
<td>35 6</td>
<td>32</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>46 48</td>
<td>56 56</td>
<td>36 4</td>
<td>9</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>44 50</td>
<td>59 57</td>
<td>38 1</td>
<td>41</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>46 0 inc. 2</td>
<td>6 1 0</td>
<td>40 0 be. 48</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUN ENTRANCE**

21d. 12h. 49m.

<table>
<thead>
<tr>
<th>D.</th>
<th>W.SUN.</th>
<th>SUNDAYS, HOLIDAYS, &amp;C.</th>
<th>O rise</th>
<th>O set</th>
<th>O decl.</th>
<th>Cr. &amp; s.</th>
<th>C a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>Press. Wales b. 1844</td>
<td>7h46</td>
<td>3h53</td>
<td>21°s50'</td>
<td>1h31'24&quot;</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>G</td>
<td>Advent Sunday</td>
<td>7 473 52</td>
<td>59 2 3525</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td></td>
<td>7 493 51 22</td>
<td>8 3 3926</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tu</td>
<td></td>
<td>7 503 51</td>
<td>16 4 4227</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td></td>
<td>7 513 50</td>
<td>24 5 4328</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Th</td>
<td></td>
<td>7 523 50</td>
<td>31 6 4229</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td></td>
<td>7 543 50</td>
<td>38 sets N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>Conception V. Mary</td>
<td>7 553 49</td>
<td>44 5 a21 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>G 2u</td>
<td>Sunday in Advent</td>
<td>7 563 49</td>
<td>50 6 12 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td></td>
<td>7 573 49</td>
<td>56 7 8 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Tu</td>
<td></td>
<td>7 583 49</td>
<td>23 1 8 10 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td></td>
<td>7 593 49</td>
<td>6 9 14 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Th</td>
<td></td>
<td>8 0 49</td>
<td>10 10 21 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td></td>
<td>8 1 49</td>
<td>14 11 31 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td></td>
<td>8 2 49</td>
<td>17 morn. 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>G 3u</td>
<td>Sun. in Add. : Cam.</td>
<td>8 3 49</td>
<td>20 0 43 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td></td>
<td>8 4 49</td>
<td>22 1 55 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Tu</td>
<td></td>
<td>8 4 49</td>
<td>24 3 12 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td></td>
<td>8 5 50</td>
<td>26 4 31 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Th</td>
<td></td>
<td>8 6 50</td>
<td>27 5 47 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td></td>
<td>8 6 51</td>
<td>27 rises F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td></td>
<td>8 7 51</td>
<td>27 5 a17 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>G 4u</td>
<td>Sunday in Advent</td>
<td>8 7 52</td>
<td>27 6 28 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td></td>
<td>8 7 52</td>
<td>26 7 42 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Tu</td>
<td>Christmas Day</td>
<td>8 8 53</td>
<td>24 8 56 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td>St. Stephen</td>
<td>8 8 54</td>
<td>23 10 8 19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Th</td>
<td>St. John Evangelist</td>
<td>8 8 54</td>
<td>20 11 17 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>Innocents</td>
<td>8 9 55</td>
<td>17 morn. 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td></td>
<td>8 9 56</td>
<td>14 0 24 22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>G 1st</td>
<td>Sun. a. Christmas</td>
<td>8 9 57</td>
<td>10 1 28 23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td>Silvester</td>
<td>8 9 58</td>
<td>6 2 32 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*PRINTED FOR THE COMPANY OF STATIONERS.*
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Pass.

1. To Mr. James Hewitt. By the Rev. John Hope, Stapleton.
   Hail, Laureate Bard! your prize enigma stands
   The pride of Dia, and each eye commands;
   Well chosen for its place, it brightly shines;
   Nay, all the charms of poesy combines;
   Without due praise no one can pass it by,
   No fault the critic can in it espy;
   It is correct, ingenious, and sublime;
   It adds the highest charm to mystic rhyme.
   May you long flourish as Diaria's friend,
   And annually engaging subjects send!

2. To Mr. Hewitt. By Miss Helen Ogden, Shaw.
   I sigh when I muse on the greetings that we
   Were wont to receive in Diaria's page
   From our mutual friend Winnie, whose innocent glee
   Sought yearly with her our thoughts to engage;
   Though now pass'd away, yet could her loved shade
   Descending behold you so worthily fill
   The post her fam'd votaries in kindness have made
   The highest to crown the attempts of each quill,
   Her smile of approval in wittiest strain
   Would have freely been paid as her confidant’s due.
   While lonely and mournful bereav'd we remain,
   May we both to her memory ever be true;
   Though pensive your strain, my kind wishes accept
   That gay summer hours may enliven your way,
   And leave you at leisure the page to respect
   That so justly records your impassionate lay.

3. By Mr. Joseph Furniss, Lois Weedon, Towcester.
   We always felt convinced that Mr. Hewitt,
   If he were minded so to do, could do it,
   And that of talents rare he owned a mass,
   And so—without mistake—it comes to pass!

   P ray, honoured Di, may a young country lass
   A mongst your learned ladies for once try to pass?
   S imple my muse and uncultured my rhyme;
   S mile on my first, I may mend it in time.

PRINTED FOR THE COMPANY OF STATIONERS.
5. Farewell to the Diary. By Cantab, M.A., formerly of Sevenoaks, Kent.

Farewell, ye pleasant hours! a long farewell!
No more on this lov'd page may I now dwell:
Farewell, ye pleasant friends! a long farewell!
Who write so charmingly and live so well!
'Tis duty calls me from your sunny clime,
Consumes my studies, and absorbs my time.

Farewell, kind Editor! with generous mind,
Thoughtful and polish'd, skilful and refin'd!
Farewell, dear friends! my heart is with you still—
Fond memory lingers here, and ever will!
Grateful I own I here have had my day;
But all—like clouds and sunshine—pass away.


Friend Hewitt the readers of Di strives to please,
But his pass, I'm afraid, is more likely to tease;
'Twill tantalise, puzzle, and p'rhaps 'twill perplex 'em,
Yet we're much obliged to James Hewitt of Hexham.

7. By Mr. James Barthram, Scarborough.

Passing, passing, passing on,
Moments pass, then days are gone;
Months, then years, thus pass away,
Passing, passing, nought can stay.
Life is but a passage—true—
All pass in, pass on, pass through;
May each—(when this passage 's done)—
Have a glorious passeport won.

8. By Mr. Joseph Hutchinson, near Halifax.

No wonder Hewitt should obtain
A place first class,
In Dia's enigmatic train,
With such a pass!

9. By the Cawkley's Laddie.

Mark the sands in yonder glass,
Steadily they downward pass;
We, like them, keep passing on
Till the sands of life are gone.

* The Rev. John Peat, M.A., Vicar of East Grinstead, Sussex, who for many years has been an able and much esteemed correspondent of the 'Lady's and Gentleman's Diary' under the above nom-de-plume.
Within a forest deep and dark
I thought I lonely lay,
No silvery light by which to mark
An opening or a way.
A ray beam’d forth, before me lay
A lake as clear as glass,
Reflected there, and by the ray,
I saw the way to pass.

’Mid crag, and fell, and wild morass,
’Twas mine awhile to stray;
But through your mazy mystic pass
At length I found my way.

12. *By Oedipus.*
I stumbled o’er the prize, as o’er a mass
Of mountains dark, until I found the pass.

13. *By Bertha.*
With calm delight I scan’d the prize,
Its tow’ring mountains, purling rills,
And paus’d when with bewildered eyes
I gain’d a pass among its hills.

14. *By Mr. W. H. Lester,* Sheffield.
Hail, Existence! Who art thou?
King of pleasure? Prince of strife?
Yes, in thee we pass our days;
Yes, in thee we end our life.
Life is short; then live it earnest;
Live it well, lest soon it flee.
Time will tell us, “Thou returnest;
Dust thou wast, and dust thou’lt be.”

15. *By Jane,* of Rydale.
To Hexham we go; Dia’s friends, don’t delay,
The train now awaits to convey us away;
Up! up and be ready, young, old—lad and lass,
Friend Hewitt now grants unto all a free pass.

16. *By Miss Emily Waind,* Kirby Moorside.
Friend Hewitt, King of Lady Di,
I cannot understand
Why you should prize a a pass so much
In England, freedom’s land.
17. To Spring. By Mr. Robert Clemiton, of Morpeth.

Hail, genial Spring! delightful guest!
All nature owns thy sway!
At thy approach fair Flora’s drest
In beauteous, sweet array.
The feathered songsters of the grove
Greet thee with gladsome lay,
As harbinger of mated love,
From every bough and spray.
The classic gems which yearly shine
On Dia’s gifted page,
Yield passages at once sublime,
Which all our thoughts engage!

18. The Two Paths. By Mr. John Grey, Stanhope.

Years pass away! two paths before us lie;
The one seems bright to every mortal eye
As evening ray;
The other dark and dreary to the sight,
As mountain pass amid the gloom of night,
Appears the way.

Pleasure, the first, whose sweet alluring wile
Would tempt our eager hearts to sin and guile:
Oh shun her sway!

Duty, the next, forbids our feet to roam:
“Enter,” she cries, “the gate that leads to home!”
Do not delay.

Oh think on Dia’s motto midst your pains!
“The Word of God eternally remains.”
Dear friends, obey;
Strive for the prize; deserve to wear the crown;
Your earthly toils and cares bring rich renown—
A sweet repay.

19. To the Editor. By Mr. C. R. Carr, Jun., of Gateshead.

Dear Di, by your riddles you often perplex,
You harass men’s minds, and sometimes them vex.
Gentle autocrat, we all annually wait
Until when your final decisions you state;
And even when pluck’d, we still persevere,
In hope that success may attend us next year:
But plucking is fearful, alack! and alas!
So I pray now, dear Di, permit me to pass.
GENERAL ANSWERS TO THE ENIGMAS.

1. Vault.  4. Care.  7. Loom.  10. (Prize.)

1. Sleep. By Miss Helen Ogden, Shaw.

When evening’s dark shades all around us descend,
    And solitude reigns o’er each varied scene,
How hushed are the sounds that do often attend
    Active life ere I reign in a silence supreme.

With assiduous care how weak mortals press on,
    Some perishing object devoted to keep,
No labour or toiling is looked down upon,
    ’Til conquered by me, overpowering Sleep.

How man boasts of his strength, of his prowess and parts;
    His varied achievements do plainly unfold—
What the mind can accomplish, what genius imparts
    From her hidden recesses a treasure untold.

When often intent on some fav’rite design,
    My magical wand as a vision may sweep;
Perchance unenvoked, and then calmly consign
    Him safe to my arms, all-cherishing Sleep.

And say, what is life, ye vain mortals, without me?
    Its splendour, its greatness, no bliss could impart;
Its gay panorama soon gloomy sure would be,
    Its enjoyments a blank should I only depart.

A blessed restorer when sickness assails;
    A balm to each wound when I secretly creep
O’er the suffering frame where sad anguish prevails,
    And wrestles with me, often conquering Sleep.

My silent embrace is a passeport to rest,
    That awaits ebbing life both in manhood and age;
Each conflict and passion encaged in the breast
    By me is subdued and deprived of its rage.

Could man, from the hand of his Maker above,
    When chastisements kindly induce him to weep,
Inherit a blessing more suited to prove
    My power—renovating, mysterious Sleep.

O welcome me, then, while you journey along
    Through each intricate maze of life’s chequer’d way,
Since none can evade or once hope to prolong
    My return, so important to each closing day;

PRINTED FOR THE COMPANY OF STATIONERS.
Nor insensible prove to the Giver of all,
Whose eye, ever watchful, doth carefully keep
His creatures in love, while I shed as a pall
My mantle around them, omnipotent Sleep.


Behold bright Phœbus in the vaulted sky
Has run his course, and now he sinks his orb;
See how the blade, that previously was dry,
Begins the falling dewdrops to absorb.

Lo! now the pointed spire reflects his ray,
When just upon the wide horizon’s bound
His disc descends, still bearing on the day
To other realms the spacious globe around.

How glowing often are his parting beams,
Which on the clouds imprint a varied hue,
As ev’ry ray from his bright surface streams
With radiance most engaging to the view!

Oft have I stood admiring; nought, indeed,
Presents a more attractive, gorgeous scene;
In it a hand divine we plainly read,
Displaying red and crimson, blue and green.

More sparkling than the purest precious stone,
Than Flora’s loom, in which are hues combined;
More fair than ever yet on garments shone,
Which are by art’s most boasted skill designed.

Ah! weak is art with nature’s hand to vie!
It must be still to her inferior found;
Yet nature’s themes afford where art may try
To imitate, and more with skill abound.

But her to equal visionary seems;
She human efforts all surpasses far;
As well a candle might excel the beams
Of rising Phœbus or the morning star!

The sun has disappeared, and twilight gloom,
The harbinger of night, invests the sky;
Now hours of darkness in the prospect loom,
And time of slumber and of rest is nigh.

Diarians! learn from the declining sun,
As fast he hastens to his western goal,
That soon, like his, your circuit may be run,
Since it no mortal’s effort can control!

What is life? 'Tis but a vapour,
Sages write and poets sing;
Wasting like the lighted taper,
Which at last doth darkness bring.
Flaming passions, fruitless scheming,
Burn or fritter it away;
Days of pain, sad nights of dreaming,
Quickly spend its fitful day.

Lo! the interesting baby,—
"Quite a prodigy!" quoth nurse;
Lovely now, but soon it may be
Or a blessing or a curse.
Innocent and cherub-looking,
As we see them oft portrayed,
Swarling, squalling, mewing, puking,
Wondering we why e'er 'twas made!

Prattling girl, all play and pleasure,
Romping with unbridled glee,
Painted "boudies" are thy treasure,
Ranged in household mimicry.

Imperceptibly assuming
Tenderest tints of rosy bud;
Modest, winning, sweetly blooming,
Softening into womanhood.

Roistering boy, all fire and folly,
Azure sable, and verdant blade,
Are things of course,—but mischief's
"jolly,"
And the world for play was made.

Sobering influences steal
O'er thee, point to future care;
Circumstances mock thy feeling,
Cage thee ere thou art aware.
Like the fixed rock in the river,
Sternly stand, its course divide,
Or the tumbling stone, that never
Rests, but rolls with every tide.

Love's sweet frenzy soon is over,
Choice is made for weal or ill,
But in prospect to discover
Loom the everlasting "bill."

Fading fast each pleasing vision,
Fancy-painted airy schemes
Melt before stern Fate's decision,
Pass away like morning dreams

Mankind still mankind deceiving,
Soon perforce he'll realize;
Doubting still, yet still believing,
Until self itself despise.

Crazy age now creeping o'er him,
Transient pleasures, lasting pain;
Grief behind, and gloom before him,
Could he live life o'er again!

How much better, how much wiser,
Every moment he'd apply!
Vain the wish! Spendthrift or miser,
Sage or savage, all must die.

4. To a Lady Diarist, who expressed a wish that the writer would contribute "more than one couplet" to the Diary. By Mrs. Furniss, Lois Weedon.

Ah! would that I could, dear madam, but do
That or anything else to give pleasure to you;
And of poesy's charms I might both write and sing,
Till even best friends would quite tire of the thing.

But there looms in the future, to judge from the past,
Dark days of sadness which ever may last;
For pale haggard sickness has wrecked me sore,
And so weakened the frame, it will be strong no more.

And much though I've striven, 'midst cares and 'midst pain,
To be what I once was and healthiness gain,
It has proved quite a failure, and alas, and alas!
How many bright visions away now must pass!

Yet think not, dear madam, the mind yet despairs
For the body's weakness or other affairs;
I would meekly bow down to the will of my God,
In deepest humility kissing the rod.

PRINTED FOR THE COMPANY OF STATIONERS.
There’s a point to be gained and a goal there’s to win,
And a “City of refuge” to be entered in,
Where neither sorrow, nor crying, nor pain,
Nor sin, nor disease, shall be e’er known again.

Though trying the stroke, in mercy it was given,
To wean the affections from earth unto heaven;
Like a bill sent in with a dreadful array
Of long and outstanding accounts to pay.

A stony heart needed softening down,
And the blade must cut sharp from the sole to the crown;
And I vaunt now no more, but humbly do tell
’Twas the will of God, who doeth all things well.

And this, my dear madam, will here explain why
I so little can do for my loved Lady Di;
But with greatest delight I can ever peruse
The various themes of your own charming muse,
And those of our friends; but henceforth there can be
Scarce more than a poor little couplet from me.

5. War. By Mr. Frederick Burrington, Exeter.

See where the cruel demon War,
With fiery eye and blood-stained face,
Vaults fiercely in his iron car,
To scourge with ills the human race;
With heart of stone and maddened brain,
He mocks at tears and laughs at pain.

That land is cursed, with vice defiled,
Where treads his dark and fiendish form;
He stirs a sea of passions wild,
That rage like billows in a storm,
And surging upon life, destroy
Its future good and present joy.

He kindles with his burning breath
The slumb’ring fires which hate hath made,
And opes the avenues to death
By pointed spear and shining blade,
And leaves behind where’er he roams,
Tears, aching hearts, and ruined homes.

Ye who in that portentous hour,
When monarchs frown and nations jar,
For glory, conquest, lust of power,
Uncage the savage “dogs of war,”
If truest glory ye would find,
Increase the love of human kind.
So war, with weak and palsied hand,
To peace his gory plumes shall yield;
His victims never more demand
From bench and loom, from forge and field;
And thus beneath Love's gentle care
Shall virtues bloom as blossoms fair.
While Hope, like morning's golden prime,
Gives promise of that brighter day,
When want and woe, and vice and crime,
Shall like a vision pass away,
And perfect that eternal plan
When man shall brother be to man.


"Try not the pass!*"* the old man said
To the Alpine youth as he onward sped;
But nothing availed the counsel kind
To the heaven-born soul and the uncaged mind;
No danger appall'd, no fatigue could tire,
But on, on, on—still higher, still higher!

That "strange device" is known better now,
Though there are who will point to the "avalanche"-brow
In dismay at the danger to dare which seems,
To their narrow vision, but empty dreams;
But who would be free from earthly mire
Must cling to the motto—still higher, still higher!

And what of the worldling's wealth untold,—
And what of his bliss with his store of gold—
And what of the fact that it should be
His all-in-all of felicity?

We can pity him much, but have no desire
For his worldly wealth; we look higher, still higher!

The gay son of pleasure—a libertine blade—
Thinks us moping and foolish, and all afraid;
"Come with us," he says, "and we'll drive away care
That will furrow the cheeks and bring early gray hair."
But to pleasures like his we can never aspire;
Something looms in the future—still higher, still higher!

Higher, still higher, poor son of toil,
Be thy labour stone-cracking or tilling the soil,
Or wielding the bill-hook, or vaulting the flail—
Stay thy mind on thy Maker, whose word will not fail
While thou still persever'st and wouldst brave flood or fire
For thy soul's earnest yearnings,—still higher, still higher!

* Vide Longfellow.

Unfettered nature's all intent
To greet the sweet return of Spring;
And first-fruit offerings to present,
Worthy the welcome of a king.
The verdant blade, the blooming flower,
All to our careful vision seem
To point in silence from the bower,
And rise to join the grateful theme.
From morn till noon the vault above
Rings with the lark's sweet notes of praise,
Which Philomel, in tones of love,
Repeats in evening warbling lays.
But, when the bird that used t'aspire
And freely breathe its native air,
Is pass'd into a cage of wire
And made a lonely prisoner there;
How seldom does the captive then
With the same pleasing sweetness sing,
As when we listen'd to its strain
When native freedom gave it wing!


Alliteration used to be
More common far than now;
But Dia feels that she is free
To use it, we allow.
For very recently she chose
The enigmatical themes
Whose titles, one may well suppose,
Express what she esteems.
To give a prominence to B
She honoured blade and bill;
In cage and care we find the C
Submissive to her will.
Again, in vision and in vault
She dignifies the V;
Nor need we find the slightest fault
That point and pace have P.
The four initials, we confess,
Deservedly were paired;
But loom and stone, to say no less,
Like honour might have shared.
That honour why withheld? We mean
All answer to decline,
And leave to critics far more keen
Di's reasons to divine.


Methinks I hear, methinks I see,
In England's elder history,
How on the ancient village green
(When peeping May-buds ope their een)
Blithe troops to plant the pole have striven,
Memorial in the early heaven;
Vaulting in joyous bands together
O'er blade of grass and bell of heather.
To aid on that remembered day
The crowning of the Queen of May,
Lo! with what grace they point the toe,
Now faster, now in measure slow.
Round the May-pole, while streamers fly,
May-lords, in all their bravery,
Dance without fear, for at this festal
All eyes salute their fairy vestal.
The floral wain brings in the fair,
Throned on her new-drawn rushes there;
White oxen stand with flow'ry horn,
Rose-garlands rosier brows adorn.

PRINTED FOR THE COMPANY OF STATIONERS.
To change the scene we now incline
And view our green in our own time;
As birds from cage, schoolboys at cricket
Within a stone-throw plant the wicket.

"Speed, bowler, speed the flying ball
"To the best batsman of them all!"
With needle-glance the block-hole shielding,
He gives both "long" and "short-stop fielding;"
While "notches" show to eager eyes
What balls are "good," and what are "wide" and "byes;"
And in his "innings" every boy doth try
Whether "eleven" keeps the victory.

Kindly, ye ruling powers! forefend
That any bill "impark" and end
Such pastimes on our village green!
Where once befell my raptured e'en—
A rural joy, that had to me
A sylvan show of sanctity—
Gay crowd upon the greensward straying,
Yet not for cricket or a-Maying.

'Twas a dear vision, come at last,
Though blithe as any pleasure past:
Across the green all take their way
To welcome Rosa's wedding-day,
To Woodland's church pass Hodge and Ruth
(A modern antique, quaint in youth),
And not a foot on thee was idle,
O gentle green, at Rosa's bridal.

10. By the Cawkey's Laddie.

What a change since I was young,
Supple, active, fleet, and strong;
Ruddy, blooming, fresh and fair,
And could skip just like a hare;
Join in each athletic fete,
Where blithe village youngsters meet;
Fault o'er fence or gate or stile;
Past the fleetest in a mile;
And the hooked blade could wield
With the reapers in the field;
Dance a reel or cotillion
When the harvest home was won.
Now this old hull needs repair,
Racked and worn with age and care;
11. On the Death of his Grace the late Duke of Northumberland.
By Mr. Robert Clemiston, of Morpeth.

The "good Algernon's" spirit's fled!
The vault now holds the honoured dead!
The blade of death with pointed aim,
Regardless of renown and fame,
With ruthless care and densesst gloom
Has hurled the "loved one" to the tomb!
Northumbria's vision's dimmed with grief,
No bill or pass can yield relief!
A mournful tone the land pervades,
From England's throne to lowest grades!
May Percy's virtuous acts engage
The gifted band on Dia's page!


Time, in his dusky robes array'd,
And arm'd with his unfailing blade,
Another day is ending;
Obedient to his firm behest,
The sun, far down the hazy west,
His seaward course is wending.

Without a care or fear of ill,
The throstle, with his simple bill,
His vespers sings unaided;
O spurn, brave bird, the wily cage,
For freedom is thy heritage,
That ne'er should be invaded.

Now, as the sod exhales the dew,
I look up to yon vault of blue,
And see the star of even;
It seems a happy isle above,
A little smiling world of love—
A doorway into heaven.
The modest flowers now hide their bloom,
And there's a peaceful, cheerful gloom
The landscape overshading;
And I would have my life's brief day
So gently, brightly fade away,
As daylight here is fading.
The vision-teeming night draws near,
In fancy even now I hear
Its curtains round me closing.
Fain would I, when my night comes on,
Pass to my rest without a stone
To point where I'm reposing.


When we behold with curious eye
The beauties of the vaulted sky,
And view the wonders there display'd,
We bless the powerful hand that made
Those glorious orbs, which we can trace
Like brilliant, sparkling points in space,
And joy to know that we too share
In the Almighty watchful care
Of him who rules the worlds above,
Yet deigns on man to fix his love.
God's love in man's redemption shone
With lustre until then unknown;
E'en angel minds desire in vain
A knowledge of its depths to gain.
Such love should all our thoughts engage,
And thus our gloomy fears assuage,
And sinful pleasures dwindle down
In our esteem, that, wiser grown,
We bow unto the will divine,
And all the Christian graces shine,
Till we as in a vision see
The glories of eternity,
And soar at length to realms of day,
Where pleasures never pass away.
GENERAL ANSWERS TO THE REBUSES AND CHARADES.


Ladies, the glare of tinsel still avoid,
By it the charms of beauty are alloyed,
It shows a silly and a childish pride;
At Sandringham a royal princess lives,
Who as to dress a modern pattern gives,
Which other ladies properly may guide.

I need not ask for pardon when I say
I'm pleased to see you always neat and gay,
Upon some useful purpose always bent;
You scarce can Miss your aim if still you be
From what to indolence inclines you free:
This almanack is for improvement sent.

Be ever heedful, and in mem'ry bear
That dire disasters come through want of care,
So moralists declare and poets sing;
Let this the touchstone of your conduct prove,
With prudent foresight ever on to move,
Tho' matters quite unseen distress may bring.

Avoid bombastick language; few admire
Its high-flown metaphors, or them require;
Aye critics blame it, yea against it rail;
They love what's modest and to nature true,
Not such strained phrases as are known to few,
And which in eastern languages prevail.

Sure hope in money foolish is and vain,
Few, very few, a wealth excessive gain;
"He that has just enough most soundly sleeps;"
Content is priceless—it a kingdom seems;
It yields more pleasure than of wealth the dreams,
And from a thousand cares the bosom keeps.

Ladies, I for the present bid good night,
To you the charm of nature, man's delight;
Without your aid but little can be done.
Improve your talents, labour to excel
In virtuous courses; then, by acting well,
Respect and honour will by you be won.

I love my cottage comforts, though they only may be few,
Just enough, perhaps, to share them with a dear old friend or two;
Through a long and chilly winter’s eve I sit beside the fire
With my almanack and other books, and never seem to tire.

I envy none, not even they of Sandringham, although
I yield to none in loyalty without a fussy show;
God bless our Albert Edward and his Alexandra fair,
To England they are priceless, and a happy, loving pair.

I hate all tinsel fin’ry and bombastick shamming, while
An honest friend, though clothed in rags, is welcomed with a smile;
Aye, if he be intelligent, whatever be his lot,
’Tis the touchstone of his “Come again and often” to my cot.

What a sweet thing is contentment in the dear “old house at home,”
With not a wish to leave it, or in distant lands to roam:—
I beg your pardon, Mr. Hughes, but if it was to be,
I would rather you go courting to Missouri, sir, than me!

Here in the little village cot I hug myself from harm,
And am hitherto a stranger to disaster and alarm;
Can lay me down and sleep in peace on bed and mattress too,
With a thankful heart, I trust, for health and blessings not a few.

A loving helpmate cheers me on through all the battling strife
And struggles, cares, and petty pests, that help to make up life;
But as for money for the pins, ’tis little to be sure
If now-a-days we just would keep the dread wolf from the door.

3. To the Editor, on gaining a Prize. By Mr. James Herdson,
           Edinburgh.

I would not be bombastick, but I am
Proud as an occupant of Sandringham;
’Tis not a tinsel’d ornament I’ve got,—
Ten priceless almanacks fell to my lot!
More prized than pin-money is by the fair,
Is Dia’s gift to me, I must declare;
I could not on my mattress go to rest
Till I’d to you my thankfulness express’d;
Besides, if I were silent, ’twould be rude;
This is the touchstone of my gratitude;
’Twould be a sore disaster, yea, a crime;
So pardon me for thanking you in rhyme.

PRINTED FOR THE COMPANY OF STATIONERS.
4. *The Prince of Wales’s Travels.* By Mr. Frederick Burrington,

*Exeter.*

Pity the state of that Diarian bard,
Who hath a list of answers to rehearse;
And yet, to custom paying due regard,
Must weave the barb’rous words into his verse:
The proverb—*pardon*, ladies—says ’tis hard
From a sow’s ear to make a silken purse;
And so ’tis hard from such a coarse material
To spin fine poetry, which is ethereal.

“If it were done, when ’tis done, then ’twere well”
*T’enlist* a subject for the muse’s quill
On which her glowing fancy should excel,
And with strange things the varied picture fill:
*A mattress* worked in rhyme her art would tell;
*Aye*, like a *priceless touchstone* test her skill;
And so to quiet all such doubts and cavils,
Her theme shall be a youthful prince’s travels.

The Prince who owns fair Sandringham’s domain
Once took a journey to the Holy Land;—
The muse indites in this familiar strain
Because a history, though it may be grand,
Should not be writ grandiloquent, but plain,
Like simple narrative, ’twill more command
Belief; historians should not be fantastic,
But truthful, neither fulsome nor *bombastick*;—

In Palestine he went to holy places,
Attended by the Reverend, now Dean Stanley;
He saw the Moslems with their bearded faces,
Their mosques and minarets that glittered grandly;
Studied men, manners, courts—such knowledge graces
The growing mind and moulds it broad and manly,
With lessons gathered fresh from wisdom’s lips,
’True as the *almanack* foretells th’ eclipse.’

He went to Canada, crossed to the States,
Heard the Niagara’s roar and saw its fall;
His royal presence Jonathan elates,
Who sends him invitation to a ball,
Where, in the dance his princely hand he mates
With fair Miss Yankee in a splendid hall;
But then he saw not dancing in their glory
Grand Missis Sippi and the great *Miss Ouri.*

*Painted for the Company of Stationers.*

See the lowly "cottage maid,"
Thou ne'er in tinsel garb arrayed,
But neat and plain she is attired,
And oft by many much admired.
At Sand-ring-ham no princess fair,
Nor "Donna," can with her compare;
Yea, men of wealth have sought to win
Her smiles, but she cares not a pin
For money, title, rank, nor fame,
Nor worldly honours' empty name.
Some say that one did vainly hope
This maiden would with him elope,
And go with him, so runs the story,
Like Mr. H., to far Missouri.
He told a fine bombastick tale,
But soon he found his project fail.


Again your humble servant Jane
Here makes a faint essay
To link fair Di's charades in rhyme
In her odd jingling way.
First, Hope with tinsel to enlist,
Looks something like a sham;
I'd rather take, with blithe Miss Smith,
A trip to Sandringham.

A pardan Cantab kindly brings
Sets the imprison'd free,
While Hughes rambles far to explore
The winding Missouri.

Hewitt, in his new almanack,
Foretells of storm and war;
That from the venturous Ædipus
Disaster lurks not far.

7. By Ædipus.

Hope's verses in genuine ore so abound,
'Tis strange that in tinsel his thoughts may be found.
Miss Smith unto Sandringham draws us away,
Where dwell those for whom we all loyally pray.

Printed for the Company of Stationers.
Let Cantab for pardon ne'er plead; his lines vie
With the foremost of all the effusions in Di.
We will not talk scandal of Hughes and his houri,
Even if we should meet them on banks of Missouri.

Mr. Hewitt an almanack takes for his theme,
And disaster is Oedipus' subject, I deem.
Mr. Herdson's is touchstone, if rightly I've guessed,
And a mattress succeeds for the long hours of rest.

The Laddie his powers on bombastick bestows,
The demerits of which he sufficiently shows.
Has Amanda, I wonder, been called on to say
To any admirer a yea or an aye?

And did Mr. Furniss, on marrying, grant
Of pin-money all Mrs. F. chose to want?
Mr. Wray's model lady now closes the rear,
And a paragon certain he makes her appear.

8. To the Editor. By Mr. John Grey, Stanhope.

Kind sir, I venture once again
To speak of Dia's sages;
To tell their very inmost thoughts,
Or what their time engages.
A 'prizeman' in Di's honoured halls,
Pray, could I silent be?
When Hope with tinsel all gilds
To take a high degree.
A lady friend now issues forth,
With ample powers: no flam!
Miss Mary Smith, of sterling worth,
To tell of Sand-rin-ham.
Cantab of Sevenoaks—gallant name!
To all Diarians dear,
A par with any don on earth,
You then will find appear.
Chesterian Hughes, from Miss-our-i
Has safely landed back;

Hewitt, of Hexham, greets his chum,
And sends an almanack.
Oedipus, clad in sad disaster,
Brings "Jacques" upon the scene:
Whilst Herdson lively Touchstone plays,
With "As you like it" mien.
Next Hutchinson a mattress brings,
A good one—hard and thick;
The Cawkley's Laddie—not behind—
A bomb sends on a stick.
From Greenwich fair Amanda comes
With greeting—aye or yea.
What! no pin-money! Furniss cries.
She's priceless! says friend Wray.
All hail! kind sir; my task is o'er,
Your riddle's brought to view:
Until another "term" comes round
I beg to make my bow.

LIST OF POETICAL ANSWERS.

Almond, Robert, Consett, near Gateshead, ans. all.
B., of Barum, ans. all.
Baines, Miss Rachel, Well Rash, Bolton, Wigton, ans. all.
Bertha, ans. Prize Enigma.
Barthram, James, Scarborough, ans. all.

PRINTED FOR THE COMPANY OF STATIONERS.
Burrington, Frederick, 2, Sydney Place, St. Thomas, Exeter, ans. all.
C. H. M. R., Greenwhich, ans. all.
Cantab, M.A., formerly of Sevenoaks, Kent, ans. Prize Enigma.
Carr, Cuthbert Rodham, jun., Carr's Villa, near Gateshead, ans. all.
Cawkley's Laddie, ans. all.
Chambers, John, Town Hall Offices, Knaresborough, ans. all.
Clemiston, Robert, of Morpeth, ans. Enigmas.
Clio, of Hexham, ans. Enigmas.
Craggs, Thomas, West Cramlington, Northumberland, ans. all.
Craiggy, Colin, Crawcrook, near Blaydon-on-Tyne, ans. Prize Enigma.
Doddson, John, jun., Kirby Mills, near Kirbymoorside, ans. all.
Drysdale, the Rev. Anderson, 73, John Street, Glasgow, ans. all.
Eddy, William Hocking, Truthwall, St. Just, ans. all.
Edwards, Thomas, Lois Weendon, ans. all.
Elliott, John, West Croft, Stanhope, ans. all.
Farn, William Henry, 149, Windmill Street, Gravesend, ans. all.
Furniss, Mrs., Lois Weendon, ans. Enigmas.
Furniss, Joseph, Lois Weendon, Towcester, ans. all.
Garbutt, William, jun., Ann Street, Sunderland, ans. all.
Grey, Miss Jane, Leadgate, near Shotley Bridge, Durham, ans. Enigmas.
Grey, John, Barrington School, Westgate, Stanhope, ans. all.
Grice, George (Gardener), Wold Newton Hall, Ganton, near York, ans. all.
Hattam, Thomas, Beachy Head Lighthouse, Eastbourne, Sussex, ans. all.
Herdson, James, The Grange, Edinburgh, ans. all.
Heslop, William, Clifton Street, Brighton, ans. all.
Hewitt, Miss Isabella, Hexham, Northumberland, ans. Prize Enigma.
Hewitt, James, of Hexham, Northumberland, ans. all.
Hope, the Rev. John, Stapleton Rectory, Carlisle, Cumberland, ans. all.
Hutchinson, Joseph, near Halifax, ans. Prize Enigma.
Jane of Ryedale, ans. all.
Janet, ans. Rebuses, Charades, and Prize Enigma.
Jerrard, John, Charmouth, Dorsetshire, ans. all.
Lester, W. H., Sheffield, ans. Prize Enigma.
Milbourn, Thomas, Riding Mill, Newcastle-upon-Tyne, ans. all.
Oedipus, ans. all.
Ogden, Miss Helen, Shaw, near Oldham, ans. all.
Rutter, Edward, 15, D'Arcy Terrace, Sunderland, ans. all.
Sadler, Miss L. M., 6, Saunders Terrace, Chobham Road, Stratford New Town, ans. all.
Seorer, Alexander, Grainger Villa, Elswick, Newcastle-upon-Tyne, ans. all.
Shelton, William, Carlton, near Nottingham, ans. all.
Somerscales, Frank, Hull, ans. all.
Somerscales, Thomas J., H.M.S. "Clio," Valparaiso, ans. all.
T. D. U., Kirby Mills, Kirbymoorside, Yorkshire, ans. all.
Waind, Miss Emily, West End, Kirbymoorside, Yorkshire, ans. Prize Enigma.
White, J., Oak Place, Lozells, Birmingham, ans. all.
White, Thomas, Allendale, Northumberland, ans. all.
Wray, Thomas, Market Weighton, ans. all.

PRINTED FOR THE COMPANY OF STATIONERS.
NEW ENIGMAS.

I. ENIGMA (1481); by Mr. WM. GARbutt, Jun., Sunderland.

I'm as a kind of fungus known,
Both light and porous I am shown.
Your cook with undisguised haste
Looks out for me amongst the paste.
I've oft been used the hair to dress,
And sprinkled many a pretty tress;
I also am a blast of wind,
On land or sea you may me find.
I swell the sails, the ship I right,
Altho' invisible to sight.
From north and south, from west and east,
I come e'en when expected least;
But strange to say, I'm oft in print,
You then can see I plainly hint
That of all goods mine are the best,
And bad and worthless all the rest.

II. ENIGMA (1482); by Mr. Thomas Edwards, Lois Weedon.

Might I, a well-known friend, of humble name,
On Dia's page a passing notice claim?
My nature's such I can both please or vex,
And here may fail to puzzle or perplex.
I cannot boast of parentage or birth,
Diarists may declare my name and worth.
I am a fair exotic, be it known,
And flourish mostly 'neath the torrid zone;
Thence from my native soil by man I'm torn,
And o'er the seas, perhaps, in triumph borne.
At his behest I'm broken, crush'd, and bruised,
'Tis by mechanic skill I'm thus abused,
Parent of luxury I may be deemed,
What I produce by many is esteemed,
And priz'd by some; but you must know
My presence oft has caused the tears to flow.
The bold pedestrian in his rambles wide,
He knows my aid, we travel side by side.
Soon night comes on, he's reached his journey's end,
And then his wearied frame I may befriend:
With kindly welcome he my form will greet,
If now on me he finds a cozy seat.
Another hint, and then my song must end,
I'm known to those who cry "Old chairs to mend!"
III. Enigma (1483); by Mr. James Bartram, Scarborough.

Ladies and gents, awhile attend,
In slim disguise, here comes a friend;
A friend, well known upon life's stage
From infancy to hoary age;
Both high and low, and rich and poor,
Have felt my all-absorbing power;
I'm in the hall, I'm in the cot,
Sad is the home where I am not.

Survey the garden, grove, or glade,
The verdant mead with flow'r's arrayed;
Where Flora's beauteous gems display,
Their virgin charms unto the day;
Where I inert or bleeding lie,
Or float, in woodland ministrelsly;
I move with all that's bright and fair,
True, I am present everywhere.

See! yonder mourners round the bier,
A friend is gone,—yet I am near.

A friend, indeed; for where I go,
I aid to soothe the pangs of woe;
I chase away the tears of grief,
And bring the mourners sweet relief.
Though kindness has been mine from birth,
I've branded been as cause of death;
Nay, oft a dark and fearful deed
From me is stated to proceed;
But I of such am innocent,—'Twas subtle foes on evil bent
That did the deeds, then spitefully
Ascrib'd the fearful acts to me.
But time will come, these foes shall be
cast down, and all shall live in me;
Who live through time, and still shall stay,
Though all things else shall pass away.

IV. Enigma (1484); by Mr. Joseph Furniss, Lois Weedon.

'Tis a hopeless task, Diarions, e'en the least of you to match,
When all are wide-awake and waiting, ready for a "catch."
I come, however, as I am, deceitful or sincere,
'Tis yours to judge, and then bestow your praise or blame next year.
Ask me no questions here of genealogy or birth,
Though by the way, I just might say I'm old as is the earth;
And since the world was rolled away from its Creator's hand
'Mongst all the elemental powers I've held my wondrous stand.
I'm in your jewels, ladies, but a casual look to see,
I honestly aver to you, would fail to find out me.
I'm in your gold and silver, too, and further be it known,
Not confined to these alone, I'm found in iron, wood, and stone.
I'm in the grain that's garnered, and the farmer knows me well,
A thing of much importance both to those who buy or sell.
Wherever you may travel you have me upon your head,
And even when you're sleeping I am lying on the bed.
I hang up in a corner all unnoticed and unseen,
But you'd recognise me better in a letter from the Queen.
Small though I am and hidden in the tiniest grain of sand,
Yet my overwhelming power is often felt on sea and land;
For with the mighty rushing flood or wave I headlong speed,
And often bring destruction or sad havoc leave indeed!
Yet though I may be harmless I may sometimes cheat the eye,
And be not quite exactly what my name would fain imply;
And hence it shames me to confess a serious failing here,
With fines in view and censure too, and punishment severe.
Diarions, if I'm hidden yet, just take a careful look
And mark what's noted down of me within the Holy Book.
These, plural, you will read of us with others near akin
Under Divine displeasure as associates in sin.
Oh! would that in these modern days all trembled 'neath the ban,
That man would walk uprightly and be just to brother-man!
But time and space are precious, so I hasten to the end,
Hoping you still will recognise in me an honest friend;
For though I have my failings, still in virtues I outweigh,
As witness Di's philosophy in matters any day!

V. ENIGMA (1485); by Mr. JAMES HERDSON, Edinburgh.

Allow me, Dia, on your page a place,
Though 'mongst your bards I seldom show my face;
(Their varied themes I might appear to mar;)
But always figure in your calendar.
I am a book-worm, very fond of books,
As any one may trace, who in them looks;
'Tis not in every volume that I'm seen,
So far, no doubt, you'll me exclusive deem;
And, as I said, through books I often pry,
Yet seldom am I seen on page of Di;
I deal in politics, adventures, crimes,—
And hence so much consulted in 'The Times,'
You've read of Atlas, who in days of yore,
Both heaven and earth upon his shoulders bore!
I do not claim such mighty strength, but oft
Vast pond'rous loads I'm doom'd to bear aloft;
My back's not broad, nor shoulders stout, withal,
But in my figure upright, short or tall;
I'm from the bowels of the earth, and must,
As Time rolls round, be crumbled into dust.
In many a silent spot you me behold,
And may have read the tale that I have told;
Where I hand down to fame, in records grave,
The noble acts and exploits of the brave.

Though I appear, sometimes, of goodly length,
Can boast of manly, of enduring strength,
And my great prowess has been often tried,
Yet I've been vanquish'd, beaten, or defied;
And when thus humbled have been doom'd to yield,
Yet I am oft victorious in the field.
My tale is told; I'm not unknown to fame,
But, yet, one parting hint to end my theme;
'Twould not be justice to myself or you,
To hide one of my properties from view:—
To various sciences my aid I lend,
Hydraulics, hydrostatics I befriend;
And those that would be weather-wise, we see
Refer with prying confidence to me.
VI. ENIGMA (1846); by the Rev. Anderson Drysdale, Glasgow.

Respected students of the mystic page,
Whose deep attention varied themes engage;
An old acquaintance speaks to you in mask,
And sportively assigns an easy task.
The task is merely to divine a name
Which all admit is not unknown to fame.
At marriage rite, in vegetable form,
Among the birds, with ships in calm and storm,
In navigation's art, in social throng,
In needle-toil (but why the list prolong?),
I may be found; yet as these hints may fail
To help you much, I add what may avail.
See, then, that happy hymeneal hand
Who gracefully before the altar stand.
The rite performed cannot with me dispense;
I give the ring a meaning most intense.
But change the scene and vegetation scan;
You find me hated by the husbandman.
In tree of every land I dwell secure,
And must exist as long as they endure.
Transformed again, I love the ambient air;
The ornithologist has seen me there;
My pinions are not made for eagle flight,
In haunts more humble I obtain delight.
All vessels, too, in port and out at sea,
Derive substantial benefit from me.
You see me plainly when the cords you view;
I boast of being friend to ship and crew.
Along the shore or far from sight of land
I exercise the ready penman's hand.
In gentle breezes and in furious gales
The captain me to mark but seldom fails.
Again, I may be found upon the beach,
Or on the meadow, far as eye can reach;
For, see those groups! what tête-à-tête delight!
Their hearts for once like kindred drops unite.
Where'er such groups are well-defined, believe
That each my designation may receive.
In fine; the sewing process needs my aid,
Without me no attire for any grade.
My name, of course, is no enigma now;
So having said enough I make my bow.

VII. ENIGMA (1847); by Mr. Frederick Burrington, Exeter.

The poets of the past,—the pastoral throng—
Invoke the muse to stimulate their song,
And when the maid was found in sullen vein,
She never strained a nerve to nerve the strain;
Our modern bards more independent grown,
Her fickle empire now refuse to own;
Rush into rhyme without reserve or care,
Nor supplicate the goddess with a prayer:
The stream of Helicon, Parnassian bays,
Elves, Fairies, Muses, Dryads, Naiads, Fays,
That played and graced poetic fancy's stage,
Are heresies in this material age.
The lover pouting for his heart's desire,
Asks no Apollo now to tune his lyre;
His blue-eye lady, gentle as the dove,
Gives birth to me the herald of his love;
While I express his thoughts without control,
And breathe the wish of his impassioned soul.
Created by authority and power,
In me sweet Hope may shine or Fate may lower,
And so within my narrow range may lie
The leave to live, or stern command to die.
Behold me now the mariner befriended,
And swiftly gliding, ocean's depths descend;
He speeds me ere he dares the dang'rous seas,
And passes me to seek th' antipodes.
When war provokes that giant arm we boast,
The pow'rful guardians of our rock-ribbed coast,
From me Bellona's deafening thunders pour,
Which awe and still old Neptune's angry roar;
But not alone upon the swelling wave,
My warlike front is seen the foe to brave;
Though here o'ermatched and broken by the storm,
The battle-field presents my living form,
There, from my presence, midst the flash and gleam,
Destruction issues like a rushing stream;
No longer let me in those scenes remain,
Where suffering, death, and devastation reign,
But trace my worth, the boast of greatest kings,
And yet the slenderest of earthly things;
Although within the narrowest limits found,
Behold me now the wide horizon bound;
Although illustrious, panderer of pride,
Yet see me here to homely duties tied;
Within my keeping chained in secret links,
The riddle is imprisoned,—like the Sphinx,—
And when the mystery of my name you gain,
Employ me then my nature to explain.
VIII. Enigma (1488); by Mr. James Hewitt, Hexham.

Ere Adam cast his wondering eyes abroad,
Or radiant Sol in full refulgence glowed;
Ere Zephyr with the new-born foliage played,
Or shadows danced in Eden's flowery glade,
I had my birth amidst the verdant scene,
But, such my modesty, I lurked unseen.
Yet strange to say—such was the mighty plan—
Though born before, I also came with man,
In woman, too, I owned a holier birth,
Though the first product of the teeming earth.
And when "the man," erect in conscious pride,
Enraptured first surveyed his blooming bride,
Or love's first accents loosed his faltering tongue,
Or young creation's varied glories sung,
Angelic speech primeval silence broke,
Was I not heard in every word he spoke?
Satanic Nachash, envious of their bliss,
Foul, subtle speech inspired for threatening hiss,
Strove to infuse a poison in their joy,
Did he not then my fellest powers employ?
Yes! 'twas through me, since I the truth must tell,
That Eve was ruined and her husband fell.
Am I then wicked? List my mystic lay,—
In spring or summer, nature's face survey;
Behold, entranced, majestic Alpine views;
The flower's rich dyes, the forest's varying hues,
Note autumn's tints, or winter's wild woods bare,—
You see me not, but know that I am there.
The lusty forester, with early day,
Through sylvan shades pursues his tangled way,
To the doomed tree the axe is quickly laid,
Whose oozing life-blood stains the glittering blade,
The burly oak yields to persistent blows,
And crashing falls, say, does it me disclose?
How oft fond parents eye the "genius boy"
His uncouth tools and half-fledged wits employ,
To form his "Armstrong" for great feats to come,
By forcing me to quit my native home.
From ancient history cull the mighty names,—
Heroes of Troy, of Grecian, Roman games—
Nay e'en the athletes of these polished rays
Owe all to me, though oft denied the praise.
Where sickness pales, or fevers rack the brain,
Or youth decays, or manhood writhes in pain,
While childhood moans, or age slow ebbs away,
Prepared, I often lend my feeble ray
To cheer the gloom—although I shun the light—
Art makes me dance! Diarions, good night!

Printed for the Company of Stationers.
IX. Enigma (1489); by the Rev. John Hope, Stapleton.

Though old, perhaps this is my first desire,
To wake to thrilling strains the mystic lyre,
Which annually resounds on Dia’s page,
Beneath the skillful hands of many a sage,
Or youthful vot’ry of the sacred Nine,
Who strives like you, Diarian nympha, to shine:
Forgive me this intrusion, should I here
Within your kindly breasts engender fear.
Perhaps you ask me, where I may be found,
At once, I answer, ev’rywhere around;
But there are certain scenes and places where
My presence I more strikingly declare:
Behold, when tempest-roused, the briny deep,
How surging waves o’er gallant steamers sweep!
Sea blended seems with sky, and far around
The wheels of angry Neptune’s car resound!
Incessant lightnings gleam and thunders roar,
Reverberating on the neigh’ring shore!
‘Midst such commotion see my form arise,
A dreadful sight, before the seamen’s eyes.

Now change the scene, direct your mental sight,
To dwell awhile on yonder Alpine height,
Where snowy masses, often threat’ning frown
To come in sweeping avalanches down;
Or, loosened from its side, some hanging rock
May strike the plain with a tremendous shock;
There often dreaded morning, noon, and eve,
Most gloomy features to my aspect cleave!

Once more change the position, and survey
Yon fierce volcano in its active sway,
Emitting fire and ashes, and afar
Displaying ensigns of its awful war.
Whilst from its crater, down its rugged sides,
Destructively the burning lava glides;
But ah! beneath, far in the deep profound,
Resistless forces shake the solid ground!
Wide rents appear, and houses toppling fall,
And swift destruction seems to threaten all!
Here is the climax—here, alas! I show
A terror bord’ring on the depth of woe!

Nor am I absent from Armenian plains,
Where roams the lion, and his prey obtains,
From Indian jungles where the tiger roves,
Or lurks in ambush in the thickest groves.
Or from the panther, or the shaggy bear,
When, roused by hunger, he forsakes his lair!
If you behead me, and the rest transpose,
You’ll have a thing that often warmly glows.
X. Prize Enigma (1490); by Miss Helen Ogden, Shaw.

Say not, ye bards of Di, that I am rude
In venturing here a moment to intrude,
Upon your mystic page, where surely I
With other objects in my turn may vie.
Admired by many, it is often mine
To bless mankind with influence divine;
The social hearth, however humble found,
Must cheerful be if with my presence crown’d.
Source of domestic joy, from me you’ll trace
Some household treasure of superior grace,
That sheds around a bright and cheering smile,
Life’s gloomy cares and sorrows to beguile.
Quitting the precincts of each peaceful home,
The tangled labyrinth of the world to roam,
Through ev’ry winding of its devious way
I may be found to hold important sway.
My pow’r, protective, highly is esteem’d,
My strength omnipotent sometimes is deem’d,
From me estrang’d how abject is the sight,
What strife and passion mingle in the fight,
For place, or pow’r, or some more harmless toy,
Which serve both peace and pleasure to destroy;
Yet I coercive measures may propound
That may, perchance, a doubtful good be found,
For such the all-absorbing love of gain
No artifice is spared it to obtain.
But blame me not, review the past, you’ll see
Conflicting int’rests were allay’d by me,
When English valour on the battle-field
Was forc’d before the Norman hosts to yield,
Conquer’d, and strongly in subjection held,
Yet fond attachment could not be withheld
From those who hail’d me as a link to bind
In after years affections true and kind.
Adown the ever rolling stream of time
At length appear’d a catalogue of crime,
Where rival roses by ambition fed,
To death, or conquest, hapless thousands led.
What awful carnage dyed the fertile plain!
Brother by brother fell ’mid heaps of slain,
Till Richmond Henry, mindful of his weal,
Sought by my aid the deadly wounds to heal.
In other lands how oft in triumph I
Have proudly wav’d my boasted banner high;
E’en kings and rulers bow to my decree,
And may have found a safeguard sure in me.
O cherish then my ever blissful sway,
That I may crown with joy life’s fleeting day.
NEW CHARADES, REBUSSES, &c.

1. CHARADE; by the Rev. John Hope, Stapleton.
My primal is in many a meadow seen,
Rejoicing in the warmth of sunny rays,
When blooming spring her grass of freshest green,
With flowrets intermixed to view displays.
My second of a legal stature seems,
Tho' frequently it is not half so long;
It like a Naiad, loves the running streams,
And in the coppices delights in song.
My total is my second; it we find
The frequent haunter of a gloomy cell,
To which it seems most strikingly inclined,
Tho' in it fiends of darkness often dwell!

2. CHARADE; by Ædipus.
My singular first, to myself being related,
Its merits of course can't be further narrated.
But my next comprehendeth a very great many,
And yet not of you, ye ladies fair, any.
But both ladies and gents are alike in possession
Of my third, in these wonderful days of progression.
I would have you, my readers, my whole still to cherish,
And love, worth, and beauty, shall wholly not perish.

3. CHARADE; by Mr. James Herdson, Edinburgh.
If you fancy you're ailing, when really you're not,
Then my first, without failing, you've certainly got;
Now, the offspring of Nature my next we'll define,
A well-known living creature of sex feminine;
Then my whole, 'tis quite plain, is a kind of a link,
Though no part of a chain, yet you so it may think.

4. REBUS; by the same.
Ah! beware of my first, I'm a tinsel'd deception;
But change me, as with the philosopher's stone,
And then I'm made worthy your cordial reception,
For in accents of gold, my decrees are made known.

5. REBUS; by Mr. James Hewitt, Hexham.
I dwell within your bosom still,
Nor am dependent on your will;
Curtail, and I'm of mundane birth,
And rove abroad upon the earth;
Transpose, and then to heaven I fly,
And dwell for ever in the sky.

PRINTED FOR THE COMPANY OF STATIONERS.
6. Charade; by Mr. Joseph Hutchinson, near Halifax.

My first’s a son, but whose by birth
We do not like to say;
My next are deem’d of little worth,
And often thrown away;

Not so my whole, to Britain’s stores
They’re welcome—tho’ from distant shores.

7. Rebus; by the Cawkley’s Laddie.

When whole I’m neither straight nor perpendicular,
But if transpos’d I’m prudent and particular;
Transpos’d again, see me in Di poetical,
Behead, I’m in the sea—a light—and intellectual.

8. Charade; by Mr. Joseph Furniss, Lois Weedon.

Attendant on the great, my first is small,
And even now before you yielding pleasure;
My second is a teacher, teaching all
Their time and opportunities to treasure:
My whole is showy, pompous, grand and gay,
And does to stare at every “Lord Mayor’s Day.”

9. Charade; by Mr. Robert Clemiston, Morpeth.

The sportsman views with joyous eye
My primal when obtained:
My next obstruction will imply
By art or nature framed!

My whole adds grace and beauty rare,
And beams on Dia’s lovely fair!

10. Charade; by Mr. W. H. Farn, Gravesend.

On sportsman’s gun my first we see,
And on his helpmate mild;
And certainly upon his knee
More often than his child.

My next allures the embattled “Line”
To glory, wounds, and sorrow:
On my plump whole well might you dine
With friends upon the morrow.

11. Charade; by Mr. Thomas Edwards, Lois Weedon.

My first’s a shred, or a slip it may be,
My second’s a fish that sports in the sea,
My whole’s a youth unembarrassed and free.

12. Rebus; by Mr. Thomas Wray, Market Weighton.

Compos’d of two numbers, I think you’ll allow
Many covet the honours I have to bestow;
But if you should fail my name to declare,
Ask Alderman Jones, or consult the Lord Mayor.

Printed for the Company of Stationers.
I. Query; by the Rev. A. Drysdale, Glasgow.

What is the origin of the word sublime, and wherein consists the sublime as distinguished from the beautiful?

Answered by Mr. James Herdson, Edinburgh.

Sublime is from the Latin sublīmis, and designates height; it is applicable only to the works of nature. Beautiful, or full of beauty, is determined by fixed rules; it admits of no excess or defect, it comprehends regularity, proportion, and a due distribution of colour, and every particular which can engage the attention. The distinction between the sublime and the beautiful consists in the former being only applied to the works of nature,—the latter either to the works of nature or art. A scene is sublime, as it elevates the imagination beyond the surrounding and less important objects; a rural scene is beautiful, when it unites richness and diversity of natural objects with improved cultivation.—Grabb's Syn.

Again, by Mr. James Hewitt, Hexham.

I am unable to trace the word sublime any higher in the etymological scale than the Latin sublīmis, and in that language I find it, in all cases, treated as a native, and in no instance referred to the Greek, or any more ancient language: the meaning invariably attached to it being identical with that in which we use the same word. Separating the root (limis) from its preposition (sub) gives us little farther information. The distinction between the sublime and the beautiful, however, is a much more tangible matter. Taking the latter word first, as being the most easy of definition, I shall merely observe, that what we call "beautiful" is something in an object, or group of objects, that entirely harmonises with our conceptions of propriety of form, symmetry, congruity of colour, position, and grouping, in relation to other objects. A beautiful picture is one in which the figures are well chosen, correctly delineated, and appropriately placed relatively to each other, and with an agreeable blending of colours, so as to avoid what is called "hardness of outline." It is only when a painting by the grandeur, or boldness, of its conception: when all its details are wrought out in such high perfection as to evoke our wonder and admiration, even more than pleasing emotions, that it merges into the sublime.

"This faculty (the sublime) operates, if we may so express it, by sudden and violent impressions, and seizes hold of the mind with irresistible force, and this not only at the first moment, but the effect increases on reflection, and deepens as we contemplate it."

II. Query; by CanTae, M.A., formerly of Sevenoaks.

Is the study of profane learning necessary to the education of a Christian gentleman? or is it at all derogatory to the character of a Christian?

Answered by Mr. James Herdson, Edinburgh.

The epithet profane is not always a term of reproach, but is employed to distinguish what is temporal from that which is especially spiritual in its nature. The history of nations is profane as distinguished from the sacred history contained in the Bible; the writings of the heathen are altogether profane as distinguished from the moral writings of Christians, or the believers in Divine Revelation; the study of the sciences, and the secular and allowed pursuits and concerns of men, which attract the attention of the well-informed
classes, or of the clergy, who are never with justice to be charged with neglect of the natural sciences, may be termed profane learning; but, in this sense, the study of profane learning, if not actually necessary to the education of a Christian gentleman, is not at all derogatory to the character of a Christian.

A similar answer was given by Mr. Thomas Hattam.

Second Answer, by Mr. James Hewitt, Hexham.

To a student possessing an unbiased mind, I should say the study of profane learning cannot but be attended with many advantages. In the first place, it greatly extends the range of his observation, gives him greater experience in the study of man; and by increasing his data, and widening the basis of his ideas, it will enable him to draw more correct conclusions than if he contented himself with becoming acquainted with only one side of the medal. In the one case, he may be likened to a monk, or a hermit, describing or rather endeavouring to describe the grandeur, the beauties, the steppes or the saharas of nature from report, or from the limited view he is able to obtain from the "slit" windows of a convent or the obscurity of his cell; in the other, to a mental Humboldt, who has ranged the pampas and threaded the forests of nature’s wilderness worlds—who has sounded the depths of human degradation, and scaled the Andes of pride and vanity,—who has sweltered in the torrid glow of enthusiasm, or shivered above the line of perpetual congelation—exhibited by the eccentric, and ever varying characteristics of the human mind. In the one case, he has the comparatively safe guide of self-conscious experience, and in the other he must be content to see with the eyes and hear with the ears of another; of one who is, perhaps, ignorant enough to misunderstand; prejudiced enough to be blind to everything but his own warped conceptions.

III. Query; by the Rev. John Hope, Stapleton.

How is Genesis ii, 19 to be understood?

Answered by the Rev. John Hope, the Proposer.

Bishop Patrick, on this passage, supposes that the different animals might be brought to Adam by angels, for which supposition there seems to be no ground in the sacred text. It may be observed that the Lord is often said to do things when He only gives the skill, wisdom, or ability to do them; thus the Lord is said to have made coats of skins for the man and the woman. They of course made them themselves. Perhaps the passage in question may be understood in much the same way, namely, that Adam gave names to animals as they fell in his way, and he found it necessary to give them distinctive appellations. We can scarcely suppose that all the different beasts and birds—some of which are adapted to one climate, some to another—were all congregated in Paradise. Some think that the names given by Adam to certain living creatures are the names which they bear in Scripture; but we have yet to learn whether or not the language of Adam was the language of the Bible. If it was, we may admit this opinion to be correct. Moreover, since ὄνομα seems to be the general term for man, may not the passage before us be considered prospective as well as present, and to apply to the different races of men descended from Adam, who constituted separate nations and peoples, many of them of very varied tongues? I offer this as a conjecture, since the names of animals vary in almost every language under the sun.

Again, by Mr. James Hewitt, Hexham.

To suppose that animals adapted to "live and move" in the eternal snows of the polar regions, with those suited to exist in the arid wastes of the torrid
zone, that the delicate and gentle humming birds of the tropics, the African or Asian vulture, and the northern eagle, the freshwater fishes of the temperate climate, and huge leviathan and his "copartners" of the icy oceans, were all assembled in the neighbourhood of the Persian Gulf, is an idea too monstrous to find, even for one moment, an abiding place in any reflecting mind. Of one thing we are well assured, that the Almighty Creator and Ruler of the universe does nothing by unnatural agencies in the present day, nor did He require to do so "in the beginning," since all the resources of nature were, and are, at His command, and could bring to pass whatever it was His supreme pleasure to will, by the most simple, natural, and effectual means. It is therefore the most reasonable interpretation, and the most in accord with our experience, to suppose that, in the verse referred to, the word Adam is intended to designate Man in general, i.e., all mankind—as it very frequently does in the sacred volume—and that man as he met with and had occasion to distinguish one species of animal from another, for the purpose of description, or found it necessary for the convenience of reference, gave names to all things; such names, if we may reason from analogy, being descriptive of some natural peculiarity. This mode of nomenclature we find obtains in all countries and languages, and we find that these appellations, though often distinctly different in sound and meaning, have seized on the same peculiarity in the object nominated.

Third Answer, by Mr. James Herdson, and in like manner by Mr. Thomas Hattam.

"And out of the ground the Lord God formed every beast of the field, and every fowl of the air; and brought them unto Adam, to see what he would call them; and whatsoever Adam called every living creature that was the name thereof." Gen. ii. 19. The language of this verse is not figurative, but must be understood literally. The Almighty brought unto Adam the living creatures he had formed; and Adam, being endued with wisdom from above, gave them names suitable to their respective natures and dispositions; and it has been remarked that it is amazing how answerable their Hebrew names are to their appearance and nature. This naming, by Adam, is a sign of man's dominion over them, and that they were to be for his service. And when the Ark was built, as the means of preserving a sample of every living creature on the earth, and when Noah and his family entered it,—by a miraculous intervention, seven pair of those animals that were fit for food and sacrifice, and one pair of other animals, entered with them, showing man's continued control and dominion over them.

IV. Query; by the Rev. John Hope, Stapleton.

In several old towns of England the word finkle or fenkle is found as the name of a street or lane,—what is its meaning, or whence derived?

Answered by Rev. John Hope, the Proposer.

All the conquerors of England left traces of there being here in our language, and more especially in the names of places, in many of which we find the peculiar terminations made use of by Romans, Saxons, Danes, and Normans. These terminations are pretty well known to those who are fond of tracing derivations. The word finkle or fenkle is the Norwegian, or rather Danish vinkel, which means curved or crooked. In J. Sullivan's 'Cumberland and Westmoreland, Ancient and Modern,' I find the following under the head "Norwegian Terminations".—"Street (N. strætt), a lane. Finkle Street, Kendal and Carlisle, the crooked street." Finkle Street in Carlisle is a seg-

PRINTED FOR THE COMPANY OFstationers.
ment of a circle, and I suppose all the streets and lanes which bear the name are more or less crooked.

Answers to the same effect were likewise given by Mr. John Chamber and Mr. Thomas Hattam.

Second Answer, by Mr. James Hewitt, Hexham.

Fenkle Street, in Newcastle, as we find from old maps and other documents, had a "local habitation and a name" as far back at least as two hundred years ago, and I have no doubt that it and others of the same name have existed from the days of Canute and Ironside. Hence, it appeared to me, that we must look upon it as the importation and transplantation of some of our kind continental cousins who thought proper to settle themselves in our island for a time and leave us such landmarks as mementoes of their friendly visits. The name "Finkle" may be traced to the Danish, Swedish, or Scandinavian language, where it still flourishes in full vigour as "vinkel," an angle or corner. Applying this meaning to the streets of the name indicated in the query, I found the description crooked, cornered, or curved, was characteristic of all the streets so named of which I was cognisant, except one, of which I have heard that it is straight. The single exception, however, seemed to invalidate my conclusions, and being thus dissatisfied, it occurred to me to consult a gentleman living in Gateshead (the Rev. John Jeffrey—I trust he will excuse me giving his name), whom I know to be a ripe and good scholar in the Danish and other northern languages. The reverend gentleman says: "My impression is that, on the whole, you are right in deriving fenkle from the Scandinavian vinkel, but in one or two minor points you are slightly mistaken. Vinkel, though frequently occurring both in the Danish and Swedish languages, is not a purely Scandinavian word; it is derived from the same [origin] as the German word winkle. Perhaps I should rather say, winkle, or vinkle, is a word common to the Teutonic family of languages, including the Southern German and the Northern Danish and Swedish. In the second place, vinkel or winkle does not properly mean crooked, but rather a corner, or angle, and hence in my opinion its propriety when applied to such streets as bear the name. In Newcastle, Fenkle Street is a side street running off at an angle from Westgate Street. Hence, I presume, its distinctive appellation."

Third Answer, by Mr. G. Robinson, Junr., Hexham.

Sedbergh, Kendal, Richmond, Carlisle, and Newcastle, all of which are ancient towns, possess a Fenkle Street. The name is derived from the Scandinavian vinkle, "an elbow," and is applied to a lesser street, making an angle with a principal one.

V. Query; by Mr. James Herdson, Edinburgh.

Geology exhibits many fossil specimens of extinct animals: have any fossil specimens of extinct species of plants ever been discovered?

Answered by Mr. James Herdson, the Proposer.

Geology abounds in specimens of fossil plants which have become extinct, but there are many of those plants that have been accurately discriminated and classified, as nearly allied to some existing genera, such as Zamia, Equisetum, and tropical ferns, but not identical with any known species. The Osmunda regalis (royal, or flowering fern), is the only species of an existing indigenous vegetable which has been discovered in a fossil state; impressions of the leaves of which are not uncommon in the shale, that is, the mud, which separates the seams of coal, and in the sand stone, and nodules of iron stone. We must
scribe the abundance of matter which furnished the materials for the formation of our immense coalfields, to the accumulation of extinct species of plants acted upon by a peculiar combination of physical agencies in the carboniferous era, which produced coal, as the result of the mineralisation of vegetable remains.

Again, by Mr. James Hewitt, Hexham.

There are some well-defined specimens of fossil remains of "extinct species" of plants to be met with in our coal measure—several pieces of which I have taken from coal got in the neighbourhood—among which are the Stigmia floccosa, Lepidodendron, Calamites, Equiseta, Sigillaria, &c. "The vegetables discovered in the coal strata," says Rhind, "consist of a variety of species, all differing from plants at present in existence. They chiefly consist of those plants allied to ferns, reeds, and some species of palms, resembling altogether plants of a tropical climate. Of the trees, the greater portion belong to the coniferæ, or pine family, some specimens of which have been discovered forty-seven feet in length. These coniferæ resemble the Araucarias of New Holland and South America, much more than they do any pines at present natives of these northern regions. The following are the most common vegetable remains of the coal measures: Stigmia floccosa, Lepidodendron Sternbergii, Lepidostrobus variabilis, the supposed seed of the Lepidodendron; Lepidophyllum lanceolatum, the supposed leaflet of the Lepidodendron—Ulodendron—Calamites Mongeotii, Calamites nodosus, and Sigillaria. The Stigmia floccosa (as is known) is one of the most common plants in the coal measures, and from all we can learn of its structure, perhaps, one of the most singular. Contrary to the usual erect position of plants, it seems to have grown horizontally, spreading out its flat leaves near the muddy soil. The nature of its stem is unknown, but the central junction of its leaves forms a knot of three feet in diameter. The leaves appear to have been cylindrical and fleshy, like the cactus. They are marked with numerous protuberances or dots, from whence the leaflets sprang. The Calamites and Equiseta have hollowed jointed stems, and greatly exceed in size any plants of the same families now known. The Lepidodendron, of which there are several species, seems to have been a splendid plant, something intermediate between arborescent ferns and the pine tribe." The roots and bottoms of the coal seams are found to be lined with innumerable stems and leaves of plants; and these are also scattered through the centre of the seams, but are less easily distinguished there, because the pressure and chemical action have been greater. Large trunks and branches of trees are also found plentifully among coal fields, with the bark and substance converted into coal.

Mr. Thomas Hattam also gave an answer agreeing with the foregoing.

VI. Query; by Mr. William Steevenson, Derby.

Required the rationale why the planets decrease in density the farther they are from the sun?

Answered by Mr. James Hewitt, Hexham.

It is not possible to give a reason for every phenomenon observed in the works of the great Creator of the universe, farther than to say that "It is a universal law of nature," and the rationale required by the query appears to be no exception to this general rule, but to fall under the general category of many things that are, and yet we know not why. One of these general laws is, that the farther any object is from its attracting or governing centre, the less

PRINTED FOR THE COMPANY OF STATIONERS.
intense is the attractive power exerted by the latter over the former, and the individual density of the object attracted is decreased. Hence, we find that while the density of the matter composing the Earth, Venus, and Mars is nearly equal, and is five times that of water—about the same as iron stone—that of the planet Mercury is equal to gold. On the contrary, the density of Jupiter very little exceeds that of water; that of Uranus and Neptune is exactly that of water, while Saturn is so light that it would float in water like a globe of pine wood. These data being admitted, we have now to give a reason for the varying densities of these different planets. In my humble opinion, however, the subject of this query could be better discussed à priori than à posteriori. I shall therefore for the purpose of supplying a fulcrum, or “stand point,” assume that every globe—whether primary planet or satellite—is composed of a system of atoms magnetically arranged, and held together by the gravitation of cohesion; that each of such atoms is possessed, per se, of attracting and repelling properties; that those most strongly attracted arrange themselves around the immediate centre of such globe, and that those less forcibly attracted arrange themselves seriatiim—the converse of these positions being also true—until at the surface of such planets as Jupiter, the atomic attraction is little more than nominal; or, in other words, that the centripetal force diminishes as the square of the distance from the centre, and the centrifugal force increases in a corresponding degree. Following up the assumption, and applying the same principles to the solar system—as to a system of atoms—and substituting the terms “centripetal force” for “gravitation or cohesion,” we find that it exactly coincides with what science has demonstrated beyond controversy to be a general law governing all the celestial bodies with which we are acquainted, namely, that the mean density at the surface of any body is less than at the centre, and also that the mean density of the minor planets (those within the orbit of the Earth) is much greater than that of the major planets—or those whose orbits encompass that of the Earth.

I. Query; by Mr. John White, Lozells, Birmingham.

When and where was cotton first fabricated into cloth?

II. Query; by Mr. James Herdson, Edinburgh.

Whence originated the popular superstition of “The man-in-the-moon?”

III. Query; by the Rev. John Hope, Stapleton.

Profane oaths are entirely forbidden in the New Testament; were they accounted sinful under the Jewish Dispensation?

IV. Query; by Mr. James Hewitt, Hexham.

Is it a fact, as asserted by some bird-fanciers, that the female lark is equally as good a singer as the male?

V. Query; by Mr. James Hewitt, Hexham.

Required the origin of the terms “Picts and Scots.”

VI. Puzzle; by Mr. Septimus Tebay, Rivington.

Place five halfpence in such a way
That each shall touch the rest, and may
Be so arranged that while they touch,
The pressure can be made as much
As you may please. The puzzle try,
And leave your card with Lady Di.

Printed for the Company of Stationers.
ANSWERS TO THE MATHEMATICAL QUESTIONS
PROPOSED LAST YEAR.

I. QUEST. (2034); by Mr. Thomas Milbourn, Riding Mill.

Determine the loci of the centres of the circles of contact of a plane triangle of given base, when the sum of the two sides is constant.

Answered by Mr. Thomas Dobson, Hexham.

Bisect AB, the given sum of the sides, in C; and make CF = Cf = half the given base. Then the locus of the vertex P of the triangle FPF is known to be the ellipse of which AB is the major axis, and F, f the foci. Let the tangents at A and B meet at that at P in O2O2. By Conics, O2F and O2f bisect the angles at F and f, hence O2 is the centre of the escribed circle opposite to f.

Similarly, O3 is the centre of that opposite to F. Hence the tangents at the extremities of the major axis of the ellipse are the loci of the escribed centres opposite to the angles at the base.

If xy be the rectangular coordinates of P, AC = a, FC = ae, and b = \(a(1 - \varepsilon^2)\); the equation to the locus of P is

\[a^2y^2 + b^2x^2 = a^2b^2\]

(1).

Let the normal at P cut O2f in O, Ff in D, and O2F in O1; then O is the inscribed centre, and O1 that of the escribed circle opposite to P.

If \(x'y'\) be the coordinates of O, \(a'x = \Delta FPf = a(1 + \varepsilon)y'\).

By the ellipse CD = \(\varepsilon^2x\), and by similar triangles,

\[y : y' = x - \varepsilon x : x' - \varepsilon x; \cdot \; x' = \varepsilon x.

Substituting for x and y in eq. (1), and suppressing the accents,

\[a^2(1 + \varepsilon^2)y^2 + b^2x^2 = a^2b^2\varepsilon^2\]

(2).

Therefore the locus of O is a concentric ellipse of which Ff is the major axis.
Similarly, the locus of $O_1$ is the concentric ellipse
\[ a^2(1 - e^2)y^2 + b^2x^2 = a^2b^2e^2 \]
of which $Ff$ is the minor axis.

Cor. Replacing $y'$ by $r$ and $r_1$, in the expression for $\Delta FPf$, we have
\[ (r_1 + r) e = r_1 - r. \]

It was answered in like manner by Mr. Thomas Milbourn, the Proposer; and Messrs. Barlow, "Civis," Coutts, Dale, Farmar, M'Namara, Rutter, Somerscales, Traynor, Turnbull, and Wilson.

II. QUEST. (2035); by GEOMETRICUS, Chelsea.

The sum of the areas of the three triangles of which the vertices are the points of contact of each of the three escribed circles with the sides of a plane triangle, diminished by the area of the triangle of which the vertices are the points of contact of the inscribed circle, is equal to twice the area of the primitive triangle.

**Answered by GEOMETRICUS, the Proposer.**

Adopting the usual diagram for a triangle, and its four circles of contact, let $R$, $r$, $r_1$, $r_2$, $r_3$ be the radii of the circles circumscribing the triangles ABC, DEF, D_1E_1F_1, D_2E_2F_2, D_3E_3F_3, and $S$ the area of the triangle ABC; then
\[ \Delta D_1E_1F_1 = E_1O_1D_1 + F_1O_1D_1 - E_1O_1F_1 = \frac{1}{2} r_1^2 (\sin C + \sin B - \sin A) \]
\[ = \frac{1}{2} r_1^2 \cdot \frac{b + c - a}{2R} = \frac{1}{2} r_1^2 \cdot \frac{s_1}{R} \]
\[ = \frac{r_1 S}{2R}. \]

Similarly, $\Delta D_2E_2F_2 = \frac{r_2 S}{2R}$, $\Delta D_3E_3F_3 = \frac{r_3 S}{2R}$, $\Delta DEF = \frac{S}{2R}$.

Hence $\Delta D_1E_1F_1 + \Delta D_2E_2F_2 + \Delta D_3E_3F_3 - \Delta DEF = \frac{r_1 + r_2 + r_3 - r}{2R} S$ (*Horae Geom.* IX) = 2S.

Solutions agreeing in substance with the preceding were also given by Messrs. Barlow, "Civis," Collins, Coutts, Dale, Dobson, Farmar, Grey, Hall, M'Namara, Melburn, Rutter, Somerscales, Traynor, Turnbull, and Wilson.

III. QUEST. (2036); by the Editor.

Let the point (l) of intersection of the perpendiculars of a plane triangle be joined with the centre (O) of the circumscribing circle, and also with the centres (O) of the four circles of contact, and show that
\[ 2a^3 - 10a^3 = 2r_1^3 - 10r_1^3 = 2r_2^3 - 10r_2^3 = 2r_3^3 - 10r_3^3. \]
Solution by Mr. Charles F. Coutts, Brixton.

Since \( OA = 4R \sin \frac{1}{2}B \sin \frac{1}{2}C, \)
\( IA = 2R \cos A, \)
and the angle \( OAI = (\frac{1}{2} \pi - C) - \frac{1}{2}A \)
\( = \frac{1}{2}(B - C), \)

we get \( IO^2 \)
\( = AO^2 + IA^2 - 2AO \cdot IA \cos OAI \)
\( = 4R^2\{4 \sin \frac{1}{2}B \sin \frac{1}{2}C + \cos^2 A \)
\( - 4 \sin \frac{1}{2}B \sin \frac{1}{2}C \cos A \cos \frac{1}{2}B \cos (\frac{1}{2}B \sin \frac{1}{2}C) \}\)
\( = 4R^2\{4 \sin \frac{1}{2}B \sin \frac{1}{2}C(1 - \cos A) \)
\( + \cos A(\cos A - \sin B \sin C) \}\)
\( = 4R^2\{8 \sin \frac{1}{2}A \sin \frac{1}{2}B \sin \frac{1}{2}C - \cos A \cos B \cos C \}\)
\( = 2r^2 - 4R^2 \cos A \cos B \cos C; \)
\( \therefore 2r^2 - IO^2 = 4R^2 \cos A \cos B \cos C. \)

If \( O_1 \) be the centre of the circle escribed to \( BC, \)
\( AO_1 = 4R \cos \frac{1}{2}B \cos \frac{1}{2}C, \) and we similarly find
\( IO_1^2 = AO_1^2 + IA^2 - 2AO_1 \cdot IA \cos OAI \)
\( = 4R^2\{8 \sin \frac{1}{2}A \cos \frac{1}{2}B \cos \frac{1}{2}C - \cos A \cos B \cos C \}\)
\( = 2r_1^2 - 4R^2 \cos A \cos B \cos C; \)
\( \therefore 2r_1^2 - IO_1^2 = 4R^2 \cos A \cos B \cos C, \)
the same symmetrical result as before. Hence the truth of the proposed theorem.


IV. QUEST. (2037); by Mr. William Godward, Chelsea.

Let \( AB \) be the transverse axis of an ellipse, and \( SY, HZ \) perpendiculars from the foci \( S, H \) upon the tangent at any point \( P. \) Find the locus of \( P, \) the intersection of \( AZ, BY; \) of \( P_2 \) the intersection of \( AY, BZ; \) of \( P_3 \) the intersection of \( SZ, HV; \) and of \( O \) the centre of the circle through \( Y, Z \) and the centre \( C. \)

Solution by Mr. William Godward, the Proposer.

Take \( CA, CD, \) the semi-axes major and minor of the ellipse \( ADB \) for

PRINTED FOR THE COMPANY OF STATIONERS.
axes of coordinates, draw the normal PG and let \( x'y' \) be the coordinates of P. Then, by conics, \( SP = r = a - ex' \), 
\[ HP = r' = a + ex', SY = b \sqrt{\frac{r}{r'}}, \text{ and} \]
\[ HZ = b \sqrt{\frac{r'}{r}}. \] Also \( PG = \frac{b}{a} \sqrt{rr'} \); \( \therefore \) \[ \sin \angle PGA = \frac{ay'}{b \sqrt{rr'}}, \text{ and} \]
\[ \cos \angle PGA = \frac{ax'(1-e^2)}{b \sqrt{rr'}} = \frac{bx'}{a \sqrt{rr'}.} \]

From these we readily find the coordinates of
\[ Y = a \frac{1}{r'} \{(1-e^2)x' + er'\}, \frac{a}{r'} y'; \quad Z = a \frac{1}{r} \{(1-e^2)x' - er\}, \frac{a}{r} y'. \]

We have also the coordinates of
\[ A = a, 0; \quad B = -a, 0; \quad S = ae, 0; \quad H = -ae, 0. \]

From these coordinates we find the equations of the following lines, viz.—

\[ AZ \ldots y = \frac{y'(a-x)}{(1+e)(a-x')}(1), \quad BY \ldots y = \frac{y'(a+x)}{(1+e)(a+x')}(2), \]
\[ AY \ldots y = \frac{y'(a-x)}{1-e(a-x')}(3), \quad BZ \ldots y = \frac{y'(a+x)}{(1-e)(a+x')}(4), \]
\[ SZ \ldots y = \frac{y'(x-ae)}{(1-e^2)x'-2er}(5), \quad HY \ldots y = \frac{y'(x+ae)}{(1-e^2)x'+2er}(6). \]

Equations (1) and (2) give \( x = x' \) and \( y = \frac{y'}{1+e} \), showing that the locus of \( P_1 \) is an ellipse, whose semiaxes are \( a \) and \( \frac{b}{1+e} \).

Equations (3) and (4) give \( x = x' \) and \( y = \frac{y'}{1-e} \); hence the locus of \( P_2 \) is an ellipse whose semiaxes are \( a \) and \( \frac{b}{1-e} \).

Equations (5) and (6) give \( x = \frac{x'(1+e^2)}{2} \) and \( y = \frac{y'}{2} \), which show that the locus of \( P_3 \) is an ellipse whose centre is C and semiaxes \( \frac{a}{2} \) \((1+e^2)\) and \( \frac{b}{2} \).
Bisect CZ in E, and draw EO perpendicular to CZ meeting CQ, which is perpendicular to YZ in O, the centre of the circle through C, Y, Z. Then CE = \frac{1}{2} CZ = \frac{1}{2} a; also by conics CQ = a\sqrt{(1 - e^2 \sin^2 PGA)}

= \frac{ab}{\sqrt{rr'}}, and by similar triangles, CO = CE. \frac{CZ}{CQ} = a\sqrt{rr'}. The coordinates of O are \( x = CO \cdot \cos \angle PGA = \frac{x'}{2}, \) and \( y = CO \cdot \sin \angle PGA \)

= \frac{a^2 y'}{2b^2}; hence the locus of the centre O of the circle CYZ is an ellipse whose centre is C and semi-axes \( \frac{a}{2} \) and \( \frac{a^2}{2b}. \)

Cor. 1.—The equation to the circle CYZ will evidently be

\[ x^2 + y^2 - x'x - \frac{a^2}{b^2} y = 0, \]

and this when \( y = 0 \) gives \( x = x' \), which is the common abscissa of P, P', P. Hence the circle CYZ intersects AB in a point which ranges with P, P, P in a line perpendicular to AB.

Cor. 2.—The equation to the normal at P of the ellipse APB is

\[ x - x' = (1 - e^2) (y - y') \frac{x'}{y'} \ldots

Equations (5) and (7), and (6) and (7), give the same values of \( x \) and \( y \) as we have found above from (5) and (6), showing that SZ and HY both pass through the point of bisection of PG. This corollary furnishes a solution to question 5, page 196, Salmon's 'Conic Sections,' fourth edition.

Analogous solutions were also given by Mr. Farmar, of Dover; and Messrs. Barlow, Collins, Coucts, Dale, Dobson, Doolittle, Grey, Hall, M'Namara, Milbourn, Rutter, Traynor, Turnbull, and Watson.

V. QUEST. (2038); by Mr. THOMAS DOBSON, B.A., Hexham.

The tangent to the circumscribing circle at each vertex of a plane triangle is produced to meet the right line, opposite to that vertex, through the middle points of the sides of the escribed triangle; and the corresponding sides of these two triangles are also produced to meet. Prove that the six points of intersection lie in one right line.

Answered by Mr. THOMAS DOBSON, the Proposer; and in like manner by Messrs. JOHN COLLINS, MATTHEW COLLINS, GREY, RUTTER, and TURNBULL.

Let \( O_1, O_2, O_3 \) be the escribed centres opposite to the vertices \( ABC \)
of a plane triangle, and LMN the middle points of $O_2O_3$, $O_1O_3$, and $O_1O_2$ respectively.

Let BC and $O_2O_3$ meet in $S_1$, AC and $O_1O_3$ in $S_2$, and AB and $O_1O_2$ in $S_3$. Since the lines $AO_1$, $BO_2$, $CO_3$ intersect in one point, $S_1S_2S_3$ are in a right line. (*M'Dowell's Ex. 3, p. 169.)

Draw tangents at A, B and C to the circle passing through ABCLMN, and denote by $T_1T_2T_3$ the intersection of the tangent at A with MN, of that at B with LN, and of that at C with LM.

By taking the sides of an inscribed pentagon in the order ABMNCA, and supposing a side of an original hexagon to have vanished at A, it follows, by Pascal's Theorem, that the intersection of the tangent at A with MN, of CA with BM, and of AB with CN, that is, the points $T_1S_2S_3$, are in a right line.

Similarly, by means of the pentagons LABCNL and LACBML, each of the triads of points $S_1T_2S_3$, $S_1S_2T_3$, lies in a right line.

$\therefore$ $S_1S_2S_3$, $T_1T_2T_3$ are all in one right line.—Q.E.D.

Cor.—If circles be described about ABC and $O_1O_2O_3$, the intersections of the tangents at A and $O_1$, at B and $O_2$, and at C and $O_3$, and also those of the corresponding sides of the two triangles, are in one right line.

For, join $T_1O_1$. Since MN bisects the perpendicular $AO_1$ at right angles, and is a common chord of the two equal circles about $MNL$ and $MNO_1$.

$$T_1O_1^2 = T_1A^2 = T_1M \cdot T_1N;$$

$\therefore$ $T_1O_1$ is a tangent to the circle about $O_1MN$, and therefore to that about $O_1O_2O_3$; for these equiangular triangles evidently have the same tangent at the common angle $O_1$.

Good analytical solutions were also given by Messrs. Barlow, "Civis," Coutts, Dale, Escott, M'Namara, Milbourn, and Traynor.

VI. QUEST. (2039); by Mr. Stephen Watson, Haydonbridge.

Show that three rectangles can be inscribed in any triangle, so that they may severally have a side coincident in direction with the respective sides of the triangle, and their diagonals all intersecting in the same point. Also show that one circle will circumscribe all the three rectangles, and find its radius.
Answered by Mr. Thomas Dobson; and in like manner by Mr. Stephen Watson, the Proposer; and Messrs. Barlow, Collins, Farmar, McNamara, Milbourn, Rutter, Traynor, and Turnbull.

Construction.—Draw perpendiculars AD, CE to the sides CB, BA of the triangle ABC; and in CB produced take BF = CD.
Let a circle through A, C, and F cut AB produced in G. Join GC, and draw BH parallel to GC, meeting AC in H.
Draw HI perpendicular and HK parallel to AB, meeting AB and BC in I and K. About KHI describe a circle cutting AC, CB, BA in L, M, and N; then, KHLMN are the angular points of the required inscribed rectangles, of which the diagonals are three diameters of the circle about HKI.

Demonstration.—By similar triangles,
\[
\frac{AD}{CE} = \frac{AB}{BC} = \frac{BF(CD)}{BG}; \quad \text{and} \quad \frac{HI}{CE} = \frac{AH}{AC} = \frac{AB}{AG} = \frac{HK}{BG};
\]
\[
:\therefore AD : CD = HI : IK; \text{ and the right-angled triangles ADC, HIK are equiangular.}
\]
Now, by the circle, the angle KLI = KHI = DAC;
\:: KL is parallel to AD. And ILK = IHK = a right angle;
\:: IL is parallel to BC, and ILKM is one of the rectangles.
Again, HN is a diameter, \:: HIN is a right angle.
\:: HINK is another of the rectangles.
But NLH and NMH are also right angles, \:: HLNM is the third rectangle.

Let abc \(\triangle\) denote the sides and area of the triangle, and \(\rho\) the radius of the circle about HIK.
By the figure 2c . BG = 2ab \cos C = a^2 + b^2 - c^2,
\:: 2c . AG = 2c(c + BG) = a^2 + b^2 + c^2.

Now, HI . AG = AB . CE = 2\(\triangle\),
\:: HI(a^2 + b^2 + c^2) = 4c \(\triangle\) = 2abc \sin C.
But HI = KI \sin C = 2\rho \sin C,
\:: \rho(a^2 + b^2 + c^2) = abc.

PRINTED FOR THE COMPANY OF STATIONERS.
Elegant analytical solutions were given by Messrs. Coutts, "Civis," Dale, "Geometricus," and Hall.

**VII. QUEST. (2040); by Mr. Thomas Dobson, B.A., Hexham.**

Determine the condition of projection of a hoop in a vertical plane, so that when it reaches the ground it may roll backwards.

*Answered by Mr. Thomas Dobson, the Proposer; and similarly by "Civis," "Cubic," M.A., and Mr. Thomas Milbourn.*

Let the hoop, centre C, be projected from A and strike the horizontal line AB in B.

Let \( M, a = \) the mass and radius of the hoop.
\( k = \) its radius of gyration about C.
\( V = \) linear velocity of projection of C.
\( \omega = \) angular velocity of projection of C.
\( v, \pi = \) linear and angular velocities of C after impact.
\( F = \) horizontal impulsive action at B.

Then,
\[
Mv = MV \cos a - F,
\]
\[
Mk^2 \pi = Mk^2 \omega - Fa,
\]
\[
v + a\pi = 0.
\]

Eliminating \( F \), and observing that \( k = a \),
\[
2a\pi = a\omega - V \cos a.
\]

Now, in order that the hoop may roll back towards A, we must have \( \pi \) positive,
\[
\therefore a\omega > V \cos a,
\]

the condition required; and it shows that the initial velocity of each particle due to its rotation round the centre must be greater than the progressive velocity of the centre of gravity, and in a contrary direction, in order that the hoop may roll backwards towards the point of projection.

**VIII. QUEST. (2041); by Mr. Matthew Collins, A.B., Dublin.**

Can the common difference of three rational square numbers, in arithmetical progression, ever be 17?

*Printed for the Company of Stationers.*
Answered by "Civis."

The squares may be of the forms
\[ \left( \frac{a^2 - b^2 + 2ab}{q} \right)^2, \left( \frac{a^2 + b^2}{q} \right)^2, \left( \frac{a^2 - b^2 - 2ab}{q} \right)^2; \]
and the common difference equated to 17 gives
\[ 4ab(a^2 - b^2) = 17q^2. \]

For \( a, b \) write \( r^2, s^2 \), then
\[ r^2 - s^2 = 17 \frac{q^2}{4r^2s^2}. \]

Put \( 2(r^2 - s^2) = 16v^2 \); then \( r^2 - s^2 = 8v^2, r = 2v^2 + 1, \)
\[ s = 2v^2 - 1, r^2 + s^2 = 8v^4 + 2; \therefore 64v^6 + 16v^2 = \frac{17q^2}{4r^2s^2}. \]

or if
\[ u^2 = \frac{q^2}{8r^2s^2v^2}, \text{ we have } \]
\[ 17u^2 - 1 = 4v^4 \] ............................ \( (a) \).

Up to this point I have adopted the process from the answer to the Prize Question, 'Ladies' Diary,' 1803, where, however, 17 is replaced by 13. The equation \( 13u^2 - 1 = 4v^4 \) can be solved by rational numbers, as there shown, but \( (a) \) cannot be so solved, as I proceed to show.

One solution of \( 17u^2 - 1 = z^2 \) is \( u = 1, z = 4 \), and the general solution is of the form, as to \( z \),
\[ z = \frac{(4 + \sqrt{17})^{2m+1} + (4 - \sqrt{17})^{2m-1}}{2}. \]

And in order that \( (a) \) may be rationally solved we must have
\[ 4v^2 = (4 + \sqrt{17})^{2m+1} + (4 - \sqrt{17})^{2m+1}, \]
i.e. the right-hand member must be a square.

Now, by a known theorem,
\[ x^{2m+1} + y^{2m+1} = (x + y)M, \]
and \( M \) cannot be divisible by \( x + y \) or any factor of \( x + y \), unless \( y^{2m} \) or \( 2m + 1 \) be divisible by \( x + y \) or such factor. In the present case \( x + y = 8 \), and its factors are even, and therefore cannot be contained in \( 2m + 1 \), and \( y^{2m} \) cannot contain \( x + y \) or any of its factors, since 17 is a prime. Therefore,
\[ (4 + \sqrt{17})^{2m+1} + (4 - \sqrt{17})^{2m+1} = 8k \]
where \( k \) is odd. But in order that \( 8k \) may be a square, we must have \( k \) even. Since this cannot be the case, \( (a) \) cannot be solved in rational numbers.

PRINTED FOR THE COMPANY OF STATIONERS.
IX. QUEST. (2042); by the Editor.

In the year 1818, Easter Day was on the 22nd of March, the earliest date on which it can happen. When will it be so again?

Answered by Mr. Thomas Dobson, Hexham; Mr. W. H. Levy, Shalbourne; Mr. C. H. Brooks, C. E., Port Louis; Mr. A. Hall, Naval Observatory, Washington; and "Civis."

Let \( e \) = the epact,
\( L \) = the dominical letter,
\( g \) = the golden number,
\( c \) = number of centuries,
\( 100c + y \) = number of years of date.

Then by the article on measures of time in Woolhouse's excellent little 'Treatise on the Measures and Weights of All Nations,'

\[
L = 2 \left( \frac{c}{4} \right) r + 2 \left( \frac{y}{4} \right) r + 4 \left( \frac{y}{7} \right) r + 1 \quad \ldots \quad (1),
\]

\[
g = \left( \frac{100c + y + 1}{19} \right) r \quad \ldots \quad (2),
\]

\[
e = \left\{ \frac{11(g - 1)}{30} \right\} r + 8 + \left( \frac{c}{4} \right) \omega + \left( \frac{c - a}{5} \right) \omega - c \quad \ldots \quad (3),
\]

where \( a = \left( \frac{c - 17}{25} \right) \omega \) and the subscripts \( r \) and \( \omega \) denote that the remainder, or the whole number, resulting from the division, is to be used.

Also, if \( e < 24 \), the date of Easter Sunday is

\[
\text{March} \ (45 - e) + \frac{1}{7} (L + e + 1) \quad \ldots \quad (4).
\]

Now, that the expression (4) may become March 22, we must have \( e = 23 \), and \( L = 4 \).

Putting \( e = 23 \) and \( c = 18 \) in equation (3), we find \( g = 14 \); and this substituted in eq. (2) gives \( \frac{1}{19} (y + 1) \) a whole number; \( \therefore y = 19n - 1 \). Making \( n = 1, 2, 3, 4, 5 \) successively, and tabulating the corresponding values of \( L \), we get

| \( y \) | \( 18 \) | \( 37 \) | \( 56 \) | \( 75 \) | \( 94 \) |
| \( L \) | \( 4 \) | \( 1 \) | \( 5 \) | \( 3 \) | \( 7 \) |

Therefore Easter Sunday can fall on March 22 in no other year of this century than 1818.

Making \( c = 19, 20, 21 \), and \( e = 23 \), we have \( g > 19 \), and therefore in no year of these three centuries is the epact 23.
When \( e = 22 \) we find \( g = 0 \), and from eq. (3) we must have \( \frac{1}{19}(y + 10) \), a whole number; whence the corresponding values of \( y \) and \( L \) are found to be

\[
\begin{array}{cccccc}
   y & 9 & 28 & 47 & 66 & 85 \\
   L & 1 & 5 & 3 & 0 & 4 \\
\end{array}
\]

of which the last satisfies the condition required.

Therefore Easter Sunday will not fall on the 22nd day of March before the year 2285.

The question was answered nearly thus by Mr. Matthew Collins, Mr. Albert Escott, and Mr. Septimus Tebay.

Second Solution, by the Editor.

The requisite calculation is reduced to mere inspection by the use of the complete set of tables given in the work referred to. These tables are carefully constructed from the formulae laid down, and, being stereotyped, the accuracy of every figure may be safely relied upon. In the table for Easter Day, page 160, the proposed date, March 22, occurs only once, and the table indicates that the epact must be \( e = 23 \), and the dominical letter \( D \), which are, therefore, the two conditions of the question. Now, in the first place, looking for the number 23 in the table of Epacts, page 156, the corresponding golden numbers for the several centuries are found to be

\[
\begin{align*}
1700, & 1800, e = 23, g = 14, \\
1900, & 2000, 2100, e \text{ never } 23, \\
2200, & 2400, e = 23, g = 6, \\
2300, & 2500, e = 23, g = 17, \\
2600, & 2700, 2800, e \text{ never } 23, \\
2900, & 3000, e = 23, g = 9, \\
& \&c. & \&c.
\end{align*}
\]

Hence, finding these respective values of \( g \) in the table of Golden Numbers, pages 150 and 151, the years of each century are in each case found in a horizontal line to be as in the following table:

<table>
<thead>
<tr>
<th>Century</th>
<th>( g )</th>
<th>Years</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700</td>
<td>14</td>
<td>4 23 42 61 80 99</td>
<td>1761</td>
</tr>
<tr>
<td>1800</td>
<td>14</td>
<td>*18 37 56 75 94</td>
<td>1818</td>
</tr>
<tr>
<td>2900</td>
<td>6</td>
<td>9 28 47 66 *85</td>
<td>2285</td>
</tr>
<tr>
<td>2300</td>
<td>17</td>
<td>15 34 *53 72 91</td>
<td>2353</td>
</tr>
<tr>
<td>2400</td>
<td>6</td>
<td>18 *37 56 75 94</td>
<td>2437</td>
</tr>
<tr>
<td>2500</td>
<td>17</td>
<td>*5 24 43 62 81</td>
<td>2505</td>
</tr>
<tr>
<td>2900</td>
<td>9</td>
<td>15 34 53 *72 91</td>
<td>2972</td>
</tr>
<tr>
<td>3000</td>
<td>9</td>
<td>10 *29 48 67 86</td>
<td>3029</td>
</tr>
</tbody>
</table>

&c.
The years in this table answer to the condition \( e = 23 \). In order to satisfy the remaining condition, an entry is made with each of these years in the table of Dominical Letters, page 146, and an asterisk is affixed to distinguish the cases in which the letter is D, as required. The years so marked are, of course, those in which Easter falls on March 22, and for greater distinctness are all put down in the last column.

Any chronological calculation, whether direct or inverse, may be thus easily effected by a suitable inspection of the tables. The table of Epacts, which is given as far as the century 4000, may be easily extended by means of the formulae on page 155.

Mr. Albert Escott and Mr. W. H. Levy also resolve the question by the use of the tables; and Mr. Levy observes that "the occurrence of 2972 is somewhat remarkable, since that is the first leap year in which it ever has or can happen prior to that date, to fall on the day in question."

X. QUEST. (2013); by Mr. John Buttery, Chatham.

An elliptic lamina has one point in its perimeter fixed, and is struck by a blow perpendicular to the plane of the lamina at the extremity of the diameter conjugate to that through the fixed point. Find the impulse on the fixed point, and the initial axis of rotation.

Answered by Mr. Charles F. Coutts, Brixton.

Take the tangent at the fixed point and the diameter through the point as coordinate axes.

\[ \begin{align*}
\text{Let } \phi &= \text{the angle between the axes} ; \\
a, b &= \text{the semidiameters} ; \\
F &= \text{the blow, or impact} ; \\
R &= \text{the impulse on fixed point} ;
\end{align*} \]

then the blow has no moment about a line perpendicular to the plane of the lamina, and the instantaneous axis is therefore in the lamina; let \( x, y \) be any point in the instantaneous axis; \( \omega_1, \omega_2 \) the initial angular velocities about the coordinate axes, and \( m \) the mass of the lamina;

\[
\begin{align*}
m \frac{5b^2 \sin^2 \phi}{4} \omega_1 &= Fb \sin \phi \quad \text{......................... (1)} \\
m \frac{a^2 \sin^2 \phi}{4} \omega_2 &= Fa \sin \phi \quad \text{......................... (2)}
\end{align*}
\]

Also, since any point in the instantaneous axis has no velocity immediately after impact,

\[ \omega_1 y \sin \phi = \omega_2 x \sin \phi \quad \text{......................... (3)} \]
From (1), (2), (3) we get
\[ ay = 5bx, \]
which is the equation to the instantaneous axis of rotation.

Also, initially, the velocity of the centre of gravity of the lamina is perpendicular to the lamina and \( = \omega b \sin \phi \);

\[ \therefore F - R = m\omega b \sin \phi = \frac{4}{5} F \text{ by equation (1)}; \]

\[ \therefore R = \frac{1}{5} F. \]

The question was nearly thus answered by Mr. John Buttery, the proposer; Mr. Thomas Dobson; "Cubic," M.A.; and "Civis."

XI. QUEST. (2014); by Mr. Septimus Teray, Rivington.

If the sides and area of a triangle be integers, the area is divisible by 6; prove this, and show that every multiple of 6 is not the area of a triangle whose sides are integers.

Answered by Mr. Septimus Teray, the Proposer; and similarly by Messrs. Barlow, Brooks, John Collins, Matthew Collins, Dobson, and Milbourn.

Let the sides of the triangle be
\[ ab(c^2 + d^2), cd(a^2 + b^2), (ad + bc)(ac - bd), \]
and the area \( \Delta = abcd(ad + bc)(ac - bd). \)

If the sides have a common measure, we may suppose this to be expunged before the area is formed.

If none of the numbers \( a, b, c, d \) be divisible by 2, both \( ad + bc \) and \( ac - bd \) are divisible by 2; therefore \( \Delta \) is always divisible by 2. If none of these numbers be a multiple of 3, they must be of the form \( 3\lambda \pm 1 \). Therefore \( ad + bc \) is of the form \( 3\mu \pm 1 \pm 1 \), and \( ac - bd \) is of the form \( 3\nu \pm 1 \pm 1 \); one of which is divisible by 3. Therefore the area is always divisible by 6.

Also, as the form of expression for the area is composed of six factors, it is evident that no prime multiple of 6, or any other multiple not comprehended in that particular form, can represent the area of a triangle whose sides are integers.

Mr. Matthew Collins adds the following:

Cor.—When the sides and area of a triangle are integers, then the three tangents drawn from the vertices to the inscribed circle will be whole numbers, and not all odd.

XII. QUEST. (2015); by Mr. William Godward, Chelsea.

Let \( DD_1, EE_1, FF_1 \), be the diameters of the circumscribed circle bisecting the sides \( BC, CA, AB \) of the triangle \( ABC \), and \( G, H, K \) the points of contact of the inscribed circle; prove that each of the triads \( DG, EH, FK \) and \( D_1G, E_1H, F_1K \).
F, K is concurrent. Also prove that if \( a_3 \beta_1 \gamma_1 \) and \( a_2 \beta_2 \gamma_2 \) be the trilinear coordinates of the points of intersection of these concurrent lines, \( \Delta \) the area of the triangle, and \( R \) and \( r \) the radii of the circumscribed and inscribed circles, then

\[
\sqrt{a_1 a_2} + \sqrt{\beta_1 \beta_2} + \sqrt{\gamma_1 \gamma_2} = \sqrt{\frac{\Delta}{R^2 - r^2}}.
\]

**Solution by Mr. William Godward, the Proposer.**

Join Q and O, the centres of the circumscribed and inscribed circles, and let DG meet QO in \( P_1 \) and \( D_1 G \) in \( P_2 \); also let \( L \) be the intersection of BC and DD_1. Then \( P_1 Q : P_2 O : \) \( R : r \) \( ..(1) \), and \( P_2 Q : P_2 O : R : r \) \( ..(2) \); hence, as the centres \( Q, O \) and radii \( R, r \) are symmetrical and independent of the order of the sides of the triangle, the points \( P_1, P_2 \) are so too; therefore \( P_1 \) is common to the triad DG, EH, FK, and \( P_2 \) to the triad \( D_1 G, E_1 H, F_1 K \).

Again, if \( a_1 \beta_1 \gamma_1 \) be the coordinates of \( P_1 \), then,

\( P_1 Q : P_1 O : a_1 - QL : r - a_1, \)

also \( QL = R \cos A; \therefore \) by \( (1), \)

\( r : r = a_1, \)

or \( R - r : r = R \cos A : r - a_1, \)

which gives \( a_1 = \frac{2Rr}{R + r} \cos^2 \frac{A}{2} \); by symmetry,

\( \beta_1 = \frac{2Rr}{R + r} \cos^2 B, \) and \( \gamma_1 = \frac{2Rr}{R + r} \cos^2 C. \)

Likewise, if \( a_2 \beta_2 \gamma_2 \) be the coordinates of \( P_2 \), we have

\( P_2 Q : P_2 O : a_2 - QL : a_2 - r, \)

or, by \( (2), \) \( R : r : a_2 - R \cos A : a_2 - r; \therefore R - r : r = R \cos A : a_2 - r, \)

which gives \( a_2 = \frac{2Rr}{R - r} \sin^2 \frac{A}{2}; \) hence, by symmetry,

\( \beta_2 = \frac{2Rr}{R - r} \sin^2 \frac{B}{2}, \) and \( \gamma_2 = \frac{2Rr}{R - r} \sin^2 \frac{C}{2}. \)

Wherefore,

\[
\sqrt{a_1 a_2} + \sqrt{\beta_1 \beta_2} + \sqrt{\gamma_1 \gamma_2} = \frac{Rr}{\sqrt{(R^2 - r^2)(\sin A + \sin B + \sin C)}} = \frac{\Delta}{\sqrt{(R^2 - r^2)}},
\]

Nearly thus also were the solutions by Messrs. Barlow, Bills, "Civis," John Collins, Matthew Collins, Dobson, Escott, M'Namara, Milbourn, Watson, and Traynor.
Mr. Godward completes the investigation by adding the following interesting corollaries.

Cor. 1.—Produce $OD_1$ to $O_1'$, making $D_1O_1 = D_1O$, then $O_1'$ is the centre of the escribed circle touching $BC$ externally. Let $O_1G$ and $O_1D$ meet $QO$ in $P_3$ and $P_4$; also draw $O_1S$ parallel to $DD_1$ meeting $QO$ in $S$, then $O_1S = 2D_1Q = 2R$; hence $S$ is the centre of the circle through $O_1O_2O_3$, the centres of the three escribed circles. Now, $P_3O : P_3S :: r : 2R$, and $P_4Q : P_4S :: R : 2R$; hence, for the same reason as before, $P_3$ will be common to the triad $O_1G$, $O_2H$, and $O_3K$, and $P_4$ to the triad $O_1D$, $O_2E$, $O_3F$, so that we have seven points ranging in the same straight line, viz., $Q$, $O$, $S$, the centres of three circles, and $P_3$, $P_4$, $P_3'$, $P_4'$ the intersections of four triads, $P_4'$ being the centroid of the escribed triangle $O_1O_2O_3$.

Cor. 2.—Let $a_3\beta_3\gamma_3$ and $a_4\beta_4\gamma_4$ be the coordinates of $P_3$ and $P_4'$; then we shall find, in the same manner as above, that

$$
a_3 = \frac{rr_1}{2R - r}, \quad \beta_3 = \frac{rr_2}{2R - r}, \quad \gamma_3 = \frac{rr_3}{2R - r};
$$
$$
a_4 = \frac{4R \cos^2\frac{1}{2}A - r}{3}, \quad \beta_4 = \frac{4R \cos^2\frac{1}{2}B - r}{3}, \quad \gamma_4 = \frac{4R \cos^2\frac{1}{2}C - r}{3}.
$$

XIII. QUEST. (2046); by Mr. William Gibson, Hexham.

If a quadrilateral in a circle be completed, and $p$ be the radius of the circle through the centres of the circles $(r_1)$, $(r_2)$, $(r_3)$, $(r_4)$ about the four component triangles, and $2r = r_1 + r_2 + r_3 + r_4$; prove that

$$
16p^2 = \frac{(rr_1 + r_2r_3)(r_1r_3 + r_2r_4)(r_1r_4 + r_2r_3)}{(r - r_1)(r - r_2)(r - r_3)(r - r_4)}.
$$

Answered by Mr. Thomas Dobson; and Messrs. Barlow, "Civis."


Let $A'B'DC$ be a quadrilateral in a circle. Produce $A'D$, $CB$ to meet in $P$; and $CA'$, $BD$ to meet in $B'$; and let $O_1O_2O_3O_4$ be the centres of the circles about the respective triangles $ABD$, $A'B'D$, $CBB'$, and $CAA'$.

It is known (see M'Dowell’s ‘Exercises,’) that these four circles have a common point $(P)$ of intersection, and that the five points $O_1O_2O_3O_4P$ lie in the circumference of a circle $Q(p)$. From $O_1$ draw $O_1a$, $O_1b$ perpendicular to $AA'$, $BD$ respectively; and join $ab$. Then $ab$ is parallel to $AB$, and the points $O_1a$, $Db$ lie in the circumference of a circle on diameter $O_1D$.
The angle $O_1\theta A = O_1\beta \alpha = 90^\circ - ABD$; similarly, the angle $O_2\beta A' \theta = O_2\alpha' \beta' - 90^\circ = O_1\theta A$, because $B'\alpha' \theta = 180^\circ - ABD$; for this reason also one only of the centres $O_1O_2$ will lie between $DA$ and $DB'$.

$\therefore O_1DO_2 = ADB' = 180^\circ - C$.

Now, $O_1QO_2 = 2(180^\circ - O_1\theta P'O_2) = 2(180^\circ - O_1\theta D'O_2) = 2C$; similarly, $O_2QO_4 = 2C$; $\therefore$ arc $O_1O_2 = $ arc $O_3O_4$; and consequently $O_1O_4$ is parallel to $O_2O_3$.

In the arc $O_2O_4$ take $P$ such that $O_2P = O_1P$, and $\therefore O_4P' = O_2P'$; then $r_1r_2r_3$ are the respective chords of the arcs $P'O_2$, $P'O_4$, $P'O_3$, and $P'O_4$, and are consequently the sides of a quadrilateral inscribed in the circle $Q(\rho)$.

Hence (Todhunter's 'Trigonometry,' p. 189),

$$16\rho^2 = \frac{(r_1r_2 + r_3r_4)(r_2r_3 + r_1r_4)(r_1r_3 + r_2r_4)}{(r - r_1)(r - r_2)(r - r_3)(r - r_4)}.$$

The parallels $O_1O_4$, $O_2O_3$ are respectively perpendicular to the common chords $AP$ and $PB'$; $\therefore$ APB' is a right line.

Perpendiculars from $O_1O_4$ on $BD$ and $A'D$ obviously meet in the centre of the circle through $A'DB$, and therefore in the centre of the circle about the original quadrilateral $A'DBC$; but these perpendiculars also meet at an angle $ADB = C = 180^\circ - O_1\theta P'O_2$; therefore the centre ($P'$) of the circumscribing circle also lies in the circumference of the circle ($\rho$).

XIV. QUEST. (2047); by Mr. Stephen Watson, Haydonbridge.

Through each two of the angles of a triangle $ABC$, any circles are described, cutting the sides again in $D$, $E$; $F$, $G$; $H$, $I$; and at each of those pairs of points tangents are drawn to the circles, meeting in $P$, $Q$, $R$. Show that the loci of $P$, $Q$, $R$ are conics passing respectively through the angles of the triangle, and intersecting the two contiguous sides, in each case, in two points $D'$, $E'$; $F'$, $G'$; $H'$, $I'$; also show that the tangents to those conics at the angles, and the lines $D'E'$, $F'G'$, $H'I'$ all pass through one point.

Answered by Mr. Stephen Watson, the Proposer.

Let $O_1O_2O_3$ be points respectively on the circles $BCDE$, $CAFG$, $ABHI$, and lying also respectively on the same side of $BC$, $CA$, $AB$ as the triangle $ABC$. Put the angle $BO_1C = \theta_1$, $CO_2A = \theta_2$, $AO_3B = \theta_3$; then the trilinear equations of the circles are,

$$\sin(A-\theta_1)x^2 + \sin(B+\theta_1)y^2 = 0,$$

$$\sin(B-\theta_2)y^2 + \sin(C+\theta_2)z^2 = 0,$$

$$\sin(C-\theta_3)z^2 + \sin(A+\theta_3)x^2 = 0.$$  

\[ \cdots (1). \]
For, put the angle $O_1BC = \phi$, $O_1CB = \phi_1$; then the equation of $BO_1$ is

$$\gamma = \frac{\sin (B - \phi)}{\sin \phi} = \sin B \cot \phi - \cos B, \quad \therefore \cot \phi = \frac{\gamma + \cos B \alpha}{\sin B \alpha}.$$  

Similarly, the equation of $CO_1$ gives $\cot \phi_1 = \frac{\beta + \cos C \alpha}{\sin C \alpha}.$

But $\tan \theta_1 = - \tan (\phi + \phi_1) = \frac{\cot \phi + \cot \phi_1}{1 - \cot \phi \cot \phi_1};$

hence, substituting the preceding values of $\cot \phi$, $\cot \phi_1$, the result is easily reduced to the first equation in (1). Similarly, the other equations in (1) may be found.

The equations of the tangents at $D$, $E$ are

$$\sin (B + \theta_1) \{ \sin (A - \theta_1) \alpha + \sin (B + \theta_1) \beta + \sin (C + \theta_1) \gamma \} - \sin (A - \theta_1) \sin \theta_1 \gamma = 0 \quad \cdots (2).$$

For, put $\gamma = 0$ in the first equation in (1), the result $\sin (A - \theta_1) \alpha + \sin (B + \theta_1) \beta = 0,$ is the equation of $BD$; hence, if $D'$ be any other point on the circle $BDCE$, the equation of $DD'$ may be written

$$\sin (A - \theta_1) \alpha + \sin (B + \theta_1) \beta - r \gamma = 0 \quad \cdots (3).$$

Putting the value of $\gamma$ derived from this in the first in (1), the result,

$$\{ \sin (A - \theta_1) \alpha + \sin (B + \theta_1) \beta \} r \alpha + \sin (C + \theta_1) \alpha + \sin \theta_1 \beta = 0,$$

must have its factors equal, when $DD'$ is a tangent at $D$.

$$\therefore \frac{\sin (B + \theta_1)}{\sin (A - \theta_1)} = \frac{\sin \theta_1}{r + \sin (C + \theta_1)};$$

or $r = \frac{\sin (A - \theta_1) \sin \theta_1 - \sin (B + \theta_1) \sin (C + \theta_1)}{\sin (B + \theta_1)}$; and this substituted in (3), the result easily gives the first of (2).

The equation of the locus of $P$ is

$$\sin B \sin C (\beta^2 + \gamma^2) - \sin (B - C) (\sin C \beta - \sin B \gamma) \alpha + 2 \sin \beta (B - C) - \sin ^2 B - \sin ^2 C \beta \gamma = 0 \quad \cdots (4),$$

with like expressions for those of $Q$ and $R$.

For, the equations (2) give

$$\sin (B + \theta_1) \beta = \sin (C + \theta_1) \gamma; \quad \therefore \cot \theta_1 = \frac{\cos C \gamma - \cos B \beta}{\sin B \beta - \sin C \gamma};$$

and the first of equations (2) may be written

$$(\sin A \alpha + \sin B \beta + \sin C \gamma) \cot \theta_1 = \cos \lambda \alpha + \cos \beta \beta + \cos C \gamma$$

$$= \frac{\sin A \cot \theta_1 - \cos \lambda}{\sin B \cot \theta_1 + \cos \beta \gamma};$$

PRINTED FOR THE COMPANY OF STATIONERS.
hence, substituting the foregoing value of cot $\theta$, the result reduces to (4).

Therefore the loci of $P, Q, R$ are conics, passing through $A, B, C$ respectively, and the tangents at these points are all comprehended in

$$\frac{a}{\sin A} = \frac{\beta}{\sin B} = \frac{\gamma}{\sin C} \cdots (5),$$

as is obvious from (4), and the symmetry of the three cases.

Put first $\gamma = 0$, then $\beta = 0$, in (4), the results,

$$\sin B\beta - \sin (B - C)\alpha = 0, \quad \text{and} \quad \sin C\gamma + \sin (B - C)\alpha = 0,$$

are the equations of $BD', CE'$; hence the equation of $D'E'$, and by symmetry those of $F'G', H'I'$, are seen to be

$$\sin B\beta - \sin C\gamma - \sin (B - C)\alpha = 0, \quad \sin C\gamma - \sin A\alpha - \sin (C - A)\beta = 0, \quad \sin A\alpha - \sin B\beta - \sin (A - B)\gamma = 0,$$

Eliminate any one of the quantities $\alpha, \beta, \gamma$ from any two of these equations, the result is the same as (5); hence the six lines in (5) and (6) all pass through one point, which point is the same as the common centre of the three rectangles, and their circumscribing circle determined in Quest. VI.

"Civis," and M'srs. M. Collins, Dale, Dobson, Escott, McNamara, Milbourn, and Traynor solved the question in a similar manner.

XV. PRIZE QUEST. (2048); by Mr. C. H. Brooks, C.E., Port Louis, Mauritius.

Determine the numerical value of the definite integral

$$u = \int_0^{3\pi} \frac{d\theta}{\sin \theta + \cos \theta + \tan \theta + \cot \theta + \sec \theta + \csc \theta}.$$

Answered by Mr. Thomas Dobson, B.A., Hexham, and Mr. C. H. Brooks, the Proposer.

Expressing $\tan \theta + \cot \theta + \sec \theta + \csc \theta$ in terms of $\sin \theta$ and $\cos \theta$ only, we readily find

$$\frac{du}{d\theta} = \frac{\sin \theta + \cos \theta - 1}{(\sin \theta + \cos \theta)^2 - (\sin \theta + \cos \theta) + 2};$$

Let $\theta = \phi + \frac{1}{2} \pi$, then $d\theta = d\phi$, and $\sin \theta + \cos \theta = \sqrt{2} \cos \phi$; and

$$\frac{du}{d\phi} = \frac{\sqrt{2} \cos \phi - 1}{2 \cos^2 \phi - \sqrt{2} \cos \phi + 2};$$

Assume $(1 + x^2) \cos \phi = 1 - x^2$; then $(1 + x^2) \sin \phi = 2x,$ and $(1 + x^2) d\phi = 2dx$, and we have to integrate.
N° 163. QUESTIONS ANSWERED.

\[
\frac{du}{dx} = \frac{2 - \sqrt{2} - (2 + \sqrt{2})x^2}{2\sqrt{2} - 1 + (2\sqrt{2} + 1)x^4}
\]

Now, by Hirsch's "Integral Tables," p. 54,

\[
\int \frac{dx}{a + bx^4} = \frac{1}{4ab^3\sqrt{2}} \left\{ 2 \tan^{-1}\left(\frac{kx\sqrt{2}}{k^2 - x^2}\right) + \log \frac{x^2 + kx\sqrt{2} + k^2}{x^2 - kx\sqrt{2} + k^2} \right\}
\]

\[
\int \frac{x^2dx}{a + bx^4} = \frac{1}{4bk\sqrt{2}} \left\{ 2 \tan^{-1}\left(\frac{kx\sqrt{2}}{k^2 - x^2}\right) - \log \frac{x^2 + kx\sqrt{2} + k^2}{x^2 - kx\sqrt{2} + k^2} \right\}
\]

where \(a = b \cdot k^4\).

In this case \(a = 2\sqrt{2} - 1\), \(b = 2\sqrt{2} + 1\); \(\therefore k = 0.8313\) and \(k^2 = 0.6911\).

Now, we shall obtain half the required integral by integrating between the limits 0 and \(\frac{\pi}{4}\) of \(\phi\), that is, between the values

\(x = 0,\) and \(x = \sqrt{2} - 1\).

Both integrals vanish when \(x = 0\); and when \(x = \sqrt{2} - 1\),

\[2 \tan^{-1}\left(\frac{kx\sqrt{2}}{k^2 - x^2}\right) = 2(43^\circ 9') = 1.50622\] in circular measure,

\[
\log_{10} \left\{ \frac{x^2 + kx\sqrt{2} + k^2}{x^2 - kx\sqrt{2} + k^2} \right\} = 0.5553960, \text{ which in Naperian logarithms becomes 1.27885.}
\]

Taking the sum and difference of these values, we have

\[u = \frac{1}{2bh} \left\{ \left(\frac{\sqrt{2} - 1}{k^2}\right)(2.78557) - (\sqrt{2} + 1)(0.22737) \right\} = 0.17602.\]

The solutions by "Civis," Mr. Stephen Watson; Mr. G. W. Hill, Cambridge, Massachusetts, United States, and Messrs. Barlow, Bills, John Brown, John Collins, Matthew Collins, Escott, Shelton, and Tebay, were in substance the same as the preceding.

A second solution, by Mr. Stephen Watson, Haydonbridge.

Put \(\frac{1}{2}\pi + \phi\) for \(\theta\); then the given expression easily reduces to

\[u = \int_{-\frac{1}{2}\pi}^{\frac{1}{2}\pi} \sqrt{\frac{1}{2}} (\cos \phi - \sqrt{\frac{1}{2}}) \cos \frac{1}{2} \cos \phi + 1\]
and since this is the same whether $\phi$ be $+$ or $-$, it follows that we
only need integrate between 0 and $\frac{1}{2}\pi$, and then double the result.

Hence, putting $\cos \phi = \frac{1 - x^2}{1 + x^2}$ and $d\phi = \frac{2dx}{1 + x^2}$ it becomes

$$u = \frac{4n}{m} \int_0^m \frac{m^2 - x^2}{n^2 + 14x^4} dx$$

(where $m = \sqrt{2} - 1$, $n = 4 - \sqrt{2}$).

Whence, dividing, integrating, and putting $\frac{14m^4}{n^2} = r$, we have

$$u = \frac{8m^2}{n} \left( \frac{1}{1.3} - \frac{r}{5.7} + \frac{r^2}{9.11} - \frac{r^3}{13.15} + \&c. \right) = \cdot17602442.$$

The very rapid convergency of the series here determined by Mr. Watson is
very convenient for calculation. Mr. A. Hall, Naval Observatory, Washing-
on, likewise developed the integration in series; and both he and Mr. John
Brown, Whitwell Colliery, Durham, also obtained correct numerical results by
means of quadratures.

---

**LIST OF MATHEMATICAL ANSWERS.**

A. E. Cantab., ans. 6.
Barlow, William, 48, Edwardes Square, Kensington, ans. 1 to 6, 8, 11, 12, 13,
Prize.
Bills, Samuel, Hawton, near Newark-upon-Trent, ans. 12, Prize.
Borradaile, Walter A., Spring Grove, Middlesex, ans. 1 to 5, 8, Prize.
Bradbury, Edward, Chippenham, Wiltshire, ans. 8, 11.
Brooks, C. H., C.E., Port Louis, Mauritius, ans. 8, 9, 11, Prize.
Brown, John, Whitwell Colliery, Durham, ans. 1, Prize.
Buttery, John, H.M. Dockyard, Chatham, ans. 10.
"Civis," ans. all the Questions.
Collins, John, 5, Parliament Street, Dublin, ans. 1 to 6, 9, 11, 12, 13, Prize.
Collins, Matthew, A.B., Sen. Moderator in Mathematics and Physics, T.C.D.,
Eden Quay, Dublin, ans. all the Questions.
Coutts, Charles F., Brixton, ans. 1 to 6, 10.
Dale, James, 13, Craigie Street, Aberdeen, ans. 1 to 6, 13, 14.
Dobson, Thomas, B.A., Royal Grammar School, Hexham, ans. all the Questi-
ons.
Doolittle, M. H., Naval Observatory, Washington, United States, ans. 4.
Escott, Albert, F.R.A.S., Royal Hospital School, Greenwich, ans. 5, 9, 12, 14,
Prize.
Farmer, Wm., 50, York Street, Dover, ans. 1 to 4, 6.
"Geometricus," Chelsea, ans. 2, 6, 12.
Gibson, William, Hexham, Northumberland, ans. 13.
Goddard, William, 30, Margaretta Terrace, Oakley Street, Chelsea, ans. 4, 12.
Grey, John, Westgate, Stanhope, ans. 1, 2, 4, 5, 6, 9, 11.
Hall, A., Naval Observatory, Washington, United States, ans. 1 to 4, 6, 9, Prize.
Hill, G. W., Cambridge, Massachusetts, United States, ans. Prize.

PRINTED FOR THE COMPANY OF STATIONERS.
McNamara, T., Collooney, Sligo, Ireland, ans. 1 to 6, 12, 14.
Milibourne, Thomas, Riding Mill, Newcastle-upon-Tyne, ans. 1 to 8, 11 to 14.
Rutter, Edward, 15, D'Arcy Terrace, Sunderland, ans. 1 to 6, 9.
Shelton, William, Carlton, near Nottingham, ans. Prize.
Somerscales, Thomas, Hull, ans. 1, 2.
Tebay, Septimus, Rivington, ans. 9, 11, Prize.
Traynor, James, Land Surveyor and C. E., Shercock, Carrickmacross, Ireland, ans. 1 to 6, 12, 14.
Turnbull, John, Bedlington, ans. 1 to 6, 12, 13.
Watson, Stephen, Grammar School, Haydonbridge, Northumberland, ans. 6, 12, 13, 14, Prize.
Wilson, James, 45th Regiment, Bombay, ans. 1 to 4, 6, 9, 11 to 13, Prize.

* * *
Our correspondents will please to bear in mind, that the arranging of the matter for the printer is greatly facilitated when they obligingly write out their contributions, intended for insertion, on one side of the paper only, or so that each distinct answer or subject may admit of an easy separation from other matter, without the necessity of having it re-written.

We regret to have to record the decease of Mrs. Ann Towns, at Woolwich, on the 28th of August last, aged 36 years. The last of her valuable poetical contributions was an answer to the Prize Enigma inserted in the Diary for 1862, for which she was awarded a prize in that year.

The following publications have been received:

1. 'School Class Book of Arithmetic.' Part II. By Barnard Smith, M.A. (Macmillan and Co.)
   This compact arithmetic, the first part of which we noticed last year, has the merit of not ignoring the intelligence of the student, and it is well stored with examples. It will recommend itself as a school-book.

2. 'The College Euclid.' By A. K. Isbister, M.A. (Longmans and Co.)
   Isbister's edition of Euclid is now a complete work of its kind, and does not appear to admit of further improvement. It is, indeed, admirably adapted to the use of schools.

3. 'Examples in the Methods of Modern Geometry, especially Trilinear Coordinates.' By the Rev. R. H. Wright, M.A. (Longmans and Co.)
   This collection, from various sources, comprises a mass of beautiful theorems and problems, embracing nearly the whole range of plane geometry, and will be acceptable as supplying the best exercises on the different methods, and as a book of reference.

   Those who are at all familiar with the remarkable work of Laplace on the 'Theory of Probabilities' need not be told that it embraces a much wider field of research than would be commonly surmised. Mr. Todhunter in the work before us has shown much ability and discrimination in drawing up an interesting historical account of the distinctive traces of the successive stages
of improvement and progressive development. We should be glad to see it followed by a digested and systematic treatise on a subject but imperfectly known to many who are well versed in other branches of mathematics.

5. 'A Treatise on Navigation and Nautical Astronomy.' By the late John Riddle, F.R.A.S. Eighth edition, revised by Albert Escott, F.R.A.S. (Simpkin, Marshall, and Co.)

The editorship of this well-known and most excellent treatise could not have been placed in better hands. Mr. Escott, the talented editor, has exercised a commendable discretion in adhering as much as possible to the original text, which he has thoroughly revised. The tables are now given in a separate volume, which will undoubtedly facilitate their practical use.

6. 'The Educational Times.' (C. F. Hodgson, Gough Square.)

The mathematical department of this important monthly journal, under the able editorship of W. J. Miller, B.A., is now supported by an array of talent; and the half-yearly volumes of the "Reprint" are, in consequence, rich in mathematical lore. The fourth of these volumes is to be published in January.

7. 'The Oxford, Cambridge, and Dublin Messenger of Mathematics.' No. XI (published every Term). (Macmillan and Co.)

This number contains several very choice mathematical papers; and, moreover, a full account is given of Professor Sylvester's able proof and extension of Newton's rule for assigning limits to the roots of algebraical equations. We have to thank Professor Sylvester for a copy of the syllabus of his interesting lecture on this subject, delivered at King's College, June 23, 1865.

8. 'A Study of Trilinear Coordinates.' By "Thomas Theorem, A.M." (Printed at the Crichton Press for private distribution.)

This small pamphlet contains a symbolical enunciation of sixty-three interesting theorems, chiefly relating to transversals.

The several Prizes are allotted as follows:

For answers to the Prize Question, to Mr. John Brown, Whitwell Colliery, Durham, and Mr. G. W. Hill, Cambridge, Massachusetts, U.S., each twelve Diaries.

For General Mathematical Answers, to "Civis," and Mr. Thomas Dobson, of Hexham, each ten Diaries.

For Poetical Answers to the Prize Enigma, to "Cantab," M.A., formerly of Sevenoaks, Kent, and "Edipus," each ten Diaries.

For General Answers to the Enigmas, to the Rev. John Hope, Stapleton, Carlisle, and Mr. W. H. Farn, of Gravesend, each ten Diaries.

For answers to the Rebuses and Charades, to Mr. Frederick Burrington, of Exeter, and Mr. Thomas Edwards, Lois Weedon, each eight Diaries.

All letters must, as usual, be directed "To the Editor of the Lady's and Gentleman's Diary, Stationers' Hall, London." They must likewise be post-paid, and arrive before May 1st, 1866, excepting letters from the United States, which will be received up to July 1st.
NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2049); by Mr. EDWARD RUTTER, Sunderland.

Let P be any point in the circumference of the circle circumcribing a
triangle ABC; demit the perpendiculars PD, PE, PF on the sides BC, CA,
AB; and let O1, O2, O3 be the centres of the circles through AEF, BDF,
CDE; then the circle through O1O2O3 is constant in magnitude.

II.* QUEST. (2050); by Professor ARENDT, Missouri, U.S.

Eliminate φ from the equations

\[ y \cos \phi - x \sin \phi = a \cos 2\phi \]
\[ y \sin \phi + x \cos \phi = 2a \sin 2\phi \]

III. QUEST. (2051); by Mr. W. S. B. WOOLHOUSE, London.

If \( \tan (\alpha + \beta \sqrt{-1}) = \frac{f + g \sqrt{-1}}{f + g \sqrt{-1}} \), \( \alpha, \beta \) are determined by the formulæ

\[ \tan 2\alpha = \frac{2(f'g - g'f)}{(f'^2 + g'^2) - (f^2 + g^2)} \quad \tan 2\beta = \frac{2(f'g - g'f)}{(f'^2 + g'^2) + (f^2 + g^2)} . \]

IV. QUEST. (2052); by Mr. A. HALL, Washington, U.S.

At a given latitude (\( \phi \)) two stars whose right ascensions and declinations are
\( \alpha, \alpha', \beta, \beta' \), have the same altitude above the horizon. It is required to find
the hour angle, and the conditions under which the phenomenon is possible.

V. QUEST. (2053); by Mr. STEPHEN WATSON, Haydonbridge.

Let semicircles be described on the three sides of a plane triangle, mutually
cutting the sides in D, E, F; then the sum of the three angles of the circular-
ized triangle DEF is equal to four right angles.

VI. QUEST. (2054); by Dr. RUTHERFORD, Woolwich.

If the quiescent air in a certain north latitude where suddenly transferred to a
latitude \( \beta \) degrees further north than the former, the west wind had a velocity
of \( m \) miles an hour; but if transferred to a latitude \( \beta' \) degrees south of the
original latitude, the east wind had a velocity of \( m' \) miles per hour; what was
the latitude of the place?

VII. QUEST. (2055); by Mr. THOMAS DOBSON, B.A., Hexham.

At three islands (or ships) of known positions the times are noted of the
arrival of an unusually high wave caused by a distant submarine volcanic
eruption or by a cyclone. Supposing the velocity of the wave after it reaches
the first station to be uniform and known, find the bearing and distance of the
central disturbance.

VIII. QUEST. (2056); by Mr. W. S. B. WOOLHOUSE, London.

An ellipse being referred to its principal axes (\( ab \)), let \( \rho \) denote the radius of
curvature at the point \( ry \); then the radius of curvature of the evolute at the
point which corresponds to the centre of curvature of the ellipse
\[ = 3\rho y \left( \frac{1}{a^3} - \frac{1}{a^2} \right) . \]

* From Todhunter's 'Plane Trigonometry.'

PRINTED FOR THE COMPANY OF STATIONERS.
IX. QUEST. (2057); by Mr. John Collins, Dublin.

Prove that the squares of the diagonals of any quadrilateral inscribed in a circle have the same ratio as the distances of their middle points from the middle point of the third diagonal of the quadrilateral; and show that this theorem gives an immediate and new solution of the famous problem "Given a circle and the lengths of the three diagonals of a quadrilateral inscribed in it, to construct the quadrilateral" (vide Mulcahy's 'Mod. Geom.', Art. 78).

X. QUEST. (2058); by Mr. Stephen Watson, Haydonbridge.

If through any point O within a triangle ABC three lines, AD, BE, CF, be drawn meeting the sides in D, E, F; and a conic be described through D, E, F, cutting the sides again in D', E', F'; then AD', BE', CF' pass through one point O'. Show that if O be fixed, and the conic pass also through O, the locus of O will be a conic passing through A, B, C.

XI. QUEST. (2059); by Mr. C. H. Brooks, C.E., Port Louis.

Two bars or rods, AB, BC, connected by a joint at B, move always in a place parallel to the paper, and on a given point of the bar BC is placed a wheel which turns upon it as an axis; show that if the end A be fixed while C is passed completely round the periphery of any area, the amount of rotation of the wheel, by sliding and rubbing over the paper, will be proportional to the area.

XII. QUEST. (2060); by Mr. A. Ewbank, Cantab.

AFBDCE is a hexagon whose opposite sides are equal and parallel; AF = a, FB = b, BD = c; AD = a, BE = b, CF = γ. If the hexagon consist of rods freely joïeted at the vertices, and AD, BE, CF be strings whose tensions are P, Q, R respectively, then will

\[
\frac{\sin \alpha (b \sin \beta + c \sin \gamma)}{\sin \beta (a \sin \alpha + c \sin \gamma)} = \frac{\gamma \sin \alpha (a \sin \beta + b \sin \gamma)}{\gamma \sin \alpha (a \sin \beta + b \sin \gamma)}
\]

XIII. QUEST. (2061); by Mr. Thomas Dobson, B.A., Hesham.

Two small heavy particles, P, Q, are connected by a rigid rod of inconsiderable weight; P is placed on a moveable wedge which rests on a smooth horizontal plane, and Q is laid on this plane. Show that during the ensuing motion P moves in a conic section.

XIV. QUEST. (2062); by Mr. William Godward, Chelsea.

Let H1, H2, H3, H4 be the intersections of the four triads (AD, BE, CF), (AD1, BE1, CF1), (AD2, BE2, CF2), (AD3, BE3, CF3) drawn from the vertices of a plane triangle to the points of contact of the inscribed circle (O) and of each of the escribed circles (O1), (O2), (O3), taken separately; and P1, P2, P3, P4 the intersections of the four triads (LR, MS, NT), (LR1, MS1, NT1), (LR2, MS2, NT2), (LR3, MS3, NT3) drawn from L, M, N, the middle points of the sides BC, CA, AB, parallel to the rays of the preceding triads taken in order. It is required to prove that each of the quadrats (HP, H1P1, H2P2, H3P3) and (OP, O1P1, O2P2, O3P3) is concurrent.

XV. PRIZE QUEST. (2063); by Mr. W. S. B. Woolhouse.

Suppose the periphery of a given circle to be made up of an indefinite number of points, and the plane of the circle to be covered by straight lines connecting every two of those points; and determine the law of density of this mass of lines as depending on the distance from the centre of the circle.
THE LADY'S AND GENTLEMAN'S DIARY,
FOR THE YEAR OF OUR LORD 1867,
Being the third after Bissextile, or Leap Year.
DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF
STUDENTS IN MATHEMATICS:

COMPRISING /

MANY USEFUL AND ENTERTAINING PARTICULARS,
INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT.

THE ONE HUNDRED AND SIXTY-FOURTH ANNUAL NUMBER.
LONDON:
PRINTED FOR
THE COMPANY OF STATIONERS,
AND SOLD BY J. GREENHILL
AT THEIR HALL, LUDGATE ST.
J. E. ADLARD, PRINTER,
[Price 1s. 4d. stitched.] BARTHOLOMEW CLOSE.
CHRONOLOGICAL NOTES, &c. IN 1867.

| Dominical Letter | F Sundays after Epiphany | Easter Day | Apr. 21 |
| Golden Number | 6 | " Trinity | 23 | Rogation Sunday | May 26 |
| Epact | 25 | Septuages. Sunday Feb. 17 | Ascension Day | May 30 |
| Solar Cycle | 28 | Shrove Sunday | Mar. 3 | Whit Sunday | June 9 |
| Number of Direction | 31 | Lent begins | Mar. 6 | Trinity Sunday | June 16 |
| Roman Indiction | 10 | 1st Sund. in Lent | Mar. 10 | Mah. year 1293 beg | May 16 |
| Julian Period | 6580 | Midlent Sunday | Mar. 31 | Jew. " 5638 " | Sept. 30 |
| Year of the Dionysian | 196 | Good Friday | Apr. 19 | Advent Sunday | Dec. 1 |

ECLIPSES, &c.

This year there will be Four Eclipses; Two of the Sun, and Two of the Moon.

I. March 6th.—An annular eclipse of the Sun, visible in Great Britain as a partial eclipse, of from \( \frac{8}{4} \) to 9 digits on the lower limb. It begins in the morning at 8h. 17m.; greatest obscuration at 9h. 32m.; eclipse ends at 10h. 52m.

First contact \( \times 90\) \( \times \) from the Sun's vertex towards west or right hand.

Last contact \( \times 97\) \( \times \) east or left hand.

For any place in Great Britain, whose north latitude expressed in degrees is \( 50^\circ + L \), and west longitude expressed in minutes of time is \( M \), the correct Greenwich or railway times of beginning and ending, and the magnitude of the eclipse, may be readily obtained from the following formulae:

Time of beginning \( = 8h. \quad \frac{14m.2+2^m.06L}{0m.16M} \)

ending \( = 10h. \quad \frac{50m.5+0^m.94L}{0m.37M} \)

Magnitude of eclipse \( = 9 \text{ dig.} \times 10' - 6' \times 0' - 67M \).

This interesting eclipse will be visible throughout the whole of Europe and the greater part of Asia and Africa. It will be central and annular in Morocco, Algeria, Naples, Austria, Turkey, and Russia.

II. March 20th.—A partial eclipse of the Moon, but not visible in Great Britain. It will be visible to the whole of North and South America, Australia, New Guinea, and over the North and South Pacific Ocean.

III. August 29th.—A total eclipse of the Sun, also invisible in Great Britain. It will be chiefly visible in South America and over the South Atlantic Ocean.

IV. September 13th.—A partial and visible eclipse of the Moon; magnitude nearly 83 digits on the upper limb. It begins in the evening at 10h. 57m.; greatest obscuration at 12h. 26m.; eclipse ends at 1h. 55m. in the morning.

First contact \( \times 44\) \( \times \) from the Moon's vertex towards east or left hand.

Last contact \( \times 90\) \( \times \) west or right hand.

This eclipse will be visible throughout Europe, Africa, North and South America, a large western portion of Asia, and over the South Atlantic Ocean.

Mercury will be visible in the mornings, before the Sun rises, near the eastern horizon, about April 23, August 21, and December 9; and in the evenings, soon after sunset, near the western horizon, about March 9, July 6, and October 31.

Venus will be a Morning Star until September 25; and afterwards an Evening Star to the end of the year.

Mars comes into opposition to the Sun on January 10, and will be particularly favorable for observation in the evenings during the months of January, February, March, April, and May.

Jupiter will be an Evening Star until February 3; then a Morning Star until August 28; and afterwards an Evening Star to the end of the year.

Saturn's Rings are visible, and have now acquired their full opening. The planet will be in opposition on May 20; and the most favorable time of the year for telescopic observation will be during the months of May, June, July, and August; but he is in the southern hemisphere, and will not therefore be a very conspicuous object.
<table>
<thead>
<tr>
<th>D. W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>rise</th>
<th>set</th>
<th>decl.</th>
<th>C. &amp; S.</th>
<th>l. a</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tb</td>
<td>Circumcision</td>
<td>8°</td>
<td>9°</td>
<td>3°59'</td>
<td>23°46'</td>
<td>1°</td>
</tr>
<tr>
<td>2 W</td>
<td></td>
<td>8</td>
<td>9</td>
<td>4</td>
<td>022</td>
<td>56</td>
</tr>
<tr>
<td>3 Th</td>
<td>h rises 3 49 morn.</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>4 F</td>
<td></td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>5 S</td>
<td>[Epiph.: 12th day</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>6 F</td>
<td>2d Sun. af Christmas</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td>7 M</td>
<td>Plough Monday</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>8 Tb</td>
<td>Lucian</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>9 W</td>
<td>U sets 5 53 aflern.</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>10 Th</td>
<td></td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>11 F</td>
<td>Hilary Term begins</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td>12 S</td>
<td>[Cam. T. beg.</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>13</td>
<td>40</td>
</tr>
<tr>
<td>13 F</td>
<td>1st S. a. Ep.: Hilary</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>14</td>
<td>31</td>
</tr>
<tr>
<td>14 M</td>
<td>Oxford Term begins</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>15 Tb</td>
<td></td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>16 W</td>
<td>£ sets 5 21 aflern.</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>17 Th</td>
<td></td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>20</td>
<td>47</td>
</tr>
<tr>
<td>18 F</td>
<td>Prisca</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>22</td>
<td>35</td>
</tr>
<tr>
<td>19 S</td>
<td></td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>20 F</td>
<td>2d Sun. af. Epiphany</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>21 M</td>
<td>Agnes [Fabian</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>22 Tb</td>
<td>Vincent</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>23 W</td>
<td>g rises 5 43 morn.</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>24 Th</td>
<td></td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>25 F</td>
<td>Con. St. Paul: Ps. B.</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>26 S</td>
<td>[mar. 1858</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>27 F</td>
<td>3d Sun. af. Epiphany</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td>28 M</td>
<td></td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>39</td>
<td>14</td>
</tr>
<tr>
<td>29 Tb</td>
<td>g rises 5 34 morn.</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>41</td>
<td>17</td>
</tr>
<tr>
<td>30 W</td>
<td>K. Chas. I. mart. 1649</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>43</td>
<td>42</td>
</tr>
<tr>
<td>31 Th</td>
<td>Hilary Term ends</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>44</td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tb</td>
<td>50m</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>6 m</td>
<td>6 m 14</td>
<td>3° 44&quot;</td>
</tr>
<tr>
<td>6</td>
<td>57</td>
<td>13 2</td>
<td>10</td>
<td>49</td>
<td>6</td>
<td>2</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>6 22 1</td>
<td>15</td>
<td>54</td>
<td>8</td>
<td>8</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>18</td>
<td>34 5 59</td>
<td>21</td>
<td>59</td>
<td>9</td>
<td>59</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>47 56</td>
<td>28</td>
<td>5</td>
<td>11</td>
<td>32</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>45</td>
<td>1 1 51</td>
<td>35</td>
<td>10</td>
<td>12</td>
<td>47</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
### SUN ENTERS

New Moon ...... 4th, 16m. past 6 Aftern.
First Quarter ...... 12th, 40m. past 1 Morn.
Full Moon ...... 18th, 41m. past 7 Aftern.
Last Quarter ...... 26th, 32m. past 11 Morn.

#### D. D. SUNDAYS, HOLIDAYS, &c.

<table>
<thead>
<tr>
<th>Planets rise and set.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Sun's declin.</th>
<th>Crises</th>
<th>Eclipse</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>7142° 4146° 17°s 9° 5°m 6° 26'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S Purif.: Candel.-day</td>
<td>7 40° 48° 16° 51° 5° 51° 27'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F 4th S. af. Epip.: Blase</td>
<td>7 38° 54° 50° 34° 6° 31° 28'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7 37° 52°</td>
<td>16°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tu Agatha</td>
<td>7 35° 54° 15° 58° 6° 3° 1'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W Δ rises 1 47 morn.</td>
<td>7 34° 55° 50° 40° 7° 11° 2'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th 4 sets 4 38 aftern.</td>
<td>7 32° 57° 21° 8° 21° 3'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>7 30° 59°</td>
<td>2° 9° 32° 4'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>7 28° 5° 14° 43° 10° 44° 5'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F 5th Sun. a. Epip.: Qu.</td>
<td>7 26° 5° 3° 24° 11° 58° 6'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M [Vict. mar. 1840]</td>
<td>7 25° 5°</td>
<td>4° morn. 7°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tu</td>
<td>7 23° 5° 6° 13° 4° 1° 10° 8'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>7 21° 5° 8°</td>
<td>24° 2° 21° 9'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th Valentine</td>
<td>7 19° 5° 10°</td>
<td>4° 3° 27° 10'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>7 17° 5° 12° 12° 4° 4° 27° 11°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>7 15° 5° 14°</td>
<td>23° 5° 19° 12°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Septuages. Sunday</td>
<td>7 13° 5° 15°</td>
<td>2° 6° 3°13°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7 11° 5° 17° 11° 4° 11° rises F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tu</td>
<td>7 9° 19°</td>
<td>2° 7° 2° 32° 15°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W Δ sets 5 34 morn.</td>
<td>7 7° 5° 10° 5° 5° 3° 44° 16°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th Δ rises 4 44 morn.</td>
<td>7 5° 23°</td>
<td>37° 8° 2° 53° 17°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>7 3° 25°</td>
<td>15° 1° 1° 18°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>7 1° 26° 9° 5° 11° 6° 19°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Sexages. Sund.: St.</td>
<td>6 5° 28°</td>
<td>31° morn. 20°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M Matthias</td>
<td>6 5° 3° 5° 30°</td>
<td>9° 0° 9° 21°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tu Camb. Term div. mid.</td>
<td>6 5° 32°</td>
<td>8° 4° 1° 9° 22°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>6 5° 3° 34°</td>
<td>24° 2° 6° 23°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th Δ sets 6 55 aftern.</td>
<td>6 5° 35°</td>
<td>1° 2° 5° 8° 24°</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Length of D.

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day Inc.</th>
<th>D. breaks</th>
<th>Tw.</th>
<th>Sun East</th>
<th>C. bef. Sun</th>
<th>Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9° 5°m.</td>
<td>1 21°</td>
<td>5° m 44°</td>
<td>6 a 44° 5° m 17° 13° 50°</td>
<td>16° 16&quot;</td>
<td>15° 16&quot;</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>22°</td>
<td>38°</td>
<td>37°</td>
<td>52°</td>
<td>23°</td>
<td>14° 20°</td>
<td>14° 21°</td>
</tr>
<tr>
<td>11</td>
<td>40°</td>
<td>56°</td>
<td>29°</td>
<td>7°  0°</td>
<td>29°</td>
<td>14° 31°</td>
<td>14° 32°</td>
</tr>
<tr>
<td>16</td>
<td>58°</td>
<td>2° 14°</td>
<td>21°</td>
<td>8°  3°</td>
<td>14°</td>
<td>21°</td>
<td>13°</td>
</tr>
<tr>
<td>21</td>
<td>10° 17°</td>
<td>33°</td>
<td>12°</td>
<td>16°</td>
<td>40°</td>
<td>13° 53°</td>
<td>12°</td>
</tr>
<tr>
<td>26</td>
<td>37°</td>
<td>53°</td>
<td>2°</td>
<td>25°</td>
<td>45°</td>
<td>13° 10°</td>
<td>11°</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
### March, 31 Days

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F David, Least twilight</td>
<td>6:48</td>
<td>5:37</td>
<td>7:39</td>
<td>3:45</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>S Chad</td>
<td>6:46</td>
<td>5:39</td>
<td>3:45</td>
<td>27:26</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F Shrobro Sunday</td>
<td>6:44</td>
<td>4:11</td>
<td>6:53</td>
<td>5:42</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>M Rises 0 7 morn.</td>
<td>6:42</td>
<td>5:42</td>
<td>3:5</td>
<td>37:28</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tu Shrobro Tuesday</td>
<td>6:40</td>
<td>5:44</td>
<td>3:46</td>
<td>7:29</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>W Lent Beg.: Ash Wed.</td>
<td>6:37</td>
<td>5:46</td>
<td>3:44</td>
<td>4:33</td>
<td>29</td>
</tr>
<tr>
<td>7</td>
<td>Th Perpetua</td>
<td>6:35</td>
<td>5:48</td>
<td>5:17</td>
<td>8:32</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>6:33</td>
<td>5:49</td>
<td>4:57</td>
<td>3:32</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>6:31</td>
<td>5:51</td>
<td>3:46</td>
<td>4:3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>F 1st Sun. in Lent: Pr.</td>
<td>5:28</td>
<td>5:53</td>
<td>10:10</td>
<td>59:4</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Tu Gregory</td>
<td>6:24</td>
<td>5:56</td>
<td>23:0</td>
<td>12:6</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>W Ember Week</td>
<td>6:22</td>
<td>5:58</td>
<td>2:59</td>
<td>1:27</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>Th</td>
<td>6:20</td>
<td>5:50</td>
<td>3:62</td>
<td>2:18</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>F U Rises 5 26 morn.</td>
<td>6:17</td>
<td>5:2</td>
<td>12:3</td>
<td>15:9</td>
<td>9</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>6:15</td>
<td>5:3</td>
<td>3:48</td>
<td>4:10</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>F 2d Sun. in Lent: St.</td>
<td>6:13</td>
<td>5:5</td>
<td>25:4</td>
<td>38:11</td>
<td>11</td>
</tr>
<tr>
<td>18</td>
<td>M [Patrick</td>
<td>6:10</td>
<td>5:7</td>
<td>5:10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>19</td>
<td>Tu Prs. Lou. b. 1845: Ed.</td>
<td>6:06</td>
<td>5:0</td>
<td>5:06</td>
<td>12:12</td>
<td>12</td>
</tr>
<tr>
<td>20</td>
<td>W [K. W. Sax.</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>21</td>
<td>Th Benedict: Eq. day and night</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>22</td>
<td>F</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>23</td>
<td>S F sets 3 44 morn.</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>24</td>
<td>F 3d Sun. in Lent</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>25</td>
<td>M Lady Day</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>26</td>
<td>Tu</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>27</td>
<td>W</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>28</td>
<td>Th F Rises 4 28 morn.</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>29</td>
<td>F Rises 5 21 morn.</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
<tr>
<td>30</td>
<td>S</td>
<td>6:06</td>
<td>5:10</td>
<td>5:37</td>
<td>40:13</td>
<td>13</td>
</tr>
</tbody>
</table>

**Day** | **Length of Day** | **Inc. Sun.** | **D. Breaks** | **Tw. Ends** | **Sun. East** | **Sun. West** | **Semidiameter**
---|-------------------|---------------|---------------|--------------|---------------|---------------|--------------|
1 | 10 h. 49 m. | 3 | 5 | 4 m 56 | 7 a 30 | 5 m 48 | 12 31 | 16 10 |
6 | 11 8 | 24 | 45 | 39 | 53 | 11 | 32 | 9 |
11 | 28 | 44 | 33 | 48 | 58 | 10 | 17 | 8 |
16 | 48 | 4 | 21 | 57 | 6 | 3 | 54 | 6 |
21 | 12 8 | 24 | 8 | 7 | 8 | 7 | 25 | 5 |
26 | 28 | 44 | 3 | 55 | 17 | 12 | 5 | 53 | 4 |

**Printed for the Company of Stationers.**
SUN ENTR.  

APRIL, 30 DAYS.  

1867  

New Moon ......... 4th, 4m. past 10 Aftern.  
First Quarter ...... 11th, 9m. past 3 Aftern.  
Full Moon .......... 18th, 6m. past 11 Aftern.  
Last Quarter ...... 27th, 1m. past 2 Morn.  

<table>
<thead>
<tr>
<th>D. W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>rise</th>
<th>set</th>
<th>decl.</th>
<th>C. r. &amp; s. (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 M</td>
<td></td>
<td>5°38'6''30'</td>
<td>4°28'26'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Tb</td>
<td></td>
<td>5 36 33</td>
<td>51 4 34 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 W</td>
<td>Rich. Bp. Chich.</td>
<td>5 34 6 33</td>
<td>5 15 5 22 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Th</td>
<td>St. Ambrose</td>
<td>5 32 6 35</td>
<td>37 sets N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 F</td>
<td></td>
<td>5 29 6 37</td>
<td>0 7 a 29 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 S</td>
<td>Old Lady Day</td>
<td>5 27 6 38</td>
<td>23 8 45 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 F</td>
<td>5th Sun. in Lent: Pr.</td>
<td>5 25 6 40</td>
<td>46 9 59 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 M</td>
<td>[Leopold b. 1853]</td>
<td>5 23 6 41</td>
<td>7 8 11 11 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Tb</td>
<td>b rises 9 36 aftern.</td>
<td>5 20 6 43</td>
<td>31 morn. 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 W</td>
<td>a rises 3 55 morn.</td>
<td>5 18 6 45</td>
<td>53 0 16 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Tb</td>
<td></td>
<td>5 16 6 46</td>
<td>8 15 1 12 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 F</td>
<td>Cambridge Term ends</td>
<td>5 14 6 48</td>
<td>37 2 0 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 S</td>
<td>Oxf. Tm. ends [b. 1857]</td>
<td>5 12 6 50</td>
<td>59 2 39 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 F</td>
<td>Palm Sun.: Ps. Beat.</td>
<td>5 9 6 52</td>
<td>9 21 3 13 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 M</td>
<td>Easter Term begins</td>
<td>5 7 6 53</td>
<td>42 3 43 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 Tb</td>
<td>a sets 2 33 morn.</td>
<td>5 5 6 55 10</td>
<td>3 4 10 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 W</td>
<td></td>
<td>5 3 6 57</td>
<td>25 4 34 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 F</td>
<td>Maundy Thursday</td>
<td>5 1 6 58</td>
<td>46 rises F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 S</td>
<td>Good Friday: Alphege</td>
<td>4 59 7 0 11</td>
<td>7 7 a 41 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 F</td>
<td>2 rises 3 55 morn.</td>
<td>4 57 7 2</td>
<td>27 8 44 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 F</td>
<td>Easter Sunday</td>
<td>4 54 7 3</td>
<td>48 9 45 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 M</td>
<td>Easter Monday</td>
<td>4 52 7 5 12</td>
<td>8 10 41 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Tb</td>
<td>East. Tu.: St. George</td>
<td>4 50 7 6</td>
<td>28 11 32 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 W</td>
<td>Oxf. Term beg. [1843]</td>
<td>4 48 7 8</td>
<td>48 morn. 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Tb</td>
<td>St. Mk.: Prs. Alice</td>
<td>4 46 7 10 13</td>
<td>8 0 18 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 F</td>
<td>Camb. Term begins</td>
<td>4 44 7 11</td>
<td>27 0 59 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 S</td>
<td></td>
<td>4 42 7 13</td>
<td>46 1 35 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 F</td>
<td>1st, or Low Sunday</td>
<td>4 40 7 15 14</td>
<td>5 2 6 32 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 M</td>
<td>¥ rises 4 7 morn.</td>
<td>4 38 7 16</td>
<td>24 2 35 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Tb</td>
<td></td>
<td>4 36 7 18</td>
<td>43 3 2 26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 1    | 12° 51' | 5     | 7     | 3 m 38 | 8 a 30 | 6 m 18 4' | 16   | 2°   |
| 6    | 13     | 11    | 27    | 24     | 41     | 23 2     | 34   | 0    |
| 11   | 31     | 47    | 9     | 53     | 27 1   | 9       | 15   | 59   |
| 16   | 50     | 6     | 6     | 2     | 54 9   | 6       | 32 0 aft. 8 | 58 |
| 21   | 14     | 9     | 25    | 38     | 20     | 37 1     | 17   | 57   |
| 26   | 27     | 43    | 21    | 34     | 41 2   | 14       | 55   |      |
**N° 164. MAY, 31 DAYS.**

New Moon ......... 4th, 40m. past 7 Morn.
First Quarter ...... 10th, 4m. past 10 Aftern.
Full Moon .......... 18th, 52m. past 1 Aftern.
Last Quarter....... 28th, 22m. past 5 Aftern.

<table>
<thead>
<tr>
<th>D.</th>
<th>W.</th>
<th>SUNDAYS, HOLIDAYS, &amp;c.</th>
<th>☉rise</th>
<th>☉set</th>
<th>☉decl.</th>
<th>Cr. &amp; s.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>St. Ph. &amp; Js. P. Ar. [b. 1850]</td>
<td>4°35'</td>
<td>7°20'</td>
<td>15°N</td>
<td>1°3'm 29''</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td>Invention of the Cross</td>
<td>4°17'</td>
<td>23'</td>
<td>37°4'</td>
<td>25°29'</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>7</td>
<td>Tu</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>9</td>
<td>Th</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>14</td>
<td>Tu</td>
<td>[Term ends]</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>21</td>
<td>Tu</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
<td>☉</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>1</th>
<th>14h. 45m</th>
<th>7</th>
<th>1</th>
<th>2 m 4</th>
<th>9 a 50</th>
<th>6 m 48</th>
<th>2'</th>
<th>59'</th>
<th>15° 54'</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15</td>
<td>2</td>
<td>18</td>
<td>1</td>
<td>46</td>
<td>10</td>
<td>7</td>
<td>51</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>19</td>
<td>35</td>
<td>26</td>
<td>27</td>
<td>55</td>
<td>3</td>
<td>47</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>34</td>
<td>50</td>
<td>2</td>
<td>50</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>21</td>
<td>48</td>
<td>8</td>
<td>4</td>
<td>30</td>
<td>11</td>
<td>22</td>
<td>4</td>
<td>3</td>
<td>41</td>
</tr>
<tr>
<td>26</td>
<td>16</td>
<td>1</td>
<td>17</td>
<td>No real Night.</td>
<td>8</td>
<td>3</td>
<td>16</td>
<td>49</td>
<td></td>
</tr>
</tbody>
</table>
### June, 30 Days, 1867

**New Moon** .... 2nd, 12m. past 3 Aftern.
**First Quarter** .... 9th, 37m. past 6 Morn.
**Full Moon** .... 17th, 54m. past 4 Morn.
**Last Quarter** .... 25th, 28m. past 5 Morn.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>Nicomedes</td>
<td>3°51' 8&quot; N 2° 34&quot; 29&quot;</td>
<td>10 sets</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>Sun. ast. Ascension</td>
<td>3°50 8 5</td>
<td>18 a 51 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td></td>
<td>3°49 6</td>
<td>25 9 50 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td></td>
<td>3°49 7</td>
<td>32 10 39 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td></td>
<td>3°48 8</td>
<td>38 11 18 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Th</td>
<td></td>
<td>3°47 9</td>
<td>44 11 52 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>Oxford Term ends</td>
<td>3°47 10</td>
<td>50 morn. 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>Oxford Term begins</td>
<td>3°46 11</td>
<td>55 0 21 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>Whit Sunday</td>
<td>3°46 12</td>
<td>0 47 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>Whit Monday</td>
<td>3°45 8 13 23</td>
<td>5 1 11 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>Whit Tue.; St. Barna.</td>
<td>3°45 8 13</td>
<td>9 1 36 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td>Ember Week</td>
<td>3°45 8 14</td>
<td>13 2 31 11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Th</td>
<td></td>
<td>3°45 8 15</td>
<td>16 2 30 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td></td>
<td>3°45 8 15</td>
<td>19 3 11 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td></td>
<td>3°44 8 16</td>
<td>21 3 37 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>Trinity Sunday</td>
<td>3°44 8 16</td>
<td>23 rises F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>St. Alban.; Trin. T.ends</td>
<td>3°44 8 17</td>
<td>25 8 58 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>Cambridge Commenc.</td>
<td>3°44 8 17</td>
<td>26 9 37 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td>[Corpus Christi]</td>
<td>3°44 8 18</td>
<td>27 10 12 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Th</td>
<td>Qu. Victo. acc. 1837</td>
<td>3°44 8 18</td>
<td>27 10 42 19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>Qu. Pr.; Long.day</td>
<td>3°44 8 18</td>
<td>27 11 9 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td>[Camb. T. ends]</td>
<td>3°45 8 19</td>
<td>27 11 35 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>1st Sun. aft. Trinity</td>
<td>3°45 8 19</td>
<td>26 12 0 22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>Mid. Day; Nat. Ju.</td>
<td>3°45 8 19</td>
<td>25 morn. 23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Th</td>
<td></td>
<td>3°45 8 19</td>
<td>23 0 25 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td></td>
<td>3°46 8 19</td>
<td>21 0 52 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10h. 13m.</td>
<td>8</td>
<td>29</td>
<td>7 m 12</td>
<td>2' 31&quot;</td>
<td>15' 48&quot;</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>38</td>
<td>No real Night,</td>
<td>16 1 42</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>44</td>
<td>but constant</td>
<td>19 0 45</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>48</td>
<td>Day or Twi-light</td>
<td>21 0 bef.17</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>34</td>
<td>50</td>
<td></td>
<td>22 1 21</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>decr. 1</td>
<td></td>
<td>23 2 25</td>
<td>46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16h. 30m.</td>
<td>0</td>
<td>4</td>
<td>7 h 23 m</td>
<td>3° 27&quot;</td>
<td>15° 46&quot;</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>24</td>
<td>10</td>
<td></td>
<td></td>
<td>22</td>
<td>4</td>
<td>46</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
<td>18</td>
<td>No Real Night.</td>
<td>21</td>
<td>5</td>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>16</td>
<td>6</td>
<td>28</td>
<td></td>
<td>19</td>
<td>5</td>
<td>43</td>
<td>46</td>
</tr>
<tr>
<td>21</td>
<td>15</td>
<td>54</td>
<td>40</td>
<td>16</td>
<td>6</td>
<td>5</td>
<td>47</td>
</tr>
<tr>
<td>28</td>
<td>41</td>
<td>53</td>
<td>0 m 59</td>
<td>11 a 14</td>
<td>12</td>
<td>6</td>
<td>47</td>
</tr>
</tbody>
</table>

**Printed for the Company of Stationers.**
# AUGUST, 31 DAYS.

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day dec.</th>
<th>D. breaks</th>
<th>Tw. ebb</th>
<th>Sun Riset.</th>
<th>Cl. bef. Sun.</th>
<th>@Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15th. 23m.</td>
<td>1 11</td>
<td>1 m 29</td>
<td>7 m 7</td>
<td>6' 5'</td>
<td>15' 48'</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>27</td>
<td>49 22</td>
<td>5 41</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>44 2 7</td>
<td>3 6 56</td>
<td>5 2</td>
<td>49</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>2 23 9</td>
<td>45 49 4</td>
<td>8 50</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>20 37 29</td>
<td>43 3 2</td>
<td>51</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>13</td>
<td>38 51 13</td>
<td>36 44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

First Quarter ...... 7th, 9m. past 7 Morn.
Full Moon............... 15th, 37m. past 10 Morn.
Last Quarter .......... 22nd, 22m. past 9 Aftern.
New Moon .......... 29th, 5m. past 1 Aftern.
<table>
<thead>
<tr>
<th>D. W.</th>
<th>Sundays, holidays, &amp;c.</th>
<th>Rise</th>
<th>Set</th>
<th>Decl.</th>
<th>C. R. S.</th>
<th>Ca</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11th Sun. a. Tr.: Giles</td>
<td>5h13'6b47'</td>
<td>8°N 2'</td>
<td>8b4 12'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>London: 1666, o.s.</td>
<td>5 15 45</td>
<td>0 8 38</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Th</td>
<td>5 17 42</td>
<td>7 38 9</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>5 18 40</td>
<td>16 9 38</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Th</td>
<td>5 20 38</td>
<td>6 54 10</td>
<td>14 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>5 21 36</td>
<td>32 10</td>
<td>54 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Sl Enuruchus</td>
<td>5 23 33</td>
<td>9 11 41</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>12th Sun. a. Tr.: Nat.</td>
<td>5 24 31</td>
<td>5 47</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>[V. Mary</td>
<td>5 26 29</td>
<td>24 0</td>
<td>31 11</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Th</td>
<td>5 28 26</td>
<td>2 1 27 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>5 29 24 4</td>
<td>3 2</td>
<td>28 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Th</td>
<td>5 31 22</td>
<td>3 16</td>
<td>32 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>5 33 20</td>
<td>3 53</td>
<td>39 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>S Holy Cross</td>
<td>5 34 17</td>
<td>30</td>
<td>rises F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>13th Sun. aft. Trinity</td>
<td>5 36 15</td>
<td>7 7 a 6 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>5 37 13 2</td>
<td>4 44</td>
<td>7 32 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Th</td>
<td>5 39 10</td>
<td>21 8</td>
<td>4 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>W Ember Week: Geo.</td>
<td>5 40 6 8 1</td>
<td>57 8 37 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Th [and II. landed</td>
<td>5 42 6 6</td>
<td>34 9 18 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F 8 sets 6 54</td>
<td>5 44 6 3</td>
<td>11 10 6 22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S St. Matthew</td>
<td>5 45 6 1</td>
<td>0 47 11</td>
<td>3 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>F 14th Sun. aft. Trinity</td>
<td>5 47 5 59</td>
<td>24 morn. 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>M Equal day and night</td>
<td>5 49 5 56</td>
<td>0 N 1</td>
<td>0 6 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Th 9 rises 5 44</td>
<td>5 50 5 54</td>
<td>0 s 23</td>
<td>1 18 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>5 52 5 52</td>
<td>46 2</td>
<td>33 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Th St. Cyprian</td>
<td>5 53 5 50 1</td>
<td>10 3</td>
<td>47 28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>5 55 5 47</td>
<td>33 30</td>
<td>sets N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>S 9 sets 6 3</td>
<td>5 57 5 45</td>
<td>56 6 a 11 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>F 15th S. a. Tr.: Mich.</td>
<td>5 58 5 43 2</td>
<td>20 6</td>
<td>38 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>M St. Jerome</td>
<td>6 0 40</td>
<td>43 7</td>
<td>6 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of D.</th>
<th>Day dec.</th>
<th>D. breaks</th>
<th>Tw. ends</th>
<th>Sun East</th>
<th>Cl. aft. Sun</th>
<th>Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13h. 33m.</td>
<td>3</td>
<td>1 3 m 6</td>
<td>8 a 54</td>
<td>6 m 27</td>
<td>0</td>
<td>2&quot;</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>20</td>
<td>18</td>
<td>39</td>
<td>20 1</td>
<td>38</td>
<td>55</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>39</td>
<td>29</td>
<td>25</td>
<td>12 3</td>
<td>21</td>
<td>56</td>
</tr>
<tr>
<td>16</td>
<td>35</td>
<td>59</td>
<td>39</td>
<td>11</td>
<td>4 5</td>
<td>6</td>
<td>57</td>
</tr>
<tr>
<td>21</td>
<td>16</td>
<td>4 18</td>
<td>49 7 57</td>
<td>5 56 6 52</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>11</td>
<td>38 59</td>
<td>44 48 8 35</td>
<td>16 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### OCTOBER, 31 DAYS. 1867

**First Quarter** ....... 5th, 17th. past 6 Aftern.  
**Full Moon** ......... 13th, 24th. past 1 Aftern.  
**Last Quarter** ....... 20th, 17th. past 9 Morn.  
**New Moon** .......... 27th, 3rd. past 1 Aftern.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tb</td>
<td>Remigius : Camb. Tm.</td>
<td>6h 2m 3s</td>
<td>38e 3°</td>
<td>3°</td>
<td>7°</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>[begins]</td>
<td>6 5 36 30</td>
<td>8 11</td>
<td>5 6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Th</td>
<td>sets 7 9 aftern.</td>
<td>6 5 34 53</td>
<td>8 49</td>
<td>6 7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td></td>
<td>6 7 31 16</td>
<td>9 32</td>
<td>7 8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td></td>
<td>6 8 29 39</td>
<td>10 22</td>
<td>8 9</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>16th Sun. aft. Trinity : [Faith]</td>
<td>6 10 5 27 5</td>
<td>11 16</td>
<td>9 10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td></td>
<td>6 12 25</td>
<td>26 morn.</td>
<td>10 11</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tb</td>
<td></td>
<td>6 13 5 22</td>
<td>49 0</td>
<td>14 11</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>St. Denys</td>
<td>6 15 20 6</td>
<td>12 17</td>
<td>12 13</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Th</td>
<td>Oxford Term begins</td>
<td>6 17 5 18</td>
<td>34 2</td>
<td>22 13</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>Old Michaelmas Day</td>
<td>6 18 5 16</td>
<td>57 3</td>
<td>30 14</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>Least twilight</td>
<td>6 20 5 13 7</td>
<td>20 4</td>
<td>40 15</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>17th Sun. aft. Tr. : Tr.</td>
<td>6 22 5 11</td>
<td>42 rises F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>[K. Edw. Conf.]</td>
<td>6 23 5 9 8</td>
<td>5 6 a</td>
<td>4 17</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Tb</td>
<td>2 sets 1 24 morn.</td>
<td>6 25 5 7</td>
<td>27 6</td>
<td>37 18</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td></td>
<td>6 27 5 5</td>
<td>49 7</td>
<td>16 19</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Th</td>
<td>Etheldreda</td>
<td>6 29 3 9</td>
<td>11 8</td>
<td>22 20</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>St. Luke</td>
<td>6 30 5 0</td>
<td>33 8</td>
<td>57 21</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td></td>
<td>6 32 4 58</td>
<td>55 9</td>
<td>59 22</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>18th Sun. aft. Trinity</td>
<td>6 34 4 56 10</td>
<td>17 11</td>
<td>7 23</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td></td>
<td>6 35 4 54</td>
<td>38 morn.</td>
<td>24 25</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Tb</td>
<td>5 sets 5 31 aftern.</td>
<td>6 37 4 52 11</td>
<td>0 0</td>
<td>20 25</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>5 sets 5 8 aftern.</td>
<td>6 39 4 50</td>
<td>21 1</td>
<td>34 26</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Th</td>
<td></td>
<td>6 41 4 48</td>
<td>42 2</td>
<td>46 27</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>Crispin</td>
<td>6 43 4 46 12</td>
<td>3 3</td>
<td>58 28</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td></td>
<td>6 44 4 44</td>
<td>23 5</td>
<td>9 29</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>19th Sun. aft. Trinity</td>
<td>6 46 4 42</td>
<td>44 sets N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>St. Sim. &amp; St. Jude</td>
<td>6 48 4 40 13</td>
<td>4 5 a</td>
<td>35 1</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Tb</td>
<td></td>
<td>6 50 4 38</td>
<td>24 6</td>
<td>7 2</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td>5 sets 5 11 aftern.</td>
<td>6 51 4 36</td>
<td>44 6</td>
<td>44 3</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Th</td>
<td></td>
<td>6 53 4 35 14</td>
<td>4 7</td>
<td>25 4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day.</th>
<th>Length of D. Day dec. D. break.</th>
<th>Tw. ends Sun East</th>
<th>Od. aft. Sun.</th>
<th>@Semidiameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 11h. 36m.</td>
<td>4 58 4m 8</td>
<td>7 a 32 5m 40</td>
<td>16' 10'</td>
<td></td>
</tr>
<tr>
<td>6 17 5 17 17</td>
<td>20 32 11 46</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 57 37 25</td>
<td>9 25 13 9</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 38 56 34</td>
<td>6 56 18 14 19</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 19 6 15 42</td>
<td>48 11 15 15</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 0 34 50</td>
<td>38 4 15 54</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All Saints</td>
<td>6h55m, 9h33m</td>
</tr>
<tr>
<td>2</td>
<td>All Souls</td>
<td>6h57m, 9h31m</td>
</tr>
<tr>
<td>3</td>
<td>20th Sun. aft. Trinity</td>
<td>6h58m, 9h29m</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>1h10m, 1h17m</td>
</tr>
<tr>
<td>5</td>
<td>Gun Plot, 1605: K. W.</td>
<td>7h24m, 10h25m</td>
</tr>
<tr>
<td>6</td>
<td>W. Leonard</td>
<td>7h44m, 10h24m</td>
</tr>
<tr>
<td>7</td>
<td>T. sets 5 1 aftern.</td>
<td>7h64m, 10h22m</td>
</tr>
<tr>
<td>8</td>
<td>F. Camb. Term div. noon</td>
<td>7h74m, 10h20m</td>
</tr>
<tr>
<td>9</td>
<td>Br. W.ales: 1841: Ld.</td>
<td>7h94m, 10h19m</td>
</tr>
<tr>
<td>10</td>
<td>F. 21st S. at. Tr. [M.D.]</td>
<td>7h11h, 10h17m</td>
</tr>
<tr>
<td>11</td>
<td>M. St. Martin</td>
<td>7h13h, 10h16m</td>
</tr>
<tr>
<td>12</td>
<td>T. (Shooting stars)</td>
<td>7h14h, 10h14m</td>
</tr>
<tr>
<td>13</td>
<td>W. Britius</td>
<td>7h16h, 10h13m</td>
</tr>
<tr>
<td>14</td>
<td>T. sets 11 26 aftern.</td>
<td>7h18h, 10h11m</td>
</tr>
<tr>
<td>15</td>
<td>F. Machutus</td>
<td>7h20h, 10h10m</td>
</tr>
<tr>
<td>16</td>
<td>S.</td>
<td>7h21h, 10h08m</td>
</tr>
<tr>
<td>17</td>
<td>F. 22d Sun. aft. Trinity:</td>
<td>7h23h, 10h07m</td>
</tr>
<tr>
<td>18</td>
<td>M. [Hugh Bp. Linc.]</td>
<td>7h25h, 10h05m</td>
</tr>
<tr>
<td>19</td>
<td>T. sets 4 35 aftern.</td>
<td>7h27h, 10h03m</td>
</tr>
<tr>
<td>20</td>
<td>W. Edm. King &amp; Martyr</td>
<td>7h28h, 10h03m</td>
</tr>
<tr>
<td>21</td>
<td>T. Crown Prs. Prussia b.</td>
<td>7h30h, 10h02m</td>
</tr>
<tr>
<td>22</td>
<td>F. St. Cecilia [1840]</td>
<td>7h32h, 10h00m</td>
</tr>
<tr>
<td>23</td>
<td>S. St. Clement</td>
<td>7h33h, 10h00m</td>
</tr>
<tr>
<td>24</td>
<td>F. 23d Sun. aft. Trinity</td>
<td>7h35h, 10h00m</td>
</tr>
<tr>
<td>25</td>
<td>M. Mich. Term ends:</td>
<td>7h36h, 10h00m</td>
</tr>
<tr>
<td>26</td>
<td>T. [Catherine]</td>
<td>7h38h, 10h00m</td>
</tr>
<tr>
<td>27</td>
<td>W. sets 4 46 aftern.</td>
<td>7h40h, 10h00m</td>
</tr>
<tr>
<td>28</td>
<td>T. sets 6 16 morn.</td>
<td>7h41h, 10h00m</td>
</tr>
<tr>
<td>29</td>
<td>F.</td>
<td>7h42h, 10h00m</td>
</tr>
<tr>
<td>30</td>
<td>S. St. Andrew</td>
<td>7h44h, 10h00m</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9h. 38m</td>
<td>6h 56</td>
<td>5m 0</td>
<td>6a 28</td>
<td>4m 57</td>
<td>16°</td>
<td>17°</td>
<td>16°</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>7h 14</td>
<td>7</td>
<td>20</td>
<td>51</td>
<td>16</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>31</td>
<td>15</td>
<td>13</td>
<td>48</td>
<td>15</td>
<td>52</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>47</td>
<td>22</td>
<td>8</td>
<td>42</td>
<td>15</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>21</td>
<td>32</td>
<td>8</td>
<td>20</td>
<td>3</td>
<td>39</td>
<td>14</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>26</td>
<td>19</td>
<td>15</td>
<td>36</td>
<td>5</td>
<td>59</td>
<td>37</td>
<td>12</td>
<td>37</td>
</tr>
<tr>
<td>D. W.</td>
<td>SUNDAYS, HOLIDAYS, &amp;c.</td>
<td>rise</td>
<td>set</td>
<td>decl.</td>
<td>r. &amp; s.</td>
<td>Ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>--------</td>
<td>----</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Advent Sunday: Prs.</td>
<td>7:45</td>
<td>3:53</td>
<td>21°48'</td>
<td>8°48'</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wales b. 1844</td>
<td>7:47</td>
<td>3:52</td>
<td>57</td>
<td>9</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>h rises 6</td>
<td>7:48</td>
<td>3:52</td>
<td>52</td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>morn</td>
<td>7:50</td>
<td>3:51</td>
<td>14</td>
<td>11</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>7:51</td>
<td>3:51</td>
<td>22</td>
<td>morn.</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F Nicholas</td>
<td>7:52</td>
<td>3:50</td>
<td>29</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7:53</td>
<td>3:50</td>
<td>36</td>
<td>2</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2nd Sunday in Advent</td>
<td>7:55</td>
<td>3:49</td>
<td>43</td>
<td>3</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Conc. V. Mary</td>
<td>7:56</td>
<td>3:49</td>
<td>49</td>
<td>4</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>y sets 10</td>
<td>7:57</td>
<td>3:49</td>
<td>55</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0 aftern.</td>
<td>7:58</td>
<td>3:49</td>
<td>58</td>
<td>3</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>7:59</td>
<td>3:49</td>
<td>58</td>
<td>5</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F Lucy</td>
<td>8:03</td>
<td>3:49</td>
<td>6</td>
<td>38</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>8:13</td>
<td>3:49</td>
<td>15</td>
<td>7</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>3rd Sunday in Advent</td>
<td>8:23</td>
<td>3:49</td>
<td>53</td>
<td>16</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Cam. T. ends: O! Sap.</td>
<td>8:33</td>
<td>3:49</td>
<td>18</td>
<td>10</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Oxford Term ends</td>
<td>8:33</td>
<td>3:49</td>
<td>23</td>
<td>11</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Ember Week</td>
<td>8:43</td>
<td>3:49</td>
<td>23</td>
<td>12</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>y sets 5</td>
<td>8:53</td>
<td>3:49</td>
<td>25</td>
<td>0</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>20 aftern.</td>
<td>8:53</td>
<td>3:49</td>
<td>53</td>
<td>1</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>St. Thos.: Short. day</td>
<td>8:63</td>
<td>3:51</td>
<td>27</td>
<td>3</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>4th Sunday in Advent</td>
<td>8:73</td>
<td>3:51</td>
<td>27</td>
<td>4</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>8:73</td>
<td>3:52</td>
<td>27</td>
<td>5</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>y rises 6</td>
<td>8:73</td>
<td>3:52</td>
<td>26</td>
<td>6</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Christmas-day</td>
<td>8:83</td>
<td>3:53</td>
<td>25</td>
<td>16</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>St. Stephen</td>
<td>8:83</td>
<td>3:53</td>
<td>23</td>
<td>4 a 49</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F St. John Evangelist</td>
<td>8:83</td>
<td>3:54</td>
<td>21</td>
<td>5</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Innocents</td>
<td>8:83</td>
<td>3:55</td>
<td>18</td>
<td>6</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>1st Sun. af. Christmas</td>
<td>8:93</td>
<td>3:56</td>
<td>15</td>
<td>7</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>8:93</td>
<td>3:57</td>
<td>11</td>
<td>8</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>St. Silvester</td>
<td>8:93</td>
<td>3:58</td>
<td>7</td>
<td>9</td>
<td>46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rh. 8° m.</td>
<td>8</td>
<td>26</td>
<td>5 m 42</td>
<td>5 a 57</td>
<td>4 m 35 10'</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>58</td>
<td>36</td>
<td>47</td>
<td>55</td>
<td>34 8</td>
</tr>
<tr>
<td>11</td>
<td>51</td>
<td>43</td>
<td>52</td>
<td>55</td>
<td>34 6</td>
<td>40</td>
</tr>
<tr>
<td>16</td>
<td>46</td>
<td>48</td>
<td>56</td>
<td>56</td>
<td>35 4</td>
<td>18</td>
</tr>
<tr>
<td>21</td>
<td>44</td>
<td>50</td>
<td>59</td>
<td>57</td>
<td>37 1</td>
<td>49</td>
</tr>
<tr>
<td>26</td>
<td>45 incr. 18</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>40 0 be. 41</td>
<td>18</td>
</tr>
</tbody>
</table>

PRINTED FOR THE COMPANY OF STATIONERS.
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Union.

Miss Ogden, by her prize, no doubt intends
To make Diarions close and closer friends;
May she in her delightful task succeed!

For union's strength, and unions formed in love,
Are sanctioned by that gracious Pow'r above
Whose favour is the Christian's wished-for need.

2. The Diaries. By Mr. James Herdson, Edinburgh.

To answer Tyro’s quaint inquiries,
When was the Union of the Diaries?
In tracing back to years byegone,
In Eighteen hundred and forty-one,
‘Twas then this ancient pair, we find,
Were hand and heart in wedlock joined;
Their ages I may, too, make known,—
The Gent's, One hundred years and one;
The Lady's, still in vig'rous plight,
One hundred years and thirty-eight.

3. By Mr. Frederick Burrington, Exeter.

Long hath Miss Ogden, rich in rhyme,
With Dia's spirits held communion;
And long may all-destroying Time
With sparing hand preserve the Union.

4. By Kitty.

Miss Ogden has a clever way
Of saying what she has to say,
And well she dwells upon a theme
Of which true lovers ever dream—
The Union! Is it not a pity,
When she is youthful, rich, and pretty,
There isn't such a dream for Kitty?

5. By Mr. Joseph Hutchinson, near Halifax.

Miss Ogden as laureate creates no surprise,
Since honour is due for such talent display'd;
Our wonder is this, which we cannot disguise,
That her "blissful" union so long is delay'd.

Help it and aid it all—all surely can,
With wishes good—
The happy union of man with man
In Brotherhood.

7. To Miss Helen Ogden. By Mrs. Renwick, Camden Town,
London.

Though we should miss the old familiar name
Attached to strains of high poetic fame;
Yet, if you can but make a happy choice,
Thy union, then, would make us all rejoice.


Truth in all her fair proportions
Impress bears of birth divine;
Die she cannot, though distortions
Much to mar her may combine.

Art and science with religion
Are not all they ought to be;
Even in the airy region
We might have more purity.

Time will come when, error ceasing,
Kindred forces will unite
More and more to give increasing
Light and peace and moral might.

Hail! thou all propitious era:
Let the threefold cord be spun;
Happy union! no chimera!
One may say it has begun.

9. By Dr. Rutherford, Maryon Road, Charlton.

Her union to conceal Miss Ogden tries;
In vain the mystic muse her efforts plies;
Diarian bards can penetrate the veil,
And Helen's choice with pride and pleasure hail.

10. To Miss Ogden. By Mr. James Bartram, Scarborough.

Dear Miss, with many happy days,
I should be glad to greet,
When you in union with a mate
Are spending moments sweet.
For true the purest, sweetest joys
By earthly mortals known,
Is when two hearts in union
Are blended both in one.


Whilst discord dire in distant lands
Sweet union destroys,
Fair England still unrivalled stands,
And union sweet enjoys!

PRINTED FOR THE COMPANY OF STATIONERS.
Her flag in every clime waves high,
    Her commerce knows no bound;
Her statesmen guard with jealous eye
    Her honour, bright-renowned!

The laws enacted by her queen
    On freedom's basis stand;
And liberty has ever been
    The boast of Albion's land!

12. By the Rev. J. Jackson Wray, Redruth, Cornwall.

Miss Ogden's 'Prize' I sought to guess,
    For many a day, without success;
My darling wife at length
    Joined her efforts to my own,—
All mystery fled, the secret's known,
    For "Union is strength."

13. By Oedipus.

Well do Miss Ogden's mystic verses show
    The blessings which from union may flow;
From page historic she unfolds at length—
    'Tis peace and happiness, as well as strength.


Our Helen, unlike her fam'd namesake of Troy,
    Whose fate with fell discord so long held communion,
Delights the rich powers of her muse to employ
    In painting the virtues and pleasures of union.

15. By Mr. William Botterill, Hull.

Year after year names disappear
    From Dia's pleasant pages,
Friends pass away—their powers decay,
    And earth no more engages.
In time's increase, all unions cease
    Of love or friendship's sending;
Yet faith and hope look smiling up
    To union never ending.

16. By Clio, of Hexham.

Fair Dia to her mystic bards
    A bond of union proves,
Where they express their kind regards
    In language that she loves;
And, like a happy family,
    They live in peace and amity.
17. By Mr. George Jones, Selby.
When with the gayest flowers we tie
The roses sweet of various dye;
Let’s ne’er forget that discord fled
The union of the white and red.
And as the ages move along,
May Britain, in her union strong,
Show tyrants, who may dare her seas,
The Union flag still braves the breeze.

18. By Mr. John Grey, Barrington School.
Union her theme; attuned with subtle art,
Fair Helen’s chords vibrate in every heart.

Friendship and love are only names,
A name, too, is communion;
And nothing more are life’s affairs,
Or social groups or married pairs,
Without the bond of Union.

20. By Mr. R. Elliott, Jun., Choppington.
How sure young lovers ought to be
They’re one in thought and sympathy,
Before they form, as man and wife,
A union that must last for life;
For on the tying of the bow
Depends their future weal or woe.

U p with the lark each morning in spring,
N ature is smiling, the air is serene;
I n yon pleasant vale the cuckoo does sing;
O h let us away to the sweet sylvan scene,
N ow the buds are tipt with a verdant green.

22. To Mrs. H—, on her Wedding-day. By Mr. Thomas Hattam,
Beachy Head Lighthouse.
May our hearts, now united, dwell in love’s sweet communion,
Until He who us joined shall dissever the union.

23. To Miss Helen Ogden. By Mr. Ashton Smith, Uppingham.
Oh, pleasing bard, how sweet your measure flows;
What graceful ease its blending themes disclose;
Your mystic lay displays your spacious mind,
Its soaring rise with piercing thought’s combined.
May sweet content encircle round your cot,
And may your happy union be your lot.
(No 164.

GENERAL ANSWERS TO THE ENIGMAS.

| 1. Puff.  | 4. Weight.  | 7. Line.  | 10. (Prize.) Union.  |

1. Health. By Miss Helen Ogden, Shaw.

Say is there a blessing bestow’d by the hand
That formed us from perish ing clay,
More worthy our duty and love to command,
Or feelings of gratitude sway;
Than health with its ever-enliv’ning power,
That sheds like an halo around
A light that illumines even sorrow’s dark hour,
And cheers its most gloomy profound?
For what is the pomp, with the puff, and display
That await on humanity’s lot;
Divested of it and its genial sway,
What pleasure, what joys are forgot?
The monarch that lifts like a column on high
His head, to which subjects must yield,
Finds that even grandeur is link’d with a sigh,
Apart from its glittering shield.
The cot of the lowly, though humble and bare,
Where patient industry doth bring
To its wishes and wants a quite competent share,
For all that repose ’neath its wing,
Is assuredly blest if I as a balm
Do bind up each dangerous wound;
The lines must be pleasantly soothing and calm,
Though labour and toil may abound.
Oh! cherish it then, all ye vot’ries of pleasure,
Nor seek by excess to destroy;
Indulge not in folly, but carefully measure
The source and extent of each joy.
Weigh well in the balance each step that may lead
To impair its beneficent sway,
If broken or lost, ah! in vain you may plead
Restoration on some future day.
Let caution preserve whate’er goodness bestows,
Through life’s ever-varying scene;
Its daily arrangements too often disclose
Where sighing and sorrow have been.

PRINTED FOR THE COMPANY OF STATIONERS.
Disunion its flag may uplift in the air,
Disappointment assert its decree;
While aided by it each trial to bear
Man surely not wretched can be.


The nineteenth century is much renowned,
It needs no puff its merits to enhance;
Science and art it has with success crowned,
And made improvements rapidly advance.

To it we railroads owe, where, as on wings,
The rapid locomotive onward glides;
One scarce can tell what great advantage springs
From speed increased and many things besides.

We love to see the gallant steamer move
Just like a king upon its iron way;
It tends indeed man's wondrous art to prove,
And his inventive talent to display.

Lo! see what weights the steamer drags along!
What vast amount of tons it moves with ease!
This would have suited once an Eastern song,
Or fairy tale adapted boys to please.

The nineteenth century also justly claims
Th' electric telegraph, that wondrous thing
Invented by some highly-gifted names,
Whose rare abilities improvement bring.

By it how quickly telegrams are borne,
Within the hollow wires they sweep along,
By land and sea, at eve or rising morn,
Or other times the columned hours among.

When all is right, no knots their course impede,
'Tis lightning's self that runs along the line;
Of old who would have thought such glorious meed
Would e'er arise from mortal man's design?

The nineteenth century can further boast
Photography, invention high in art,
By which the orb that rules the planets' host
Draws human features true in ev'ry part,

And also landscapes; strange this surely seems,
Yet 'tis a fact that no one can deny,
Which, tho' it looks much like the work of dreams,
Is daily witnessed by the public eye.
How wondrous is the union that we see
Within this century together brought,
The steamer, telegraph, photography,
The works of deep and persevering thought!

Diarians! though our talents are not such
As are adapted wonders to produce,
Yet still our less acquirements can do much
To forward things of smaller gen’ral use.

Di’s Editor’s accomplished, he can rise
High in the flights of mathematic lore;
Long may he live as time incessant flies,
Adorning still Diaria more and more!

3. The Smith Family’s Journey to the Sea-side. By Mr. Frederick Burrington, Exeter.

"The cabs are waiting, Mrs. Smith,—John, see the luggage right,—There’s not much time to spare, my dear, the train will start at eight;"
"I can’t be hurried, Mr. Smith, you’re always glad to roam,
And little know what I’ve to do, to leave things right at home;
Ann, fetch my bag and parasol, remember my commands,
And mind the house: where’s Freddy’s spade? he’ll want it on the sands;
See that the doors are safe at night; dear me, if it should rain!
Have we umbrellas?" "Come, my love, or we shall lose the train."
"Well, if we lose it, Mr. Smith, why we must find another,
I have my duties to perform, as mistress, wife, and mother."
At last the cabs with rattling sounds—matched like a poet’s rhyme—Whirled off with speed, and so they reached the station just in time; The porters quickly seized the trunks, Smith rushed to get the tickets, And Mrs. Smith to get the seats, the children blithe as crickets;
"Porter, this luggage-label here, eight boxes and a bale,"
But ere he put it in the van, he put it in the scale:
Smith found his seat, the porter came, said with polite address,
"Your luggage, sir, is over weight, you’ll have to pay excess."
"There’s six of us," said Smith, "how much?" inclined to yield submission;
"Nonsense," said she. "I wouldn’t pay, ’tis quite an imposition."
The whistle sounds, the engine puffs, the doors are fiercely slammed:
"Take care, my dear," cries Mrs. Smith, "you’ll get your fingers jammed."

He read a column of the ‘Times’ as o’er the line they rattled, With crochet she employed herself, the children laughed and prattled: Earth dressed in garments green looked up, and laughed in heaven’s blue eye;
Like meteors in a summer night, the fire-horsed trains rushed by:

PRINTED FOR THE COMPANY OF STATIONERS.
"Harry, be still, take in your head, or else you'll get the cane,"
"I feel a little draught this side, put up the window, Jane;
Hark to those horrid whistling screams, there's danger here, I fear,
The union's near;" Smith smiled and said, "You mean the junction, dear."
"Well, that's a union, Mr. Smith; pray, is it not a spot
Where lines are in alliance, all united in a knot?"
The busy junction soon was passed, and many a nameless station,
And so the family reached at last their place of destination.
Now let us hope the bath, the drive, the breeze upon the shore,
Their flagging spirits may revive, their jaded health restore;
The muse in running 'er the lines hath given you the pith,
And sung the railway journey of the family of Smith.

See clouds in weighty columns deep
Across the wintry ocean sweep!
To lofty billows mounts the main,
Forced by the dangerous hurricane!
How great the contrast in our eyes,—
Summer and spring with cloudless skies
Bring gentle puffs, to fan the cheek;
The shady bower we love to seek,
And there the cooling breeze invoke,
Reclined on seat of knotted oak.
This contrast, too, will have no end,
Till cold and heat in union blend.

5. By Mr. Joseph Hutchinson, near Halifax.

Dear friends, with admiration
I view your publication,
And for a generation
Have had participation
In its dissemination
Of mental recreation,
And in continuation,
Presume on this occasion
To give a variation,
If meeting approbation;
Though with no ostentation,
Or puff of commendation,
Nor yet with trepidation,
Fearing administration
Of cane or castigation
For this my innovation.
Your love of application,
And deep investigation,

Of themes for penetration,
Give weight and animation
To each communication;
While columns of narration
Replete with information,
Or pithy observation;
With clear elucidation,
Of knotty complication,
In lines of adaptation,
The muse's inspiration
Are hail'd with acclamation,
A pleasing indication
Of public estimation,
And Dia's preservation.
No danger of cessation,
With such a combination,
Union and emulation,
For mutual elevation.

PRINTED FOR THE COMPANY OF STATIONERS.
6. **To my Nephew and his Wife on their Marriage. By Mr. Joseph Furniss, Lois Weedon.**

'Twas love of purest stamp all through That hastened on the day
That made a mystic one of two,
And threw a name away;
But gentle Anna, beauty's queen,
By purest virtue led,
Accepted with a modest mien
Another in its stead.

I wish you joy, dear youthful pair,
And may the union be
For each a prospect bright and fair
And real prosperity;
And now that sacred wedlock's knot
Is tied between the two,
Be happiness your constant lot,
Your pleasures ever new.

I'll waive the pithy speech and puff,
Of which the columns treat,
For trials will be smooth and rough
Which both may have to meet;
And thorns as well as roses grow
In every path of life,
And danger lurks and cometh woe
And cares and grief and strife.

And thousand ills all unforeseen
And unsuspected too,
Have ever come and ever been
The lot of not a few;
And troubles thick, and sorrows' darts—
Dread foes to peaceful sleep—
And weeping eyes and aching hearts
And anguish keen and deep.

From all these ills may heaven defend,
Or give you strength to bear
Whatever trials it may send,
And weight of every care;
Bear and forbear with tempers mild,
And in your hearts agree
That pure religion undefiled
Your household rule shall be.

And if upon some future day
As "olive branches" rise,
And "round about the table" play
To glad your hearts and eyes,
And certain poets live to see
What one, at least, opines,
Who knows but such a thing might be
As just a few more lines?

7. **By Dr. Rutherford, Tweed Cottage, Maryon Road, Charlton.**

Awake, my Muse! cast sleep and slumber far away,
And sing in gladsome strain thy short and simple lay;
The answers to the mystic themes reveal aright,
And shed around their names a lustre clear and bright.

Nor puff, nor cane, 'tis clear, now suit the public mind—
The one's a bore, the other barb'rous and unkind;
True worth speaks for itself, and love has weight indeed
To stimulate the youthful mind to take more heed,
And learn to read each column's knotty lines with ease,
To lay up stores of knowledge future friends to please;

But pith and power are clearly wanted more than ever
To speed dull learners on and make them wise and clever.
'Tis said "a little learning is a dangerous thing;"
Drink deep, for time is short and ever on the wing.
And when our work and warfare here below shall close,
In union with the blest above may we repose.
In future years, as in the past, may Dia keep
The paths of truth and virtue and of science deep:
Long may she bloom with energy renewed to cheer
The hearts and homes of all her friends year after year:
Long—long may Hope his proud position still maintain,
And Helen Ogden grace her page with pleasing strain;
May Hewitt's mystic muse with outstretched wing soar high,
And pluck from other brows the palm of victory.
Brave son of Di, your varied talents brightly shine;
And may the motto "Onward, upward," still be thine,
Until the summit of Parnassus you have gained,
And after years of toil your crowning wish attained.

8. A fresh Love Adventure. By the CAWKLEYS LADIE.
Prospects bright and happier days
Dance before the Laddie's gaze.

On Cawkley's Hill puffing along,
I twirled my cane and tried a song,
My heart was warmly glowing;
Love chased the weight of years away,
Kept rheumatism and cramps at bay,
So I tripped lightly o'er the Lea.
To court sweet Mary Owen—
She was a neat and comely queen,
Though three-score summers she had seen,
A maiden lone and single;
She might have cast a line to hook,
And lure a partner to her nook,
But none e'er yet the bait had took,
To join her:—by the Ingle.
We met, and oh, my heart beat warm,
Her words and smiles possessed a charm,
That banish'd thought of danger;
I says, "My dear, I'm all a-glown,
E'er since I first caught sight of you,
I fain would be your lover true,
Can you accept a stranger?"
She blush'd, and whisper'd a consent,
And there our first love hour was spent,
With vows in streamlets flowing;
And now each evening we meet,
To have a loving tête-à-tête,
And feast on kisses, ripe and sweet,
Me and sweet Mary Owen.
Then as we sit, we cheerily chat,
But what is said tell I must not
In our secret communion;
Yet a few more short months may bring
A nuptial knot—a wedding ring;
Should they do so, then I shall sing
The pleasures of our union.

9. An Invitation. By Mr. JAMES BARTHRAM, Scarborough.

Come! come! my love, the dawning morn
Invites us to the fields;
The scented woodbine like the rose
Delightful fragrance yields.
In puffs sweet zephyr fans the air,
Enriched with odours sweet;
From Flora's nymphs just opening,
The rosy morn to greet.
The verdant lawns with lilies and
Sweet columbines are fair;
Come, love, and let us visit them,
There's health and pleasure there.
In unison the warblers sing,
Péans on every tree;
While o'er the meads with busy hum
There roam the lab'reng bee.
Rich weighty loads away she bears
Unto her humble home;
Oh! ask me not to loiter here,
Come, let us! let us roam.

PRINTED FOR THE COMPANY OF STATIONERS
ENIGMAS ANSWERED.

How can ye stay when love invites,
There's danger in delay
Of losing half the glorious sights:
Come, come, my love, away.

10. By Ædipus.

The first I think is clear enough,
And dully answers to a puff;
The next ingeniously, 'tis plain,
Details the merits of a cane.
Then love affords a mystic theme,
And truthful is the verse I deem.
Next comes the power that's out of sight,
Which we are wont to name as weight:
And now behold a column rise
Before the reader's wondering eyes.

'Tis followed by a Gordian knot,
Where not one fibre seems forgot.
A bard would have us next divine
His carefully ensheathed line.
The nerve or pith, I ween, ensues,
Enveloped by a mystic muse.
Next danger headless we transpose,
And as a range it "warmly glows."
Then union glitters in the rear:
Thus all in order due appear.


When men in weighty columns move,
And danger seek for those they love,
Their pith in union they then prove:
As line on line they face the foe
In fields of misery and woe,
Our ardent blessings with them go.
When hurricanes with mighty stride
And angry puff, o'er ocean ride;
When sky seems blended with the tide:
Our seamen bluff, true "hearts of oak" With knotted brows their foes provoke,
And scorn to bear a foreign yoke.

But sweeter union is portrayed,
In mingled hues of sun and shade,
Beneath some silent forest glade;
In such a scene the heart feels best,
Peace soothes each wearied human breast,
Man finds a brief, a soothing rest.
So love can solace every life,
The gentle voice of mother—wife—
Breathes soft repose amid each strift;
An Eden this whence sorrows fly,
Where "kindred by one holy tie,"
Our household treasures round us lie.

12. To my Old Walking-Stick. By B., of Barum.

My stout old stick, the muse inclines
To spin for thee some votive lines,
Though few and weak they'll be;
For in my weary wand'rings through
Life's rugged road, thou'rt been a true
And trusty friend to me.
The beau, with pride puff'd up, and vain,
May choose thy relative the cane,
So polished, trim, and smart;
But I prefer my oaken bough—
A thing of "pith and moment" thou hast ever been, and art.
With thee, in early manhood's prime,
'Twas mine the mountain range to climb,
(No toil or danger fear'd),

To roam the beach where dash the waves,
O'er rocky cliffs, in gloomy caves,
And where the torrent's heard.
And though this vital frame now bears
The weight of more than threescore years,
I yet am pleas'd to say
That still I love the lonely stroll,
My muse, and thou, my stick, the sole "Companions of my way."
Adieu! in thee though friendship sees
A union of good qualities
That claim a laureate's lays,
Think not 'tis I can want the will
In these attractive sheets to fill
A column in thy praise.

PRINTED FOR THE COMPANY OF STATIONERS.

No one to love! Uncourteous word,  
Can he e'er happy be  
That toils, and sighs, and dwells alone,  
Courting celibacy.  
Ah no! the weary night moves on,  
No pleasure dwelleth there;  
When one unblest by union  
Has none his toils to share;  
His is a weary lonesome way  
Through an umbrageous grove,  
Which ne'er admits of light one ray,  
That has no one to love.

By Janz of Ryedale.

He puffs and pants and journeys on  
‘Mongst brambles, furze, and thorn,  
Till pitiless worn out he falls  
With sympathy from none.  
Musing alone when griefs oppress  
Like columns dangers rise;  
His days spent brooding o’er distress,  
His nights in moans and sighs.  
Hard, hard must be that mortal’s fate  
That lone and singly roves,  
Throughout his life without a mate,  
And knows not one he loves.


I love my Home, my native Home, the place where I was born,  
Where many long, long years ago I pass’d life’s tranquil morn.  
But, ah! those dear and happy days are now for ever fled,  
And some who were my schoolmates then are number’d with the dead.  
No weighty cares I then did know, nor did of sorrow dream,  
Tho’ disappointment oft times marr’d some vain and pitiless scheme;  
But like a gentle puff of wind that agitates the air  
Such trials passed, and all again was placid, smooth, and fair.  
Tho’ many leave their native home strange scenery to see,  
And some for sordid gain will brave the dangers of the sea;  
“But he who in a happy home is not content to stay,  
“May leave it when he likes and find a better where he may.”  
My home it still has charms for me; oft in my chimney nook  
A column in the Times I read, or some old fav’rite book.  
The Diary, when the season comes, doth oft my mind engage,  
In finding out those knotty themes that grace her mystic page.  
As now I’m past life’s middle line I find my strength decay,  
And soon from loving friends and home I may be call’d away:  
I hope and trust we all shall meet in that blest home above,  
And dwell in blissful union there in peace, and joy, and love.

15. By Mr. Thomas Wray, Market Weighton.

A dashing fop once took his cane,  
And went his love to see;  
He’d sent some pitiless lines before,  
Dress’d up in columns three.  
With reasons weighty, he supposed  
Why she should share his lot;  
A bleeding heart there was portray’d,  
And a true-lover’s knot.

And as he neared her rose-decked cot  
All danger seemed away;  
And when she met him at the gate,  
Blithe as the Queen of May,  
“My dear,” he said, “let us be wed,”  
But she replied, “Such stuff!”  
A union with a fop! For shame,  
You are not worth a puff!”

16. By Mr. William Botterill, Hull.

With puff, and pit, and cane,  
And love in union blended,  
Weight on the column, knot on line  
No danger—my tale’s ended.

PRINTED FOR THE COMPANY OF STATIONERS.
GENERAL ANSWERS TO THE REBUSES AND CHARADES.

1. Ram-rod.
3. Hyp-hen.
4. Lure, rule.
5. Care, car, arc.
6. Imp-orts.
7. Awry, wary, Wray, ray.
10. Cap-on.
12. CIVIC, or M-ace.

When on the moors once more the heather blooms,
The sportsman then his pleasing course resumes,
  With ramrod furnished, and with rifle sure;
With these mementoes of his former sports
He keenly passes then to choice resorts,
  The feathered denizens there to allure.
When vernal breezes fan the limpid brooks,
The angler carefully prepares his hooks,
  And puts his rod and line in order bright;
Then hies away to where the fishes rise,
Them to allure by well-dissembled flies,—
Things most important to his pure delight.
Behold the merchant poring o'er his books,
How wary he through his ledger looks!
If profits are increasing, pleased he seems;
Then studies deeply how he may get more,
By adding to his present stock and store,
  Delighted with his castle-building schemes.
Yon titled lady doubtless pleasure finds
In pageantry which dazzles weaker minds,
  Whilst golden bracelets gleam upon her arms;
All spangled o'er with diamonds is her dress,
In which she happiness seeks to possess,—
They seem to her to have resistless charms.
The epicure, when seated at a feast,
Appears to have his pleasure much increased
  By capons, ham, and delicacies choice:
It matters little what the age he bears,
Or man or striping, he perhaps declares,
  "A dinner good still makes my heart rejoice."
Is he allowed with London's Mayor to dine,
On whom the highest CIVIC honours shine,
Then, then indeed he feels supremely blest;
Quite pleased he looks around him and enjoys
What then his whole attentive mind employs,
Forgetting ev'rything that would molest.
Diarians, when dear Lady Di arrives,
Each one of us by varied genius strives
Well satisfied her mysteries to solve;
From her we doubtless much advantage find,
In knowledge gained; improvement, too, of mind,
As circling years successively revolve.

2. The Dandelion. By Miss Helen Ogden, Shaw.

’Tis delightful to gaze on the flowery maze
That summer presents to the eye,
In each ramble around some memento is found
To remind us of pleasure and joy;
For is it not then, thou bright star of the glen,
Unpretending and lowly, we see
Thee daily unfolding thy mantle of gold,
Though few give a welcome to thee,
Since others more fair, imported and rare,
Can boast of an owner who will
For pageantry gay and for gorg’ous array
Most ardently seek to excel.
Oft tended with care from ungenial air,
A beauty short-liv’d to enhance,
While thou, little gem, on a soft milky stem,
Such care and protection must chance.
In each valley we find, under storm, rain, and wind,
A stripling on liberty’s wing;
No culture is thine to improve or refine,
Or forth to maturity bring;
But showy and gay, beneath sol’s ardent ray,
In meekness unfolding thy crest;
Of nature a child, who, beneficent, mild,
 Allows thee to bloom on her breast.

3. To the Editor. By Mr. James Herdson, Edinburgh.

Materials such as Di imports,
Crooked, avry, and all ill sorts,
As ramrod, bracelet, hyphen, worse,
Are strange mementoes for a verse!
Though mace with capon, if you wish,
With Soyer’s care might make a dish,
To please some tastes; but where’s the rule,
Either in college or in school,
To make such stripling words combine,
Or form this pageant into rhyme?

PRRINTED FOR THE COMPANY OF STATIONERS.

There is a literary world,
A commonwealth of letters;
'Tis often a Republic called,
Which world alarms our betters.

But what imports the names of things,
If th' essence be complete?
By any name—so Shakespeare sings—
A rose would smell as sweet.

By many office and degree
Are held within its border;
They have their posts like sentinels,
Mementoes of its order.

And their authority is known
To ev'ry judge, of course;
For when a sentence is pronounced,
They help to give it force.

We meet with Mr. Comma first,
Our manners to correct;
We pause a moment in our haste,
And pay him due respect.

'Tis Colon's place to colonize—
And what can well be wiser;—
His son a stripling, half his size,
Is Semicolonizer.

And some in duty's path upright,
When called to take their station,
Express their wonder and delight,
In Notes of Admiration.

If states contain both bad and good,
Though under civic rule,
It is not strange Republics should
Be tured in such a school.

And so we have within its bounds
A wary and crooked thing,
A wary, prying character,
For ever questioning.

But further would you recognise
This questioner so rude?
He hath a cap on, very like
The deadly Cobra's hood.

Then Mr. Hyphen meets our sight,
Straight as a ramrod seen,
And yet he's never found upright,
A thorough go-between.

Parenthesis his portion grasps
(Exclusive from his birth),
And like a bracelet often clasps
What's very little worth.

Now Caret, arch informer, comes,
We never see his face,
Unless to show a careless act,
Or something out of place.

Then Asterisk shines on our path,
Enlight'ning with its glow,
And like the pole-star fixed in space,
Directs us where to go.

But as the solemn pageant dark
Death's passage doth attend;
So doth the final Period mark
This passage as—the end.

5. *By Mr. JOSEPH FURNISS, Lois Weedon.*

With strength for toil and a willing mind,
I would leave the cares of the world behind,
Nor be frightened, forsooth, at its looks unkind,
That would set me all awry;

There are none so low but they yet may rise,
And none so bad that would e'er despise
Whoever it is that in earnest tries,
Be they humble and poor as I.

But though a mere nothing, rough-grained, and all that,
With a working cap on instead of a hat,
I know—or I fancy so—what I am at
When to Di I am penning a lay;
I am lured by mementoes of friendship true,
And favours of kindness and courtesy, too,
Far more than to show what the muse can do
In its simple poetical way.
And yet I would fain merit praise if I could,
Though good motives are sometimes not well understood,
And the world will condemn both the bad and the good,
As its temper may happen to be;
'Tis of little importance its smiles or its frowns,
I have so much to do with its "ups" and its "downs;"
Yet I wouldn't change places with those who wear crowns,
If a kingdom were offered to me.
But all this is selfish, and wide of the mark,
With riddles to answer from many a spark—
And there is the hyphen, confoundedly dark,
And a poser to many a brain;
From striplings and bards of poetical prime
These pages, I'll warrant, are teeming with rhyme,
But how will they ever make such things to chime
In a sober and sensible strain?
The ramrod's more homely, it "sticks to its gun,"
And all right for its work where the game hide or run,
And a brace of plump birds will be better than none,
When I sit down to dine with a friend;
But if good Mr. Wray should happen to say
Turtle soup would be much better fare than they
At a CIVIC repast—he must have his own way,
And so I will here make an end.

6. By Dr. Rutherford, Charlton.

Hard is the task the mystic themes to clear
Of the disguise in which they all appear;
To bring to view the nature and the name
Of things designed for enigmatic fame.
Friend Hope presents a ramrod polished bright,
And rich and rare mementoes meet our sight.
Then Herdson's hyphen, and his tinsel lure
Dressed up with care the salmon to secure.
On imports oft our luxuries depend;
The east and west their contributions send.
When lines are neither straight, nor yet erect,
They must be bent awry in some respect.
Now view the pageant passing in a line;
And see the brilliant bracelets, how they shine;
The rich caparison the horses bear,
And the young striping, free from worldly care.
To bring my rambling story to a close,
The civic chair or mace will all disclose.

7. To Mr. Editor. By the Rev. Anderson Drysdale, Glasgow.
Dear sir, we hail with joy the days of smiling May,
When for your Lady Dia gifts both rich and gay
Come pouring in; the one now made is none of these,
But, humble though it be, it possibly may please.
Di’s witty rebuses for ’56 are four,
And she assigns of tough charades as many more.
Beginning with the former, we will lure select,
In which by transposition we may rule detect.
The next is care, a term wherein two words we trace;
Curtail, you car obtain, then are by change of place.
The third, avery, suggests an epithet and name;
The letters forming vary, Wray, are quite the same;
Then, as required, the latter we decapitate,
And ray of course remains when thus we mutilate.
But last comes CIVIC, and if palindromes can please,
This bears away the palm, for it has i’s and c’s;
Two numbers it contains—you feel inclined to laugh;
It reads,* “twice fifty-two, twice fifty and a half.”
Replies to the charades remain, and these we indicate
In briefest style; we cannot now expatiate.
To ramrod and me-men-to (on the hyp-hens rest),
For each imports a thought poetically dressed).
Add page-ant, brace-let, cap-on, strip-ling; these declare
What seemed at first a deeply mystic garb to wear.

8. By the Cawley’s Laddie.
The charades and rebuses here would I name,
And in a few brief lines encompass the same.
As it is said brevity’s sure still to win,
I with them in order at once here begin.
There’s ramrod, memento, hyphen, lure, and care,
Imports, avery, pageant, and bracelet, too, there;
Then capon, and striping; and civic names all,
So no more at present from yours,—J. Marshall.

LIST OF POETICAL ANSWERS.
B., of Barum, ans. Enigmas.
Bainbridge, Thomas, Front Street, Stanhope, ans. all.
Barnes, Rachel, Well Rash, ans. all.
Barthram, James, Scarborough, ans. all.

* CIV = 104 = twice 52, and CI = 101 = twice 50½.

PRINTED FOR THE COMPANY OF STATIONERS.
Burrington, Frederick, 17, East Southernhay, Exeter, ans. all.
Campbell, William, jun., Tow Law Iron Works, near Darlington, ans. all.
Cawley's Laddle, ans. all.
Chambers, John, Town Hall Offices, Knaresborough, ans. all.
Clemisone, Robert, Morpeth, ans. Prize Enigma.
Clitho, of Hexham, ans. Enigmas.
Drysdale, the Rev. Anderson, 73, John Street, Glasgow, ans. all.
Eddy, William Hocking, Truthwall, St. Just, Cornwall, ans. all.
Edwards, Thomas, Lois Weedon, ans. all.
Elliott, John, Sack Head, near Stanhope, ans. all.
Elliott, R., jun, Choppington, near Morpeth, ans. all.
Escott, F. A., 2, Cambridge Villas, Greenwich, ans. all.
Furniss, Joseph, Lois Weedon, Towcester, ans. all.
Garbutt, William, jun., Bishop Auckland, ans. all.
Grey, Miss Jane, Leadgate, near Shotley Bridge, Durham, ans. Enigmas.
Grey, John, Barrington School, Westgate, Weardale, ans. all.
Grice, George (Gardener), Wold Newton Hall, Ganton, near York, ans. all.
Hattam, Thomas, Beachy Head Lighthouse, near Eastbourne, ans. all.
Heslop, Thomas G., Allendale, Northumberland, ans. all.
Heslop, William, Clifton Street, Brighton, ans. all.
Herdsen, James, The Grange, Edinburgh, ans. all.
Hope, the Rev. John, Stapleton Rectory, Carlisle, Cumberland, ans. all.
Hutchinson, Joseph, near Halifax, ans. Enigmas.
J. B., Uppingham, ans. Prize Enigma.
J. D. W. W., ans. all.
Jackson, J., Retford Place, Sheffield, ans. all.
Jackson, Thomas, Alnwick, ans. all.
Jane of Ryedale, ans. Enigmas.
Janet, ans. Prize Enigma.
Jones, George, of Selby, ans. Enigmas.
Kitty, ans. Prize Enigma.
Lindley, George, Three Horse Shoes Inn, Crowle, Bawtry, ans. Enigmas and
Rebus and Charades 2, 7 to 11.
Lester, J. H., St. John's College, Cambridge, late of Woodhouse, ans. Prize
Enigma.
Milbourn, Thomas, Riding Mill, near Newcastle-upon-Tyne, ans. all.
Nodwons, J., Murah, ans. Enigmas.
Novitals, ans. all.
Oedipus, ans. all.
Ogden, Miss Helen, Shaw, near Oldham, ans. all.
Rutherford, Dr., Tweed Cottage, Maryon Road, Charlton, ans. all.
Ryley, Robert, Mickleover, near Derby, ans. all.
Scrder, Alexander, Grainger Villa, Elswick, Newcastle-upon-Tyne, ans. all.
Smith, Ashton, South Street, Uppingham, Rutland, ans. Prize Enigma.
Somerscales, Thomas, Hull, ans. all.
Watson, Stephen, Haydonbridge, Northumberland, ans. all.
White, J., Oak Place, Losels, Birmingham, ans. all.
White, Thomas, Allendale, Northumberland, ans. all.
Wray, the Rev. J. Jackson, Redruth, Cornwall, ans. Prize Enigma.
Wray, Thomas, Market Weighton, Yorkshire, ans. all.

PRINTED FOR THE COMPANY OF STATIONERS.
NEW ENIGMAS.

I. Enigma (1491); by Mr. WM. Garbutt, jun., Bishop Auckland.

I am a common well-known thing,
Rich blessings to mankind I bring;
I've neither colour, taste, nor smell,
As every chemist sure can tell;
I am a compound, they will say,
And one in common use each day.
At times quite lustrous I have been,
In precious stones may oft be seen;
To be both hard and soft I'm known,
That I'm a paradox you'll own,
For I resist and yield as well,
As all my properties will tell.
However light a thing may be,
Or heavy in its density,
If dropp'd upon me, 'tis the case,
I it admit to my embrace.
I also make an easy couch,
As any doctor well can vouch;
I'm pliant, flexible, and smooth;
But if I tell the truth, forsooth,
Destructive I am often found;
Should you the ocean view around,
In storm and tempest I display
My force and power in the spray;
You cannot ever me compress,
Now what I am you'll surely guess.

II. Enigma (1492); by Mr. James Herdson, Edinburgh.

Ladies, may I your thoughts engage?
Then I will nimbly mount the stage;
With Blondin I will try to cope
Upon the high elastic rope;
And on the light "fantastic toe,"
Make my début, my powers to show.
Oft in the ball-room I am seen,
Adorn'd in satin, white, or green.
I am a somewhat airy thing,
Yet to the earth I closely cling;
And if you search it will be found
I work incessant underground;
In arts, mechanical of course,
I'm used to give increase of force.
By sons of Galen I am tried,
But only inwardly applied.
I fill the intoxicating cup
Where Bacchus and his vot'ries sup;
For parlour or saloon don't care,
But take my station at the bar;
Bold attic flights I seldom try,
Nor raise my energies so high;
I rather choose, if you must know,
To toil in humd vaults below.
You'll sometimes see me in the street,
There often placed in snug retreat;
And though I'm useful, you will find
I'm roughly handled by mankind;
To see my treatment you'd be shocked,
I'm often fetter'd, muzzled, chok'd!
Such usage, you will say at least,
To one the friend of man and beast
Is cruel,—'tis no wonder I
At times refuse the wish'd supply.
I've other enemies, no doubt—
The winter's frost, the summer's drought;
But these I patiently endure,
Till changing seasons work a cure.
From what's been said you'll understand
My varied uses upon land.
You cannot in the Bible trace
That I'd in Noah's ark a place,
Yet the Great Eastern without me
Would not have ventured out to sea.
You know my name? then be it so,
But if you don't let others know,
I'll try my praying powers to wrest,
And draw the secret from your breast.

PRINTED FOR THE COMPANY OF STATIONERS.
III. Enigma (1493); by Mr. Thomas Wray, Market Weighton.

Once more, fair wits of Lady Di,
And gents, I have a mind to try
To write a new enigma;
My subject's so strange a class,
Instead of winning praise, alas!
I may incur a stigma.

Yet don't suppose me all that's base,
I've sometimes power to wreath the face,
With smiles and hues of pleasure;
Yon sacred fane of ancient date
Has had my aid and, let me state,
The builder knows my measure.

And know, likewise, 'tis mine t'assist
The vocal choir, the organist,
When music charms to rapture.
Grammarians know my uses well,
But on this theme I will not dwell:
Adieu! So ends my chapter.

No mystic bard can tell when I
First plagued mankind (but by the bye)
I may be old as Adam;
We're almost countless as the stars,
And oft caused discord, strife, or jars
Between her lord and madam.

IV. Enigma (1494); by Dr. Rutherford, Charlton.

Revert to dusky time of old, when round
The globe no shore the tumbling ocean found;
The high-piled hills no safety could supply,
The buoyant ark above their tops rose high.
The deluge came,—wide dashed the foaming waves,
And all mankind, save eight, found wat'ry graves.
I sailed with righteous Noah in the ark,
And gained some fame within his dwelling dark:
For when the winds the waters did assuage,
I Noah's thoughts did instantly engage;
And when the cov'ring off the ark he took,
He cast around a hasty anxious look,
Nor sought my aid, as he had done before.
Joy filled his heart—he water saw no more:
The face of all the ground appeared quite dry,
The dense-charged clouds had mounted to the sky.
Jehovah's mighty arm restrained the rain,
And Noah, pleased, looked on dry land again.

In these enlightened, busy times of ours
I often task the painter's utmost powers
In richest colours—orange, green and gold.
Historic scenes I commonly unfold;
I grace the palace, and the cot adorn,
My services commence at early morn;
I love the day,—of little use at night,
And busy menials shut me out of sight;
In every busy street you see me placed,
And at the close of day with gaslight graced.
In me some thousand gems you may behold,
And richest robes adorned with lace and gold.
Filled with the luxuries of life I stand,
In ample size your notice to command;
Ye sons of song and daughters of the muse,
To view me in my pride you ne'er refuse,
Look at me then, and feast your longing eyes,
Look through me, and my beauty learn to prize.

V. ENIGMA (1495); by Mr. Thos. Edwards, Lois Weedon.

Diarians! 'tis a fact none will dispute,
Whoe'er relieves the poor and destitute,
The sick, and those that are with pain oppressed,
The promise is they surely shall be blest.
Some lowly peasant, or the man of wealth,
May have at times, perhaps, "done good by stealth;"
And some by public means, as we may see,
Have shown their true and heartfelt sympathy.
Witness those institutions where we find
Benevolence with philanthropy combined,
Founded by some, perhaps, of noble birth;
They stand mementoes of departed worth.
In some of them I always may be found,
Where pain, alas! and sickness, too, abound:
Hark! a shriek issues from some saddened home,
And men with muffled voices slowly come,
Bearing along the mutilated form
Of some beloved one, whose heart's blood yet warm
Throbs but for them—his children and his wife,
Whose earthly hopes all centre in his life.
He so beloved is wounded,—must he die,
Round whom his children cling caressingly?
Oh, no! the sufferer now to me is brought,
Where marvels of great skill are daily wrought.
Some leave me with their health and strength renewed,
Look back upon the past with gratitude;
Although at times in me there may have been
Many a sad and painful deathbed scene.
Behold me now, a helpless orphan left,
Of parents and a happy home bereft;
No bosom friend my joys or woes to share,
I now am placed beneath a guardian's care.
Sometimes I have been placed to guard the crown,
I also am a district of a town;
I may be north or south, or east or west,
Whichever suits your whim or fancy best.
Now pray beware, and keep aloof from me,
Or perhaps you may get into custody.

PRINTED FOR THE COMPANY OF STATIONERS.
VI. ENIGMA (1496); by Mr. JOSEPH HUTCHINSON, near Halifax.

Though after novelties we often run,
'Tis said there's nothing new beneath the sun,
And said by one denominates wise,
Whose sayings we are ever taught to prize;
Therefore in falling of a subject new,
'Tis well if we can something bring in lieu:
So here I come, where I have been before,
On Dia's page a thousand times and more,
And while my properties you love to trace,
I add a charm and your productions grace;
No stranger am I, therefore, but a friend,
And frequently to your enjoyment tend;
And in such general service I have been,
There's scarce a place where I was never seen;
I was in Eden, when the primal pair
Had yielded to the tempter's wily snare;
With Joseph when from prison he was brought,
And to interpret dreams divinely taught;
And from that period to the present time
I have been known in every age and clime.
At court,—in cabinet affairs of state,
You'll often find my influence is great,
And in a nation's throes, or evil hour,
Monarchs have fear'd and empires felt my power;
Tho' varied the effects that from me flow,
A curse or blessing—public weal or woe;
In trade and commerce I am useful found,
And in the realm of fashion I abound;
And though I may be always found at home,
Many in search of me will daily roam.
I aid the juggler in his tricky arts,
And on the stage appear in many parts,
And when the curtain falls or intervenes,
I'm equally alert behind the scenes.
In every country shop or city store
I may be found in numbers less or more;
But tho' a thriving trade may there be driven,
I'm neither bought nor sold, tho' often given,
And, what no doubt will more astonish you,
The miser has been known to give me too.
But why still further try to hide myself,
In either power or party, play or pelf;
'Tis vain my name attempting to conceal—
I may be in your pocket if you feel,—
You say there's nothing—turn it inside out,
And then you'll find me there, I have no doubt.

PRINTED FOR THE COMPANY OF STATIONERS.
VII. Enigma (1497); by Mr. Joseph Furniss, Lois Weedon.

Diarians, scarcely need I beg of you
To judge of nothing by the outside view;
But first of all that favour I would ask,
While yet I revel briefly 'neath my mask.
Lo! then I come before you gracefully
And beauteous to behold; in symmetry
Am faultless to a pin; and—mark me well—
In gait and mien and movement I excel.
So much am I admired, the painter's art
Can scarcely do me justice, or impart
My beauties to his canvas, though he will,
To please the critic, tax his utmost skill.
For I'm angelic though I move on earth,
Yet am I humble as of noble birth;
Can rouse the tender passion, and can make
Conquests of hearts, and all for love's sweet sake.
But now, as you might deem me some sweet Miss,
Or haply thinking that or guessing this,—
Behold me nursed with all the tend'rest care
The gardener can bestow on objects rare,
A splendid plant, exotic all in bloom,
Well fitted to adorn the sitting-room
Of 'ladye fair,' who in a pet might see
So much to love and to admire in me.
But task and judgment differ much in all,
And pride as soon or late must have a fall;
And yet disdain not, should you chance to meet
A pitiable object in the street,
Uncouth, unsightly, twisted all awry,
Pitied, perhaps condemned by passers by;
Ah, judge not harshly, if you find me such,
For my intrinsic value may be much,
Although in sundry cases I must own
It is but little if the truth were known.
I'm in the rainbow, and I'm in your shoe,
And in your household may be old or new.
You hear me in the church, and, as a rule,
My use is known, though varied, in the school;
Aye, in the depths of learning most profound,
In halls and colleges I'm ever found.
But now, to finish off my rugged lay,
The jolly sportsman shouts—Away, away,
With hound fleet-footed o'er the marshy lea
Where, peradventure, he will soon find me;
And if he should, what follows but a run?
And with that hint, dear friends, my rhyme is done.
VIII. Enigma (1498); by the Rev. Anderson Drysdale, Glasgow.

I first existed in the realms of light,
Yet I am always deemed a child of night.
The angel Gabriel could correctly tell
My age exact, for he remembers well
When I among the shining ones took place,
And with much boldness looked them in the face.
He hated me, and, had he but had power,
My first would have become my latest hour.
I bring you now to earth; in Eden-land
Full often was I touched by Adam's hand.
In pristine form his partner knew me first,
Because forbidden fruit had caused a thirst
Which she would gratify, and thus she died.
The fatal tempting fruit he also tried,
And formed with me acquaintance to his cost,
For now he found that all his joy was lost.
But think not I to gardens am confined;
On ice you see me, and are not inclined
To be on friendly terms with one so low,
Lest you your standing lose and lower go.
Since dogs as close companions I caress,
The feeling of disgust you scarce repress;
Yet hear from me a striking fact or two,
And then avoiding me your way pursue.
On banks of Thames, of Mersey, Wear, and Clyde,
I have position; thither if you guide
Your footsteps I will promise you delight,
My architecture is a pleasant sight.
Again, to hills of Switzerland repair,
My dreaded presence is acknowledged there;
The valleys I exalt, the rocks denude,
At one fell sweep I slay a multitude.
Now leave these hills and traverse Erin's isle;
Examine prisons, see in durance vile
That noted Stephens, of the Fenian school,
Who Ireland wished to free from British rule.
Authorities had deemed his cell secure,
But his confinement did not long endure;
The plot for his evasion had success;
Escape was due to me, I must confess.
No more of prisons; go with me to post;
Sustaining office there I well may boast.
Inspect the box or boxes with due care,
He must be blind who cannot find me there.
Concluding hint:—Suppose in festive hall
An ox's tongue has been allowed to fall;
What Latin phrase would designate the fact?
Translate it; you are right, my friend,—my joke is cracked.

PRINTED FOR THE COMPANY OF STATIONERS.
IX. ENIGMA (1499); by Miss Helen Ogden, Shaw.

Without a preamble or lengthy preface,
Diarians, I come your fair pages to grace,
For doubtless I may, to some mystical song,
Have render'd my aid the sweet strain to prolong.
To boast of descent would perhaps be in vain,
Since fortune and birthright so many maintain,
As quite accidental in life's chequer'd ring
Real honour alone from true merit doth spring.
Then as to my birth, I will merely relate,
I sprung up like many from lowly estate;
And if I must tell you with candour the truth,
I've little pretension to beauty or youth;
But whose fertile genius first fashioned me
On history's pages we clearly don't see;
My service we daily, nay hourly behold,
Unfolding a treasure precious as gold.
Abroad in the world, and such is my lot,
I'm known in the palace as well as the cot;
Respect unto rank by me never is made,
I serve all alike, yea of every grade;
From life's early morn through each bustling scene,
Despite the rude cares that so oft intervene.
At school with the stripling, where bustle and noise
Seem constantly held in a joint equipoise;
By me his young efforts are often display'd,
Some germ of the future, though distant portray'd,
With which the young tyro in age more mature
May find most essential his fame to secure.
Nor am I confin'd to the ardour of youth,
I also aid man in his search after truth;
With him I am known still to act well my part,
When bent to unravel some labyrinth of art;
Things puzzling and queer oft his temper may vex,
Points knotty and dark, too, his vision perplex.
In bus'ness or trade he to me will apply,
A substitute useful he will not deny;
In the absence of one who always must share
In patronage worthy, unequall'd, and rare.
But here I must pause, and must candidly own
My nature if chang'd great results oft has shown;
To masters in art, and in works rich and rare,
I've doubtless sustain'd a quite competent share;
In aiding each step to encompass a name
That shines like a star in the summit of fame;
But surely 'tis vain any more to enlarge
On duties I'm known ev'ry day to discharge;
Accept then, with pleasure, my present adieu,
While I hope to remain still your servant most true.
X. PRIZE ENIGMA (1500); by the Rev. JOHN HOPE, Stapleton.

Ye nymphs of Dia, fav'rites of the Nine,  
Who on the mystic page so brightly shine,  
You me admire, in me you gladly move,  
Still striving all my excellence to prove;  
I therefore come—sure of reception kind—  
To entertain awhile your gifted mind.

In time's beginning, when old mother Earth  
Rose into being and obtained her birth,  
I was not hers; then chaos held its reign,  
With pitchy darkness brooding o'er the main:  
A course of lengthened ages it required  
To bring me forth in sightly robes attired.  
Then solid ground bedecked with lovely green,  
From heav'n's bright azure was by angels seen.

I'm in the circling year:—survey the spring,  
When flow'rets blush, and am'rous warblers sing,  
The summer op'ning into richer bloom,  
Whilst o'er the earth more genial cloudlets loom;  
The autumn with her rip'ning produce crowned,  
The gift of Ceres, spread the country round;  
The winter with its frost and chilling snow,  
Investing all the hills and valleys low;—  
No doubt in these I plainly meet your view,  
As needful work or pleasure you pursue.

Look back to Græcia, there to public gaze  
I used with pride my lineaments to raise;  
In Doris I a chastened form obtained,  
In fair Ionia more enrichments gained,  
Till standing forth in all my parts complete,  
I honours showered upon that classic seat;  
Yet, strange to say, when many an age had passed,  
A something barb'rous clung to me at last!

But let the azure vault your mind engage,  
I there before you spread an ample page;  
Though uninstructed vision in it see  
Few signs that indications give of me,  
Yet I am there—there ages I have reigned,  
And my effects have constantly maintained;  
I act from Neptune's far-extended bound  
To golden Sol, still in perfection found,  
The solar system rule with nicest art,  
Nor from that rule I ever once depart;  
More distant stars, tho' fixed, I also guide,  
A fact astronomy tends to decide;  
Through boundless space unnumbered orbs I run,  
'Midst hosts of planets from each central sun;  
I am the work of that all-perfect Mind  
Which all the plan of nature first designed.
NEW CHARADES, REBUSES, &c.


My first and third, connected in a line,
    Produce what braves the ragings of the sea;
Though oft a plaything, yet it doth combine
    Both much of firmness and solidity.
My second doubtless highly is admired,
    How bright with songs! how full of mystic lore
Which, neatly in their fairest robes attired,
    Increase my second’s merits more and more.
My total shows what’s gen’rous and sincere,
    Proceeding kindly from the inmost breast,
Adapted friends and neighbours to endear,
    And soothe the bosom that’s with grief opprest.

2. Rebus; by Mr. James Herdson, Edinburgh.

The urchin at school dreads the shake of my first;
Curtail it, and by the remainder reversion’d
A place of confinement will then be display’d,
    If you don’t know its name, ask the nursery maid.

3. Rebus; by Mr. Joseph Hutchinson, near Halifax.

A body form’d for enterprise,
    Curtail again and change, you’ll find
Subject to certain laws;
    Me somewhat cold and shy;
Curtail, and when before your eyes,
    Another shortening from behind,
Be sure you make a pause.
    Will give a gentle cry.

4. Rebus; by Mr. Thomas Harrison, Abbey Holme, Carlisle.

Anticipating future shame,
    As if I’d headed plot or rout,
Foreseeing wretched doom,
    Just edicts to withstand;
My antecedents and my name
    Or for the crown had waged dispute,
I faint would wrap in gloom;
    And led rebellious band,—
Still, if you question whence I came,
    My head’s struck off, my heart’s torn out,
I answer—From the loom.
    Farewell, my native land!

5. Rebus; by Oedipus.

I sink deep beneath; I mount up toward the skies:
    Behead,—I’m an adjunct of much varied use:
Behead me once more, and I will but surmise
    You will find me a term which our sailors adduce.
6. Charade; by J. D. W. W.
On rugged roads my first with ease you'll trace;
My next observe belongs the female race;
My third in rivers has for ages been,
And often found where flows the shallow stream.
My whole well known in Di a favorite son,
Who on her page a glorious fame has won.

7. Rebus; by the Cawkley's Laddie.
Short, stumpy, and heavy, my whole you will see;
But should you curtail, then a mate I shall be.
Replace then my tail, and my head take away,
I ride on the back of some every day;
Bereft of them both, then away from the throng,
I'm heard in the morn flow'ry meadows among.

Much I have to do with books,
But transposed give work to cooks;
Then curtailed, and backward read,
I am often cold as lead.

9. Rebus; by Mr. Septimus Tebay, Rivington.
Oft have I sung for Lady Di
When she was young; and still I sing
Her praises; as each year rolls by
An offering at her shrine I fling.

Curtail, and move me if you can;
The seaman dreads me near the shore;
I am a friend, a foe to man;
But move me, and you'll need no more.

10. Rebus; by Mr. Thomas Harrison, Abbey Holme, Carlisle.
Up the hill-side an animal bolted,
With half a score chasing behind;
On the summit, o'ertaken, it halted,
Where they all together reclined.

11. Rebus; by the Rev. J. Jackson Wray, Redruth, Cornwall.
Over the sea my whole is bound:
Behead, transpose, I'm something pleasant;
Behead again, and now I'm owned
Alike by prince, and peer, and peasant.

12. Charade; by Mr. Thomas Wray, Market Weighton.
The goblin tales, so often told,
To please or scare the young,
Relate unto my first; my next's
Related to the tongue.
Down verdant vales, 'mong leafy trees,
My whole's been borne upon the breeze.
ANSWERS TO THE QUERIES.

I. QUERY; by Mr. JOHN WHITE, Lozells, Birmingham.

When or where was cotton first manufactured into cloth?

Answered by the Rev. JOHN HOPE, Stapleton.

Cotton is derived from the Arabic word *kutn* or *kutun*, its original name. The exact period when cotton was first manufactured into cloth cannot be determined; but there seems to be little doubt that cloth was made from it in India many centuries before it was introduced into Europe. Herodotus, the Greek historian, in his short account of the Indi (Thalla, 47), mentions cotton, though not under its native name; he calls it *είρων από ζυλον*; that is, tree-wool. It appears that cotton was known in Egypt as far back as the reign of Amasis, B.C. 589—525, though perhaps not grown there. Arrian informs us that the Romans received cotton cloths from India; and there is scarcely a doubt that the manufacture of cotton had been carried on there long ages before any European visited that part of the world. The cotton cloth made by the Indians at an early period is said to have been good and serviceable, although their weaving apparatus must have been very imperfect. The manufacture of cotton cloth, it is thought, was not commenced in China till about the sixth century of the Christian era, though it had been previously grown in gardens. Cotton seems to have been introduced into England about the middle of the seventeenth century, and about the same time, or soon after, into other European nations, particularly Spain. To trace the progress of the cotton manufacture from its small beginnings in England and elsewhere, to its apparent climax in 1860, is no part of the query. Thus we must refer the making of the first cotton cloth to India, but at what time that was seems beyond the period of human acquaintance with that distant part of the earth, and also of that of authentic history.

Again, by Mr. JOHN WHITE, the Proposer.

It is impossible to ascertain at what period of history mankind first became acquainted with cotton. Columbus, Cortez, and Pizarro found it woven into garments by the aboriginal inhabitants of tropical America; Cook met with it in the Sandwich group and in Norfolk Island; Sturt, in the unexplored wilds of Australia, and the oldest law-book of India, the ‘Institutes of Menu,’ furnishes abundant evidence that the trees which bear ‘wool instead of fruit,’ as Herodotus expresses himself, were cultivated in the warmer parts of Asia more than two thousand years ago to such an extent as to engage the attention of the legislator. The Greeks were as perfectly well acquainted with Dacca muslins as we are; and Arrian mentions cotton as an article of Indian import into Rome. It is, therefore, all the more remarkable that the use of cotton has only become more general in Europe within a comparatively recent period; but it first appears to have been costly, and only used sparingly by the upper classes. It is on record that Horace’s father had no pocket-handkerchief, cotton or otherwise; and that the queen of Charles the Seventh of France had only two linen shifts. The wearing of linen in the broadest sense, and the frequent changing and washing of it, are some of the triumphs of modern civilisation, not only over mechanical difficulty, but against every species of prejudice and misrepresentation. Even after the close of the Middle Ages opposition was still encountered. Edward Campion, the Jesuit, executed on a charge of high treason in 1581, declared that the wealthier Irish wore linen shirts from sheer ‘wantoness.
and bravery;" and Spenser, the poet, lamented the insufficiency of the laws against the wearing of Irish apparel—that is, linen fabric.

Answers agreeing in substance with the foregoing were also given by Mr. Thomas Hattam, Beachy Head Lighthouse; Mr. James Herdson, Edinburgh; and Mr. Thomas Jackson, of Alnwick.

II. Query; by Mr. James Herdson, Edinburgh.
Whence originated the popular superstition of “The man-in-the-moon?”

Answered by Mr. James Herdson, the Proposer.

This is one of the most ancient and popular of our lunar superstitions, and has been the subject of observation in most countries. It is by some supposed to have originated in the account given in the Book of Numbers xv, 32, of a man who was punished with death for gathering sticks on the Sabbath-day. But I do not see anything in that incident that either directly or indirectly leads to that conclusion. I should rather attribute the fancied resemblance of the full moon to the apparent likeness of the human features, to have originated in the ignorance of the unlearned in the former ages, who really took it for a man in the moon, being ignorant of the many sublime facts since brought to light by astronomy. The different shades of light and dark exhibited on the face of the moon are now known to be caused by reflection from the irregularities of the moon’s surface, for the moon shines by light reflected from the sun.

Again, by the Rev. John Hope, Stapleton.

Some suppose that the popular superstition of the man in the moon arose from what is related in Numbers xv, of a man gathering sticks on the Sabbath-day; whether this supposition is correct or not I cannot determine. The popular story—at least as I have heard it—is this: A man was detected cutting and carrying off thorns from a widow’s hedge on a Sunday; and for his crime, which was both theft and desecration of the Sabbath, he was sent to the moon, and made a perpetual prisoner there. Now, I can scarcely divest myself of the idea—that the above story arose from certain dark figures which appear on the face of the full moon, as seen by the naked eye. On the right is an upright figure very much resembling that of a man, and by his side what may pass very well for an axe; whilst before him, on the left side, there is something like two bunches of thorns. Well do I remember that, when a boy, having been told the above story, I could point out the man, the axe, and the thorns, with great distinctness. The fact is, like many others, I seemed to have a firm belief in the whole matter, my youthful ignorance not enabling me to see its extreme absurdity. Some may smile at this opinion of mine, but I believe it is not without foundation.

Third Answer by Mr. Thomas Jackson, of Alnwick.

It is generally supposed that the origin of “The man who was condemned to wander in the moon for gathering a bundle of sticks on a Sunday,” and other absurd superstitious notions, is taken from the Book of Numbers, chap. xv, ver. 32, and are still believed by some of the Eastern nations. A work published by Lumley, of Holborn, gives a very interesting account of such superstitions.

Answers to the same effect were also given by Messrs. Hattam and White.

III. Query; by the Rev. John Hope, Stapleton.

Profane oaths are entirely forbidden in the New Testament; were they accounted sinful under the Jewish Dispensation?
Answered by the Rev. John Hope, the Proposer.

The third commandment in the Decalogue stands thus: "Thou shalt not take the name of the Lord thy God in vain; for the Lord will not hold him guiltless that taketh his name in vain." Now, however this commandment may be, and is, explained upon Christian principles, it went no farther, as it respected the Jews, than using the name of God lightly and irreverently in common conversation, or swearing falsely by it. But it must be observed that this command was supplemented by others, particularly this: "Thou shalt fear the Lord thy God, and serve him, and swear by his name." Thus they were restrained from swearing by anything but the name of their God. It is true, Joseph swore by "the life of Pharaoh," but Joseph lived before the promulgation of the law of Moses. If we examine the precepts of the law closely we shall find that profane swearing was nearly as strictly guarded against by it as it is in the New Testament. A common oath among the Jews was, "As the Lord liveth," I cannot call to mind any Jewish oath in which the name of God is not either expressed or implied; if they swore falsely by it, their oath was of course profane, and sinful as forbidden by the commands hitherto mentioned. If at any time they swore by the name of an idol, there was no doubt of the sinfulness of such swearing; whatever they swore by was wrong and profane, if it was not by the name of their God; hence they were strictly guarded and restrained from profane oaths. One form of their swearing is peculiar, and not easy to be understood; it is this: "The Lord do so to me and more also, if, &c.," which in the Hebrew text stands thus:

In the case of Ruth, who swore it to Naomi, it may perhaps be explained thus: "May the Lord forsake me and inflict even greater punishment, if ought but death part thee and me!" We therefore conclude that the law of Moses was not deficient in its prohibitions of profane oaths.

Again, by Mr. J. H. Lester, St. John's College, Cambridge (late of Woodhouse).

Profane oaths were accounted sinful under the Jewish dispensation. "He that blasphemeth the name of the Lord, he shall surely be put to death," &c., see Leviticus xxiv. 10—16. This was doubtless the kind of "swearing" forbidden by our Lord in Matthew v. 34, as well as trifling swearing. It is probably the same as that mentioned Matt. xxvi. 74.

The query was similarly answered by Mr. Thomas Hattam, Beachy Head Lighthouse, Eastbourne.

IV. Query; by Mr. James Hewitt, Hexham.

Is it a fact, as asserted by some bird-fanciers, that the female lark is equally as good a singer as the male?

Answered by Mr. J. White, Oak Place, Lozells, Birmingham.

Not being able to answer this query of my own knowledge, I have consulted a friend who has made ornithology a study and amusement, and he informs me that he has no doubt about the female lark singing as well as the male; and on referring to 'Morris's History of British Birds,' 6 vols., No. 62, page 187—8, after giving an excellent description of the bird and its habits, says, "The female sings as well as the male." Therefore I conclude that, after such authority, it must stand as a fact that the "female lark does sing as well as the male."

PRINTED FOR THE COMPANY OF STATIONEERS.
Again, by Mr. Thos. Hattam, Beachy Head Lighthouse, Eastbourne.

"The windpipe of birds is composed of entire rings of cartilage; at its bifurcation is a glottis supplied with appropriate muscles called the lower or inferior larynx. It is here that the voice of birds is formed; the vast body of air contained in the air-cells contributes to the force, and the windpipe by its form and movements to the modification of the voice. The gift of song is given to the male birds only, and their notes are mostly an expression of love; hence they are heard singing chiefly at the time when they are pairing—birds sing only when they are cheerful." — *Popular Encyclopaedia.*

V. Query; by Mr. James Hewitt, Hexham.

Required the origin of the terms "Picts and Scots."

Answered by the Rev. John Hope, Stapleton.

The history of no race of people on the face of the earth is more involved in obscurity than that of those people whom the Romans called Picti, no doubt from the circumstance of their painting their bodies. The first mention of them by any ancient writer is in an oration addressed by Eumenius to the Emperor Constantius Chlorus, on his return from conquering the usurper Allectus, in the year 296. The Roman writer Ammianus Marcellinus, about the year 360, speaks of the borders of the Roman province in Britain being assailed by those uncivilised people, the Picts and Scots. He represents the Picts as consisting of two tribes, whom he calls Ducaleones and Veturiones. The Picts and Scots seem to have divided North Britain between them for a long course of time, and to have made conjointly incursions upon the Roman province. At length, however, we are told that Kenneth II, the Scottish king, conquered the Picts, and became sovereign of the whole of Scotland. It is well known that the Roman walls were built to restrain the incursions of the Picts and Scots. In some parts of Scotland architectural remains are found which are ascribed to the Picts, some of them curious. The joint name of Picts and Scots seems to have arisen from these two peoples being leagued together against the Romans.

Second Answer by Mr. James Herdson, Edinburgh.

The Picts were an ancient people of North Britain, whose origin and history are singularly obscure. The name is not mentioned by Herodion, who wrote about A.D. 250, nor by his predecessors Julius Caesar and Tacitus, yet some writers maintain that the Picts were settled in Britain before Caesar’s invasion. The term Picts (painted) seems to have been used by the Roman writers in the sense simply of painted men, and that induced them to apply it to all the wild habitants in North Britain, who were in the habit of painting their bodies, or rather among whom the practice was supposed to exist. If any one of the North British nations bore an appellation somewhat resembling this term, the Romans, with their usual carelessness as to such matters, would readily employ the term Picti as their translation of the native name; and even, although not painting their bodies, would still retain in that application the popular sense of the epithet, and would even come to extend it as far as other tribes, no matter how different in real character and origin. This is believed to be the actual history of the use of the term Picti in the Roman ethnography of Britain.

We first hear of the Scots as a people inhabiting Ireland; and that, about the year 503, a colony of Scots from the north of Ireland emigrated to north Britain, and effected a settlement in the district now constituting the county of Argyll, to which they gave the name of Dalraid. They remained there for more than 300 years, during which time the rest of the island to the north of the Friths of
Forth and Clyde, as stated by all the oldest authors, is said to have formed the kingdom of the Picts. The Picts were at last conquered by Kenneth MacAlpine, or Kenneth II, originally King of the Scots of Dalraid, but thenceforth styled King of the Picts, and sometimes called King of the Picts and Scots.

Third Answer, by Mr. J. White, Oak Place, Lozells, Birmingham.

The Picts are pronounced by different investigators of their history to have been Germans, Scandinavians, Welsh, Gael, or something distinct from all four. The advocates of the German hypothesis rest chiefly on Tacitus's description of their physical conformation. Dr. Jamieson, assuming that the present lowland Scotch dialect was derived from them, sets them down as Scandinavians.

Bishops Lloyd and Camden conceive them to have been of Celtic race, probably related to the Britons; Chalmers, author of 'Caledonia,' regards them as nothing more than a tribe of Cambrians, or Welsh; while Skene, one of the latest authors on the subject, thinks he has proved that they were the ancestors of the present race of Scottish highlanders.

There must have been some point of distinction between the Picts and the adjoining tribes. Nemilus describes them as one of the four nations then inhabiting Britain; and Bede represents them as distinct from the Britons and the Scots, both in nationality and language. Innes, who was almost the first to throw a little light upon the chaos of ancient Scottish history, considers them to have been those ancient Caledonian tribes who retained their independence, and that their language differed from that of the colonial Britons, in having remained unmixed, while that of the latter was partly Romanised. This supposition is probably not far from the truth. That the Picts were actually Celts, and not of Teutonic race, is proved by the names of their kings, of whom a list, undoubtedly genuine, from the fifth century downwards, was published by Innes, from a manuscript in the Colbertine Library.

To any persons desirous of tracing the subject further, I would recommend them to Garnet's 'Philological Essays.'

Fourth Answer, by Mr. J. H. Lester, St. John's College, Cambridge.

At the period of the retirement of the Romans from Britain, the northern portion of the island was inhabited by the descendants of Caledonian clans, who for four centuries held the chief sway there. They were called Picts—a name supposed to be derived from Peithi, a British word, which signifies 'those that are without,' or the people of the open country. See Chalmers 'Caled.:' vol. i, 203. We find that the Scots—a Celtic race—were the ruling people in Ireland at the beginning of the fourth century. After this it is probable they became merged among the Picts; and this view is supported by a passage in Eumenius, the orator, who first mentions them. He speaks of them as 'Caledones aliquae Picti,' which implies that, although the Picts and Scots were afterwards spoken of generally as one and the same people, Picti was the generic, and that of Caledones, or Scoti, only a specific appellation.

Fifth Answer, by Mr. Thomas Jackson, Alnwick.

The Scots (whose name originally is thought to mean wanderers) were a numerous race in Ireland, and apparently the chief portion of its inhabitants. A part of them had crossed over the narrowest seas, and seized Argyleshire, and the most mountainous parts of Scotland, to which they gave their own name, so that in old books Scot means either Irishman or Caledonian. Bede states that the Scots were a tribe from Ireland who invaded Caledonia about 288, who subdued it, and gave to it its name—the Pict (whose name both signifies robbers, and also painted, from their habit of dyeing their skins blue) were apparently

PRINTED FOR THE COMPANY OF STATIONERS.
the older inhabitants, and were of the tribes called Caledonians. I may here remark that in old times Scotland, or Caledonia, only meant the country north of the great rivers Forth and Clyde, south of which was the Roman province of Valentia, extending over what is now the south of Scotland and Northumberland.

**Sixth Answer, by Mr. Thomas Hattam, Beachy Head, Lighthouse.**

Dr. Henry says the word Picts is from Pictish—a plunderer, and not from Picti—painted; and the word Scots is derived from the Celtic word Seuelté—a wanderer, the Picts and Scots being only different tribes of Caledonians. The earliest mention of the Picts by any ancient writer occurs in an oration addressed by Eumenius to the Emperor Constantius Chlorus, in the year 296. It appears from the history of Scotland that the Scots were a Celtic tribe, who in the early ages of Christianity existed in Ireland, and were denominated Scoti, or Scots, and in the year A.D. 503 effected a settlement in Argyllshire, where they afterwards became united under the reign of Kenneth the Second.

**VI. PUZZLE; by Mr. Septimus Tebay, Rivington.**

Place five halfpence in such a way
That each shall touch the rest, and may
Be so arranged that while they touch,
The pressure can be made as much
As you may please. The puzzle try,
And leave your card with Lady Di.

**Answered by Mr. Septimus Tebay, the Proposer.**

Take two halfpence in the left hand, slightly opened at the edge, and insert two others with their edges in contact between them; then place the fifth between the two last, so as to touch the first two, and hold them fast.

We also received an answer to the same effect, ingeniously dressed up in the garb of poetry, by Mr. Thomas Cranston, Greenwich Nautical School.

**I. QUERY; by Mr. James Herdson, Edinburgh.**

What is the meaning of the memorial of blowing of trumpets, mentioned in Leviticus xxii, 24; and of what materials were the trumpets made?

**II. QUERY; by Calculus, Consett.**

The word vogue is much used in the most northern parts of England. What is its present meaning; also, what is its origin?

**III. QUERY; by the Rev. Anderson Drysdale, Edinburgh.**

Which three letters of the Hebrew alphabet give, by transposition, six Hebrew roots?

**IV. QUERY; by the Rev. John Hope, Stapleton.**

What metal has been of most real use to mankind?

**V. QUERY; by the same.**

Looking at a lamp burning clearly, you can see no smoke issuing from the chimney; but viewing the reflection of it in a looking-glass, you see the vapour distinctly ascending to a considerable height. How is this phenomenon to be explained?

**VI. QUERY; by Mr. Thomas Hattam, Beachy Head Lighthouse.**

In the history of Australia it is said that the barometer is considered to rise before bad weather and fall before good, the reverse of what takes place in England. If true, what is the cause of this difference?

PRINTED FOR THE COMPANY OF STATIONERS.
Answers to the Questions.

I. Quest. (2049); by Mr. Edward Rutter, Sunderland.

Let P be any point in the circumference of the circle circumscribing a triangle ABC; demit the perpendiculars PD, PE, PF on the sides BC, CA, AB; and let \( O_1, O_2, O_3 \) be the centres of the circles through AEF, BDF, CDE; then the circle through \( O_1O_2O_3 \) is constant in magnitude.

Answered by Dr. Rutherford, Charlton; Mr. Thomas Dobson, Hexham; and Mr. Stephen Watson, Haydonbridge.

Draw the straight lines PA, PB, PC.

The points D, E, F lie in one straight line DEF, and the angles AFP, AEP are right angles by construction; therefore the line AP being drawn, it is the diameter of the circle described about the triangle AEF, and \( O_1 \), its middle point, is the centre of that circle. Similarly, BP is bisected in \( O_2 \), and therefore the line \( O_1O_2 \) is parallel to AB, and equal to one half of it. In like manner, the line \( O_2O_3 \) is half the side BC, and \( O_1O_3 \) half the side AC. Consequently the triangle \( O_1O_2O_3 \) is similar to ABC, and is one fourth of it; therefore the circle described through \( O_1O_2O_3 \) is equal to one fourth of the circle described about the given triangle ABC, and it evidently also passes through the point P.

Similar answers were given by "Cubic," and Messrs. Barlow, Borradaile, Brown, Buttery, Collins, Cranston, Dale, Escott, Hall, M‘Namara, Milbourn, Smith, Somerscales, Traynor, Tucker, Turnbull, and Wilson.

II. Quest. (2050); by Professor Arendt, Missouri, U.S.

Eliminate \( \phi \) from the equations

\[
\begin{align*}
y \cos \phi - x \sin \phi &= a \cos 2\phi \\
y \sin \phi + x \cos \phi &= 2a \sin 2\phi.
\end{align*}
\]

Answered by Mr. Thomas Dobson, Hexham; and Mr. A. Hall, Naval Observatory, Washington, U.S.

Eliminating \( x \) and \( y \) successively, we have

\[
\begin{align*}
y &= a \cos \phi + a \sin 2\phi \cdot \sin \phi, \\
x &= a \sin \phi + a \sin 2\phi \cdot \cos \phi.
\end{align*}
\]

Adding and subtracting, and observing that

\[
(sin \phi + \cos \phi) (1 + \sin 2\phi) = (\sin \phi + \cos \phi)^3,
\]

we have

\[
\begin{align*}
x + y &= a (\sin \phi + \cos \phi)^3, \\
x - y &= a (\sin \phi - \cos \phi)^3, \text{ whence} \\
(x + y)^3 + (x - y)^3 &= 2a^3.
\end{align*}
\]

Nearly all the solutions received to this question were similar to the preceding.
III. QUEST. (2051); by Mr. W. S. B. Woolhouse, London.

If \( \tan (\alpha + \beta \sqrt{-1}) = \frac{f + g \sqrt{-1}}{f' + g' \sqrt{-1}}; \) \( \alpha, \beta \) are determined by the formulae
\[
\tan 2\alpha = \frac{2(ff' + gg')}{(f'^2 + g'^2) - (f^2 + g^2)}; \quad \frac{e^{i\beta} - 1}{e^{i\beta} + 1} = \frac{2(f'g - fg')}{(f'^2 + g'^2) + (f^2 + g^2)}.
\]

Answered by Mr. W. S. B. Woolhouse, the Proposer.

A general formula for the algebraic division of imaginary expressions is
\[
\frac{f + g \sqrt{-1}}{f' + g' \sqrt{-1}} = \frac{ff' + gg'}{f'^2 + g'^2} + \frac{f'g - fg'}{f'^2 + g'^2} \sqrt{-1} \quad \cdots \quad (a),
\]
which may be easily verified.

Now, if \( k = \frac{\tan (\beta \sqrt{-1})}{\sqrt{-1}} = \frac{e^{i\beta} - e^{-i\beta}}{e^{i\beta} + e^{-i\beta}} \quad \cdots \quad (\beta),\)

then \( \tan (\alpha + \beta \sqrt{-1}) = \frac{\tan \alpha + \tan (\beta \sqrt{-1})}{1 - \tan \alpha \tan (\beta \sqrt{-1})} = \frac{\tan \alpha + k \sqrt{-1}}{1 - k \tan \alpha \sqrt{-1}}; \)

that is, by the formula \((a)\),
\[
\tan(\alpha + \beta \sqrt{-1}) = \frac{\tan \alpha (1 - k^2)}{1 + k^2} + \frac{k (1 + \tan^2 \alpha) \sqrt{-1}}{1 + k^2 \tan^2 \alpha} \quad \cdots \quad (\gamma)
\]

According to the question, \((a)\) and \((\gamma)\) are equivalent values. Let them be abbreviated by the common expression \( p + q \sqrt{-1} \). Then from the values of \( p \) and \( q \) contained in \((\gamma)\),
\[
1 + p \tan \alpha = \frac{q}{k}, \quad 1 - \frac{p}{\tan \alpha} = qk,
\]
\[
\therefore q^2 = (1 + p \tan \alpha) \left(1 - \frac{p}{\tan \alpha}\right) = p \left(\tan \alpha - \frac{1}{\tan \alpha}\right) + 1 - p^2
\]
\[
p^2 = \left(\frac{q}{k} - 1\right) (1 - qk) = q \left(\frac{1}{k} + k\right) - 1 - q^2.
\]

Hence, observing that \( \tan \alpha - \frac{1}{\tan \alpha} = -\frac{2}{\tan 2\alpha} \)
and \( \frac{1}{k} + k = 2 \frac{e^{i\beta} + 1}{e^{i\beta} - 1}, \) we get
\[
\tan 2\alpha = \frac{2p}{1 - p^2 - q^2}; \quad \frac{e^{i\beta} - 1}{e^{i\beta} + 1} = \frac{2q}{1 + p^2 + q^2}.
\]
Substituting the values of p and q contained in (a) which give,
\[ p^2 + q^2 = \frac{f^2f'' + g^2g'' + f''g' + f'g''}{(f'^2 + g'^2)^2} = \frac{f' + g'}{f'^2 + g'^2}, \]
the expressions for the determination of \( \alpha \) and \( \beta \) become
\[ \tan 2\alpha = \frac{2(f' + g'g'')}{(f'^2 + g'^2) - (f'^2 + g'^2)}, \]
\[ \frac{e^{i\beta} - 1}{e^{i\beta} + 1} = \frac{2(fg - fg')}{(f'^2 + g'^2) + (f'^2 + g'^2)} \ldots \ldots (\delta). \]

The formula (a) and (\( \delta \)) obviate all difficulties in dealing with imaginary expressions, and ought to be embodied in algebraical treatises.

Again by "Cubic," M.A., Cantab.

Since
\[ \tan (\alpha + \beta \sqrt{-1}) = \frac{f + g \sqrt{-1}}{f' + g' \sqrt{-1}}, \]
then also
\[ \tan (\alpha - \beta \sqrt{-1}) = \frac{f - g \sqrt{-1}}{f' - g' \sqrt{-1}}, \]
changing the sign of the imaginary.

Therefore, by applying the formula
\[ \tan (m \pm n) = \frac{\tan m \pm \tan n}{1 \pm \tan m \tan n}, \]
we find, after reduction,
\[ \tan 2\alpha = \frac{2(f' + g'g'')}{(f'^2 + g'^2) - (f'^2 + g'^2)}, \]
and
\[ \tan (2\beta \sqrt{-1}) = \frac{2(fg - fg')}{(f'^2 + g'^2) + (f'^2 + g'^2)}. \]

But \[ \tan (2\beta \sqrt{-1}) = \frac{1}{\sqrt{-1}} \cdot \frac{\varepsilon^{i\beta} - 1}{\varepsilon^{i\beta} + 1} = \sqrt{-1} \cdot \frac{\varepsilon^{i\beta} - 1}{\varepsilon^{i\beta} + 1}, \]
Hence,
\[ \frac{\varepsilon^{i\beta} - 1}{\varepsilon^{i\beta} + 1} = \frac{2(fg - fg')}{(f'^2 + g'^2) + (f'^2 + g'^2)}. \]

Thus nearly were the answers by Messrs. Barlow, Bills, Dobson, McNamara, Milbourn, Traynor, Tucker, and Wilson.
The expressions stated in the question may be otherwise obtained by expanding the first member of the given equation, then clearing the equation of fractions, and afterwards equating the rational and irrational parts of it, remembering that \( \sqrt{-1} \tan (\theta \sqrt{-1}) \) is rational. The question was solved in this manner by Mr. Stephen Watson, Haydonbridge, and also by Messrs. Brooks, Borradaile, Brown, Buttery, Cranston, Dale, Dobson, Escott, Hall, Rutherford, Smith, and Turnbull.

**IV. QUEST. (2052); by Mr. A. HALL, Washington, U.S.**

At a given latitude (\( \phi \)) two stars whose right ascensions and declinations are \( \alpha, \alpha', \delta, \delta' \), have the same altitude above the horizon. It is required to find the hour angle, and the conditions under which the phenomenon is possible.

*Answered by Mr. Thomas Dobson; Mr. A. Hall, the Proposer; Mr. William Barlow; Mr. John Buttery; Mr. Stephen Watson; and "Cubic."

Let \( A \) and \( B \) be the two stars, \( P \) the pole, \( Z \) the zenith of the place of observation, and \( \phi \) the latitude.

Draw \( PC \) bisecting the \( \angle APB \); then, if \( ZA = ZB = Z, \alpha - \alpha' = 2\beta \), and the mean hour angle \( ZPC = h \),

\[
\cos Z = \sin \delta \cdot \sin \phi + \cos \delta \cdot \cos \phi \cdot \cos (h - \beta)
\]

\[
\cos Z = \sin \delta' \cdot \sin \phi + \cos \delta' \cdot \cos \phi \cdot \cos (h + \beta).
\]

Equating equal values of \( \sec \phi \cdot \cos Z \), we have an equation of the form

\[
a \cos h + b \sin h + c = 0,
\]

where

\[
a = (\cos \delta - \cos \delta') \cos \frac{1}{2} (\alpha - \alpha'),
\]

\[
b = (\cos \delta + \cos \delta') \sin \frac{1}{2} (\alpha - \alpha'),
\]

\[
c = (\sin \delta - \sin \delta') \tan \phi.
\]

Hence \( (a^2 + b^2) \sin h = a \sqrt{a^2 + b^2 - c^2} - bc \).

In order that \( \sin h \) may be possible, we must have

\[
a^2 + b^2 > c^2,
\]

or

\[
\cos 2\delta + \cos 2\delta' - 2 \cos \delta \cos \delta' \cdot \cos (\alpha - \alpha') > (\sin \delta - \sin \delta')^2 \tan 2\phi.
\]

Now, if \( 2\Delta \) be the arc of a great circle intercepted between \( A \) and \( B \),

\[
\cos 2\Delta = \sin \delta \sin \delta' + \cos \delta \cos \delta' \cos (\alpha - \alpha');
\]

writing \( \sec 2\phi - 1 \) for \( \tan 2\phi \), and reducing, the condition of possibility becomes

\[
2 \sin \Delta > (\sin \delta - \sin \delta') \sec \phi.
\]

Like answers were given by Messrs. Dale, Escott, M'Namara, Milbourn, Smith, Somerscales, Traynor, and Wilson.

PRINTED FOR THE COMPANY OF STATIONERS.
V. QUEST. (2053); by Mr. Stephen Watson, Haydonbridge.

Let semicircles be described on the three sides of a plane triangle, mutually cutting the sides in D, E, F; then the sum of the three angles of the circular-sided triangle DEF is equal to four right angles.

Answered by Mr. Thomas Dobson, Hexham; and Dr. Rutherford.

At the extremities of each diameter draw tangents to the semicircles which will be perpendicular to the sides of the triangle ABC. The opposite circular angles at F and C are evidently equal, and the circular angle at C is measured by the two tangents at C.

Hence \( \angle F = \angle C + 2 \left( \frac{\pi}{2} - C \right) \)

\( = \pi - C \). Similarly, \( \angle E = \pi - B \),
\( \angle D = \pi - A \),
\( \therefore \angle D + \angle E + \angle F = 2\pi \), since \( A + B + C = \pi \).

It was similarly answered by nearly all our correspondents.

Again, by Mr. James Wilson, 45th Regiment, Poona Camp.

The points D, E, F are obviously the feet of the three perpendiculars of the triangle, intersecting in I; and as the circular angles D, E, F are severally equal to the angles BIC, CIA, AIB, round the point I, their sum is equal to four right angles.

VI. QUEST. (2054); by Dr. Rutherford, Woolwich.

If the quiescent air in a certain north latitude were suddenly transferred to a latitude \( \beta \) degrees further north than the former, the west wind had a velocity of \( m \) miles an hour; but if transferred to a latitude \( \beta' \) degrees south of the original latitude, the east wind had a velocity of \( m' \) miles per hour; what was the latitude of the place?

Answered by Dr. Rutherford, the Proposer; Mr. Stephen Watson, Haydonbridge, and "Cubic," M.A. Cantab.

Let \( \omega \) the horary rotatory velocity of the earth at the equator, and \( \phi \) the required latitude; then the velocities of the earth’s surface in this latitude and those of \( \beta \) and \( \beta' \) degrees further north and south are respectively

\[ \omega \cos \phi, \omega \cos (\phi + \beta), \text{ and } \omega \cos (\phi - \beta') \]

and when the air is quiescent it must be moving at the same rate as the earth’s surface; hence it is evident that

\[ m = \omega \{ \cos \phi - \cos (\phi + \beta) \}, \quad m' = \omega \{ \cos (\phi - \beta') - \cos \phi \}, \]
THE LADY'S AND GENTLEMAN'S DIARY. 1867

\[
\frac{m}{m'} = \frac{\cos \phi - \cos(\phi + \beta)}{\cos(\phi - \beta') - \cos \phi} = \frac{\tan \phi \sin \beta + 2 \sin^2 \frac{\beta}{2}}{\tan \phi \sin \beta' - 2 \sin^2 \frac{\beta'}{2}}
\]

and \( \tan \phi = \frac{2(m \sin^2 \frac{\beta}{2} + m' \sin^2 \frac{\beta'}{2})}{m \sin \beta' - m' \sin \beta} \).

If \( \beta = \beta' \), then \( \tan \phi = \frac{m + m'}{m - m'} \tan \frac{\beta}{2} \).

This question was similarly answered by Messrs. Barlow, Brown, Buttery, Cranston, Dale, Dobson, Escott, Hall, M'Namara, Milbourn, Traynor, Turnbull, and Watson.

VII. QUEST. (2055); by Mr. THOMAS DOBSON, B.A., Hexham.

At three islands (or ships) of known positions the times are noted of the arrival of an unusually high wave caused by a distant submarine volcanic eruption or by a cyclone. Supposing the velocity of the wave after it reaches the first station to be uniform and known, find the bearing and distance of the central disturbance.

Answered by Mr. STEPHEN WATSON, Haydonbridge; and Mr. THOMAS DOBSON, the Proposer.

Let \( A, B, C \) be the three ships, \( P \) the central disturbance. With centre \( P \) and radius \( PA \) describe an arc meeting \( PB, PC \) in \( D \) and \( E \). Then the wave must arrive at \( D, A \) and \( E \), at the same instant; and after that, being of uniform given velocity, therefore the distances \( BD, CE \) are known. Also because \( BP - AP = BD \), and \( CP - AP = CE \), the point \( P \) is at the intersection of the two hyperbolas whose foci are \( A, B \) and \( A, C \), and whose major axes are equal to \( BD \) and \( CE \).

Produce \( BA \) to meet \( PC \) in \( F \); put \( PA = r \), \( \triangle PAF = \phi \), and \( \angle FAC = \alpha \). Also let \( p, p', e, e' \), be the semiparameters and excentricities of the two hyperbolas named above. Then by these equations we have

\[
r = \frac{p}{1 - e \cos \phi} = \frac{p'}{1 + e' \cos (\alpha + \phi)} \tag{1}
\]

\[
\therefore \{ p - p' + (p'e + pe' \cos \alpha) \cos \phi \}^2 = p^2e^2 \sin^2 \alpha (1 - \cos^2 \phi)
\]

and putting for brevity \( p^2e^2 + p^2e'^2 + 2pp'e'e' \cos \alpha = m \), this quadratic gives

\[
m \cos \phi = (p' - p)(p'e + pe' \cos \alpha) \pm pe' \sin \alpha \sqrt{m - (p - p')^2},
\]

which determines the bearing; and thence the distance \( r \) is given by (1). The double value of \( \phi \) belongs to the two points \( P \) and \( P' \), in which the hyperbolas intersect.

Like answers were given by "Cubic," and Messrs. Barlow, Borradille, Brown, Buttery, Cranston, Escott, Hall, Milbourn, and Wilson.

PRINTED FOR THE COMPANY OF STATIONERS.
VIII. QUEST. (2056); by Mr. W. S. B. Woolhouse, London.

An ellipse being referred to its principal axes \((ab)\), let \(p\) denote the radius of curvature at the point \(xy\); then the radius of curvature of the evolute at the point which corresponds to the centre of curvature of the ellipse \(= 3pxy \left( \frac{1}{b^2} - \frac{1}{a^2} \right)\).

Answered by Mr. Stephen Watson, Haydonbridge; and similarly by “Cubic” and Messrs. Barlow, Borradaile, Brooks, Brown, Buttery, Cranston, Dale, Dobson, Escott, Hall, Milburn, Rutherford, McNamea, Traynor, Tucker, Turnbull, and Wilson.

Let \(a, \beta\) be the coordinates of the centre of curvature at the point \((xy)\); then (Young’s ‘Anal. Geo.’ Part I, p. 208),

\[ a^4a = c^2x^2 \text{ and } b^4\beta = -c^2y^2; \]

\[ \frac{d\beta}{da} = \frac{a^4y^2dy}{b^4x^2dx} = \frac{a^4y^2}{b^4x^2} \times \frac{b^2x}{a^2y} = \frac{a^2y}{b^2x}; \]

\[ \frac{d^2\beta}{da^2} = \frac{a^2(xy - ydx)}{b^2x^2da} = \frac{(b^2x^2 + a^2y^2)dx}{b^2xy^2da} = \frac{a^6}{3c^2x^4y}. \]

Consequently the radius of curvature at \((a, \beta)\) in the evolute is

\[ \left\{ 1 + \left( \frac{d\beta}{da} \right)^2 \right\}^{\frac{3}{2}} \frac{3c^2xy}{a^2b^2} = \frac{3pxy}{a^2b^2} \frac{c^2}{a^2b^2} = 3pxy \left( \frac{1}{b^2} - \frac{1}{a^2} \right). \]

Mr. Watson further observes,

Under similar conditions in the parabola, the radius of curvature is \(= 6pxy^{-1}\).

IX. QUEST. (2057); by Mr. John Collins, Dublin.

Prove that the squares of the diagonals of any quadrilateral inscribed in a circle have the same ratio as the distances of their middle points from the middle point of the third diagonal of the quadrilateral; and show that this theorem gives an immediate and new solution of the famous problem “Given a circle and the lengths of the three diagonals of a quadrilateral inscribed in it, to construct the quadrilateral” (vide Mulcahy’s ‘Mod. Geom.’ Art. 78).

Solution by Mr. John Collins, the Proposer; and similarly by Mr. Wm. Barlow, Kensington; Mr. James Dale, Aberdeen; Mr. Thos. Dobson, Hexham; Mr. Albert Escott, Greenwich; Mr. W. H. Levy, Shalbourne; and Mr. James Traynor, Carrickmacross.

Let ABCD be the quadrilateral; M, N and P the middles of the
diagonals AC, BD and GH; and let OM and ON produced meet GH in E and F, which are the poles of AC and BD, and therefore EA and FD are tangents, and the points E, F, G, H form a harmonic group, and \( \therefore PE \cdot PF = PG^2 \).

Also as OM : OE = OA^2 = ON : OF, the quadrilateral EMNF is inscribable in a circle, and therefore PM : PN = PE : PF = PG^2. Again, considering the sides of the triangle OMN to be cut by the transversal EFP, MP : PN : : \{ EM : EO \}
\{ OF : FN \}

But, as EM, EA, EO are in continued proportion, EM : EO :: EM^2 : EA^2 :: AM^2 : AO^2; and, similarly, OF : FN :: OD^2 : DN^2.

Therefore


To construct the quadrilateral when the three diagonals AC, BD and GH are given, we have, from the last proportion, \( \sqrt{(PM \cdot PN)} : PM - PN : : AC \cdot BD : AC^2 - BD^2; \) that is, PG : MN : : AC \cdot BD : AC^2 - BD^2; \( \therefore GH : MN : : 2AC \cdot BD : AC^2 - BD^2, \) from which MN is given; and as OM and ON are also known, from AC and BD, the three sides of the triangle OMN are given, and it may be constructed; and then we have only to draw AC and BD, perpendicu-
lars to OM and ON.

Good analytical solutions were given by Messrs. Hall, Milbourn, Turnbull, and Watson.

X. QUEST. (2059); by Mr. Stephen Watson, Haydonbridge.

If through any point O within a triangle ABC three lines, AD, BE, CF, be drawn meeting the sides in D, E, F; and a conic be described through D, E, F, cutting the sides again in D', E', F'; then AD', BE', CF pass through one point O'. Show that if O be fixed, and the conic pass also through O, the locus of O' will be a conic passing through A, B, C.

Answered by Mr. Stephen Watson, the Proposer; and in like manner by Mr. Thomas Dobson, Hexham; and Mr. Albert Escott, Royal Hospital School, Greenwich.

Let the triads of lines through O and O' be denoted by the equations

\[ l\alpha = m\beta = n\gamma \].............. (1)

\[ l'\alpha = m'\beta = n'\gamma \].............. (2);

then the equation of the conic through D, E, F, D', E', F' may at once be written down, and is

\[ (l\alpha - m\beta) (l'\alpha - m'\beta) + (m\beta - n\gamma) (m'\beta - n'\gamma) + (n\gamma - l\alpha) (n'\gamma - l'\alpha) - l'l'\alpha^2 - mm'\beta^2 - nn'\gamma^2 = 0 ....... (3). \]
Eliminate \(\alpha, \beta, \gamma\) from (1) and (3), the result
\[
\frac{l'}{l} + \frac{m'}{m} + \frac{n'}{n} = 0 \quad \text{........... (4)}
\]
is the condition that the conic (3) shall pass through O. Again, eliminate \(l', m', n'\) from (2) and (4), the result
\[
\frac{1}{la} + \frac{1}{m\beta} + \frac{1}{n\gamma} = 0,
\]
is the equation of the locus of O', and is a conic passing through A, B, C.
In like manner when O' is fixed and the conic passes through it, the locus of O is the conic
\[
\frac{1}{l'a} + \frac{1}{m'\beta} + \frac{1}{n'\gamma} = 0.
\]
Analogous answers were given by Messrs. Barlow, Borradaile, Dale, Hall, M'Namara, and Wilson.

Again, by Mr. Septimus Tebay, Rivington; and Mr. Robert Tucker, M.A., University College School.

Let the equations to BC, CA, AB be \(u = 0, v = 0, w = 0\); then the equations to EF, FD, DE are \(v + w - u = 0, w + u - v = 0, u + v - w = 0\); and the equation to a conic through D, E, F is
\[
\frac{A}{v + w - u} + \frac{B}{w + u - v} + \frac{C}{u + v - w} = 0 \quad \text{................. (1)}.
\]
In this put \(u = 0, v = 0, w = 0\) respectively, and we have
\[
\begin{align*}
(A - B + C) v - (A + B - C) w &= 0, \\
(B - C + A) w - (B + C - A) u &= 0,
\end{align*}
\]
\[
\begin{align*}
(C - A + B) u - (C + A - B) v &= 0. \\
\end{align*}
\]
which are the equations to AD', BE', CF', and which therefore pass through the same point.
If the conic (1) passes through the point \(u = v = w\), we have \(A + B + C = 0\); and equations (2) become
\[
Au = Bu = Cv.
\]
Eliminate \(A, B, C\), and we get
\[
\frac{1}{u} + \frac{1}{v} + \frac{1}{w} = 0,
\]
the equation to a conic circumscribing the triangle ABC.
XI. QUEST. (2059); by Mr. C. H. Brooks, C.E., London.

Two bars or rods, AB, BC, connected by a joint at B, move always in a plane parallel to the paper, and on a given point of the bar BC is placed a wheel which turns upon it as an axis; show that if the end A be fixed while C is passed completely round the periphery of any area, the amount of rotation of the wheel, by sliding and rubbing over the paper, will be proportional to the area.

Answered by Mr. Stephen Watson, Haydonbridge; and in like manner by Mr. C. H. Brooks, the Proposer; Mr. Thomas Dobson, Hexham; and Mr. A. Hall, Naval Observatory, Washington, U.S.

Let AB, BC, and D be corresponding positions of the rods and wheel, and AB', BC', and D' their consecutive positions. Put $AB = a$, $BC = b$; $BD = c$, and $\angle ABC = \pi - \alpha$; also the angles described by AB and BC from their initial positions $= \beta, \gamma$.

Then if $dA$ be the elementary area passed over by the rods, and $ds$ the corresponding rotation of the wheel, estimated between the positions stated, we shall have

$$ds = \text{rotation due to the distance of } B'Q \text{ from } BC$$

$$+ \text{ that due to the angular magnitude } C'B'Q \text{ at } D'.$$

$$= BB' \cos \alpha + cd\gamma.$$

$dA$ is the sum of the areas of $BAB'$, $BCQB'$, $B'QC'$

$$= \frac{1}{2} a^2d\beta + b \cdot BB' \cos \alpha + \frac{1}{2} b^2d\gamma,$$

which by (1)

$$= \frac{1}{2} a^2d\beta + b (ds - cd\gamma) + \frac{1}{2} b^2d\gamma;$$

$$\therefore A = \frac{1}{2} a^2\beta + bs + b \left(\frac{1}{2} - c\right) \gamma.$$

When C has passed completely round the periphery, $\beta, \gamma$ vanish, and $A = bs$.

If A be posited within the area, the rods will pass completely round that point, and the limits of $\beta$ and $\gamma$ will then be $0$ to $2\pi$, so that in this case

$$A = bs + \pi (a^2 + b^2 - 2bc).$$

Mr. Dobson observes, "this is a proof of the principle of an instrument called the 'Planimeter,' invented a few years ago by Professor Amsler, of Schaffhausen, for measuring the area of any portion of a map or plan drawn to scale."

Mr. Escott refers to a description of the 'Planimeter' in a popular work on Surveying, by Dr. Day, of Bristol.
XII. QUEST. (2060); by Mr. A. Ewbank, Cantab.

AFBDCE is a hexagon whose opposite sides are equal and parallel; \( AF = b, \)
\( FB = a, \) \( BD = c; \) \( AD = a, \) \( BE = \beta, \) \( CF = \gamma. \) If the hexagon consist of
rods freely jointed at the vertices, and \( AD, BE, CF \) be strings whose tensions
are \( P, Q, R \) respectively, then will

\[
\frac{P}{\alpha \sin A (b \sin C + c \sin B)} = \frac{Q}{\beta \sin B (c \sin A + a \sin C)} = \frac{R}{\gamma \sin C (a \sin B + b \sin A)}.
\]

Answered by "Cubic," M.A., Cantab.; Mr. Thomas Dobson, Hexham; Mr. Thomas Milbourn, Riding Mill; and Mr. Stephen Watson, Haydonbridge.

Through \( D \) and \( E \) draw \( mn, MN \) perpendicular to \( FB, DC \) produced.

Then for the equilibrium of the hinge at \( B, \) since the thrust of each rod acts along its length, if \( T \) be the thrust of the rod \( BD \) on \( B, \) resolving the forces at \( B \) perpendicular to \( BF, \)

\[ T \sin B = Q \sin OBF. \]

Similarly at \( A, \)

\[ T \sin A = P \sin OAF; \]

\[
\therefore \frac{P \sin B}{Q \sin A} = \frac{\sin OBF}{\sin OAF} = \frac{mn}{\beta \cdot \frac{MN}{\alpha}} = \frac{\alpha \cdot Dn + Dm}{\beta \cdot EM + EN} = \frac{\alpha \cdot b \sin C + c \sin B}{\beta \cdot \frac{c \sin A + a \sin C}{\sin A}};
\]

\[
\therefore \frac{P}{\alpha \sin A (b \sin C + c \sin B)} = \frac{Q}{\beta \sin B (c \sin A + a \sin C)}.
\]

and similarly \( \frac{R}{\gamma \sin C (a \sin B + b \sin A)} \)

The question was answered in a similar manner by Messrs. Barlow, Dale, Escott, Hall, McNamara, Smith, Traynor, and Wilson.

XIII. QUEST. (2061); by Mr. Thomas Dobson, B.A., Hexham.

Two small heavy particles, \( P, Q, \) are connected by a rigid rod of inconsiderable
weight; \( P \) is placed on a movable wedge which rests on a smooth horizontal plane, and \( Q \) is laid on this plane. Show that during the ensuing motion \( P \) moves in a conic section.
Solution, by Mr. Septimus Tebay, Rivington; Mr. Stephen Watson, Haydonbridge; and "Cubic."

Let ABC be the wedge, G its centre of gravity, GD, PM perpendiculars to AB.

Since no forces act horizontally, the common centre of gravity will remain in the same vertical line; let this be Oy, and put OM = x, PM = y, OQ = x', OD = y', PQ = a, AD = b, \( \angle BAC = \alpha \), and M the mass of the wedge. Then, by the principle of the conservation of motion of the centre of gravity,

\[ Pz + Qx' = Mx'. \]

But \( b - x - y \cot \alpha = x' \),

and \( (x' - x)^2 + y^2 = a^2 \);

\[ \therefore \{ M (b - x - y \cot \alpha) - (P + Q) x \}^2 - Q^2 (a^2 - y^2) = 0, \]

which is of the second degree; and, on applying the usual criterion, it will be found to represent an ellipse, having its centre in the line BQ.

Mr. Thomas Dobson, the proposer, and Messrs. Brooks, Escott, Hall, M'Namara, Milbourn, and Traynor, solve the question by integration from the fundamental dynamical equations; Mr. Dobson appends to his solution the following judicious note:

"If P and Q were balls of finite magnitude, the whole action of the rod would not be in the direction of its length as assumed. For, if so, all the forces on P and Q would pass through their centres, and the balls could have no accelerative motion of rotation. But they evidently would have such motion, since the rod continually changes its direction, and its angle of inclination \( \theta \) diminishes as the ball P descends.

The rod, therefore, would produce a moment \( Pk^2 \frac{d^2\theta}{dt^2} \) about the centre of the ball P, and there would be a tendency to break at any point of the rod. In the case of particles of inconsiderable dimensions, this moment vanishes, since \( k = 0 \), and the whole action of the rod is in the direction of its length."

XIV. QUEST. (2062); by Mr. William Godward, Chelsea.

Let \( H_1, H_2, H_3 \) be the intersections of the four triads (AD, BE, CF), (AD, BE, CF), (AD, BE, CF), (AD, BE, CF) drawn from the vertices.
of a plane triangle to the points of contact of the inscribed circle (O) and of each of the escribed circles \((O_1), (O_2), (O_3)\), taken separately; and \(P_1, P_2, P_3, P_4\) the intersections of the four triads \((L, M, N), (L, M, N'), (L', M, N'), (L', M', N')\) drawn from \(L, M, N\), the middle points of the sides \(BC, CA, AB\), parallel to the rays of the preceding triads taken in order. It is required to prove that each of the quartads \((HP, H_1P_1, H_2P_2, H_3P_3)\) and \((OP, O_1P_1, O_2P_2, O_3P_3)\) is concurrent.

Answered by Mr. William Godward, the Proposer; and similarly by Mr. Wm. Barlow, Kensington; Mr. Samuel Bills, of Hawton; Mr. Thos. Dobson, Hexham; Mr. Albert Escott, Greenwich; Mr. A. Hall, Washington, U. S.; Mr. John Turnbull, Bedlington; and Mr. Stephen Watson, of Haydonbridge.

The trilinear coordinates of the point \(F\) are \(s_2 \sin B, s_1 \sin A, 0\); and as the values of \(a, b\) are here proportional to \(s^2, s_1a\), the equation of \(CF\) is \(s_1a = s_2b\). Thus, the first four triads and their respective points \((H)\) of concurrence are included in the sets of equations

\[
\begin{align*}
    s_1a &= s_2b = s_3c \\
    -s &= a = s_2b = s_3c \\
    s_3b &= -s = b = s_1c \\
    s_3a &= = s_1b = -s = c
\end{align*}
\]

The equation of \(AD\) being \(s_2b - s_3c = 0\), the equation of a line parallel to it is of the form \(s_2b - s_3c + \lambda (a + b + c) = 0\). That this parallel may pass through \(L\), the middle point of \(BC\), put \(b' = c\) and \(a = 0\); then \(\lambda = \frac{1}{2} (s_2 - s_3) = \frac{1}{2} (b - c)\) and, observing that \(s_3 = s_2\), the equation of \(LR\), and, similarly, those of \(MS, NT\), are found to be

\[
\begin{align*}
    (b - c) a + b' - c' &= 0 \\
    (c - a) b + c' - a &= 0 \\
    (a - b) c + a' - b' &= 0
\end{align*}
\]

and, by eliminating each of the coordinates \(a, b, c\) from these, the set of equations of the triad \((AP, BP, CP)\), and hence also, by symmetry, those of the triads \((AP_1, BP_1, CP_1), (AP_2, BP_2, CP_2), (AP_3, BP_3, CP_3)\),
\[(AP_3, BP_3, CP_3), \text{ are} \]

\[\frac{a}{s_1} = \frac{\beta}{s_2} = \frac{\gamma}{s_3} \]

\[\frac{a}{s} = \frac{\beta}{s_3} = \frac{\gamma}{s_2} \]

\[\frac{a}{s} = \frac{\beta}{s_1} = \frac{\gamma}{s} \]

\[\begin{align*}
\alpha = \beta = \gamma \\
\end{align*}\]

\[\text{..... (2).} \]

Again, the line HP passes through the first point in (1) and the first point in (2), and its equation is

\[s_1(s_2^2 - s_3^2 c) a + s_2(s_3^2 - s_1^2 a)c = s_3(s_1 a - s_2 b)c \gamma = 0;\]

but \(s_2^2 b - s_3^2 c = s_2^2(s_3 + s_1) - s_3^2(s_1 + s_2) = (s_2 - s_3)(s_1 s_3 + s_2 s_3 + s_3 s_1),\)

and similar values obtain for the other coefficients.

Hence the equations of HP, \(H_1 P_1, H_2 P_2, H_3 P_3\) are respectively

\[\begin{align*}
& s_1(s_2 - s_3) a + s_2(s_3 - s_1) b \beta + s_3(s_1 - s_2) c \gamma = 0 \\
& s(s_2 - s_3) a + s_3(s_2 - s_1) b \beta - s_2(s_1 + s_2) c \gamma = 0 \\
& -s_2(s + s_1) a + s(s_3 - s_1) b \beta + s_3(s + s_2) c \gamma = 0 \\
& s_2(s + s_1) a - s_1(s + s_2) b \beta + s(s_1 - s_2) c \gamma = 0 \\
\end{align*}\]

\[\text{..... (3).} \]

These lines all meet in the point

\[a \alpha = b \beta = c \gamma = \frac{2}{3} \Delta \text{ .. (4),} \]

as we find by eliminating \(a, \beta, \text{ or } \gamma\) from any two of the equations; and this point of concurrency is the centre of gravity of the given triangle.

Lastly, from the equations (2) and the known equations of the internal and external bisectors, the equations of the lines OP, \(O_1 P_1, O_2 P_2, O_3 P_3\) are found to be

\[\begin{align*}
&(s_2 - s_3) a + (s_3 - s_1) b \beta + (s_1 - s_2) c \gamma = 0 \\
&(s_2 - s_3) a + (s + s_2) b \beta - (s + s_3) c \gamma = 0 \\
&-(s + s_1) a + (s_3 - s_1) b \beta + (s + s_3) c \gamma = 0 \\
&(s + s_1) a - (s + s_2) b \beta + (s_1 - s_2) c \gamma = 0 \\
\end{align*}\]

\[\text{..... (5),} \]

and these all meet in the point

\[\frac{a}{\alpha} = \frac{\beta}{b} = \frac{\gamma}{c} = \frac{2 \Delta}{a^2 + b^2 + c^2} \text{ .. (6),} \]

which is identical with that determined in Questions (2039) and (2047), 'Diary,' 1866.
Mr. Godward adds the following interesting corollaries

Cor. 1.—The point (4) is known to be such that the sum of the squares of its distances from the vertices is a minimum; and the point (6) is such that the sum of the squares of its distances from the sides of the triangle is a minimum.

Cor. 2.—Multiplying together vertically the equalities in (1), we find that the trilinear coordinates of the points H, H₁, H₂, H₃ have the relation

\[ aα₁a₂a₃ = ββ₁β₂β₃ = γγ₁γ₂γ₃. \]

And, similarly, from (2) it will appear that the same relation obtains amongst the coordinates of the other four points P, P₁, P₂, P₃.

Cor. 3.—The equations to \( LR₁, MS₂, NT₃ \), viz.,

\[ (b - c) α - bβ + cγ = 0, \]
\[ (c - a) β - cγ + aα = 0, \]
\[ (a - b) γ - aα + bβ = 0, \]

are satisfied by making \( α = β = γ \), and therefore this triad intersects in \( O \), the centre of the inscribed circle. Similarly, the triads \( LR₂, MS₁, NT₂ \), \( LR₃, MS₂, NT₁ \), \( LR₄, MS₃, NT₄ \) respectively intersect in \( O₁, O₂, O₃ \), the centres of the escribed circles.

Cor. 4.—Each of the triads \( AD₁, BE₂, CF₃ \), \( AD₂, BE₃, CF₄ \), \( AD₃, BE₁, CF₄ \), \( AD₃, BE₂, CF₃ \) is concurrent. If \( K, K₁, K₂, K₃ \) be the intersections of these triads, then \( OK, O₁K₁, O₂K₂, O₃K₃ \) will each pass through the centre of gravity of the triangle. See ‘Educational Times,’ Reprint, vol. ii, page 55, where it is also shown that \( HK, H₁K₁, H₂K₂, H₃K₃ \) intersect in a point whose coordinates are

\[ \frac{b'^2 \cos A}{R(a^2 + b^2 + c^2)} = \frac{c^2 \cos B}{R(a^2 + b^2 + c^2)} = \frac{a'^2 \cos C}{R(a^2 + b^2 + c^2)}. \]

Mr. Stephen Watson deduces the following neat corollary:

Cor.—If \( αβγ', α''β''γ'' \) denote the points (4) and (6), then

\[ α'α'' = β'β'' = γ'γ''. \]

Mr. Godward's third corollary was also given by Mr. John Turnbull.

Mr. T. M'Namara and Mr. James Traynor take two of the sides of the triangle as coordinate axes, and thereby effect good solutions, which are only excluded for want of space.

XV. PRIZE QUEST. (2063); by Mr. W. S. B. Woolhouse.

Suppose the periphery of a given circle to be made up of an indefinite number of points, and the plane of the circle to be covered by straight lines connecting every two of those points; and determine the law of density of this mass of lines as depending on the distance from the centre of the circle.
Let AB be a diameter of the given circle, C its centre, O any point in CB, POQ, P'Q' parallel chords, P and P' being consecutive points, and CD a perpendicular to PQ, cutting it and P'Q' in m, m'. Now, if we suppose the circle to be covered with lines through consecutive points parallel to PQ, and then suppose this mass of lines to move with P, while P takes every position on the semicircumference BPA, we shall have taken account of the whole mass of lines drawn as stated in the question. But so far as the density at O is concerned, it is plain we only need to take account of the closeness of P'Q' to PQ, and then suppose P to take every position as above. Put CB = a, CO = ma, \angle BCD = \phi, \text{ and } \angle CPQ = \theta. \text{ Then PP', though indefinitely small, is constant, and may be regarded as a straight line perpendicular to CP; hence the closeness of P'Q' to PQ is as } \frac{PP'}{mm'} = \frac{PP'}{PP' \cos \theta} = \frac{1}{\sqrt{1 - m^2 \cos^2 \phi}} \ldots \ldots (1),

since \sin \theta = m \cos \phi.

The whole density at O is therefore \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{r d\phi}{\sqrt{1 - m^2 \cos^2 \phi}}, an elliptic function, whose value may be determined for any given value of m, m being < 1. If D, D' be the densities at C and O,

\[ D : D' = \pi : \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{d\phi}{\sqrt{1 - m^2 \cos^2 \phi}}, \text{ the law required.} \]

Messrs. Brooks, Hall, and Milbourn answer the question in a similar manner.

Second Solution, by Mr. Septimus Tebay, Rivington; and in like manner by Mr. Thomas Dobson, Hexham; and Mr. Albert Escott, Greenwich.

Let O be the centre of the circle, OA, OC radii, P a point in OA.

Since each pair of consecutive points in the circumference will subtend equal angles at C, a circular arc mPn, described from this point to pass through P, will be of uniform density as regards all the lines drawn from C, and will vary inversely as the radius CP.

Let OA = a, OP = r, \angle AOC = \theta;
then \( PC = \sqrt{(a^2 - 2ar \cos \theta + r^2)} \);

and the density at \( P \propto \int_0^\pi \frac{d\theta}{\sqrt{(a^2 - 2ar \cos \theta + r^2)}} \).

Mr. John Brown, of Whitwell Colliery, Durham, by developing his expressions into infinite series, arrives at results which numerically exhibit a tolerably good approximation.

**Third Solution by Mr. W. S. B. Woolhouse, the Proposer.**

Suppose the circumference of the given circle to be made up of \( n \) equidistant points. Let \( P \) be one of the points, and first consider the set of \( n - 1 \) chords drawn from it to the other points; then \( PQ \) being one of these chords, making an angle \( \theta \) with the diameter \( PH \), let it be bisected by the perpendicular \( Om \). If the radius of the given circle be taken as the linear unit, we shall have \( Om = \sin \theta \). Also if \( \rho \) denote the radius of any circle concentric with the given one, the portion of the chord \( PQ \) which lies within it is \( ef = 2\sqrt{\rho^2 - \sin^2 \theta} \); and hence differentiating with respect to \( \rho \), the two equal portions comprised within the annulus, bounded by two concentric circles whose radii are \( \rho \) and \( \rho + d\rho \), are together found to be equal to

\[
\frac{2d\rho}{\sqrt{\rho^2 - \sin^2 \theta}}.
\]

Multiply this into \( 2n \frac{d\theta}{\pi} \), the number of chords \( PQ \) contained in \( 2d\theta \), and by integrating from \( \sin \theta = 0 \) to \( \sin \theta = \rho \), the quantity of line received by the annulus from all the chords which proceed from \( P \) will be

\[
\frac{4n\rho d\rho}{\pi} \int \frac{d\theta}{\sqrt{(\rho^2 - \sin^2 \theta)}}.
\]

Now, the set of chords from each of the \( n \) points must in like manner severally pour into the annulus the same quantity of line with a similar but different distribution; but, when the total is taken into consideration, the distribution will obviously become uniformly spread round the entire area of the annulus. Hence, multiplying by \( n \) and taking only half the product, because each chord is repeated backwards from the other extremity, we get the total quantity of line thrown on the annulus; and, dividing by \( 2\pi \rho d\rho \), the area of the annulus, we get for the required density of the mass of lines at the distance \( \rho \) from the centre, the formula

\[
D = \frac{n^2}{\pi^2} \int \frac{d\theta}{\sqrt{(\rho^2 - \sin^2 \theta)}} \quad \text{.......................... (a)},
\]

which expresses an elliptic function. To reduce it to the usual form,
join Oe and let φ denote the angle Oem; then \( Om = \sin \theta = \rho \sin \phi \);

\[ \therefore d\theta = d\phi \frac{\rho \cos \phi}{\cos \theta} \text{, and } \sqrt{(\rho^2 - \sin^2 \theta)} = \rho \cos \phi \; \]

\[ \therefore D = \frac{n^2}{\pi^2} \int \frac{d\phi}{\cos \theta} = \frac{n^2}{\pi^2} \int \sqrt{\frac{d\phi}{(1 - \rho^2 \sin^2 \phi)}} \quad \ldots \quad (\beta) \]

The limits are now \( \phi = 0 \) to \( \frac{1}{2} \pi \), so that the function is complete, and its modulus is \( \rho \).

\[
\text{If } \int_0^{\frac{1}{2} \pi} \frac{d\phi}{\sqrt{1 - \rho^2 \sin^2 \phi}} = \frac{1}{2} \pi \cdot A,
\]

then, \( D = \frac{n^2}{2\pi} \cdot A \quad \ldots \quad (\gamma) \]

and the values of \( A, \&c. \), will be as shown in the following table:

<table>
<thead>
<tr>
<th>( a )</th>
<th>( \log \frac{F}{\frac{1}{2} \pi} )</th>
<th>( A = \frac{F}{\frac{1}{2} \pi} )</th>
<th>( \rho = \sin a )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>0.00000000</td>
<td>1.00000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>6</td>
<td>0.0011920</td>
<td>1.0027485</td>
<td>1.0453</td>
</tr>
<tr>
<td>12</td>
<td>0.0047846</td>
<td>1.0110779</td>
<td>2.0791</td>
</tr>
<tr>
<td>18</td>
<td>0.0108284</td>
<td>1.0253468</td>
<td>3.0002</td>
</tr>
<tr>
<td>24</td>
<td>0.0194130</td>
<td>1.0437142</td>
<td>4.0674</td>
</tr>
<tr>
<td>30</td>
<td>0.0306733</td>
<td>1.0731818</td>
<td>5.0000</td>
</tr>
<tr>
<td>36</td>
<td>0.0448034</td>
<td>1.1086729</td>
<td>5.9777</td>
</tr>
<tr>
<td>42</td>
<td>0.0620765</td>
<td>1.1436558</td>
<td>6.9913</td>
</tr>
<tr>
<td>48</td>
<td>0.0828812</td>
<td>1.1806727</td>
<td>7.4314</td>
</tr>
<tr>
<td>54</td>
<td>0.1077813</td>
<td>1.2186850</td>
<td>8.0002</td>
</tr>
<tr>
<td>60</td>
<td>0.1376327</td>
<td>1.3728804</td>
<td>8.8603</td>
</tr>
<tr>
<td>66</td>
<td>0.1738201</td>
<td>1.4921763</td>
<td>9.1355</td>
</tr>
<tr>
<td>72</td>
<td>0.2188233</td>
<td>1.6559996</td>
<td>9.5106</td>
</tr>
<tr>
<td>78</td>
<td>0.2779878</td>
<td>1.9062162</td>
<td>9.7815</td>
</tr>
<tr>
<td>84</td>
<td>0.3663934</td>
<td>2.3248417</td>
<td>9.9452</td>
</tr>
<tr>
<td>90</td>
<td>∞</td>
<td>∞</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Supposing all the lines to be produced indefinitely in both directions, the foregoing reasoning up to the formula \( (\alpha) \) will hold good for an annulus exterior to the given circle. Only in this case \( \rho > 1 \), the limits of \( \theta \) will be complete, viz., from 0 to \( \frac{1}{2} \pi \), and the modulus \( \left( \frac{1}{\rho} \right) \) of the function \( (\alpha) \) will already be less than unity. Hence, when \( \rho > 1 \), we shall have
\[ D_* = \frac{1}{\rho} \left( \frac{n}{\pi} \right)^2 \int \frac{d\theta}{\sqrt{1 - \frac{1}{\rho^2} \sin^2 \theta}} = \frac{1}{\rho} \frac{D}{7} \]

which exhibits a neat relation between the exterior and interior densities.

When \( \rho = 0 \), then \( A = 1 \), and by (\( \gamma \)) the density at the centre of the given circle is

\[ D_0 = \frac{n^2}{2\pi} \]

The sum of the chords which proceed from one point \( P \) is equal to

\[ \int n \frac{d\theta}{\pi} \cdot 2\cos \theta \text{ taken from } -\frac{1}{2} \pi \text{ to } +\frac{1}{2} \pi, \text{ and is therefore } \frac{4n}{\pi} \]

Multiplying this by \( n \), the number of points, and taking half the product on account of each line being repeated backwards, we find the sum of all the lines or chords inserted in the circle to be \( \frac{2n^2}{\pi} \), which is equal to \( 4D_0 \). Thus we arrive at the remarkable property that, if the total amount of line were distributed at a uniform density equal to that at the centre, it would just cover an area equal to that of the square, which circumscribes the given circle.

The formula (\( \alpha \)), which expresses the density at any distance (\( \rho \)) from the centre, is of the same form as that which obtains for determining the time of vibration of a simple pendulum through a given circular arc. Let \( l \) be the length of a simple pendulum; \( g \) the accelerative force of gravity; \( 2\alpha \) the angle through which it vibrates on each side of the vertical, and \( 2\theta \) the angle described in ascending from the lowest point. Also let \( \sin \alpha \sin \phi = \sin \theta \); then

\[ t = \sqrt{\frac{l}{g}} \int \frac{d\phi}{\sqrt{1 - \frac{1}{\sin^2 \alpha \sin^2 \phi}}} \]

Hence, drawing the chords \( PA, PB \) touching any concentric circle and joining \( OA, OB \), we conclude that if \( O \) be the point of suspension of a simple pendulum which vibrates from \( A \) to \( B \), the time of such vibration will accurately measure the relative density round the circumference of the concentric circle to which \( PA, PB \) are tangents. This curious relation will enable us to form a practical judgment of the numerical law of density. As the time of vibration of a pendulum is nearly constant for small arcs, the density must be nearly uniform for some distance from the centre. When \( A, B \) are near to \( P \), the pendulum will at first descend very slowly, and the time of vibration will be sensibly greater; and when \( A, B \) coincide with \( P \), it will not descend at all, and the time will be infinite. Hence it appears that the density must suddenly become infinite at the boundary of the primitive circle.
When \( n \) is a given finite number, the number of lines is \( \frac{n(n-1)}{2} \).

To find the total number of intersections amongst them, it is to be observed that in every group of four points the six lines which connect them must necessarily involve one intersection. It hence follows that the number of intersections is the same as the number of ways in which four points can be chosen out of the \( n \) points, and this is equal to

\[
\frac{n(n-1)(n-2)(n-3)}{2 \cdot 3 \cdot 4}.
\]

A summation of the lines for a given finite number of points may also be accurately effected. Let \( \frac{\pi}{n} = \mu \); then the set of lines proceeding from one point P are chords of arcs equal to \( 2\mu, 4\mu, 6\mu, \ldots, 2(n-1)\mu \), and their sum is therefore

\[
2\left\{\sin \mu + \sin 2\mu + \sin 3\mu + \ldots + \sin \left(\frac{n-1}{n}\right)\mu\right\}
= 2\left\{\frac{\mu}{\sin \frac{\mu}{2}} \sin \frac{\pi}{2} \sin \frac{\pi}{2} \sin \frac{\pi}{2} \sin \frac{\pi}{2} \sin \frac{\pi}{2} \sin \frac{\pi}{2}\right\}
= 2 \cot \frac{\mu}{2};
\]

and for a circle, radius \( a \), it is \( 2a \cot \frac{\mu}{2} \). Hence, multiplying by \( \frac{1}{n} \), the complete sum of the \( \frac{n(n-1)}{2} \) lines is \( na \cot \frac{\mu}{2} = na \cot \frac{\pi}{2n} \).

This, spread over the area \( (4a^2) \) of the circumscribing square, gives a central density equal to \( \frac{n}{4a} \cot \frac{\pi}{2n} \), which varies nearly as \( \frac{n^2}{a} \).

On preparing a diagram for a given number of points, I was so struck with the beauty of the symmetrical configurations produced by the various clusters of intersections, that I have been induced to make drawings for different numbers of points, the changes observable in their progressive development investing them with a peculiar interest. Amongst the most picturesque are those which appertain to 26, 30, 32, 37, and 60 points, that of 37 being remarkably diversified.

In forming these diagrams it is most expedient to commence with the central lines, and work gradually outwards. I have had photographs taken of several of them, and also of a very large one, constructed from 144 points, with a diameter of 17 inches, containing 10,296 connecting lines, and involving 17,178,876 intersections, for which extraordinary production I am indebted to the assiduity and perseverance of my esteemed friend Mr. John Scott, of Lee.

Mr. John Brown, Whitwell Colliery, has also favoured me with an accurately executed diagram from 105 points to a diameter of 8 inches.

For the purpose of illustration I have drawn two designs on stone, one with 30 and the other with 37 points, which show the special network of these diagrams.*

* Printed by Augener and Co.
\[ n(n-1)/2 \]

It is to which comes follows the y's in which is equal to

points mostly process

\[ 2 \cot \theta \]

being by the

\[ \pi \cot \frac{\theta}{2} \]

given

I was so inclined to make it valuable in interest

30, 32,

e with photograph containing y, for y and

with matching tone, special
LIST OF MATHEMATICAL ANSWERS.

Arendt, Professor, Missouri, United States, ans. 2.
Barlow, William, 48, Edwards Square, Kensington, ans. 1 to 10, 12, 14.
Bills, Samuel, Hawton, near Newark-upon-Trent, ans. 2, 3, 14.
Borradaile, Walter A., Spring Grove, Middlesex, ans. 1, 2, 3, 5, 7, 8, 10.
Brown, John, Whitwell Colliery, Durham, ans. 1, 2, 3, 6, 7, 8, Prize.
Buttery, John, H.M. Dockyard, Pembroke Dock, ans. 1 to 8.
Collins, John, Ennis College, County of Clare, Ireland, ans. 1, 2, 5, 9.
Cranston, Thomas, Greenwich Nautical School, ans. 1, 2, 3, 5, 6, 7, 8.
"Cubic," M.A. Cantab., Stewkley, ans. 1 to 8, 12, 13.
Dale, James, 13, Craigie Street, Aberdeen, ans. 1 to 6, 8, 9, 10, 12.
Dobson, Thomas, B.A., Head Master of the Royal Grammar School, Hexham, answers all the Questions.
Escott, Albert, F.R.A.S., Royal Hospital Schools, Greenwich, ans. all the Questions.
Ewbank, A., Cantab., ans. 12.
Godward, William, 39, Margaretta Terrace, Oakley Street, Chelsea, ans. 14.
Grey, John, Westgate, Weardale, ans. Prize.
Hall, A., Naval Observatory, Washington, United States, ans. all the Questions.
Levy, W. H., Shalbourne, near Hungerford, Berkshire, ans. 9, Prize.
McNamara, T., Collooney, Sligo, Ireland, ans. 1 to 6, 8, 9, 10, 12, 13, 14.
Milbourn, Thomas, Riding Mill, near Newcastle-upon-Tyne, ans. 1 to 9, 12, 13, Prize.
Pearson, A., Derwent School, Medomsley, Gateshead, ans. 5.
Rutherford, Dr., Tweed Cottage, Maryon Road, Charlton, ans. 1 to 8.
Rutter, Edward, 15, D'Arcy Terrace, Sunderland, ans. 1.
Smith, James, Bellingham, Northumberland, ans. 1 to 5, 12.
Somerscales, Thomas, Hull, ans. 1, 2, 4, 5.
Tebay, Septimus, Grammar School, Rivington, ans. 10, 13, Prize.
Traynor, James, Land Surveyor and C. E., Shercock, Carrickmacross, Ireland, ans. 1 to 6, 8, 9, 12, 13, 14.
Tucker, Robert, M.A., &c., Mathematical Master to University College School, ans. 1, 2, 3, 5, 8, 10, 12.
Turnbull, John, Bedlington, ans. 1, 2, 3, 6, 8, 9, 14.
Watson, Stephen, Grammar School, Haydonbridge, Northumberland, ans. all the Questions.
Wilson, James, 45th Regiment, Poona Camp, ans. 1 to 10, 12.

* * * Our correspondents will please to bear in mind, that the arranging of the matter for the printer is greatly facilitated when they obligingly write out their contributions, intended for insertion, on one side of the paper only, or so that each distinct answer or subject may admit of an easy separation from other matter, without the necessity of having it re-written.

We regret to have to record the decease of the Rev. Joseph Jacques, M.A., Vicar of Bywell St. Andrew, and Incumbent of St. James's, Broomhaugh, on the 8th of May last, at Broomhaugh, aged 68 years. Mr. Jacques was a much esteemed contributor to the poetical department of the Diary.
We regret also to have to record the decease of a mathematician of distinguished ability, who was for many years a leading and most valuable contributor to the ‘Diaries.’ Mr. Peter Mason, formerly of Scoulton, near Hingham, Norfolk, died recently, aged 72, respected and regretted by all who knew him. In early life Mr. Mason was usher at Hingham, and then at Lynn. He was for nearly a quarter of a century First Mathematical Assistant at the Royal Naval College at Portsmouth, and afterwards for more than that time Head Master of the Perse School at Cambridge.

We have to return our acknowledgments for the following presentations:

To the Rev. Hugh Martin, M.A., Edinburgh, for a copy of a talented and comprehensive pamphlet, ‘A Study of Trilinear Coordinates,’ embodying a remarkably concise discussion of seventy-two interesting theorems in Transversals. We are glad to hear that Mr. Martin is engaged on a further development of this valuable paper.

To Mr. Robert Tucker, M.A., Mathematical Master to University College School, for a copy of his most interesting paper on a novel and effective branch of geometry, designated by him as “Radial Curves.” Numerous examples may be seen in the ‘Educational Times,’ and in the “Reprint,” from the same, which periodicals, we are glad to see, fully maintain their deservedly high character.

To Professor De Morgan for a copy of a paper “On Infinity; and the Sign of Equality,” from the ‘Transactions of the Cambridge Philosophical Society,’ vol. xi, part 2. It is an able and elaborate disquisition on an exclusive subject bordering on metaphysics, and will be highly prized by all who take an interest in such recondite inquiries. The learned author is inclined to dispute the solution of the three-point problem, XIV Quest. (1867), ‘Diary,’ 1862, and a paragraph purports to prove that the chance of an acute triangle is infinitely small. We have, however, endeavoured to discuss the mode of reasoning employed by Professor De Morgan, and shown that this is not so, in some observations inserted in the ‘Educational Times’ for September, 1866.

Mr. H. Herbert, of Sunderland, has also favoured us with ‘The Dial of Time,’ which comprises, on an ordinary sized card, a compact table of Dominical letters, using the vowels instead of the first letters of the alphabet, together with the table for thence finding the day of the week answering to any given date, past or to come.

The several prizes are allotted as follows:

For answers to the Prize Question, to Mr. Septimus Tebay, Rivington, and Mr. Stephen Watson, of Haydonbridge, each ten Diaries.

For General Mathematical Answers, to Mr. Thomas Dobson, B.A., Hexham, and Mr. A. Hall, Naval Observatory, Washington, United States, each ten Diaries.

For Poetical Answers to the Prize Enigma, to “Kitty,” and Mr. Ashton Smith, Uppingham, each ten Diaries.

For General Answers to the Enigmas, to Mr. Rutherford, Charlton, and Mr. James Barthram, of Scarborough, each ten Diaries.

And for answers to the Rebus and Charades, to Miss Helen Ogden, Shaw, and Mr. James Hersdon, Edinburgh, each eight Diaries.

All letters must, as usual, be directed “To the Editor of the Lady’s and Gentleman’s Diary, Stationers’ Hall, London.” They must likewise be post-paid, and arrive before May 1st, 1867, excepting letters from the United States, which will be received up to July 1st.
NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2064); by Mr. Thomas Somerscales, Schooner "Fairy."

Supposing that the velocity of a vessel, beating to the windward, varies directly as the sine of the angle by which the course exceeds 45° from the direction of the wind, determine the best angle the course can make with the direction of the wind when the vessel is plying dead to the windward.

II. QUEST. (2065); by Mr. Robt. Ambler, Stevenage Grammar School.

A gentleman has a globular glass vessel for gold fishes, one foot in diameter, and an air circle three inches in diameter. Assuming the vessel to be of no sensible relative weight, and to be freely suspended from a point in the rim, what quantity of water will it hold in that position without overflowing?

III. QUEST. (2066); by Mr. Thomas Milbourn, Riding Mill.

If $\sigma$ be the semi-perimeter of the triangle formed by joining the feet D, E, F of the perpendiculars of the triangle ABC; and $\sigma_1, \sigma_2, \sigma_3$ the semi-perimeters of triangles similar to ABC, and inscribed in the four circles of contact, prove that

$$\frac{1}{\sigma} = \frac{1}{\sigma_1} = \frac{1}{\sigma_2} + \frac{1}{\sigma_3}.$$

IV. QUEST. (2067); by Mr. Thomas Milbourn, Riding Mill.

Let $\delta$ be the diameter of the circle about the three rectangles inscribed in a triangle, having each a side coincident with one of the sides $(a, b, c)$ of the triangle, and their diagonals all intersecting in one point, and D the diameter of the circle about the triangle; prove that

$$\frac{1}{\delta^2} + \frac{1}{D^2} = \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}.$$

V. QUEST. (2068); by Mr. T. McNamara, Collooney, Stigo.

If $\sigma$ be the side of an equilateral triangle inscribed in a triangle ABC, and having one of its angular points at the middle of AB; and if $p_1, p_2$ be the perpendiculars from A and B on the opposite sides; prove that

$$\sigma^2 = \frac{p_1^2 + p_2^2 + p_1 p_2 (\cos C - \sqrt{3} \sin C)}{(\sqrt{3} \cos C + \sin C)^2}.$$

VI. QUEST. (2069); by Mr. C. H. Brooks, C. E., London.

Two straight lines of given lengths project at given angles from the circumferences of two given concentric circles; assign geometrically their relative position, so that the projecting extremities may be joined tangentially by an arc of a circle to be found.

VII. QUEST. (2070); by Mr. John Collins, Euniis College.

In a given circle to inscribe a triangle ABC having its vertex A at a given point of the circumference, AB : AC a given ratio, and its area a maximum; and prove geometrically that the base BC passes always through a fixed point, whatever be the given ratio AB : AC.

PRINTED FOR THE COMPANY OF STATIONERS.
VIII. QUEST. (2071); by Mr. C. H. Brooks, C.E., London.

Develop the function $\sin a - \sin x$ into its constituent linear factors with respect to $x$.

IX. QUEST. (2072); by Mr. Robert Tucker, M.A., London.

Perpendiculars to the vertical and focal vectors of any point on a conic are drawn through the vertex and focus; find the loci of the two points of intersection and the areas of the loops.

X. QUEST. (2073); by Mr. Artemus Martin, Franklin, U. S.

Required the mean distance of one corner of a rectangle from all points in its surface.

XI. QUEST. (2074); by Mr. Stephen Watson, Haydonbridge.

If perpendiculars PD, PE, PF be drawn from every point P in the triangle ABC to meet the sides in D, E, F, then the average area of the triangles DEF is

$$\frac{1}{12} \left( \sin^2 A + \sin^2 B + \sin^2 C \right)$$

of the triangle ABC.

XII. QUEST. (2075); by the late Professor Hearn.

Let AB be a given line of abscissæ; two systems of curves may be found, one convex and the other concave to AB, such that the radius of curvature at any point shall bear a constant ratio to the normal terminated by AB. Moreover, if two individuals, one of each system, be selected, a tangent drawn at any point in one of them and a parallel tangent to the other, the rectangle of the ordinates to the points of contact will be the same throughout the curves chosen.

XIII. QUEST. (2076); by Mr. Thomas Dobson, B.A., Hexham.

Determine the magnitude and position of the maximum and minimum values of the line of cusps during a solar eclipse, the relative rectilinear path of the moon's centre across the sun's disc being given.

XIV. QUEST. (2077); by Mr. Septimus Tebay, Rivington.

A bag contains tickets marked with the numbers 1, 2, 3, ..., 20. Required the probability that a drawing of an arbitrary number of tickets, made at random, will wholly consist of numbers in arithmetical progression.

XV. PRIZE QUEST. (2078); by Mr. Stephen Watson, Haydonbridge.

Let $O_1, O_2, O_3$ be the centres, and DEF, D₁E₁F₁, &c., the points of contact of the inscribed and escribed circles of the triangle ABC; and GHI the points where the interior bisectors of the angles meet the sides. Then the triads of lines (AB, DE, D₁E₁), (BC, EF, E₁F₁), (CA, FD, F₁D₁) meet in three points in a right line (L); the triads of lines (AB, D₁E₁, D₂E₂), (BC, E₁F₁, E₂F₂), (CA, F₁D₁, F₂D₂) meet in three points in a right line (M); and the triads (AB, GH, O₁O₂), (BC, HI, O₂O₃), (CA, IG, O₃O₁) meet in three points in a right line (N); and lastly, the triad of lines (L), (M), (N) meet in a point.
THE LADY'S AND GENTLEMAN'S DIARY,
FOR THE YEAR OF OUR LORD 1868,
Being Bissextile, or Leap Year.

DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF
STUDENTS IN MATHEMATICS:

COMPRISING
MANY USEFUL AND ENTERTAINING PARTICULARS,
INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT;

AND NOW ENLARGED BY THE
ADDITION OF A VARIETY OF GENERAL INFORMATION.

THE ONE HUNDRED AND SIXTY-FIFTH ANNUAL NUMBER.

LONDON:
PRINTED FOR
THE COMPANY OF STATIONERS,
AND SOLD BY J. GREENHILL,
[WOODFALL AND KINDER, MILFORD LANE, STRAND.]
### JANUARY, 1868.

**LUNATIONS AND PHASES.**
- First Q. D 3rd, 4h. 3m. m.
- Full M. O 9th, 10h. 53m. a.m.
- Last Q. C 16th, 5h. 4m. a.m.
- New M. O 24th, 7h. 18m. a.m.

It is mean or clock time throughout.

| D | M | W | D | Sun's | Moon's |
|   | rater. |   |   |   |   |   |
|   |   |   |   | 16 | 18'2 | 8 m 3 |
| 2 | 20 | 5 h. 24 m. |   | 13 | 16 | 17'9 | 7 25 |
| 25 |   |   |   | 16 | 16'8 | 6 47 |

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>1</td>
<td>CIRCUMCISION</td>
<td>h.</td>
<td>m.</td>
<td>h.</td>
<td>m.</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>2</td>
<td>Saturn rises 4.48 morn.</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>59</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>3</td>
<td>Epiphany: 12th Day</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>4</td>
<td></td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>5</td>
<td>2 Sunday after Christmas</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>6</td>
<td>[b. 1864; Lucian]</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>T</td>
<td>7</td>
<td>Pr. Alb. Vict. of Wales</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>8</td>
<td>Jupiter sets 8.33 aft.</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>T</td>
<td>9</td>
<td></td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>10</td>
<td></td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>11</td>
<td>Hilary Term begins</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>12</td>
<td>1 Sunday after Epiphany</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>13</td>
<td>Pl. M. ; Hil. Cam. Term begins</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>T</td>
<td>14</td>
<td>Oxford Term begins</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>15</td>
<td></td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>16</td>
<td>T</td>
<td>16</td>
<td>Mars rises 7.58 morn.</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>17</td>
<td></td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>18</td>
<td>Prisca</td>
<td>7</td>
<td>59</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td>19</td>
<td>2 Sunday after Epiphany</td>
<td>7</td>
<td>58</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>20</td>
<td>Fabian</td>
<td>7</td>
<td>57</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>21</td>
<td>T</td>
<td>21</td>
<td>Agnes</td>
<td>7</td>
<td>56</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>22</td>
<td>Vincent</td>
<td>7</td>
<td>55</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>23</td>
<td>T</td>
<td>23</td>
<td>Venus sets 7.9 aft.</td>
<td>7</td>
<td>54</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>24</td>
<td>[MAR. 1858]</td>
<td>7</td>
<td>53</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>25</td>
<td>Conv. St. Paul: Prs. Rl.</td>
<td>7</td>
<td>51</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>26</td>
<td>3 Sunday after Epiphany</td>
<td>7</td>
<td>50</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>27</td>
<td></td>
<td>7</td>
<td>49</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td>28</td>
<td>T</td>
<td>28</td>
<td>Mercury sets 4.47 aft.</td>
<td>7</td>
<td>47</td>
<td>4</td>
<td>39</td>
</tr>
<tr>
<td>29</td>
<td>W</td>
<td>29</td>
<td></td>
<td>7</td>
<td>46</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>30</td>
<td>T</td>
<td>30</td>
<td>King Chas. I. Mart. 1649</td>
<td>7</td>
<td>44</td>
<td>4</td>
<td>42</td>
</tr>
<tr>
<td>31</td>
<td>F</td>
<td>31</td>
<td>Hilary Term ends</td>
<td>7</td>
<td>43</td>
<td>4</td>
<td>44</td>
</tr>
</tbody>
</table>

### Day.
- **Length of Day:**
  - **Day incr.:**
  - **Day br.:**
  - **Twilight ends:**
  - **Sun East:**
  - **Time on clock at G's noon:**
  - **Moon's Southing:**

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East.</th>
<th>Time on clock at G's noon.</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 50</td>
<td>0 6</td>
<td>6 m 2</td>
<td>6 a 4</td>
<td>4 m 44</td>
<td>12 3 37</td>
<td>4 a 57</td>
</tr>
<tr>
<td>6</td>
<td>56</td>
<td>12</td>
<td>2</td>
<td>9</td>
<td>48</td>
<td>5 54</td>
<td>9 4</td>
</tr>
<tr>
<td>11</td>
<td>8 6</td>
<td>22</td>
<td>1</td>
<td>15</td>
<td>53</td>
<td>8 0</td>
<td>1m 11</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>33</td>
<td>5 59</td>
<td>21</td>
<td>59</td>
<td>9 52</td>
<td>5 38</td>
</tr>
<tr>
<td>21</td>
<td>30</td>
<td>46</td>
<td>55</td>
<td>28</td>
<td>5 4</td>
<td>11 27</td>
<td>9 34</td>
</tr>
<tr>
<td>26</td>
<td>45</td>
<td>1 1</td>
<td>61</td>
<td>35</td>
<td>10</td>
<td>12 43</td>
<td>1 a 27</td>
</tr>
</tbody>
</table>
### JANUARY, 1868.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
</tr>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>9 m.37</td>
<td>5 a.57</td>
<td>8 m.16</td>
<td>3 a.54</td>
</tr>
<tr>
<td>13</td>
<td>9 24</td>
<td>6 36</td>
<td>8 1</td>
<td>3 53</td>
</tr>
<tr>
<td>25</td>
<td>9  5</td>
<td>7 15</td>
<td>7 43</td>
<td>3 57</td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

#### NOTICES.

- **1. New Year’s Day.** Stock Exchange closed unless otherwise *specially* ordered. British Museum closed first week.
- **8. Fire Insurance due at Christmas must be paid by this day.** Dividends payable.

#### HISTORICAL MEMORANDA.

- **1. Union of Great Britain and Ireland, 1801.**
  - Wurtemburg made a Kingdom, 1806.
- **2. Calcutta taken, 1757.**
- **4. American Treaty with Great Britain, 1784.**
- **5. Siege of Gibraltar raised, 1783.**
- **5. Siege of Gibraltar raised, 1783.**
- **6. Lord Nelson’s Funeral, 1806.**
- **8. Cape of Good Hope taken, 1806.**
- **10. Penny Post established, 1840.**
- **13. Battle of Chillianwallah, 1849.**
- **14. Norway ceded to Sweden, 1814.**
- **16. Battle of Corunna, 1809.**
- **18. Gold discovered in California, 1847.**
- **20. First English Parliament, 1265.**
- **21. Louis XVI. guillotined, 1793.**
- **23. Royal Exchange opened, 1571.**
- **25. Commercial Treaty with France, 1860.**
- **27. Long Parliament dissolved, 1659.**
- **28. Greece declared independent, 1822.**
- **29. Battle of Aliwal, 1846.**
- **30. First Reformed Parliament, 1833.**
- **30. London Docks opened, 1805.**

During this month the days increase 27m. in the morning, and 47m. in the afternoon.

Moon in perigee on the 10th January; in apogee on the 23rd.

*Venus* is an Evening Star during the month, and will be in conjunction with the Moon on the 27th, at 2 p.m.

*Mars* is too near the Sun to be visible.

*Jupiter* is an Evening Star during the month, and will also be in conjunction with the Moon on the 27th, at 8 p.m.
### February, 1868

#### Sun enters Pisces, Sun’s Semi-diameter, Moon’s ascend. Node.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>16</td>
<td>15'9</td>
<td>61725</td>
<td>517</td>
<td>10m58</td>
<td>0m3</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>16</td>
<td>13'8</td>
<td>547</td>
<td>59</td>
<td>11m30</td>
<td>1m13</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>16</td>
<td>11'2</td>
<td>59</td>
<td>59</td>
<td>12m19</td>
<td>1m39</td>
</tr>
</tbody>
</table>

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

1. **[CANDL. DAY]**
2. **Sunday after Epiph. PURIF.**
3. **Blasius**
4. **Agatha**
5. **Saturn rises 2.44 morn.**
6. **Septuagesima Sunday**
7. **QU. VICTORIA MAR. 1840**
8. **Jupiter sets 7.2 aft.**
9. **Valentine**
10. **Sexagesima Sunday**
11. **Mars rises 6.53 morn.**
12. **Venus sets 8.37 aft.**
13. **Camb. Term div. mid.**
14. **Shrove Sunday**
15. **ST. MATTHIAS**
16. **Shrove Tuesday**
17. **Lent Beg. Ash Wed.**
18. **Mercury sets 7.7 aft.**

#### Lunations and Phases.

- First Q. D 1st, 6h. 16m. af.
- Full M. O 8th, 9h. 35m. m.
- Last Q. C 15th, 9h. 17m. m.
- New M. O 23rd, 2h. 20m. af.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 4</td>
<td>1 20</td>
<td>5m44</td>
<td>6a43</td>
<td>5m17</td>
<td>12 13 48</td>
<td>6a 0</td>
</tr>
<tr>
<td>6</td>
<td>37</td>
<td>37</td>
<td>37</td>
<td>39</td>
<td>59</td>
<td>14 19 10</td>
<td>42</td>
</tr>
<tr>
<td>11</td>
<td>55</td>
<td>39</td>
<td>39</td>
<td>59</td>
<td>59</td>
<td>14 29 2m38</td>
<td>42</td>
</tr>
<tr>
<td>16</td>
<td>14</td>
<td>22</td>
<td>7 8</td>
<td>34</td>
<td>34</td>
<td>14 20 6</td>
<td>42</td>
</tr>
<tr>
<td>21</td>
<td>33</td>
<td>12</td>
<td>16</td>
<td>39</td>
<td>39</td>
<td>13 54 10</td>
<td>39</td>
</tr>
<tr>
<td>26</td>
<td>52</td>
<td>2</td>
<td>24</td>
<td>45</td>
<td>45</td>
<td>13 12 2a23</td>
<td></td>
</tr>
</tbody>
</table>
FEBRUARY, 1868.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
</tr>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>8 m 52</td>
<td>7 a 38</td>
<td>7 m 31</td>
<td>3 a 59</td>
</tr>
<tr>
<td>13</td>
<td>8 27</td>
<td>8 15</td>
<td>7 6</td>
<td>4 6</td>
</tr>
<tr>
<td>25</td>
<td>8 0</td>
<td>8 52</td>
<td>6 39</td>
<td>4 13</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

2. Candlemas Day. One of the Quarter Days used in Scotland.


HISTORICAL MEMORANDA.

1. New River commenced, 1608.


5. Victoria Cross founded, 1856.

7. Annexation of Oude, 1856.

8. Mary Queen of Scots beheaded, 1587.


— Union of the Canadas, 1841.


11. London University chartered, 1826.

12. Lady Jane Grey beheaded, 1554.

13. William and Mary proclaimed, 1689.


15. Pope driven from Rome, 1798.


17. Battle of Eupatoria, 1855.

18. Martin Luther died, 1546.


24. Drury Lane Theatre burnt, 1819.

— Abdication of Louis Philippe, 1848.


— Napoleon escaped from Elba, 1815.

27. Earthquake at Lisbon, 1796.

During this month the days increase 55m. in the morning, and 53m. in the afternoon.

Moon in perigee on the 7th day; in apogee on the 20th.

Mercury may be seen in the evenings, about the 21st.

Venus is an Evening Star during the month, and will be in conjunction with the Moon on the 26th, at 7 P.M.

Jupiter is an Evening Star during the month, and will be in conjunction with the New Moon on the 24th, at 3 P.M.

Eclipse.—Feb. 23. An annular eclipse of the Sun, invisible.
### March, 1868

#### Sun's Position

<table>
<thead>
<tr>
<th>Date</th>
<th>Sun's Semi-diameter</th>
<th>Moon's Ascend. Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>17th 19h. 44m.</td>
<td>16 10' 47&quot;</td>
<td>30 16' 37&quot;</td>
</tr>
</tbody>
</table>

#### Lunations and Phases

<table>
<thead>
<tr>
<th>First Q.</th>
<th>2nd</th>
<th>4h. 49m. m.</th>
<th>Full M.</th>
<th>8th</th>
<th>8h. 22m. af.</th>
<th>Last Q.</th>
<th>16th</th>
<th>3h. 28m. m.</th>
<th>New M.</th>
<th>24th</th>
<th>6h. 59m. m.</th>
<th>First Q.</th>
<th>31st</th>
<th>0h. 26m. af.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sunday in Lent.</th>
<th>David</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td><strong>EMBER WEEK</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>Saturn rises 1.0 morn.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>Perpetua</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
<td>Pr. Wales Mar. 1863</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
<td>Gregory</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>18</td>
<td>Jupiter sets 5.41 aft.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
<td>Sunday in Lent</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
<td>St. Patrick</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>29</td>
<td>30</td>
<td>Benedict</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td>4th, or Midlent Sunday</td>
<td></td>
</tr>
</tbody>
</table>

#### Sunrises and Sunsets

<table>
<thead>
<tr>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>6 46</td>
<td>5 39</td>
<td>10 m 6</td>
<td>0 m 13</td>
</tr>
<tr>
<td>6 44</td>
<td>5 40</td>
<td>46</td>
<td>21</td>
</tr>
<tr>
<td>6 42</td>
<td>5 42</td>
<td>11 36</td>
<td>2 27</td>
</tr>
<tr>
<td>6 40</td>
<td>5 44</td>
<td>0 a 35</td>
<td>3 28</td>
</tr>
<tr>
<td>6 37</td>
<td>5 46</td>
<td>1 43</td>
<td>4 23</td>
</tr>
<tr>
<td>6 35</td>
<td>5 47</td>
<td>2 59</td>
<td>5 9</td>
</tr>
<tr>
<td>6 33</td>
<td>5 49</td>
<td>4 18</td>
<td>5 48</td>
</tr>
<tr>
<td>6 31</td>
<td>5 51</td>
<td>5 38</td>
<td>6 20</td>
</tr>
<tr>
<td>6 29</td>
<td>5 53</td>
<td>6 56</td>
<td>6 50</td>
</tr>
<tr>
<td>6 26</td>
<td>5 54</td>
<td>8 13</td>
<td>7 19</td>
</tr>
<tr>
<td>6 24</td>
<td>5 56</td>
<td>9 10</td>
<td>7 47</td>
</tr>
<tr>
<td>6 22</td>
<td>5 58</td>
<td>10 39</td>
<td>8 16</td>
</tr>
<tr>
<td>6 20</td>
<td>5 59</td>
<td>11 45</td>
<td>8 44</td>
</tr>
<tr>
<td>6 17</td>
<td>6 1</td>
<td>1 morn. 9</td>
<td>17</td>
</tr>
<tr>
<td>6 15</td>
<td>6 3</td>
<td>0 48</td>
<td>9 54</td>
</tr>
<tr>
<td>6 13</td>
<td>6 5</td>
<td>1 45</td>
<td>10 37</td>
</tr>
<tr>
<td>6 10</td>
<td>6 6</td>
<td>2 36</td>
<td>11 25</td>
</tr>
<tr>
<td>6 8</td>
<td>6 8</td>
<td>3 20</td>
<td>0 a 17</td>
</tr>
<tr>
<td>6 6</td>
<td>6 10</td>
<td>3 59</td>
<td>1 14</td>
</tr>
<tr>
<td>6 4</td>
<td>6 11</td>
<td>4 32</td>
<td>2 14</td>
</tr>
<tr>
<td>6 1</td>
<td>6 13</td>
<td>5 1</td>
<td>3 17</td>
</tr>
<tr>
<td>5 59</td>
<td>6 15</td>
<td>5 28</td>
<td>4 22</td>
</tr>
<tr>
<td>5 57</td>
<td>6 16</td>
<td>5 53</td>
<td>5 28</td>
</tr>
<tr>
<td>5 54</td>
<td>6 18</td>
<td>6 16</td>
<td>6 35</td>
</tr>
<tr>
<td>5 52</td>
<td>6 20</td>
<td>6 41</td>
<td>7 44</td>
</tr>
<tr>
<td>5 50</td>
<td>6 21</td>
<td>7 6</td>
<td>8 55</td>
</tr>
<tr>
<td>5 47</td>
<td>6 23</td>
<td>8 35</td>
<td>10 5</td>
</tr>
<tr>
<td>5 45</td>
<td>6 25</td>
<td>8 11</td>
<td>16</td>
</tr>
<tr>
<td>5 43</td>
<td>6 26</td>
<td>9 46</td>
<td>21</td>
</tr>
<tr>
<td>5 41</td>
<td>6 28</td>
<td>9 32</td>
<td>21</td>
</tr>
<tr>
<td>5 38</td>
<td>6 30</td>
<td>10 27</td>
<td>23</td>
</tr>
</tbody>
</table>

#### Length of Day

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on Clock at O's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 52</td>
<td>3 8</td>
<td>43</td>
<td>7 a 31</td>
<td>5 m 49</td>
<td>12 12</td>
<td>5 a 39</td>
</tr>
<tr>
<td>6</td>
<td>11 12</td>
<td>28</td>
<td>43</td>
<td>40</td>
<td>54</td>
<td>11 21</td>
<td>10 30</td>
</tr>
<tr>
<td>11</td>
<td>31</td>
<td>47</td>
<td>31</td>
<td>49</td>
<td>59</td>
<td>10 4</td>
<td>2 m 6</td>
</tr>
<tr>
<td>16</td>
<td>51</td>
<td>4 7</td>
<td>19</td>
<td>59</td>
<td>4</td>
<td>8 39</td>
<td>6 12</td>
</tr>
<tr>
<td>21</td>
<td>12</td>
<td>27</td>
<td>6</td>
<td>8 9</td>
<td>9</td>
<td>7 10</td>
<td>10 5</td>
</tr>
<tr>
<td>26</td>
<td>31</td>
<td>47</td>
<td>3 53</td>
<td>19</td>
<td>13</td>
<td>5 39</td>
<td>1 a 54</td>
</tr>
</tbody>
</table>
MARCH, 1868.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
</tr>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>7 m 50</td>
<td>9 a 8</td>
<td>6 m 28</td>
<td>4 a 16</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>23</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>25</td>
<td>7</td>
<td>0</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. Municipal assessors appointed.
2. Spring Quarter begins.
5. Noties issued, 1797.
6. Peace of Rastadt, 1798.
7. Chelsea Hospital founded, 1682.
9. Herschel’s Planet discovered, 1781.
10. Admiral Byng shot, 1757.
11. Capture of Lucknow, 1858.
12. Netherlands made a Kingdom, 1815.
15. Sir Isaac Newton died, 1727.
17. Göthe died, 1832.

During this month the days increase 1h. 10m. in the morning, and 53m. in the afternoon.

Moon in perigee on the 6th day; in apogee on the 18th.

Venus is an Evening Star during the month, and will be in conjunction with the Moon on the 27th, at 6 P.M.

Mars is unfavourable for observation.

Jupiter is an Evening Star till the 10th, and will be in conjunction with the Moon on the 23rd, at 11 A.M.

Saturn is unfavourable for observation.
### APRIL, 1868.

**Sun enters Taurus,**

- **19 d. 7 h. 42 m.**

#### LUNATIONS AND PHASES.

- **Full M. O 7th,** 7h. 17m. m.
- **Last Q. C 14th,** 10h. 34m. af.
- **New M. ● 22nd,** 8h. 20m. af.
- **First Q. D 29th,** 6h. 18m. af.

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>Day</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>5</td>
<td>5 36</td>
<td>6 31</td>
<td>11m 31</td>
<td>2m 18</td>
</tr>
<tr>
<td>9</td>
<td>5 18</td>
<td>6 45</td>
<td>9 27</td>
<td>6 40</td>
</tr>
<tr>
<td>13</td>
<td>5 16</td>
<td>6 46</td>
<td>10 33</td>
<td>7 12</td>
</tr>
<tr>
<td>17</td>
<td>5 1</td>
<td>6 59</td>
<td>0 32</td>
<td>0 a 1</td>
</tr>
<tr>
<td>21</td>
<td>4 55</td>
<td>7 2</td>
<td>3 55</td>
<td>3 12</td>
</tr>
<tr>
<td>25</td>
<td>4 46</td>
<td>7 10</td>
<td>6 7</td>
<td>9 4</td>
</tr>
<tr>
<td>29</td>
<td>4 38</td>
<td>7 16</td>
<td>9 22</td>
<td>0 16</td>
</tr>
<tr>
<td>30</td>
<td>4 35</td>
<td>7 19</td>
<td>11 44</td>
<td>4 16</td>
</tr>
</tbody>
</table>

#### Length of Day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h. m.</td>
</tr>
<tr>
<td>6</td>
<td>12 54</td>
</tr>
<tr>
<td>11</td>
<td>34 50</td>
</tr>
<tr>
<td>16</td>
<td>53 6</td>
</tr>
<tr>
<td>21</td>
<td>14 12</td>
</tr>
<tr>
<td>26</td>
<td>30 46</td>
</tr>
</tbody>
</table>

#### Day incr.

<table>
<thead>
<tr>
<th>Day</th>
<th>Day incr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 10</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>16</td>
<td>6 9</td>
</tr>
<tr>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>26</td>
<td>46</td>
</tr>
</tbody>
</table>

#### Day br.

<table>
<thead>
<tr>
<th>Day</th>
<th>Day br.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3m36</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>16</td>
<td>53</td>
</tr>
<tr>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>26</td>
<td>30</td>
</tr>
</tbody>
</table>

#### Twilight ends.

<table>
<thead>
<tr>
<th>Day</th>
<th>Twilight ends.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 a 32</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>16</td>
<td>2 51</td>
</tr>
<tr>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>26</td>
<td>19</td>
</tr>
</tbody>
</table>

#### Sun East.

<table>
<thead>
<tr>
<th>Day</th>
<th>Sun East</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6m19</td>
</tr>
<tr>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>16</td>
<td>9 8</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>26</td>
<td>36</td>
</tr>
</tbody>
</table>

#### Time on Clock at Ω's noon.

<table>
<thead>
<tr>
<th>Day</th>
<th>Time on Clock at Ω's noon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 3 49</td>
</tr>
<tr>
<td>6</td>
<td>2 20</td>
</tr>
<tr>
<td>11</td>
<td>0 56</td>
</tr>
<tr>
<td>16</td>
<td>11 59 40</td>
</tr>
<tr>
<td>21</td>
<td>58 34</td>
</tr>
<tr>
<td>26</td>
<td>57 39</td>
</tr>
</tbody>
</table>

#### Moon's Southing.

<table>
<thead>
<tr>
<th>Day</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 a 22</td>
</tr>
<tr>
<td>6</td>
<td>11 62</td>
</tr>
<tr>
<td>11</td>
<td>3 m13</td>
</tr>
<tr>
<td>16</td>
<td>7 14</td>
</tr>
<tr>
<td>21</td>
<td>11 0</td>
</tr>
<tr>
<td>26</td>
<td>3 a 21</td>
</tr>
</tbody>
</table>
APRIL, 1868.

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. Quarter Sessions this week.

2. Dividends payable. Fire Insurance due at Lady Day must be paid on or before this day.

3. Easter Monday. The Stock Exchange is now closed on this day, unless otherwise specially ordered.

15. Easter Term begins.

HISTORICAL MEMORANDA.


4. Oliver Goldsmith died, 1774.

5. British Museum instituted, 1753.


8. Lord Bacon died, 1626.

10. Roman Catholic Emancipation Bill passed, 1829.

12. Rodney's Victory, 1782.

13. Handel died, 1759.

14. President Lincoln assassinated, 1865.


20. Spanish Fleet destroyed, 1657.

21. Brazil discovered, 1500.

22. Royal Society incorporated, 1663.

23. Odessa bombarded, 1854.

23. Shakspeare died, 1616.


29. Austrians crossed the Ticino, 1859.

30. Battle of Fontenoy, 1745.

During this month the days increase 1h. 4m. in the morning, and 50m. in the afternoon.

Moon in perigee, 3rd; in apogee, 15th; in perigee, 29th.

Venus is an Evening Star during the month, and will be in conjunction with the Moon on the 26th, at 8 A.M.

Mars is unfavourable for observation.

Jupiter is a Morning Star during the month, and will be in conjunction with the Moon on the 20th, at 8 A.M.

Saturn is unfavourable for observation.
# May, 1868

**Sun's enter Gemini**, Day 20. 7th. 41 m.

### Lunations and Phases
- Full M. ○ 6th, 6h. 37m. af.
- Last Q. ⊗ 14th, 5h. 15m. af.
- New M. ● 22nd, 6h. 36m. m.
- First Q. ○ 28th, 11h. 42m. af.

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>W</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 F</td>
<td>1</td>
<td>St. PHIL. &amp; St. JAS. PR. [ARTHUR B. 1850]</td>
<td>4 33</td>
<td>7 21</td>
<td>0 a 58</td>
<td>2m 22</td>
</tr>
<tr>
<td>2 S</td>
<td>2</td>
<td></td>
<td>4 31</td>
<td>7 23</td>
<td>2 15</td>
<td>2 52</td>
</tr>
<tr>
<td>3 S</td>
<td>3</td>
<td>Sun. aft. Easter, Inv. of the Cross</td>
<td>4 29</td>
<td>7 24</td>
<td>3 29</td>
<td>3 21</td>
</tr>
<tr>
<td>4 M</td>
<td>4</td>
<td></td>
<td>4 27</td>
<td>7 26</td>
<td>4 43</td>
<td>3 47</td>
</tr>
<tr>
<td>5 T</td>
<td>5</td>
<td>Saturn rises 8.49 aft.</td>
<td>4 25</td>
<td>7 27</td>
<td>5 58</td>
<td>4 13</td>
</tr>
<tr>
<td>6 W</td>
<td>6</td>
<td>John Evangel. in P. Lat.</td>
<td>4 24</td>
<td>7 29</td>
<td>9 9</td>
<td>4 41</td>
</tr>
<tr>
<td>7 T</td>
<td>7</td>
<td></td>
<td>4 22</td>
<td>7 31</td>
<td>8 17</td>
<td>5 10</td>
</tr>
<tr>
<td>8 F</td>
<td>8</td>
<td>Easter Term ends</td>
<td>4 20</td>
<td>7 32</td>
<td>9 21</td>
<td>5 44</td>
</tr>
<tr>
<td>9 S</td>
<td>9</td>
<td></td>
<td>4 19</td>
<td>7 34</td>
<td>10 18</td>
<td>6 22</td>
</tr>
<tr>
<td>10 S</td>
<td>10</td>
<td>4 Sunday after Easter</td>
<td>4 17</td>
<td>7 35</td>
<td>11 10</td>
<td>7 6</td>
</tr>
<tr>
<td>11 M</td>
<td>11</td>
<td>Jupiter rises 2.54 morn.</td>
<td>4 15</td>
<td>7 37</td>
<td>11 55</td>
<td>7 56</td>
</tr>
<tr>
<td>12 T</td>
<td>12</td>
<td>Old May Day</td>
<td>4 14</td>
<td>7 38 morn.</td>
<td>8 50</td>
<td></td>
</tr>
<tr>
<td>13 W</td>
<td>13</td>
<td></td>
<td>4 12</td>
<td>7 40</td>
<td>0 33</td>
<td>9 48</td>
</tr>
<tr>
<td>14 T</td>
<td>14</td>
<td></td>
<td>4 11</td>
<td>7 41</td>
<td>1 40</td>
<td>4 48</td>
</tr>
<tr>
<td>15 F</td>
<td>15</td>
<td>Mars rises 3.12 morn.</td>
<td>4 9</td>
<td>7 43</td>
<td>1 33</td>
<td>11 51</td>
</tr>
<tr>
<td>16 S</td>
<td>16</td>
<td></td>
<td>4 8</td>
<td>7 44</td>
<td>1 58</td>
<td>0 55</td>
</tr>
<tr>
<td>17 S</td>
<td>17</td>
<td>Rotation Sunday</td>
<td>4 6</td>
<td>7 46</td>
<td>2 21</td>
<td>2 1</td>
</tr>
<tr>
<td>18 M</td>
<td>18</td>
<td></td>
<td>4 5</td>
<td>7 47</td>
<td>2 45</td>
<td>3 10</td>
</tr>
<tr>
<td>19 T</td>
<td>19</td>
<td>Dunstan</td>
<td>4 4</td>
<td>7 49</td>
<td>3 9</td>
<td>4 20</td>
</tr>
<tr>
<td>20 W</td>
<td>20</td>
<td>Venus sets 11.45 aft.</td>
<td>4 2</td>
<td>7 50</td>
<td>3 35</td>
<td>5 32</td>
</tr>
<tr>
<td>21 T</td>
<td>21</td>
<td>Ascension. Holy Thursday</td>
<td>4 1</td>
<td>7 52</td>
<td>3 44</td>
<td>6 44</td>
</tr>
<tr>
<td>22 F</td>
<td>22</td>
<td>Tr. Term. beg. Cam. Term</td>
<td>4 0</td>
<td>7 53</td>
<td>4 39</td>
<td>7 58</td>
</tr>
<tr>
<td>23 S</td>
<td>23</td>
<td>[div. n.]</td>
<td>3 59</td>
<td>7 54</td>
<td>5 20</td>
<td>9 8</td>
</tr>
<tr>
<td>24 S</td>
<td>24</td>
<td>Sun. aft. As. QU. V. B. 1819</td>
<td>3 58</td>
<td>7 55</td>
<td>6 11</td>
<td>10 10</td>
</tr>
<tr>
<td>25 M</td>
<td>25</td>
<td>Pr. HELENA B., 1846</td>
<td>3 57</td>
<td>7 57</td>
<td>7 11</td>
<td>11</td>
</tr>
<tr>
<td>26 T</td>
<td>26</td>
<td>Augustin</td>
<td>3 55</td>
<td>7 58</td>
<td>8 19</td>
<td>11 50</td>
</tr>
<tr>
<td>28 T</td>
<td>28</td>
<td>Mercury sets 9.32 aft.</td>
<td>3 53</td>
<td>8 1</td>
<td>10 49</td>
<td>0 26</td>
</tr>
<tr>
<td>29 F</td>
<td>29</td>
<td>K. Cha. II. rest. 1660. Oxford</td>
<td>3 52</td>
<td>8 2</td>
<td>0 a 4</td>
<td>0 57</td>
</tr>
<tr>
<td>30 S</td>
<td>30</td>
<td>Oxford Term beg. [Term ends]</td>
<td>3 52</td>
<td>8 3</td>
<td>1 18</td>
<td>1 27</td>
</tr>
<tr>
<td>31 S</td>
<td>31</td>
<td>Whit Sunday</td>
<td>3 51</td>
<td>8 4</td>
<td>2 32</td>
<td>1 52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1 14 48</td>
<td>4 7</td>
<td>4</td>
<td>2 m 1</td>
<td>9 a 52</td>
<td>6m 47</td>
<td>11 56</td>
<td>56</td>
</tr>
<tr>
<td>6 15 5</td>
<td>21</td>
<td>1 43</td>
<td>10 10</td>
<td>51</td>
<td>56 26</td>
<td>8 a 2</td>
<td></td>
</tr>
<tr>
<td>11 21</td>
<td>37</td>
<td>22</td>
<td>30</td>
<td>86</td>
<td>56 10</td>
<td>3 m 33</td>
<td></td>
</tr>
<tr>
<td>16 36</td>
<td>52</td>
<td>0 55</td>
<td>55</td>
<td>7 0</td>
<td>56 9</td>
<td>7 22</td>
<td></td>
</tr>
<tr>
<td>21 60</td>
<td>8 6</td>
<td>22</td>
<td>11 30</td>
<td>5</td>
<td>56 22</td>
<td>11 18</td>
<td></td>
</tr>
<tr>
<td>26 16</td>
<td>18</td>
<td>No real night.</td>
<td>9</td>
<td>56 49</td>
<td>4 a 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. May Day. A holiday at the Stock Offices, Bank of England. The Stock Exchange also now closed on this day, unless otherwise specially ordered. British Museum closed first week.


15. This is Whitsun-day, one of the Terms or Quarter Days used in Scotland.

22. Trinity Term begins.

24. Queen’s Birthday.

HISTORICAL MEMORANDA.

2. Battle of Lutzen, 1813.

4. Seringapatam taken, 1799.

5. Napoleon I. died, 1825.

7. Jamaica captured, 1655.


11. Spencer Perceval assassinated, 1812.

12. Earl Strafford beheaded, 1641.

13. Vienna taken, 1809.

15. Vaccination first used, 1796.


19. Anne Boleyn beheaded, 1536.


22. Kertch captured, 1855.

23. Battle of Ramilies, 1706.


27. Habeas Corpus Act passed, 1679.

During this month the days increase 43m. in the morning, and 44m. in the afternoon.

Moon in apogee on the 13th; in perigee on the 25th.

Venus is an Evening Star during the month, and will be in conjunction with the Moon on the 25th, at 2 P.M.

Mars is unfavourable for observation.

Jupiter is a Morning Star during the month, and will be in conjunction with the Moon on the 18th, at 4 A.M.
JUNE, 1868.

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>W</th>
<th>D</th>
<th>Sun's Semi-diameter</th>
<th>Moon's ascend. Node.</th>
<th>LUNATIONS AND PHASES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>15 48'1 0 m 0</td>
<td>15 48'1 0 m 0</td>
<td>Full M. 0 5th, 6h. 55m. m.</td>
</tr>
<tr>
<td>29</td>
<td>16 h. 10 m.</td>
<td>2</td>
<td>1</td>
<td>15 46'8 295 22</td>
<td>15 46'8 295 22</td>
<td>Last Q. 0 13th, 10h. 14m. m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
<td>15 46'1 28 44</td>
<td>15 46'1 28 44</td>
<td>New M. 0 20th, 2h. 45m. a.m.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1</td>
<td>15 46'1 28 44</td>
<td>15 46'1 28 44</td>
<td>First Q. 0 27th, 5h. 51m. m.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sunrises</th>
<th>Sun sets</th>
<th>Moonrises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>1</td>
<td>Whit Monday. Nicomede.</td>
<td>3 50</td>
<td>8 5</td>
<td>3 a 45</td>
</tr>
<tr>
<td>2</td>
<td>Tu</td>
<td>2</td>
<td>Whit Tuesday</td>
<td>3 49</td>
<td>8 6</td>
<td>4 56</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>3</td>
<td>Ember Week. Pr. Geo. Fr.</td>
<td>3 49</td>
<td>8 7</td>
<td>6 4</td>
</tr>
<tr>
<td>4</td>
<td>Th</td>
<td>4</td>
<td>[of Wales B. 1865]</td>
<td>3 48</td>
<td>8 7</td>
<td>9 3</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>5</td>
<td>Boniface</td>
<td>3 47</td>
<td>8 9</td>
<td>9 4</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>6</td>
<td></td>
<td>3 47</td>
<td>8 10</td>
<td>9 5</td>
</tr>
<tr>
<td>7</td>
<td>Sun</td>
<td>7</td>
<td>Trinity Sunday</td>
<td>3 46</td>
<td>8 11</td>
<td>9 5</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>8</td>
<td></td>
<td>3 46</td>
<td>8 12</td>
<td>10 3</td>
</tr>
<tr>
<td>9</td>
<td>Tu</td>
<td>9</td>
<td>Saturn sets 3.14 morn.</td>
<td>3 45</td>
<td>8 13</td>
<td>11 6</td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>10</td>
<td></td>
<td>3 45</td>
<td>8 13</td>
<td>11 36</td>
</tr>
<tr>
<td>11</td>
<td>Th</td>
<td>11</td>
<td>St. Barnabas. Corpus Christi</td>
<td>3 45</td>
<td>8 14</td>
<td>morn.</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>12</td>
<td>Trinity Term ends</td>
<td>3 44</td>
<td>8 15</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>13</td>
<td>Jupiter rises 0.54 morn.</td>
<td>3 44</td>
<td>8 15</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Sun</td>
<td>14</td>
<td>Sunday after Trinity</td>
<td>3 44</td>
<td>8 16</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>15</td>
<td></td>
<td>3 44</td>
<td>8 16</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Tu</td>
<td>16</td>
<td></td>
<td>3 44</td>
<td>8 17</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td>17</td>
<td>St. Alban.</td>
<td>3 44</td>
<td>8 17</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>Th</td>
<td>18</td>
<td>Mars rises 1.49 morn</td>
<td>3 44</td>
<td>8 18</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>19</td>
<td></td>
<td>3 44</td>
<td>8 18</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>20</td>
<td>Qu. Victoria Acc. 1837</td>
<td>3 44</td>
<td>8 18</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>Sun</td>
<td>21</td>
<td>2 Sun. aft. Trin. Qu. V. Pro.</td>
<td>3 45</td>
<td>8 18</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>22</td>
<td>[Long. day]</td>
<td>3 45</td>
<td>8 19</td>
<td>6</td>
</tr>
<tr>
<td>23</td>
<td>Tu</td>
<td>23</td>
<td>Cambridge Commencement</td>
<td>3 45</td>
<td>8 19</td>
<td>7</td>
</tr>
<tr>
<td>24</td>
<td>W</td>
<td>24</td>
<td>Mids. Day. Nat. J. Bap.</td>
<td>3 45</td>
<td>8 19</td>
<td>8</td>
</tr>
<tr>
<td>25</td>
<td>Th</td>
<td>25</td>
<td>Venus sets 9.50 aft.</td>
<td>3 46</td>
<td>8 19</td>
<td>9</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>26</td>
<td>Cambridge Term ends</td>
<td>3 46</td>
<td>8 19</td>
<td>11</td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td>27</td>
<td></td>
<td>3 47</td>
<td>8 19</td>
<td>0 a 22</td>
</tr>
<tr>
<td>28</td>
<td>Sun</td>
<td>28</td>
<td>3 Sun. aft. Trin. Qu. V. Cor.</td>
<td>3 47</td>
<td>8 19</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>29</td>
<td>St. Peter [1838]</td>
<td>3 48</td>
<td>8 18</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>Tu</td>
<td>30</td>
<td>Mercury sets 9.6 aft.</td>
<td>3 49</td>
<td>8 18</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 15 8 31</td>
<td>7 m 13 11 57 36 9 a 19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>23 39</td>
<td>16 58 26 0 m 36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>29 45</td>
<td>19 59 23 4 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>33 49</td>
<td>21 12 0 26 8 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>34 50</td>
<td>22 1 31 0 a 56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>33 Deer. 1</td>
<td>23 2 35 5 39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
JUNE, 1868.

NOTICES AND HISTORICAL MEMORANDA.

**NOTICES.**

1. Whit Monday. The Stock Exchange is closed on this day, unless otherwise specially ordered.

20. On or before this day overseers are to affix to church and chapel doors the register of county voters for their parish or township; it must remain affixed for a period including two Sundays, but must be removed before July 20.

21. Summer Quarter begins.

24. Midsummer Day. Quarter Sessions held in the last week.

**HISTORICAL MEMORANDA.**

1. Lord Howe's Victory, 1794.


4. Reform Bill received Royal Assent, 1832.

5. Seven Bishops sent to the Tower, 1688.

6. Metropolitan Cattle Market opened, 1855.


8. Battle of Marengo, 1800.


11. Magna Charta signed, 1215.

12. Stamp Duties first instituted, 1694.


15. Treaty with China, 1858.


17. Battle of Oudenarde, 1708.

---

From the 1st to the 21st, the days increase 6m. in the morning, and 13m. in the afternoon.

Moon in apogee on the 10th; in perigee on the 22nd.

Mercury may be seen through a telescope immediately after sunset about the 17th.

Venus is an Evening Star; greatest brilliancy about the 9th; in conjunction with the Moon on the 22nd, at 8 p.m.

Jupiter is a Morning Star during the month, and will be in conjunction with the Moon on the 14th, at 9 p.m.
### LUNATIONS AND PHASES.

Full M. ○ 4th, 8h. 39m. af.

Last Q. C 13th, 0h. 40m. m.

Full M. ○ 19th, 9h. 56m. af.

First Q. D 26th, 1h. 52m. af.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>d.</td>
<td>3 h.</td>
<td>6 m.</td>
<td>115 46’0</td>
</tr>
<tr>
<td>23</td>
<td>13</td>
<td>15</td>
<td>46’2</td>
<td>27</td>
</tr>
<tr>
<td>24</td>
<td>15</td>
<td>15</td>
<td>47’1</td>
<td>27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 W</td>
<td>PR. ALICE MAR. 1862</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>2 Th</td>
<td>Visitation Virgin Mary</td>
<td>5 49</td>
<td>8 18</td>
<td>5 0</td>
</tr>
<tr>
<td>3 F</td>
<td>Dog days begin</td>
<td>3 50</td>
<td>8 18</td>
<td>6 2</td>
</tr>
<tr>
<td>4 S</td>
<td>Trs. St. Martin [MAR. 1866]</td>
<td>3 51</td>
<td>8 17</td>
<td>6 58</td>
</tr>
<tr>
<td>5 S</td>
<td>Sun. att. Trim. PR. HELENA</td>
<td>3 51</td>
<td>8 17</td>
<td>7 49</td>
</tr>
<tr>
<td>6 M</td>
<td>Old Midsummer Day</td>
<td>3 52</td>
<td>8 16</td>
<td>8 32</td>
</tr>
<tr>
<td>7 Tu</td>
<td>Thomas à Beckett. Oxf. Act.</td>
<td>3 53</td>
<td>8 16</td>
<td>9 5</td>
</tr>
<tr>
<td>8 W</td>
<td>Saturn sets 1.10 morn.</td>
<td>3 54</td>
<td>8 15</td>
<td>9 39</td>
</tr>
<tr>
<td>9 Th</td>
<td>Oxford Term ends</td>
<td>3 55</td>
<td>8 14</td>
<td>10 7</td>
</tr>
<tr>
<td>10 F</td>
<td>5 Sunday after Trinity</td>
<td>3 56</td>
<td>8 14</td>
<td>10 31</td>
</tr>
<tr>
<td>11 S</td>
<td>Oxford Term ends</td>
<td>3 57</td>
<td>8 13</td>
<td>10 53</td>
</tr>
<tr>
<td>12 S</td>
<td>Sun. att. Trim. PR. HELENA</td>
<td>3 58</td>
<td>8 12</td>
<td>11 17</td>
</tr>
<tr>
<td>13 M</td>
<td>5 Sunday after Trinity</td>
<td>3 59</td>
<td>8 11</td>
<td>11 40</td>
</tr>
<tr>
<td>14 Tu</td>
<td>St. Swithin</td>
<td>4 0</td>
<td>8 10</td>
<td>morn. 0 a 50</td>
</tr>
<tr>
<td>15 W</td>
<td>Jupiter rises 10.43 aft.</td>
<td>4 2</td>
<td>8 10</td>
<td>0</td>
</tr>
<tr>
<td>16 Th</td>
<td>St. Swithin</td>
<td>4 3</td>
<td>8 9</td>
<td>0</td>
</tr>
<tr>
<td>17 F</td>
<td>Magdalene</td>
<td>4 4</td>
<td>8 8</td>
<td>1</td>
</tr>
<tr>
<td>18 S</td>
<td>Mars rises 0.39 morn.</td>
<td>4 5</td>
<td>8 7</td>
<td>1 47</td>
</tr>
<tr>
<td>19 S</td>
<td>6 Sunday after Trinity</td>
<td>4 6</td>
<td>8 6</td>
<td>2 37</td>
</tr>
<tr>
<td>20 M</td>
<td>Margaret</td>
<td>4 7</td>
<td>8 5</td>
<td>3 38</td>
</tr>
<tr>
<td>21 Tu</td>
<td>Magdalene</td>
<td>4 8</td>
<td>8 4</td>
<td>4 49</td>
</tr>
<tr>
<td>22 W</td>
<td>Venus rises 3.17 morn.</td>
<td>4 9</td>
<td>8 3</td>
<td>5 9</td>
</tr>
<tr>
<td>23 Th</td>
<td>7 Sunday aft. Trinity. St. Anne</td>
<td>4 10</td>
<td>8 2</td>
<td>6 7</td>
</tr>
<tr>
<td>24 F</td>
<td>St. James. Ds. Camb. b. 1797</td>
<td>4 11</td>
<td>8 1</td>
<td>7 29</td>
</tr>
<tr>
<td>25 S</td>
<td>Venus rises 3.17 morn.</td>
<td>4 12</td>
<td>8 0</td>
<td>8 49</td>
</tr>
<tr>
<td>26 Sun</td>
<td>7 Sunday aft. Trinity. St. Anne</td>
<td>4 13</td>
<td>7 59</td>
<td>9 a 36</td>
</tr>
<tr>
<td>27 M</td>
<td>7 Sunday aft. Trinity. St. Anne</td>
<td>4 14</td>
<td>7 58</td>
<td>10 6</td>
</tr>
<tr>
<td>28 Tu</td>
<td>Venus rises 3.17 morn.</td>
<td>4 15</td>
<td>7 57</td>
<td>11 22</td>
</tr>
<tr>
<td>29 W</td>
<td>7 Sunday aft. Trinity. St. Anne</td>
<td>4 17</td>
<td>7 55</td>
<td>0 a 36</td>
</tr>
<tr>
<td>30 Th</td>
<td>Venus rises 3.17 morn.</td>
<td>4 18</td>
<td>7 54</td>
<td>1 45</td>
</tr>
<tr>
<td>31 F</td>
<td>Venus rises 3.17 morn.</td>
<td>4 19</td>
<td>7 53</td>
<td>2 52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>29</td>
<td>0</td>
<td>5</td>
<td>7m23</td>
<td>12</td>
<td>3 35</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>No real night.</td>
<td>22</td>
<td>4 29</td>
</tr>
<tr>
<td>11</td>
<td>14</td>
<td>20</td>
<td>0</td>
<td>5</td>
<td>20</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>30</td>
<td>h. m.</td>
<td>h. m.</td>
<td>18</td>
<td>5</td>
<td>46</td>
</tr>
<tr>
<td>21</td>
<td>15</td>
<td>52</td>
<td>42</td>
<td>0 m 15</td>
<td>11 a 57</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>26</td>
<td>39</td>
<td>55</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>6</td>
<td>14</td>
</tr>
</tbody>
</table>
JULY, 1868.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
</tr>
<tr>
<td></td>
<td>h.m.</td>
<td>h.m.</td>
<td>h.m.</td>
<td>h.m.</td>
</tr>
<tr>
<td>1</td>
<td>6m55</td>
<td>9a15</td>
<td>1m20</td>
<td>5a4</td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>53</td>
<td>7</td>
<td>53</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>40</td>
<td>6</td>
<td>32</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

6. Appraisers’ Licences granted.

8. Dividends payable. Fire Insurances due at Midsummer must be paid on or before this day.

20. Last day for sending in claims for county and borough voters. Before this day also parliamentary electors in counties, cities, or boroughs must have paid assessed taxes and poor rates to the 5th of January preceding, or else are disqualified.

31. List of electors to be completed.

HISTORICAL MEMORANDA.

1. Battle of the Boyne, 1690.

2. Sir Robert Peel died, 1850.


5. Sir Thomas More beheaded, 1535.


12. Crimea evacuated by the English, 1856.


20. Spanish Armada destroyed, 1588.


22. Battle of Salamanca, 1812.

24. Window Tax repealed, 1851.

25. Jeddah bombarded, 1858.


27. Battle of Talavera, 1809.

30. Almanack Duty repealed, 1834.

31. Atlantic Cable successfully laid, 1866.

During this month the days decrease 36m. in the morning, and 32m. in the afternoon.

Moon in apogee on the 7th; in perigee on the 20th.

*Venus* is an Evening Star till the 16th; afterwards a Morning Star; in conjunction with the Moon on the 19th, at 2 P.M.

*Jupiter* is a Morning Star during the month, and will be in conjunction with the Moon on the 12th, at 11 A.M.

*Saturn’s* Rings are visible during the evenings.
### AUGUST, 1868.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun's Semi-diameter.</th>
<th>Moon's ascend. Nodes.</th>
<th>LUNATIONS AND PHASES.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22d</td>
<td>9h</td>
<td>43m</td>
<td>115 48'0 26 Q 46</td>
<td>13 15 49'8 26 8</td>
<td>Full M. o 3rd, 11h. 52m. m.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>2</td>
<td>4 26</td>
<td>7 46</td>
<td>6 a 30</td>
<td>2m 28</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>8</td>
<td>7 44</td>
<td>7 9</td>
<td>9 3 21</td>
<td>4 18</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>4</td>
<td>7 43</td>
<td>7 43</td>
<td>4 18</td>
<td>8 11 5 19</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>5</td>
<td>7 41</td>
<td>7 39</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>6</td>
<td>7 37</td>
<td>7 37</td>
<td>4 18</td>
<td>8 11 5 19</td>
</tr>
<tr>
<td>6</td>
<td>T</td>
<td>7</td>
<td>7 36</td>
<td>7 36</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>8</td>
<td>7 34</td>
<td>7 34</td>
<td>4 18</td>
<td>8 11 5 19</td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>9</td>
<td>7 32</td>
<td>7 32</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>10</td>
<td>7 30</td>
<td>7 30</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>11</td>
<td>7 28</td>
<td>7 28</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>12</td>
<td>7 26</td>
<td>7 26</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td>13</td>
<td>7 24</td>
<td>7 24</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>14</td>
<td>7 21</td>
<td>7 21</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>15</td>
<td>7 19</td>
<td>7 19</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td>16</td>
<td>7 17</td>
<td>7 17</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>17</td>
<td>7 15</td>
<td>7 15</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>18</td>
<td>7 14</td>
<td>7 14</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>19</td>
<td>7 12</td>
<td>7 12</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td>20</td>
<td>7 10</td>
<td>7 10</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>20</td>
<td>T</td>
<td>21</td>
<td>7 8</td>
<td>7 8</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>22</td>
<td>7 6</td>
<td>7 6</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td>23</td>
<td>7 4</td>
<td>7 4</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>23</td>
<td>M</td>
<td>24</td>
<td>7 2</td>
<td>7 2</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>24</td>
<td>T</td>
<td>25</td>
<td>7 0</td>
<td>7 0</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>26</td>
<td>6 58</td>
<td>6 58</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>26</td>
<td>T</td>
<td>27</td>
<td>6 55</td>
<td>6 55</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>28</td>
<td>6 53</td>
<td>6 53</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>29</td>
<td>6 51</td>
<td>6 51</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td>30</td>
<td>6 50</td>
<td>6 50</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>31</td>
<td>6 48</td>
<td>6 48</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td></td>
<td>6 47</td>
<td>6 47</td>
<td>5 2 21</td>
<td>9 3 21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>15 21</td>
<td>1 13</td>
<td>1m 33</td>
<td>10 a 39</td>
<td>7 m 6</td>
<td>12 6 2</td>
<td>10 a 54</td>
</tr>
<tr>
<td>6</td>
<td>4 30</td>
<td>2 9</td>
<td>9 43</td>
<td>26</td>
<td>42</td>
<td>3 58</td>
<td>10 20</td>
</tr>
<tr>
<td>11</td>
<td>14 47</td>
<td>2 9</td>
<td>9 43</td>
<td>26</td>
<td>42</td>
<td>3 58</td>
<td>10 20</td>
</tr>
<tr>
<td>16</td>
<td>30 2</td>
<td>2 9</td>
<td>9 43</td>
<td>26</td>
<td>42</td>
<td>3 58</td>
<td>10 20</td>
</tr>
<tr>
<td>21</td>
<td>12 22</td>
<td>2 9</td>
<td>9 43</td>
<td>26</td>
<td>42</td>
<td>3 58</td>
<td>10 20</td>
</tr>
<tr>
<td>26</td>
<td>13 53</td>
<td>2 9</td>
<td>9 43</td>
<td>26</td>
<td>42</td>
<td>3 58</td>
<td>10 20</td>
</tr>
</tbody>
</table>
NOTICES AND HISTORICAL MEMORANDA.

1. Hawkers and Pedlars' Licences granted.
   List of voters in cities and boroughs to be affixed to church and chapel doors for 14 days. Objections to votes must be made before the 20th. This is Lammas Day, and is one of the Terms or Quarter Days used in the payment of rents in Scotland and some parts of England. These days are sometimes called "Cross Quarter Days," as being near the middle of the Quarter Days in more general use in England.

2. Half-Quarter Day.

31. All taxes and rates payable on March 1st must be paid on or before this day by persons claiming to be enrolled as burgesses under the Municipal Corporation Act.

10. These remarkable phenomena, commonly called Shooting Stars, may be expected to make their appearance after 6 P.M.

1. Battle of the Nile, 1798.

15. New Reform Bill received Royal Assent, 1867.


23. Treaty of Prague, 1866.


30. Peace with China, 1842.

During this month the days decrease 49m. in the morning, and 1h. 1m. in the afternoon.

Moon in apogee, 3rd day: perigee, 17th; apogee, 31st.

Venus is a Morning Star; in conjunction with the Moon on the 15th, at 4 P.M.; greatest brilliancy about the 21st.

Jupiter is a Morning Star during the month, and will be in conjunction with the Moon on the 8th, at 6 P.M.

Eclipse.—August 18. A total eclipse of the Sun, invisible.
### SEPTEMBER, 1868.

### LUNATIONS AND PHASES.
- Full M. O 2nd, 3h. 57m. m.
- Last Q. C 9th, 10h. 4m. af.
- New M. ● 16th, 1h. 19m. af.
- First Q. D 23rd, 3h. 22m. af.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun's Semi-diameter</th>
<th>Moon's ascend. Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>6</td>
<td>31</td>
<td>1 15 33.7 25ο 8</td>
<td>23 5 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T</td>
<td>u</td>
<td>Giles</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td></td>
<td></td>
<td>5 15</td>
<td>6 44</td>
<td>6 4 a 30</td>
<td>4 m 13</td>
</tr>
<tr>
<td>3</td>
<td>T</td>
<td>h</td>
<td></td>
<td>5 16</td>
<td>6 42</td>
<td>7 5 5</td>
<td>5 16</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td></td>
<td></td>
<td>5 18</td>
<td>6 40</td>
<td>7 27</td>
<td>6 20</td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td></td>
<td>Old Bartholomew</td>
<td>5 20</td>
<td>6 38</td>
<td>7 49</td>
<td>7 25</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>n</td>
<td>13 Sunday after Trinity</td>
<td>5 21</td>
<td>6 35</td>
<td>8 13</td>
<td>8 30</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td></td>
<td>Enuruchus</td>
<td>5 24</td>
<td>6 31</td>
<td>9 6 10</td>
<td>4 44</td>
</tr>
<tr>
<td>8</td>
<td>T</td>
<td>u</td>
<td>Nativity V. Mary</td>
<td>5 26</td>
<td>6 29</td>
<td>9 38</td>
<td>11 52</td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td></td>
<td></td>
<td>5 28</td>
<td>6 26</td>
<td>10 18</td>
<td>1 a 0</td>
</tr>
<tr>
<td>10</td>
<td>T</td>
<td>h</td>
<td>Saturn sets 8.59 aft.</td>
<td>5 29</td>
<td>6 24</td>
<td>11 7</td>
<td>2 4</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td></td>
<td>Jupiter rises 7.0 aft.</td>
<td>5 31</td>
<td>6 22</td>
<td>morn.</td>
<td>3 5</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td></td>
<td></td>
<td>5 32</td>
<td>6 20</td>
<td>0 5 3</td>
<td>5 58</td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>n</td>
<td>14 Sunday after Trinity</td>
<td>5 34</td>
<td>6 17</td>
<td>1 13</td>
<td>4 43</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td></td>
<td>Holy Cross</td>
<td>5 35</td>
<td>6 15</td>
<td>2 29</td>
<td>5 22</td>
</tr>
<tr>
<td>15</td>
<td>T</td>
<td>u</td>
<td></td>
<td>5 37</td>
<td>6 13</td>
<td>3 50</td>
<td>5 55</td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td></td>
<td>Ember Week</td>
<td>5 39</td>
<td>6 10</td>
<td>5 11</td>
<td>6 25</td>
</tr>
<tr>
<td>17</td>
<td>T</td>
<td>h</td>
<td>Lambert</td>
<td>5 40</td>
<td>6 8</td>
<td>6 32</td>
<td>6 54</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td></td>
<td></td>
<td>5 42</td>
<td>6 6</td>
<td>7 52</td>
<td>7 22</td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td></td>
<td>Mars rises 11.33 aft.</td>
<td>5 44</td>
<td>6 3</td>
<td>9 11</td>
<td>7 50</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>n</td>
<td>15 Sunday after Trinity</td>
<td>5 45</td>
<td>6 1</td>
<td>10 24</td>
<td>8 20</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td></td>
<td>St. Matthew</td>
<td>5 47</td>
<td>5 59</td>
<td>11 34</td>
<td>8 55</td>
</tr>
<tr>
<td>22</td>
<td>T</td>
<td>u</td>
<td></td>
<td>5 48</td>
<td>5 56</td>
<td>0 38</td>
<td>9 35</td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td></td>
<td></td>
<td>5 50</td>
<td>5 54</td>
<td>1 35</td>
<td>10 19</td>
</tr>
<tr>
<td>24</td>
<td>T</td>
<td>h</td>
<td>Venus rises 1.36 morn.</td>
<td>5 52</td>
<td>5 52</td>
<td>2 26</td>
<td>11 9</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td></td>
<td></td>
<td>5 53</td>
<td>5 50</td>
<td>3 9</td>
<td>morn.</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td></td>
<td>St. Cyprian</td>
<td>5 55</td>
<td>5 47</td>
<td>3 46</td>
<td>0 4</td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td>n</td>
<td>16 Sunday after Trinity</td>
<td>5 57</td>
<td>5 45</td>
<td>4 17</td>
<td>1 2</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td></td>
<td>Mercury sets 6.11 aft.</td>
<td>5 58</td>
<td>5 43</td>
<td>4 45</td>
<td>2 4</td>
</tr>
<tr>
<td>29</td>
<td>T</td>
<td>u</td>
<td>Michaelmas Day</td>
<td>6 0</td>
<td>5 41</td>
<td>5 9</td>
<td>3 6</td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td></td>
<td>St. Jerome</td>
<td>6 1</td>
<td>5 38</td>
<td>5 31</td>
<td>4 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day.</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>13</td>
<td>30</td>
<td>3</td>
<td>4</td>
<td>8  a 52</td>
<td>6 m 26</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>25</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>37</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>52</td>
<td>42</td>
<td>3</td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>24</td>
<td>41</td>
<td>9</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td>21</td>
<td>13</td>
<td>21</td>
<td>61</td>
<td>7</td>
<td>55</td>
<td>5 55</td>
</tr>
<tr>
<td>26</td>
<td>11</td>
<td>53</td>
<td>41</td>
<td>4</td>
<td>0</td>
<td>42</td>
</tr>
</tbody>
</table>
NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. On this day lists of objections to both county and borough electors to be affixed to church doors. British Museum closed first week.

20. Revising Barristers hold their courts for the revision of county voters' list between this day and Oct. 15.

22. Autumn Quarter commences.

29. Michaelmas Day.

HISTORICAL MEMORANDA.


3. Oliver Cromwell died, 1658.

7. Battle of Borodino, 1812.

8. Fall of Sebastopol, 1855.


13. Capture of Quebec, 1759.

— First Railway opened, 1830.

14. Moscow burnt, 1812.

— Duke of Wellington died, 1852.


Sir Walter Scott died, 1832.

Battle of the Alma, 1854.


30. Peace of Ryswick, 1697.

During this month the days decrease 48m. in the morning, and 1h. 9m. in the afternoon.

Moon in perigee on the 16th day; in apogee on the 27th.

Venus is a Morning Star during the month, and will be in conjunction with the Moon on the 13th, at 7 A.M.

Mars is visible in the mornings.

Jupiter is a Morning Star during the month, and will be in conjunction with the Moon on the 4th, at 9 P.M.

Saturn's Rings are now visible after sunset.
<table>
<thead>
<tr>
<th>Day</th>
<th>Sun's Semi-diameter</th>
<th>Moon's ascend. Node.</th>
<th>LUNATIONS AND PHASES.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>W</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>Sun's Semidiameter</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>23° 33'</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sun</td>
<td>17 Sunday after Trinity</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>Faith</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tu</td>
<td>Saturn sets 7.18 aft.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>St. Denys</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Th</td>
<td>Oxford Term begins</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>Trs. King Edw. Conf.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Tu</td>
<td>Jupiter sets 5.6 morn.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>W</td>
<td>Etheldreda</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>20 Sun. aft. Trinity. Crispin</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Day Length: h. m.**

| 1   | 11 33 | 5 1 | 4 m 9 | 7 a 30 | 5 m 39 | 11 43 30 | h. m. 11 49 31 |
| 6   | 14 20 | 18 7 27 | 18 18 | 31 | 11 49 31 | 48 0 |
| 10  | 54 40 27 7 24 17 | 45 32 0 20 44 39 4 39 |
| 16  | 35 59 35 6 56 17 | 45 32 0 20 44 39 4 39 |
| 21  | 16 18 43 46 10 | 44 39 4 39 |
| 26  | 9 57 37 51 37 | 44 39 4 39 |
### OCTOBER, 1868.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
</tr>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>11 a 45</td>
<td>4 a 7</td>
<td>11 a 24</td>
<td>3 a 27</td>
</tr>
<tr>
<td>13</td>
<td>2 6</td>
<td>3 52</td>
<td>11 12</td>
<td>3 0</td>
</tr>
<tr>
<td>25</td>
<td>2 31</td>
<td>3 33</td>
<td>11 1</td>
<td>2 29</td>
</tr>
</tbody>
</table>

### M D

<table>
<thead>
<tr>
<th>C's age.</th>
<th>High Water</th>
<th>Lond. Br.</th>
<th>h. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>1 m 19</td>
<td>1 59</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>1 59</td>
<td>3 36</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>2 36</td>
<td>3 12</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>3 12</td>
<td>3 50</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>3 50</td>
<td>4 29</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>4 29</td>
<td>5 12</td>
</tr>
<tr>
<td>7</td>
<td>21</td>
<td>5 12</td>
<td>6 0</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
<td>6 0</td>
<td>6 54</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
<td>6 54</td>
<td>8 0</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>8 0</td>
<td>9 17</td>
</tr>
<tr>
<td>11</td>
<td>25</td>
<td>9 17</td>
<td>10 40</td>
</tr>
<tr>
<td>12</td>
<td>26</td>
<td>10 40</td>
<td>11 53</td>
</tr>
<tr>
<td>13</td>
<td>27</td>
<td>11 53</td>
<td>0 a 60</td>
</tr>
<tr>
<td>14</td>
<td>28</td>
<td>0 a 60</td>
<td>1 37</td>
</tr>
<tr>
<td>15</td>
<td>N</td>
<td>1 37</td>
<td>2 18</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>2 18</td>
<td>2 57</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>2 57</td>
<td>3 37</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>3 37</td>
<td>4 18</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>4 18</td>
<td>5 5</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td>5 5</td>
<td>6 36</td>
</tr>
<tr>
<td>21</td>
<td>6</td>
<td>6 36</td>
<td>7 27</td>
</tr>
<tr>
<td>22</td>
<td>7</td>
<td>7 27</td>
<td>8 20</td>
</tr>
<tr>
<td>23</td>
<td>8</td>
<td>8 20</td>
<td>9 19</td>
</tr>
<tr>
<td>24</td>
<td>9</td>
<td>9 19</td>
<td>10 16</td>
</tr>
<tr>
<td>25</td>
<td>10</td>
<td>10 16</td>
<td>11 9</td>
</tr>
<tr>
<td>26</td>
<td>11</td>
<td>11 9</td>
<td>12 0</td>
</tr>
<tr>
<td>27</td>
<td>12</td>
<td>12 0</td>
<td>14 morn.</td>
</tr>
<tr>
<td>28</td>
<td>13</td>
<td>14 morn.</td>
<td>15 46</td>
</tr>
<tr>
<td>29</td>
<td>14</td>
<td>15 46</td>
<td>1 F</td>
</tr>
<tr>
<td>30</td>
<td>15</td>
<td>1 F</td>
<td>2 29</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>2 29</td>
<td></td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

#### NOTICES.
13. Fire Insurance due at Michaelmas must be paid on or before this day.
14. Dividends are payable.
19. Quarter Sessions in this week.

#### HISTORICAL MEMORANDA.
1. Paper Duty repealed, 1861.
5. First English Bible printed, 1536.
8. Battle of Torres Vedras, 1810.
11. America discovered, 1492.
— Peace of Vienna, 1809.
16. Battle of Leipsic, 1813.
— Houses of Parliament burnt, 1834.
17. Sir Philip Sidney killed at Zutphen, 1586.
18. Treaty of Zurich, 1859.
18. Battle of Neville’s Cross, 1346.
— Lord Palmerston died, 1865.
20. Battle of Navarino, 1827.
29. Sir Walter Raleigh executed, 1618.

During this month the days decrease 53 m. in the morning, and 1 h. 5 m. in the afternoon.

Moon in perigee on the 13th; in apogee on the 25th.

Mercury may be seen after sunset about the 13th.

Venus is a Morning Star during the month; and will be in conjunction with the Moon on the 12th, at 3 P.M.

Jupiter is an Evening Star; and will be in conjunction with the Moon on the 1st, at 9 P.M., and on the 28th, at 10 P.M.

Neptune is now favourable for telescopic observation.
### NOVEMBER, 1868.

#### Sun enters Sagittar.,

<table>
<thead>
<tr>
<th>Sun's Semi-diameter</th>
<th>Moon's Ascend. Node.</th>
<th>LUNATIONS AND PHASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11° 9' 21Ω 54</td>
<td>21° 36</td>
<td>Last Q. C 7th, 1h. 46m. af.</td>
</tr>
<tr>
<td>13° 16' 21</td>
<td>16</td>
<td>New M. 14th, 10h. 55m. m.</td>
</tr>
<tr>
<td>25° 16' 15°</td>
<td>20 38</td>
<td>First Q. D 22nd, 6h. 46m. m.</td>
</tr>
<tr>
<td>21d. 11 h. 36 m.</td>
<td></td>
<td>Full M. O 30th, 1h. 0m. m.</td>
</tr>
</tbody>
</table>

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sun 21 Sun. Trin. All Saints</td>
<td>6 56</td>
<td>4 31</td>
<td>5 a 40</td>
<td>7 m 34</td>
</tr>
<tr>
<td>2 M All Souls. Mich. T. beg.</td>
<td>6 58</td>
<td>4 29</td>
<td>6 15</td>
<td>8 44</td>
</tr>
<tr>
<td>3 Tu</td>
<td>7 0</td>
<td>4 27</td>
<td>6 59</td>
<td>9 52</td>
</tr>
<tr>
<td>4 W Saturn sets 5.36 aft.</td>
<td>7 0</td>
<td>4 25</td>
<td>7 49</td>
<td>10 56</td>
</tr>
<tr>
<td>5 Th Gunp. Plot, 1605. K. W. III.</td>
<td>7 4</td>
<td>4 24</td>
<td>8 49</td>
<td>11 53</td>
</tr>
<tr>
<td>6 F [landed]</td>
<td>7 5</td>
<td>4 22</td>
<td>9 57</td>
<td>0 a 41</td>
</tr>
<tr>
<td>7 S [div. noon]</td>
<td>7 7</td>
<td>4 20</td>
<td>11 12</td>
<td>1 22</td>
</tr>
<tr>
<td>8 Sun 22 Sun. Trin. Camb. Term</td>
<td>7 9</td>
<td>4 19</td>
<td>morn. 1</td>
<td>56</td>
</tr>
<tr>
<td>9 M PR. WALES B. 1841. Lord</td>
<td>7 11</td>
<td>4 17</td>
<td>0 27</td>
<td>2 26</td>
</tr>
<tr>
<td>10 Tu [Mayor's Day.]</td>
<td>7 12</td>
<td>4 16</td>
<td>1 46</td>
<td>2 54</td>
</tr>
<tr>
<td>11 W St. Martin</td>
<td>7 14</td>
<td>4 14</td>
<td>3 3</td>
<td>3 20</td>
</tr>
<tr>
<td>12 Th</td>
<td>7 16</td>
<td>4 13</td>
<td>4 19</td>
<td>3 47</td>
</tr>
<tr>
<td>13 F (Shooting Stars) Britius</td>
<td>7 18</td>
<td>4 11</td>
<td>5 37</td>
<td>4 13</td>
</tr>
<tr>
<td>14 S Jupiter sets 2.53 morn.</td>
<td>7 19</td>
<td>4 10</td>
<td>6 52</td>
<td>4 44</td>
</tr>
<tr>
<td>15 Sun 23 Sunday after Trinity</td>
<td>7 21</td>
<td>4 8</td>
<td>8 3</td>
<td>5 19</td>
</tr>
<tr>
<td>16 M [Machatus]</td>
<td>7 23</td>
<td>4 7</td>
<td>9 10</td>
<td>6 1</td>
</tr>
<tr>
<td>17 Tu Hugh Bp. of Lincoln</td>
<td>7 24</td>
<td>4 6</td>
<td>10 9</td>
<td>6 47</td>
</tr>
<tr>
<td>18 W</td>
<td>7 26</td>
<td>4 4</td>
<td>11 0</td>
<td>7 39</td>
</tr>
<tr>
<td>19 Th Mars rises 10.27 aft.</td>
<td>7 28</td>
<td>4 3</td>
<td>11 43</td>
<td>8 36</td>
</tr>
<tr>
<td>20 F Edm. King and Martyr</td>
<td>7 30</td>
<td>4 2</td>
<td>0 a 20</td>
<td>9 37</td>
</tr>
<tr>
<td>21 S CR. PRS. PRUSSIA B. 1840</td>
<td>7 31</td>
<td>4 1</td>
<td>0 50</td>
<td>10 39</td>
</tr>
<tr>
<td>22 Sun 24 Sunday after Trinity</td>
<td>7 33</td>
<td>4 0</td>
<td>1 17</td>
<td>11 42</td>
</tr>
<tr>
<td>23 M ST. CLEMENT [ST. Cecilia</td>
<td>7 35</td>
<td>3 59</td>
<td>1 40</td>
<td>morn.</td>
</tr>
<tr>
<td>24 Tu</td>
<td>7 36</td>
<td>3 58</td>
<td>2 2</td>
<td>0 45</td>
</tr>
<tr>
<td>25 W Mich. T. ends. Catherine.</td>
<td>7 38</td>
<td>3 57</td>
<td>2 25</td>
<td>1 50</td>
</tr>
<tr>
<td>26 Th</td>
<td>7 39</td>
<td>3 56</td>
<td>2 48</td>
<td>2 57</td>
</tr>
<tr>
<td>27 F Venus rises 3.57 morn.</td>
<td>7 41</td>
<td>3 55</td>
<td>3 12</td>
<td>4 6</td>
</tr>
<tr>
<td>28 S Mercury rises 5.52 morn.</td>
<td>7 42</td>
<td>3 54</td>
<td>3 39</td>
<td>5 16</td>
</tr>
<tr>
<td>29 Sun ADVENT SUNDAY</td>
<td>7 44</td>
<td>3 53</td>
<td>4 12</td>
<td>6 28</td>
</tr>
<tr>
<td>30 M ST. ANDREW</td>
<td>7 45</td>
<td>3 53</td>
<td>4 52</td>
<td>7 39</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decret</th>
<th>Day br.</th>
<th>Twilight ends.</th>
<th>Sun East.</th>
<th>Time on Clock.</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m. s.</td>
<td>h. m.</td>
</tr>
<tr>
<td>6</td>
<td>9 35</td>
<td>6 50</td>
<td>5 m 1</td>
<td>6 a 27</td>
<td>4m 56</td>
<td>11 43 42</td>
<td>0 m 16</td>
</tr>
<tr>
<td>11</td>
<td>17 17</td>
<td></td>
<td>9</td>
<td>19</td>
<td>51</td>
<td>43 47</td>
<td>4 48</td>
</tr>
<tr>
<td>16</td>
<td>8 45</td>
<td>49</td>
<td>23</td>
<td>7</td>
<td>42</td>
<td>45 2</td>
<td>1 a 37</td>
</tr>
<tr>
<td>21</td>
<td>30 8</td>
<td>4</td>
<td>30</td>
<td>2</td>
<td>39</td>
<td>46 11</td>
<td>5 41</td>
</tr>
<tr>
<td>26</td>
<td>17 17</td>
<td></td>
<td>37</td>
<td>5 m 59</td>
<td>37</td>
<td>47 39</td>
<td>9 20</td>
</tr>
<tr>
<td>D</td>
<td>Venus</td>
<td>Mars</td>
<td>Jupiter</td>
<td>Saturn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>--------</td>
<td>-------</td>
<td>---------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
<td>sets.</td>
<td>rises.</td>
</tr>
<tr>
<td></td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
<td>h. m.</td>
</tr>
<tr>
<td>1</td>
<td>2 m48</td>
<td>3 a 22</td>
<td>10 a 52</td>
<td>2 a 10</td>
<td>3 a 30</td>
<td>3 m48</td>
<td>9 m11</td>
</tr>
<tr>
<td>13</td>
<td>3 19</td>
<td>3</td>
<td>10</td>
<td>36</td>
<td>2 41</td>
<td>2 57</td>
<td>8 30</td>
</tr>
<tr>
<td>25</td>
<td>3 52</td>
<td>4</td>
<td>10</td>
<td>1 2</td>
<td>1 53</td>
<td>2 7</td>
<td>7 51</td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

#### NOTICES.

1. All Saints, or All Hallows.
2. Michaelmas Term begins. Borough Councillors elected. The Stock Exchange is closed on this day unless otherwise specially ordered. Also a holiday at the Stock Offices, Bank of England.
3. Mayors and Aldermen of boroughs elected.
5. Attorneys' Certificates granted.

#### METEORS.

13. The earth will pass the orbit of the November Meteors on the 13th at about 2h. P.M., when the recurrence of these phenomena may be expected. The time of day, however, is not favourable to their brilliancy.

#### HISTORICAL MEMORANDA.

1. Queen proclaimed in India, 1858.
2. Battle of Oltenitza, 1853.
3. Battle of Inkerman, 1854.
4. Princess Charlotte died, 1817.
5. First *Gazette* published, 1665.
7. Treaty of Zurich, 1859.
8. Treaty of Kars, 1855.
9. The *Times* printed by steam, 1814.

During this month the days decrease 50m. in the morning, and 39m. in the afternoon.

Moon in perigee on the 9th; in apogee on the 22nd.

*Venus* a Morning Star; conjunction with Moon, 11th, at 7 A.M.

*Jupiter* an Evening Star; conjunction with Moon, 25th, at 3 A.M.

Transit—Nov. 5. A transit of the planet Mercury over the Sun's disc. Ingress before sunrise; Sun rises at 7h. 4m.; egress at 9h. 3m., which will take place at 89° from the Sun's vertex towards the right hand.
### DECEMBER, 1868.

**LUNATIONS AND PHASES.**
- Last Q. \( \bigcirc \) 6th, 9h. 34m. af.
- New M. \( \bullet \) 14th, 1h. 33m. m.
- First Q. \( \bigcirc \) 22nd, 4h. 28m. m.
- Full M. \( \bigcirc \) 29th, 1h. 48m. af.

| M | W | D | Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, 
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TU</td>
<td>PRS. WALES B. 1844.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TH</td>
<td>Saturn rises 7.21 morn.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>SUN</td>
<td>2 Sunday in Advent. Nicholas</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TU</td>
<td>Concept. Virgin Mary</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>Jupiter sets 1.13 morn.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TH</td>
<td>Mars rises 9.43 aft.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>SUN</td>
<td>3 Sunday in Advent. Lucy</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td>EMB. WEEK. Camb. Term</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>TH</td>
<td>Oxford Term ends.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>Venus rises 4.59 morn.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SUN</td>
<td>4 Sunday in Advent</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>St. THOMAS. Short. Day</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>Mercury rises 7.46 morn.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>TH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>CHRISTMAS DAY</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>ST. STEPHEN</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>SUN</td>
<td>1 Sun. aft. Christ. ST. JOHN</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>INNOCENTS [EVANG.</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>TU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>TH</td>
<td>Silvester</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East.</th>
<th>Time on Clock at O's noon.</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 6 8 26</td>
<td>5 m 43</td>
<td>5 a 56</td>
<td>4 m 35</td>
<td>11 49 25</td>
<td>0 m 45</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6 57 37</td>
<td>48</td>
<td>55</td>
<td>34</td>
<td>51 27</td>
<td>5 31</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50 44</td>
<td>52</td>
<td>55</td>
<td>35</td>
<td>53 42</td>
<td>9 44</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>46 48</td>
<td>56</td>
<td>56</td>
<td>36</td>
<td>56 6</td>
<td>2 a 0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>45 49</td>
<td>59</td>
<td>58</td>
<td>38</td>
<td>58 35</td>
<td>5 46</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>46 Incr. 1</td>
<td>6 1</td>
<td>6 1</td>
<td>41</td>
<td>12 1 4</td>
<td>9 35</td>
<td></td>
</tr>
</tbody>
</table>

Sun enters Capricorn, 21 d. 6h. 28 m.

Sun's Semi-diameter: 16 15' 20' 19 1

Moon's ascend. Node: 16 17' 3 19 41

Moon's ascend. Node: 16 18' 1 19 3

Moon's ascend. Node:
### Notices and Historical Memoranda

**NOTICES.**

3. Dec. 26. Stock Exchange now closed on this day, unless otherwise specially ordered.

**HISTORICAL MEMORANDA.**

1. 2. Battle of Austerlitz, 1805.
2. 3. Battle of Hohenlinden, 1800.
3. 4. Lord Liverpool died, 1828.
4. 7. Algernon Sydney beheaded, 1683.
6. 10. Fall of Genoa, 1809.
7. 18. First gold from Australia, 1851.
9. 3. Rome evacuated by the French, 1866.
10. 4. Cromwell made Protector, 1653.
11. 5. Dr. Johnson died, 1784.
13. 7. H. R. H. the Prince Consort died, 1861.
14. 8. Izaak Walton died, 1683.
15. 9. Battle of Moodkee, 1845.
17. 11. Saxony made a kingdom, 1806.
23. 17. Wycliffe died, 1834.

From the 1st to the 21st the days shorten 20m. in the morning, and 1m. in the afternoon.

Moon in perigee, 4th day; apogee, 19th; perigee, 31st.

*Venus* is a Morning Star during the Month; and will be in conjunction with the Moon on the 11th, at 4 A.M.

*Jupiter* is an Evening Star during the month; and will be in conjunction with the Moon on the 22nd, at 2 P.M.

*Saturn's Rings* are visible, but for some years to come the planet can only be seen at low altitudes.
### JEWISH CALENDAR.

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1568</td>
<td>Jan. 5, 10th of Tebet.—Fast; Siege of Jerusalem.</td>
</tr>
<tr>
<td></td>
<td>Feb. 25, 1st of Shebat.</td>
</tr>
<tr>
<td></td>
<td>Mar. 5, 11th of ditto.—Fast of Esther.</td>
</tr>
<tr>
<td></td>
<td>Apr. 7, 15th of ditto.—Second Day.</td>
</tr>
<tr>
<td></td>
<td>May 22, 1st of Sivan.</td>
</tr>
<tr>
<td></td>
<td>June 21, 1st of Tammuz.</td>
</tr>
<tr>
<td></td>
<td>July 17, 17th of ditto.—Fast; Taking of Jerusalem.</td>
</tr>
<tr>
<td></td>
<td>Aug. 19, 1st of Elul.</td>
</tr>
<tr>
<td></td>
<td>Sept. 17, 1st of Tishri. (Year 5629 begins.)</td>
</tr>
<tr>
<td></td>
<td>Oct. 7, 1st of Av.</td>
</tr>
<tr>
<td></td>
<td>Nov. 15, 1st of Kislev.</td>
</tr>
<tr>
<td></td>
<td>Dec. 15, 1st of Tebet.</td>
</tr>
<tr>
<td>1868</td>
<td>Aug. 19, 1st of Elul.</td>
</tr>
<tr>
<td></td>
<td>Sept. 17, 1st of Tishri. (Year 5629 begins.)</td>
</tr>
<tr>
<td></td>
<td>Oct. 7, 1st of Av.</td>
</tr>
<tr>
<td></td>
<td>Nov. 15, 1st of Kislev.</td>
</tr>
<tr>
<td></td>
<td>Dec. 15, 1st of Tebet.</td>
</tr>
</tbody>
</table>

### MAHOMETAN CALENDAR.

**Employed in Turkey, Persia, Arabia, &c., and by Mahometans at Gibraltar.**

Year 1284 of the Hegira began May 5, 1867; ends April 24, 1868.

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1867</td>
<td>Dec. 27, 1st day of Ramadān.</td>
</tr>
<tr>
<td>1868</td>
<td>July 22, 1st day of Ramadān II.</td>
</tr>
</tbody>
</table>

### CHRONOLOGICAL CYCLES, ETC.

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.D.</td>
<td>Dominical Letters...</td>
</tr>
<tr>
<td>7</td>
<td>Golden Number...</td>
</tr>
<tr>
<td>6</td>
<td>Epact...</td>
</tr>
<tr>
<td>4</td>
<td>Sundays after Epiphany...</td>
</tr>
<tr>
<td>24</td>
<td>Sundays after Trinity...</td>
</tr>
<tr>
<td>1</td>
<td>Solar Cycle...</td>
</tr>
<tr>
<td>22</td>
<td>Number of Direction...</td>
</tr>
<tr>
<td>6851</td>
<td>Julian Period...</td>
</tr>
<tr>
<td>11</td>
<td>Roman Indiction...</td>
</tr>
<tr>
<td>197</td>
<td>Year of the Dionysian...</td>
</tr>
</tbody>
</table>

### ECCLESIASTICAL FEASTS.

<table>
<thead>
<tr>
<th>Feast</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrove Sunday</td>
<td>Feb. 23</td>
</tr>
<tr>
<td>Lent begins, Ash Wednesday</td>
<td>Feb. 26</td>
</tr>
<tr>
<td>Mid-Lent Sunday</td>
<td>March 22</td>
</tr>
<tr>
<td>Good Friday</td>
<td>April 10</td>
</tr>
<tr>
<td>Easter Day</td>
<td>April 13</td>
</tr>
<tr>
<td>Rogation Sunday</td>
<td>May 17</td>
</tr>
<tr>
<td>Ascension Day</td>
<td>May 21</td>
</tr>
<tr>
<td>Whit Sunday</td>
<td>May 31</td>
</tr>
<tr>
<td>Trinity Sunday</td>
<td>June 7</td>
</tr>
<tr>
<td>Advent Sunday</td>
<td>Nov. 29</td>
</tr>
</tbody>
</table>

### LAW TERMS.

<table>
<thead>
<tr>
<th>Term</th>
<th>Begins</th>
<th>Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hilary Term</td>
<td>Jan. 14</td>
<td>Apr. 4</td>
</tr>
<tr>
<td>Easter Term</td>
<td>Apr. 15</td>
<td>May 29</td>
</tr>
<tr>
<td>Trinity Term</td>
<td>May 30</td>
<td>July 11</td>
</tr>
<tr>
<td>Michaelmas Term</td>
<td>Oct. 10</td>
<td>Dec. 17</td>
</tr>
</tbody>
</table>

### UNIVERSITY TERMS.

<table>
<thead>
<tr>
<th>Term</th>
<th>Oxford</th>
<th>Cambridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hilary Term</td>
<td>Jan. 14</td>
<td>Begins</td>
</tr>
<tr>
<td>Easter Term</td>
<td>Apr. 15</td>
<td>Jan. 13</td>
</tr>
<tr>
<td>Trinity Term</td>
<td>May 30</td>
<td>Apr. 17</td>
</tr>
<tr>
<td>Michaelmas Term</td>
<td>Oct. 10</td>
<td>Oct. 1</td>
</tr>
</tbody>
</table>

The Act, July 7.
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Order.

1. By Frederick Burrington, Exeter.
In Memoriam—The Rev. John Hope.
Weep, Dia, weep, thou hast much cause for grief,
Thy faithful veteran son is now no more;
Time, that steals on as silent as a thief,
Hath brought the pale destroyer to his door.

He roamed the regions of poetic thought,
Th’ Elysian gardens of the classic nine;
And like a true and constant lover brought
His gathered flow’rs as off’rings to thy shrine.

Mourn, brothers, mourn, your plaintive tributes bring,
Our kindred sympathies the muses crave;
Soft let Euterpe touch her tender string,
And chaunt a requiem o’er his honoured grave.

When fancy reigned supreme and life was young,
I pondered with delight his mystic lay,
That swelled the chorus which “Companions”* sung—
Sweet sounds remembered still, though passed away.

In nature’s order, ripe and full of years,
Death kindly came his spirit to release;
His memory Dia hath embalmed with tears,
Whose “life was gentle,” and whose end was peace.

2. Order. By Miss M. Smith, Ampleforth.

When first the world from chaos sprung,
And darkness fled before the light,
The morning stars together sang,
And Order chased away the night.

So where the ocean rolls its wave,
The tides, obedient to their law,
The shores of distant lands may lave;
Still Order guides their ebb and flow.

And when the moon and stars above,
Resplendent in their orbits run,
Through boundless realms of space they rove,
Yet Order guides them safely on.

In earth and air, in sea and sky,
In all this vast and wondrous ball,
We trace the hand of One on high—
’Tis Heaven’s first law—’tis Order all!

3. By Dr. Rutherford, Charlton.

When heaven and earth came from creative hands,
And ev’ry thing obeyed divine commands;
Soft slept the waters—darkness hid the face
Of the great deep, and light sprung up to its place.
The darkness God called night, light He called day,
Pronounced it good, and gave its cheering ray.
Creation to complete six days required;
God ended all his works and then admired;
Well pleased, He rested on the seventh day,
And order reigned with universal sway.

* Mr. Hope contributed with the writer to the poetical department of ‘The Companion,’ forty-four years ago.
By Mr. Joseph Hutchinson, near Halifax.
Mourn, Dia, mourn, resume the pensive lay,
And robe of sable hue again put on;
Entwine a wreath of cypress for thy bay,
Our honour'd chief and laureate bard is gone;
In vain my humble muse or slumbering lyre
Essays in worthy strains to pour her plaints,
Oppress'd with grief—tho' friendship would inspire—
"Tis now "as when a standard-bearer faints."
For eight and forty years his talents rare,
Adorn'd these pages—rich in classic lore—
Poet and pastor—gifts and graces fair,
Alike endear'd him, whom we now deplore;
A skilful master of the mystic pen,
"We ne'er may look upon his like again.

5. By Mr. Robert Clemitson, of Morpeth.
Di's favorite bard in mystic lays
Sweeps o'er his tuneful lyre;
Again his verse evokes our praise,
Which yearly all admire.
When first this beauteous world was fram'd
By Heaven's high command,
Chaotic gloom supremely reign'd
O'er boundless sea and land.
As time rolled on with silent mien,
"Gross darkness" was dispell'd,
And graceful order, like a queen,
Her sovereign sway upheld.

6. By "Œdipus."
"Order is Heaven's first law:"—then prize it we:
A prize to one of us 'tis sure to be.

7. By "Zig-Zag."
Permit me, Sir, though in disguise,
To send an order for your prize.

The prize enigma seems to me
To be a strange anomaly;
For when the 'Diary' 's the recorder,
Order is nothing but disorder. (Di's order.)

On Hope's fair prize
I fixed my eyes,
Then left my cot
For garden plot,
Look'd at, and through, and round it;
And in the border found it.

We here insert the following expressive lines by a former esteemed correspondent:


Last of the laureate bards! Thy race is run,
And classic Dia's tears bewail her son—
Her much-lov'd son! whose heart-improving lays
Earn'd, by consent of all, immortal bays.
When shall we look upon his like again?—
We search, we question; but, alas! in vain!
The kind adviser, prompt to give or lend,
The steady student, and the constant friend,
The genial poet, and the honor'd priest—
He shone in all—from greatest things to least.
Gone is that kindred soul to kindred skies—
Aloft, aloft th' immortal spirit flies!
Let other writers praise—my heart is sore—
I say but little, but I feel the more.

An ocean tempest is a dreadful thing,
From it the direst evils often spring,
When spars are floating on the watery deep;
When choked the pump, and ev'ry hope is gone;
With surging billows ever pressing on,
Which o'er the steamer's deck incessant sweep!
Then racked her crooked sides; the chest's which hold
Things needful for the crew, their clothes and gold,
Are at the mercy of the frenzied gale,
Which soon may burst the barriers that sustain
Them in their places, and with force amain
O'er them and all eventually prevail!
The cabin window's smashed that stood between
The waves and inmates;—ah, then what a scene!
Confusion seemeth at its greatest height,
Whilst the inflowing flood asserts its pow'r.
Alas! the horrors of that dreadful hour,
When all rolls overturned, and nought upright!

But onward comes the close; no help is near,
The faintest dawn of hope does not appear;
All, all is sunk in deep and dark despair;
To Heav'n the poor unhaptunates now turn,
And o'er their former sins devoutly mourn,
But lost amid the storm each cry and prayer!

Not lost to Heav'n, 'tis hoped;—one sweeping blast,
Which well might seem the howling tempest's last,
Engulfs the ship, and down at length she goes;
Whilst then the crew, upon the surging main,
Strive both with boats and spars life to sustain,
Amidst the sudden change, increasing woes.

Lost were the steamers "London," "Morning Star,"
With others too 'midst elemental war;
Their tow'ring forms sank into ocean drear.
Say, in such cases, are there many saved,
Who thus the fury of the waves have braved?—
Few, few alas, on lists of saved appear!

What pen or pencil can the ills depict,
Which oft in casual order tars afflict,
Or passengers who leave their native shore,
To seek new domiciles in lands afar,
Beneath the guidance of the polar star,
With hopes, tho' distant, to return once more?
2. To the Memory of the late Rev. John Hope.

By Miss Helen Ogden, Shaw.

How oft is our sojourn here below
Compar’d unto the shadow’s passing ray;
Or like the flow’rets of the field that glow
Awhile in vigour and anon decay.

Too soon, alas! the visionary scenes,
By gathering clouds seem overcast;
Some sad bereavement often intervenes,
To warn us earthly ties are not to last.

And say, Diarians, could a darker gloom,
A more d’pressing influence round have shed,
Than the removal to the silent tomb
Of Hope rever’d, our fav’rite and our head?

Oh! Di, bereav’d, behold thy vot’ries stand
In deepest anguish at the high behest,
Whose awful pow’r admits of no remand;
But all consigns in kindred dust to rest.

Expression’s powers may prove too weak
The fulness of the human heart to tell,
And leave for silent eloquence to speak
The secret workings of its inmost swell.

Forgive, ye kindred mourners, I implore,
This feeble effort of the willing mind,
From one who has for twice ten years or more
Enjoy’d with him a correspondence kind;

Who mourns her inability to wreathe
A chaplet meet to deck his hallow’d bier,
Yet shuns not here the heart-felt sigh to breathe,
And to his memory drop a grateful tear.

Review Di’s page; his numbers, rich and rare,
Attest the genius of a master-mind,
That sought near fifty rolling years with care
Some hidden germ of intellect to find.

When Death’s unpitying mandate bow’d
The lov’d associates of his early day,
His sympathetic mind the gift bestow’d
Of an impressive tributary lay.

And though his harp, like theirs, is silent now,
His bright example still remains behind;
A shining beacon to direct us how
Communion’s closest ties to bind.

And let us yet, while ling’ring here below
Upon the changing slippery sands of time,
Submissive yield, since each succeeding blow
Is but to win us to a happier clime.
Remem’bring still our duty here must be
Our house in order duly to prepare,
If we the joys of heaven would hope to see,
And finally with him its blessings share.

3. By Dr. Rutherford, Chariton.

Wake, harp and lute, sound high Diaria’s praise,
And let the trembling strings their voices raise;
Discourse sweet music to the listening ear,
And echoes play around each heart to cheer.
Dear Dia, welcome to my hearth and home.
The dusky, dark November days are come;
Amusement and instruction ever blend
To swell thy pages and the truth defend.
And now the muse attempts to bring to light
The mystic stories hid in shades of night,
Dispel the veil that screens the poet’s themes,
Develop and disclose his deep-laid schemes.
No easy task the thoughts of maids and men
To catch as they flow from the cunning pen;
From well-stored mem’ries constantly they try,
With skill and craftiness to mystify.
Yet see the water from the pump flow clear,
The crotchet in its fitting place appear;
Rich silks and satins the shop window grace,
And in each humble ward some comfort trace.
These times in which we live are times of change,
And form and fashion ever widely range:
Amid all change no angry word let slip,
Nor flippant language ever leave the lip;
But still employ the pencil and the pen
In acts of kindness to the sons of men,
Their habits and their order to improve,
As through this vale of tears they onward move
To mansions in the realms of bliss above,
Where nought for ever reigns but purest love.


How quickly round the seasons roll!
And still in varying forms appear;
Their changing order, as a whole,
Complete the circuit of the year.
Vain man may pencil out a way,
A course erratic as the flood
Of water from the pump, but say,
How can that lead him unto good?
Summer and winter, autumn, spring,
Slip from him like a gliding stream;
And as they roll, a day they’ll bring
To wake him from this fatal dream.
The darkest gloom can not conceal
His way-ward thoughts and actions past;
From mortal eyes he may them veil—
’Tis a poor flimsy veil at last.
There’s an all-seeing eye above,
That doth his words and conduct scan;
Heaven’s windows always open prove,
Nor can be closed by mortal man.


’Tis winter truly now, and old King Frost
Rules with a tyrant’s sceptre lake and land,
Highways and water ponds alike are cross’d,
And pumps are paralysed beneath his hand.
But tho' despotical as a Czar or Turk, 
Beauties artistic mark his rigid reign, 
And forms more fanciful than crotchets work. 
Are freely pencilled on the window pane. 
And tho' there are who find his presence hard, 
Who wish for early change and milder sway, 
Others with pleasure due respect award, 
And hail him as a boon—tho' not for aye. 
No—all will have thee slip away, O King! 
In timely order for returning spring.

6. The Shipwreck. By Miss Mary Smith, Ampleforth.

'Twas morn, a barque sped on her way; 
Around the boundless ocean lay; 
The gentle breeze her canvas spread, 
Her crew was brave—all fear had fled.

* * * * *

'Tis night, across the watery deep, 
The howling winds their revels keep; 
A leak has sprung—ah, sore distress, 
The pumps are tried without success, 
The skilful sailors' plans are vain, 
All crotchets fail—the waters gain. 
The wind blows high, the billows roar; 
Far distant is the friendly shore,

And darkness frowning from the skies, 
While upwards still the waters rise; 
Without a change no power can save 
The seamen from a briny grave. 
Then death in awful form they see, 
A moment seems eternity. 
They crowd upon the slippery deck; 
Huge waves wash o'er the fated wreck. 
What artist's pencil now could trace 
The agony in every face? 
Her masts were gone, no sails were seen, 
Disorder seemed to reign supreme; 
One headlong plunge the vessel gave, 
Then sank into her ocean grave.

7. The Teetotaller's Lay. By Mr. T. Harrison, Abbey Holme, Carlisle.

Of beer-pots let working men banter, 
The merits of water I tell; 
Let gentlefolks hug the decanter, 
I'll stick by the pump and the well: 
Say, scoffer, am I short at labour, 
Or nearer to poverty's brink? 
Or how am I less than my neighbour, 
That spends half his earnings on drink?

At morning, away with my hatchet, 
My strokes make the woodlands ring; 
At mid-day—don't call it a crotchets— 
I take my repast by the spring; 
At evening one watches, how cheering! 
My coming when labour is done; 
For me through the window oft peeping, 
'Mid little ones' romping and fun.

As kind now as when she spell-bound me, 
She hastens to open the door; 
The youngsters then gather around me, 
Their freaks of the day telling o'er. 
We grieve not tho' lowly our station, 
Toils word away want from our cot; 
Contended with full occupation, 
We wish not for change in our lot. 
Our meal o'er, my wife, no one averter, 
Old garments will mend, or form new, 
Whilst I read the children a chapter 
On Eve's slip, or Joseph still true; 
Or, haply, with pencil and paper, 
Our boys show their progress at school; 
Blisthe faces encircle the taper, 
And order and harmony rule.

8. By ÒEdipus." 

"Water is best," we hear old Pindar sing, 
Therefore a pump must be a useful thing; 
E'er ready to respond to your desire, 
Nor key, nor window, does its form require. 
You gently move the handle from its place, 
Wave to and fro, and there slips out space 
Nature's own beverage, of which whoso sups 
May well decline intoxicating cups. 
If water you prefer to wines or ale, 
Order will at your table more prevail, 
And many a headache you shall thus ward off, 
And venture at the healing art to scoff.

An elaborate elegy on the lamented death of the Rev. John Hope, by our talented correspondent, Mr. James Hewitt, of Hexham, has been cancelled for want of space.
GENERAL ANSWERS TO THE REBUSES AND CHARADES.

1. Address to Diarians. By Mr. JAMES HEWITT, Hexham.

Dear friends, how may a bard excuse
The slips of a vagarious muse,
Who humbly pleads her want of time
To cogitate her bit of rhyme?
In lack of time, or over-work,
Harassed like a lazy Turk;
But Moslem stern, th' impetuous drone,
Takes precious care of number one!
She left her Di—confound her tricks!—
To flirt with Madam Polly Ticks,
And cut no end of curious capers,
With country "clash" and vile newspapers;
News and letters, scanning, sorting,
"Reading," revising proofs, reporting—
Not what Sir Roger Bumpkins said,
But what he should have said, instead;
Paring prosers down to "mense,"
Setting "saw" to common-sense,
Eliminating spite and "puxzen,"
From stings of libellous country cousin;
Listening some Dundreary bore
Prompting Mr. "Heddytor;"
Culling comic paragraph
To make some toothless gossip laugh;
Penning sage, didactic "leaders,"
To grab the rust off rustic readers;
Cardinal pouring into wounds;
Birching wild, false-scented "hounds,"
Telling colony to go to,
Textiles useful—what to know, too;
Accidents of shelf, or board—
But here comes Dr. Rutherford!—
Throw that clump upon the fire,
From the shelf take down the lyric,
Bid the bard an ode recite,—
Touch the apex of delight,—
Sing how rowan trea yach may sail,
In spite of witch, against the gale;
Orall our youthful joys recall,
In a polished pastoral;

To while away a little time,
Til in rough, unstudied rhyme,
I pay devours of due respect
And cancel debts of sad neglect
To friends who, two long years ago,
Flattered my poor music so.
But, ah! can I enough deplore
The peerless Hope, alas! no more!
For him, so wills my cruel fate,
My humble thanks come now too late.
Unjealous of his laureate bays,
How lavish he of warmest praise;
More glad to see on Dia's throne
Poor me, than claim that seat, his own;
That praise my merits far transcends,
But proves himself the best of friends.
Yet better crown and throne reward
Di's loved, revered, lamented bard;
And higher praise, his to receive,
Than human tongue or pen can give.
To Ogden, too, my thanks are due—
Of talents bright, and genius true;
Long had I tried her smile to gain,
And, now rejoice, strove not in vain:
Long may she in Diaria shine,
Our Venus pure, of rays divine;
Lone mystic star, of many bright,
That cheered us erst with heavenly light;
May she to Dia still be true,
And her attractions bring to view
New female constellations, sent
To adorn the mystic firmament.
Furniss, Herdson, Hutchinson,
Jane, and Waind, my thanks more won;
To each and all my kind regards,
And luck to Di's esteemed rewards:
And while in this uncertain life,
Be ours the love-inspiring strife
In Dia's service to excel—
My congee, in a kind farewell.

2. An Invitation. By Mr. JAMES HERDSON, Edinburgh.

Come, Dr. Rutherford, the bard,
And be a cordial clump with me;
We'll Dia on the shelf discard,
And seek some distant colony.
I have a snug and well-built yacht,
Rigg'd fore and aft, well fit to ply;
This little craft that I have got,
Is just the crib for you and I.

We'll take a trip to foreign lands,
Report to Di on our return;
Our log shall be at her commands,
And she shall all our travels learn.
Now then, dear sir, this favour grant,
And we will leave our busy isle;
'Twould be the apex of my want,
To make this willing short exile.

B
3. By the Cawkley’s Laddie.

Fair Diary’s puzzles in rhythmical strain,
Require from the Laddie an answer again;
So quick to the summons he enters the ring,
And in a brief sonnet commences to sing;
Each one in due order to name he will try:
A cordial the first, then birch and colony,
Textile, and then shaft, led on by Rutherford,
A chump and a shelf, after which comes a bard;
An apex, a yacht,—and a sweet pastoral,
Makes up this short ditty and mentions them all.

4. By Mr. Joseph Hutchinson, Halifax.

Dear Di, ’tis forty years and more
Since we had our first meeting,
And in your pages, as of yore,
I’ve still a cordial greeting.

But ah! how many bards are gone,
That once adorn’d these pages,
As Birch, and Claye, and Richardson,
A colony of sages.

And now another honour’d name
Death’s ruthless shaft has taken,
When on the apex height of fame,
Which must our sorrows waken.

One who has long these columns stor’d,
And textile furnish’d,
With Herdson, Wray, and Rutherford,
Whose wits are highly burnish’d.

Yes, HOPE is gone, whose master mind
And mystic muse was ever
With much of courtesy combin’d,
Unselfish, kind, and clever.

And may we all his spirit catch,
So full of grace and beauty;
And as a faithful pastor watch
Each point or path of duty.

5. By “Œdipus.”

Our cordial thanks to Hope are ever due;
Herdson, tho’ armed with birch, is ever true;
The well-known name of Hutchinson we love,
And hope that to no colony he’ll move;
Of Harrison my pen has nought to tell,
And yet his muse her textile web weaves well.
My shaft next soars before Diarian sight,
’Tis not for me to say if aimed aright.

We all with W. acclaim, nem. con.,
Our Rutherford is Dia’s favorite son.
Let’s hope the Cawkley’s Laddie is not chump,
Nor on his back there rides an odious hump.
Could we the Reverend Drysdale’s shelf look o’er,
Doubtless we there should find a varied lore.
Among the bards of Di may Tebay long
Not fail to join his tributary song!
Next Harrison to Rattenberg would lead;
Then to the ship’s hatch let us pay good heed.
Lastly, we need the pastoral of Wray
To answer all the mystical array.

6. By “Zig Zag.”

A cordial Mr. Hope supplies,
And Herdson birch for naughty boys;
A colony you next produce,
With textile fabrics for its use;
A shaft to rise or to descend,
Which Rutherford will comprehend;

A chump of wood not very hard.
A shelf of books to suit a bard;
An ope or a mountain tip,
A yacht in which to take a trip.
A pastoral for grove or grot,
And this completes the mystic lot.
NEW ENIGMAS.

I. ENIGMA (1501); by Mr. Ashton Smith, Uppingham.

In ages dark, when bold commanders led
Their daring hosts arrayed, as we have read,
My dismal form, quick as the pointed dart,
Cold terror spreads that strikes through every heart.
By time exact, slow passing measured space,
Again attend and note my onward pace;
If railway speed has reached perfection’s height,
It cannot thus exceed my rapid flight;
For soaring on, I pass o’er mountains steep,
Or valleys low, or cross the mighty deep.
'Tis mine to mark, quick as the moments pass,
The stream of time, like sands in yonder glass.
Again 'tis mine to cast a glimmering ray
At great events fulfilled some distant day.
I'm found erect, though often prostrate lie,
Yet scarce remarked as you go passing by.
But why disdain? why not impartial show
My welcome aid when rays intensely glow?
In compass small, confined to little space,
And yet the earth I clasp in my embrace.
In modern times of novelty I boast,
My mystic form, attracting quite a host.
Concluding hint—two centre-letters move,
Then vulgar folk to please at fairs I prove.

II. ENIGMA (1502); by Mr. Thomas Edwards, Lois Weedon.

Ye bards of mystic song, might I engage
Your kind attention on Di’s much-low’d page?
I cannot venture here to claim your praise,
Tho’ I am useful found in various ways.
In sacred writ my name you seldom trace,
Yet in the Ark I doubtless had a place;
But that a question is we can’t decide,
Altho’ my presence there may be implied.
A work of Nature I, yet formed by art,
And in life’s busy scenes I bear a part;
Cross purposes I have, as you may see,
But then the fault does not belong to me;
Of course I never have a wish to tease,
My use and object rather is to please.
If you don’t know me, ask the feathered choir,
Whose songs and plumage often you admire;
I them support, to me they firmly hold,
Yet I no shelter give from heat or cold.
To seek their rest some thousands round me flock;
The soaring eagle finds me on the rock.
But to the partridge, snipe, the quail, or grouse,
Perhaps I am of questionable use.
Of many feet I boast, but cannot run;
Yet view me in another state, feet I have none.
Just one more hint—for me seek in the Trent,
You’ll find me there in native element;
And epicures, though I don’t know the reason,
Prefer me mostly at a certain season.

III. ENIGMA (1503); by MR. JOSEPH FURNISS, LOIS WEEDON.

Dear friends, sans ceremonie or a meaningless ado,
And yet with all respect, I introduce myself to you;
And I’m sure you’ll give me welcome when I tell you that my name
To the most exquisite beauty close affinity may claim.
Ask the florist of my value when, with pleasure in his eyes,
He anticipates the future when an “Exhibition prize”
Shall reward him for his skill and care and ingenuity
In bringing to perfection all the varied charms of me.
Of course you think me some choice bloom amongst his blushing lot;
Its colour, say you, or its scent, its foliage, or what?
Nay, hold you, gentle friends, for mind, a mystic garb I wear,
And let me hasten onward other wonders to declare.
I’m found in India’s jungle where the tiger prowls for prey;
And yet, forsooth, why should I lure your thoughts so far away?
Since many a lovely English dame, drest up for play or ball,
Or dinner-party, oft displays my beauties all-in-all.
Nor will the gents disown me, as, for instance, swells and fops,
With braggart strut and newest cut of fashion in “pegtops,”
With dandy cane and Albert-chain all massive, and the ring,
Display me oft from toe to top, a very showy thing.
Again, I’ve been a sheer disgrace I’ll honestly confess,
As witness public sentiment and clamour of the press;
Devising this, persuading that, but bandied to agree
In honest excretion and in hatred deep of me.
Yet what strange inconsistencies throughout the world abound!
Would you believe it, after all, I ever should be found
Esteemed an honour and reward, while press and people too,
If not applauding, yet approve, that merit have its due?
I would not have you think of me as monster of ill-fame,
Albeit many a bloody stain will hang about my name,—
Look on me still as beautiful where richest colours glow,
For freely I confess both art and nature make me so.
I. ENIGMA (1504); by the Rev. J. J. Wray, Redruth, Cornwall.

When, where, and how I had an origin,
And where my Protean history did begin,
I cannot say; I'm very old, at least
As ancient as the "old and hoary East."
Wide is my rule, expansive my domain,
From frozen Arctic to the cliffs of Spain;
O'er all I spread my sceptre, and, in fact,
Own every hill and dale and level tract.
Not on the earth alone have I control,
Through my estates the distant planets roll;
And yet, though thus stupendous my command,
You've often held me lightly in your hand.
When war's wild fury spends its awful strength,
My power is often gladly sought at length;
I hush the cannon's roar, the gleaming blade
Glides to its sheath, and welcome peace is made.
The wearied soldiers, through my high behest,
Can turn to us in search of needful rest.
Now turn your gaze to yon palatial pile,
Built firm and massive, and in ancient style;
Above its gates the proud escutcheon see,
Which tells of noble blood and pedigree.
I've done my part to make their honours clear,
With what success does not, perhaps, appear,
For goodness brings the most enduring fame,
The brightest 'escutcheon is a spotless name.
When bending ears nod to the reaper's scythe,
And teeming harvests make the farmer blithe,
When piles of sheaves oppress the loaded wain,
Hopeful, he thinks of me and golden grain.
But why should I my needless strain prolong?
To you there is no secret in my song.

V. ENIGMA (1505); by Mr. Joseph Hutchinson, Halifax.

Dear ladies, think me not some power divine,
Nor yet a devotee at fashion's shrine,
Although that fickle goddess you may see
At times bestow her patronage on me;
When I on dress or bonnet meet your gaze—
Though query as to bonnet now-a-days.
However, leaving this, I take my stand
With other products form'd by nature's hand.
When summer smiles upon the gay parterre,
And bees sip sweets and fragrance scents the air,
With choice companions there I may be seen,
If not in lowly form, in lovely mien;
And though I may not with their splendour vie,
I have peculiar interest in the eye.
But leaving nature's scenes for works of art,
To decorations I a charm impart;
Applied by one of skilful hand and taste,
Your mansion I have beautified and graced.
And where the limpid brook pursues its way
O'er polish'd pebbles, there I frisk and play,
Though oft the sport of urchins, who with glee
Will try by various arts to capture me.
Another hint—and though it strange may seem—
From one that boasts of excellence supreme—
It is a fact I wish not to disguise,
I am not always what my name implies;
But what's a name?—"the rose," without deceit,
"By any other name would smell as sweet."

VI. ENIGMA (1506); by Mr. James Herdson, Edinburgh.
When Mother Earth was scarcely three days old
I had existence, as we're plainly told;
In Eden's garden surely I was found,
Where peace and happiness reign'd all around;
But now I come from nature's thorny wood,
Where I, for years, the rudest storms withstood;
And now you take and garnish me complete,
And tolerate me in your warm retreat;
More honour'd still, like some attractive star,
I'm made to sparkle in the gay bazaar;
You make me welcome to your house, perchance,
When Christmas parties gambol in the dance,
Perhaps in the servants' hall supreme I reign,
Give my protection to the bashful swain;
For there's a licence I at times pursue,
Whether legitimate or not, say you.
But fly to foreign lands, for we are told
That deeds of darkness I can there unfold;
Guilty of murder, robbery, and crime,
At least I've screen'd and hid them for a time;
But a sad fate sometimes awaits me there,
The devastating flame I've need to fear;
Whether by hands incendiary or not,
Such is my doom, my melancholy lot.
My tale is told, but with this parting hint
Before I vanish from this page of print;
At times deceptive,—on the village green
I for a ghost may have mistaken been.

VII. ENIGMA (1507); by Dr. Rutherford, Charlton.
Ye maidens fair who grace Diaria's page,
Ye sons of song who in her ranks engage,
In modest guise permit me to appear,
And ask the favour of my name next year.
As generous deeds with pleasure fill the mind,
And, well recorded, benefit mankind,
So from the treasures charity bestows
I yield assistance and alleviate woes.
Whate’er my substance, shape, or colour be,
That I am handy ladies all agree.
Observe the eager miser watch for wealth,
The sportsman on the moor in robust health—
They love me much; well-filled they me admire,
And after greater gains they still aspire.
Survey the Corn Exchange of modern days,
And view the stalls arranged in various ways;
The ruddy farmer on his samples bent,
Keeps pushing me about on sales intent.
In times gone by the mail, by coach conveyed,
Found me a trusty friend and sought my aid.
In most commercial dealings I abound,
And with the dusty miller I am found.
The schoolboy finds a ready friend in me;
The tourist all my usefulness can see.
In the far north of Britain’s wondrous isle,
The weary tourist oft I cause to smile;
The warlike pipe, with music shrill and clear,
And screaming din, bursts wildly on his ear.
Dear ladies, when you walk abroad, beware,
And watch your purse and me with greatest care;
For whether I am seen or hid from view,
I am in danger of the filching crew.
Enough has now been said the mask to rend;
Free from restraint on all I still attend.

VIII. ENIGMA (1508); by MR. FREDERICK BURRINGTON, Exeter.
Come, wake with the morn, for the sky looketh fair,
And follow me fast in the keen winter air;
In my prison of darkness I’ve passed the long night,
Now revel in freedom and bound with delight.
I’ll lead you through valley, “through brake and through briar,”
’Till the spirits excited rise higher and higher;
My voice echoes now from the hills as a knell,
So list, and an episode fearful I’ll tell.
When the moon, like a maiden, so modest and bright,
Walks forth through the stars on the blue floor of night,
From the depths of my den like a demon I fly,
Making hideous the night, for there’s death in my cry;
I sweep through the forest, I rush through the flood,
On the trail of my victim to revel in blood.
My fortunes are changed, and I come at your call,
To the cottage, the kitchen, the parlour, the hall.
I enter the palace; my state now behold,
Dressed in colours of beauty and radiant with gold;
Encircled by rank and fair eyes beaming bright,
My presence creates and diffuses delight;
To my lot the rich emblems of royalty fall,
The ermine, the sceptre, the crown, and the ball,
While the marquis, the duchess, the brave, and the fair,
Are rival expectants my honours to share.
It would harrow my heart had it sensitive feelings,
To submit after this to the loose, shuffling dealings
Of traders so orderly, prim, and delectable,
Who, though in the world's esteem highly respectable,
Behind each their counters, so cat-like—excuse me—
For gain, in the sad way I've stated, thus use me.
My treasure so charming attracts quite a bevy
When furnished with stock—but I'm now getting heavy,
And likely to tire; so, withdrawing politely,
Lest my burthen encumber and press you as tightly
As th' Old Man of the Sea oppressed Sinbad the Sailor,
When he sat on his shoulders cross-legged like a tailor,
I'll bid you farewell, having told you the reason;
To each and to all,—the best wish of the season.

IX. ENIGMA (1509); by MISS HELEN OGDEN, Shaw.

Since novelty permitted is to range
On Dia's page, pray do not deem it strange,
Should I in mystic guise attempt to shine
Among her followers of the tuneful nine.
Each musing vot'ry of her pleasing page,
From tyros young t' grave and sapient age,
Me to attain per chance exerts his skill,
His ardent wish some fav'rite niche to fill.
My influence here is limited, you'll say,
Where harmless recreation rules the day;
No jarring discord by ambition fed,
By kindly emulation only led.
Yet such the tenure of our earthly lot,
I may be found by those who seek me not,
Whose sober wishes choose the peaceful glade
Of calm retirement's contemplative shade,
Content to move beneath home's downy wing,
And to its quiet pleasures fondly clinging:
Yet many court me with assiduous aim,
Some wish'd for post or honour to attain.
Amid the scenes of this our busy world
What strife and conflict daily are unfurl'd;
Ungovern'd passions loose from reason's sway,
Man seeks to lead his brother in the way
Seen by himself alone, nor thinks that he
Has equal right and privilege to see
His private interest or the public weal,
Yet ventures not by clamour to reveal
Where noisy demagogues around proclaim
Their country's good their only end and aim.
Believe it, so admitted it may be;
But is there not some secret wish for me?
And can we turn without regret to view
The sad divisions many now pursue,
'Mongst those whose sacred mission is to lead
The child of error, if aright we read,
With cautious steps along the narrow way
That points to realms of bliss and endless day;
Not by parade or love of vestment seek,
Or wily arts, to draw aside the meek,
Since the great Author, source and fount of love,
Enjoined no love of dress the thoughts should move.
Is it for me, forbid the muse to say,
They venture to assume the rich array?
Yet think not I am hurtful; it is mine
On noblest deeds and pious worth to shine,
And sometimes urge the timid to unfold
A talent fair and pleasing to behold.

X. PRIZE ENIGMA (1510); BY MR. JAMES HEWITT, Hexham.

Old as the everlasting hills I reign,
Firm as the rock or treacherous as the main;
Nay, e’en the seething, fierce, chaotic storm
Would oft display me in a transient form.
When primal floods, obedient to command,
Gathered to seas, uprose the solid land,
High o’er the scene I stood, from pole to pole,
And from my native heights surveyed the whole;
Or, when the deluge o’er a sinful world
Resistless rolled, and to perdition hurled
Man and his works, how strove he me to gain;
Futile the wish! his strength was spent in vain.
Yet, though thus ancient, child of every clime,
I live and flourish to the present time,
By art’s prolific fingers daily made
To purchase bread—serve the behests of trade.
My colours? Ask the rainbow—what you choose—
Nature and art ordain me varied hues.
I’m on the Andes, Himalayas too,
My rugged outlines never meet the view;
In borrowed plumes my features lie concealed,
But even in these my likeness is revealed;
On Blanc, St. Bernard, hills of humbler class,
I stand as sentinel, by the sinuous pass.
Lo! Neptune in his glittering shallop glides
O’er heaving mountains, foaming, chafing tides;
With conscious pride he eyes my mantling form,
Bridles the whirlwind, and o’errules the storm.
The trembling sailor stands aghast to see
Danger and death concentrated all in me;
Puerile his fears, my hideous frown is gone,
And all my strength is spent to urge him on.
But, hark! the clarion’s clanging call “to arms!”
Filling a myriad souls with dire alarms,
The tramp of foemen shakes the trembling ground,
While warriors’ eyes in search of me roll round;
For spotless there I float, exalted high,
The guiding cynosure of every eye.
NEW CHARADES, REBUSES, &c.

1. Charade; by the late Rev. John Hope, Stapleton.
   My first gave rise to a destructive siege,
      Of which in classic authors we are told;
   My second was a king, a sov'reign liege,
      Who proved a tyrant in the days of old.
   My third is gen'rally obscured with gloom,
      It has a place above and under ground;
   Near to its presence terrors often loom,
      And dangers, sometimes sudden, circle round.
   My total owneth talents, rich and rare,
      Shown forth by lays which annually appear
   On Dia's pages, and a mind declare
      With genius stored and judgment ever clear.

2. Rebus; by Mr. James Hewitt, Hexham.
   My first, sir, it is gone, and so
      You this time are too late!
   I'm oft behind myself, you know,
      When I'm a thing of state.
   Behead, and I a blessing prove,
      Diffusing health and joy;
   But, though all good is from above,
      I also much annoy.
   Curtail, transpose, to make amends,
      Though deadly down below,
   You'll own I am the best of friends,
      And cheer where'er you go.

3. Rebus; by Mr. James Herdson, Edinburgh.
   A slight impediment in speech,
      Possess'd by some, but not by each;
   Transposed, possessed by all;
      When changed again, of me beware;
   Experience does this fact declare,—
      I come before a fall.

4. Rebus; by Mr. Frederick Burrington, Exeter.
   Could it by mortal eye be seen,
      It would be nothing to admire;
   Submitted to the guillotine,
      'Tis anything you can desire.
5. **REBUS; by Mr. R. Elliott, Jun., Choppington, Morpeth.**

My whole stands high amongst the gifted few  
Whose name on Dia's page we yearly view;  
Curtained, through pleasant vales I often run,  
And yet a race I never yet have won.  
Behead me now, and you will bring to view  
A bird that owns a somewhat darkish hue.

6. **CHARADE; by Mr. Joseph Hutchinson, Halifax.**

My first invigorates and life sustains,  
My next will flourish on uncultur'd plains;  
My whole, though weak, gives promise of a form  
That bears the blast of many a wintry storm.

7. **REBUS; by the CAWKLEY'S LADDIE.**

When whole, I circumspect am, very;  
Behead, then see me in a hurry;  
Behead again and then transpose,  
I'm sought for rest, ease, and repose;  
Transpose again, I'll say no more,  
For surely then I'm one of four.

8. **CHARADE; by “AMANDA.”**

Dear ladies, my whole you doubtless possess,  
For my primal you've always an eye;  
To enter my second I frankly confess,  
As well might I ask you to fly.

9. **REBUS; by Mr. Thomas Harrison, Abbey Holme, Carlisle.**

Though at first I indignantly bid you begone,  
And may then, with my head off, boast how I have done;  
When beheaded again I'm more mannerly grown,—  
Only too prim, at times, if still “blooming alone.”

10. **CHARADE; by “ZIG ZAG.”**

My first is form'd within a cell,  
With others of its kind;  
My next you have, and know it well,  
Perhaps better than your mind.  
My whole is one whose deeds may claim  
The highest honours for his name.

11. **CHARADE; by Mr. Septimus Tebay, Rivington.**

Without my first the earth would roll  
Through space without a guide;  
My second marks the course of time,  
Nor slumbers in the tide.  
Athenian whole, a brighter name  
Ne'er graced the hallowed scroll of fame.

12. **CHARADE; by Mr. Thomas Wray, Market Weighton.**

My first has often told of grief,  
During my second's course;  
My whole, alas! brings no relief,  
But tells of something worse.
ANSWERS TO THE QUERIES.

I. QUERY; by MR. JAMES HERDSON, Edinburgh.

What is the meaning of the memorial of blowing of trumpets, mentioned in Leviticus xxiii, 24; and of what materials were the trumpets made?

Answered by MR. JAMES HERDSON, the Proposer.

God appointed a variety of sacred seasons or festivals to the Israelites, as memorials to bring a person or thing to remembrance. The Feast of Trumpets was to be observed on the same day with that of the new moon, of the seventh sacred month, that is, the first day of the civil year, which happens in our September or early in October. The design of it was to commemorate the creation of all things, and to give thanks for the mercies of the finished year, and to sanctify the commencement of the New Year. On the Feast of Trumpets the priests blew with trumpets, from morning to evening, over the burning sacrifices. As trumpets were always made use of the first day of this feast, it was called the Feast of Trumpets, or memorial of blowing of trumpets. David Levi tells us that their trumpets are made of rams' horns, in remembrance of Abraham offering up a ram for a burnt offering instead of his son Isaac.

Again, by "EDIPUS."

Commentators tell us that the ceremonies ordained in Leviticus xxiii, 24, 25, were intended to solemnize the commencement of the civil New Year, and to usher in the other rites appointed for that month. Scott says, that "some think the Feast of Trumpets was appointed as a memorial of the creation." From Numbers x, 2, it would appear that the trumpets were made of silver.

Third Answer, by the late Rev. JOHN HOPE, Stapleton.

We are told that the trumpet has been found, as a musical instrument, among all nations, civilized as well as savage. It is thought to be derived from ισχυς, ish, a shell. Trumpets have been made of different materials—horn, brass, and even silver. The trumpets at the sound of which the walls of Jericho fell down were of rams' horns; yet it is highly probable—that it does not appear in the Bible—that the Jews also had brazen trumpets, especially as they had brazen symbols, and so many other things made of brass. The blowing of trumpets by the Jews took place on various occasions, namely, the calling of an assembly, removing of the ark, proclaiming the jubilee, testifying of gladness at some important event, preparing for war, on the appearing of the new moon, &c.; and the seventh month was an especial month, and many important things were performed in it. The memorial made by the blowing of trumpets was, perhaps, intended to indicate a joyful remembrance of their deliverance from Egyptian slavery, and the many mercies which, as his chosen people, God had showered upon them.

An answer was also given by Mr. Thomas Hattam, agreeing in substance with the preceding.

II. QUERY; by "CALCULUS," Consett.

The word vogue is much used in the most northern parts of England. What is its present meaning; also, what is its origin?

Answered by the late Rev. JOHN HOPE, Stapleton.

The word vogue is French; it does not seem to be restricted to the north; it is used by authors generally in the sense of fashion or custom. Such expressions as "came into vogue," or "continued in vogue," are frequently met with in the works of various writers. Respecting its derivation I know nothing; I can find no word, in any ancient language with which I am acquainted, to which its derivation may be referred. Vogue, in French, has an additional acceptation, namely, the act of rowing.

Again, by Mr. JAMES HEWITT, Hexham; and in like manner by Mr. THOMAS HATTAM and "EDIPUS."

The word vogue, in some form or other, obtains a local habitation and a name in the dictionaries of almost every European language, and seems allied to most of our words signifying forward motion, progress, &c., and the expression that such a thing is "all the go" seems to be its equivalent in common parlance. In Saxon and German it is near akin to the terms way, way, &c. "It keeps one constantly wagging," a ship is "under way," &c. In the 'Imperial Dictionary' it is thus treated:—"Vogue, n. (voy); Fr., vogue, a rowing; It.
III. QUERY; by the REV. ANDERSON DRYSDALE, Glasgow.

Which three letters of the Hebrew alphabet give, by transposition, six Hebrew roots?

Answered by the late REV. JOHN HOPE, Stapleton.

It is well known that by permutation three things may be formed into six combinations—that is, $1 \times 2 \times 3 = 6$. Thus, three letters may be transposed, but the Hebrew language, perhaps, furnishes the only instance of three letters making by transposition six words or roots. The letters, I think, are ב, ו, י, yod, ayin, resh, making

ב, ו, י, י, ו, ב;

which seem to fulfill the required conditions. It may be remarked that ב, ו, י—at least in the Bible—is never used separately; but in the hiphil tense it is ב, ו, י, which, pronouncing י as ry, may be kairing, probably the source from which the word harangue is derived. There are no other three Hebrew letters—so far as I know—that will answer the conditions of the query.

In the cxix Psalm there is a curious application of the Hebrew alphabet, each of the eight verses contained in each of the twenty-two parts into which the psalm is divided beginning, in the Hebrew text, with the letter which stands at its head, which must surely have been a laborious task.

Again, by "ŒDIPUS."

I submit a twofold answer to this query.

First.

€ב, to bless.
€ב, to bake.
€ב, to ride.
€ב, to proceed.
€ב, to multiply.
€ב, cherub.

Second.

€ב, to lighten.
€ב, to draw near.
€ב, morn.
€ב, to bury.
€ב, to tie; a stall.
€ב, to become putrid.

IV. QUERY; by the REV. JOHN HOPE, Stapleton.

What metal has been of most real use to mankind?

Answered by the Proposer; and similarly by Messrs. HATTAM, HERSDON, and HEWITT.

There can scarcely be a doubt that iron has been of the most real utility to mankind, and this utility has been especially manifested in the present century. The numerous railways throughout the world could never have been made without iron. Without iron where would have been our iron ships, our iron-plated men-of-war, our gallant steamers, our Armstrong guns, and other instruments of warfare? Where would have been our ploughshares, our gunning hooks, and reaping machines, as well as all the tools made use of by mechanics? Where would have been our table and pocket knives, and a hundred other things, all wholly or partially made of iron? Truly they would not have existed. It may be said that copper, lead, and brass, are useful; so they are, but not so useful as iron. It may also be said that gold and silver are necessary to defray the expense of the working of iron in its various applications. This is also true; but would the substance of these metals—comparatively small in quantity—have been sufficient for engines, rails, and all other things enumerated above for which iron is used? They would have gone, indeed, only a very short way, and would have been, in most cases, quite useless. We, therefore, conclude that iron has been, and still is, the most useful metal to mankind.

Again, by "ŒDIPUS."

I think there can be no doubt that iron has been the most useful metal to mankind. Locke says, "he who first made known the uses of iron may be truly styled the Father of Arts and the Author of Plenty." Solon said well to Crossus, when he was ostentatiously showing him his gold, "If any other come who has better iron than you, he will be master of all." Wilber-
force, in opposing an intended tax on iron, said, "The possession of iron is one of the great marks of distinction between civilised and barbarian society."

V. QUERY; by the late Rev. JOHN HOPE.

Looking at a lamp burning clearly, you can see no smoke issuing from the chimney; but viewing the reflection of it in a looking-glass, you see the vapour distinctly ascending to a considerable height. How is this phenomenon to be explained?

Answered by the Proposer.

This phenomenon appears strange. The evidence of my own eyes would seem to show that reflection intensifies the vapour so as to render it visible. The query, however, is proposed to elicit the opinions of others.

Again, by Mr. JAMES HEWITT, Hexham.

I have tried many experiments towards solving this query, both with paraffin lamps and candles of various kinds, having in view, in some cases, as many as four refracted flames, as well as the reflected one, but have hitherto failed to discover the vapour, even indistinctly, ascending, as stated in the query. Such a vapour, however, may be perceived as stated, under certain circumstances, and it occurs to me that I have witnessed the phenomenon at some time or other. The undue contraction of the pupil, caused by the intensity of the light, may serve to explain the defect of the direct vision. The rays of light in passing through the glass, and being retransmitted from the reflecting medium, become doubly refracted, and the optic nerve, being relieved in some measure from the intensity of the direct rays, is enabled to penetrate a greater area of the space occupied by the flame and vapour, and hence the latter may sometimes become visible.

Third Answer, by Mr. THOMAS HATTAM, Beachy Head Lighthouse.

I placed a looking-glass behind one of the Argand lamps in the lantern of this establishment, but could discover no smoke or vapour issuing from the chimney reflected by the mirror; neither have I seen any smoke or vapour in the reflection of the lamps burning clearly in the focus of the parabolic silver-faced reflectors here, and there are thirty of them kept burning bright and clear throughout the night. But if with other lamps the vapour or smoke is visible it may, perhaps, be accounted for by the reflected rays passing through the vapour.

"OEDIPUS" also states, "I have tried the experiment, and do not find it a matter of fact."

VI. QUERY; by Mr. THOMAS HATTAM, Beachy Head Lighthouse.

In the history of Australia it is said that the barometer is considered to rise before bad weather and fall before good, the reverse of what takes place in England. If true, what is the cause of this difference?

Answered by Mr. THOMAS HATTAM, the Proposer.

The words quoted in this query appear in the 'Popular Encyclopaedia,' published by Blackie and Son, in the year 1846, under the article "Australia." As far as my general information goes, the variations of the barometer, as a general rule, are the same in all parts of the world. But I have been informed, by reliable authority, that the changes on the barometer about thirty years ago were very sudden in Australia, and would, on that account, indicate changes in the weather the reverse of our experience here. Even in this country the sudden rise or fall of the barometer is not reliable, for I frequently notice that a rapid rise of the barometer is followed by unsettled weather. Slow and continued rise precedes fine weather, slow and continued fall wet or stormy weather; but a sudden rise or fall is very frequently followed, the first by wet, and the second by dry weather.

Again, by Mr. JAMES HEWITT, Hexham.

The flora and fauna of Australasia exhibit many very interesting and singular peculiarities—I might say contrarieties—such as trees clothed with grass instead of leaves, leaves growing with their planes vertical to the horizon, cherries with their stones exterior to the pulp, in the former; and in the latter, the bipeed and quadraped confounded, and amongst others that remarkable combination of bird and quadraped, the ornithorychus. In its meteorological phenomena, also, we have the fact that the most salubrious winds are from eastern points, and their deleterious blasts from the westward, exactly the contrary of what obtains in the northern hemisphere. With regard, however, to the phenomena mentioned in the query, I am inclined to think that it is a hasty conclusion, drawn from insufficient or erroneous data. The cause of the rise and fall of the barometer is a matter pretty well demonstrated, and why its action in relation to meteorological phenomena, under the atmosphere of
Australia, should be exactly the converse of what obtains in every country in the northern hemisphere, is certainly problematical.

Third Answer, by Mr. Thomas Dobson, Hexham.

During a residence of six years in Australia, Tasmania, and New Zealand, I collected much information concerning the storms of the South Pacific Ocean, which was embodied in a work published at Hobart Town, in 1853.

The greatest storms that I witnessed there occurred in July and August, 1852; and I succeeded in investigating their nature and course satisfactorily by means of the excellent meteorological observations at Melbourne, Sydney, Hobart Town, Auckland, &c., and by the comparison of a great number of log-books of merchant ships and Queen's ships, of which one, the " Fantôme," was lying at the time at the Auckland Islands.

The bad weather on those occasions was caused by the passage of cyclones passing to the eastward; the mercury in the barometer fell everywhere as the bad weather began with a northerly wind, and rose with the consequent southerly wind as the storm passed off. Indeed, it is a universal law, resulting from the nature of a cyclone, which is merely an immense aerial eddy, that the mercury should fall when bad weather approaches, but the direction of the wind at any place where this fall is observed may be any whatever, as it depends solely on the point of the compass towards which the cyclone may happen to be moving when its margin first strikes the place.

Fourth Answer, by the late Rev. John Hope, Stapleton.

Barometer is from the two Greek words βάρος, weight, and μέτρον, I measure, and means a measurer of weight, that is, of the pressure of the atmosphere. It may seem unnecessary to observe that, as shown by the barometer, the pressure of the air is equal to about 29.9 inches of mercury. Now, it is well known that when the air is heavy the mercury rises, and it is generally fair weather; when it is light, the contrary; this must be the case round the whole globe, as the atmosphere surrounds it on all sides. There are some variations in the height to which the mercury rises or falls in different parts of the earth, but the general principle of rising for fair weather and falling for rain must still hold good.

I. Query; by the late Rev. John Hope, Stapleton.

What part of speech is the to which forms our infinitive mood?

II. Query; by Mr. H. Harrington, London.

What is Poetry?

III. Query; by Mr. Artemas Martin, Venango, U.S.

Who was Cain's wife?

IV. Query; by Mr. James Hewitt, Hexham.

Required the origin of the words "illuminations" and "illustrations," as applied to manuscripts, &c., and the precise meaning they were intended to convey?

V. Query; by Mr. Thomas Hattam, Beachy Head Lighthouse, Eastbourne.

What is the origin of the terms "Whig" and "Tory."

VI. Query; by the same.

What is the cause of the baneful qualities of the east wind?

We here beg to state that many of the poetical pieces and answers to Queries, which were originally written at considerable length, have this year unavoidably been much cut down, in order to get the whole of the matter into the space available for this department of the Diary; and we take the opportunity of suggesting to our correspondents generally that in future the recurrence of this inconvenience will be obviated, or at least greatly modified, if they will kindly limit their several contributions to more moderate dimensions.—Ed.
A TABLE OF THE
KINGS AND QUEENS OF ENGLAND
SINCE THE CONQUEST.

<table>
<thead>
<tr>
<th>Kings and Queens</th>
<th>Born A.D.</th>
<th>Reigns began</th>
<th>Reigned T.M.D.</th>
<th>Reigns ended</th>
<th>Age</th>
<th>Where Buried</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will. Conq.</td>
<td>1027</td>
<td>1066 Dec. 25</td>
<td>20 8 15</td>
<td>1087 Sept. 9</td>
<td>60</td>
<td>Caen, Norm.</td>
</tr>
<tr>
<td>Will. Rufus</td>
<td>1057</td>
<td>1067 Sept. 26</td>
<td>12 10 7</td>
<td>1100 Aug. 2</td>
<td>43</td>
<td>Winchester</td>
</tr>
<tr>
<td>Henry I.</td>
<td>1068</td>
<td>1100 Aug. 5</td>
<td>35 3 27</td>
<td>1135 Dec. 1</td>
<td>67</td>
<td>Reading</td>
</tr>
<tr>
<td>Stephen</td>
<td>1105</td>
<td>1135 Dec. 26</td>
<td>18 10 0</td>
<td>1154 Oct. 25</td>
<td>49</td>
<td>Faversham</td>
</tr>
</tbody>
</table>

THE SAXON LINE RESTORED.

| Henry II.        | 1133      | 1147 Dec. 19 | 24 6 18       | 1189 July 6  | 56  | Fontevrault |
| Richard I.       | 1156      | 1189 Sept. 3 | 9 7 3         | 1199 April 6 | 43  | Fontevrault |
| John             | 1165      | 1199 May 27  | 17 4 23       | 1216 Oct. 19 | 51  | Worcester   |
| Henry III.       | 1176      | 1216 Oct. 28 | 56 0 19       | 1273 Nov. 16 | 65  | Westminster |
| Edward I.        | 1239      | 1273 Nov. 22 | 34 7 17       | 1307 July 7  | 67  | Westminster |
| Edward II.       | 1254      | 1327 July 8  | 19 6 12       | 1327 Jan. 20 | 43  | Gloucester  |
| Edward III.      | 1312      | 1327 Jan. 25 | 50 4 27       | 1377 June 21 | 65  | Westminster |
| Richard II.      | 1306      | 1377 June 32 | 22 3 7        | 1399 Sept. 39| 53  | Westminster |

THE LINE OF LANCASHER.

| Henry IV.        | 1367      | 1399 Sept. 30 | 13 5 30       | 1413 Mar. 20 | 46  | Canterbury  |
| Henry V.         | 1389      | 1413 Mar. 21  | 9 5 10        | 1432 Aug. 21 | 33  | Westminster |
| Henry VI.        | 1421      | 1432 Sept. 1  | 38 6 3        | 1461 Mar. 4  | 39  | Windsor     |

THE LINE OF YORK.

| Edward IV.       | 1442      | 1461 Mar. 4   | 22 1 5        | 1483 April 9 | 41  | Windsor     |
| Edward V.        | 1471      | 1483 April 9  | 0 2 16        | 1483 June 25 | 12  | Not known   |
| Richard III.     | 1443      | 1485 June 26  | 2 1 26        | 1485 Aug. 22 | 42  | Leicester   |

THE FAMILIES UNITED.

| Henry VII.       | 1546      | 1485 Aug. 22  | 22 3 70       | 1509 Apr. 21 | 52  | Westminster |
| Henry VIII.      | 1492      | 1509 Apr. 22  | 37 9 6        | 1547 Jan. 28 | 55  | Windsor     |
| Edward VI.       | 1537      | 1547 Jan. 28  | 6 5 9         | 1553 July 6  | 16  | Westminster |
| Queen Mary       | 1516      | 1553 July 8   | 5 4 11        | 1558 Nov. 17 | 42  | Westminster |
| Q. Elizabeth     | 1533      | 1558 Nov. 17  | 44 4 7        | 1603 Mar. 24 | 69  | Westminster |

THE UNION OF THE ENGLISH AND SCOTCH CROWNS.

| James I.         | 1566      | 1603 Mar. 24  | 22 0 3        | 1625 Mar. 27 | 58  | Westminster |
| Charles I.       | 1600      | 1625 Mar. 27  | 23 10 3       | 1649 Jan. 30 | 48  | Windsor     |
| Charles II.      | 1630      | 1649 Jan. 30  | 36 0 7        | 1665 Feb. 6  | 54  | Westminster |
| James II.        | 1633      | 1665 Feb. 6   | 3 10 5        | 1688 Dec. 11 | 67  | Paris       |
| William III.     | 1650      | 1688 Dec. 11  | 13 0 20       | 1702 Mar. 8  | 61  | Westminster |
| Mary II.         | 1682      | 1689 Feb. 13  | 13 0 20       | 1702 Mar. 8  | 62  | Westminster |

THE UNION OF THE TWO KINGDOMS.

| Queen Anne       | 1665      | 1702 Mar. 8   | 12 4 24       | 1714 Aug. 1  | 49  | Westminster |
| George I.        | 1660      | 1714 Aug. 1   | 12 10 10      | 1737 June 11 | 67  | Hanover     |
| George II.       | 1683      | 1737 June 11  | 33 4 14       | 1760 Oct. 25 | 77  | Westminster |
| William III.     | 1738      | 1760 Oct. 25  | 59 3 4        | 1820 Jan. 29 | 82  | Windsor     |
| George IV.       | 1762      | 1820 Jan. 29  | 10 4 28       | 1830 June 26 | 68  | Windsor     |
| William IV.      | 1765      | 1830 June 26  | 6 11 28       | 1837 June 20 | 72  | Windsor     |
| Victoria         | 1769      | 1837 June 20  |                |              |     | Whom God preserves |

The Commonwealth, under Cromwell and his Son, lasted from Jan. 30th, 1649, to May 29th, 1660; or 11 years, 3 months, 29 days.

It was not until the reign of Elizabeth that the principle that “The King never dies” was admitted; that of hereditary right from November, 1272.

The three longest reigns were those of Henry III, Edward III, and George III. Richard I’s body was buried at Fontevrault, his lion heart he bequeathed to the citizens of Rouen. Henry VI deposed in 1461, died in 1471.

John was crowned four times, viz., on May 27th, 1199; on October 8th, 1200; on March 25th, 1201; and on April 14th, 1202. Henry III was crowned twice, viz., Oct. 28th, 1216; and May 17th, 1230. Edward III was King of France from January 1340 to May 1360.

Some legal documents between July 5th and 17th, 1553, refer to Jane [Grey] as Queen.
THE ROYAL FAMILY—OFFICERS OF STATE.

THE QUEEN AND ROYAL FAMILY.

THE QUEEN.—Victoria, of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, was born May 24, 1819; succeeded to the throne June 20, 1837, on the death of her uncle, King William IV.; crowned June 28, 1838, and married Feb. 10, 1840, to his Royal Highness Prince Albert of Saxe Coburg, who died Dec. 14, 1861. Her Majesty is the only daughter of his late Royal Highness Edward Duke of Kent, son of King George III.


H.R.H. Alice Maud Mary, b. April 25, 1843; m. July 1, 1862, Prince Louis of Hesse.


H.R.H. Louisa Caroline Albert, b. March 18, 1848.


H.R.H. Leopold George Duncan Albert, b. April 7, 1853.

H.R.H. Beatrice Mary Victoria Feodore, b. April 14, 1857.

PRINCES AND PRINCESSES.

Augusta Wilhelmina Louisa, Duchess of Cambridge, niece of the Landgrave of Hesse, b. July 25, 1797; m. in 1818, the late Duke of Cambridge, by whom she has issue George William, Augusta Caroline, and Mary Adelaide, named below.

George Frederic Alexander Charles Ernest Augustus, K.G., Duke of Cumberland (Ex-King of Hanover), cousin to her Majesty, b. May 27, 1819; m. Feb. 18, 1843, Princess Mary of Saxe Altenburg.


Augusta Caroline Charlotte Elizabeth Mary Sophia Louisa, daughter of the late Duke of Cambridge, and cousin to her Majesty, b. July 19, 1822; m. June 28, 1843, Frederick, Grand Duke of Mecklenburg-Strelitz.

Mary Adelaide Wilhelmina Elizabeth, daughter of the late Duke of Cambridge, and cousin to her Majesty, b. Nov. 27, 1833; m. June 12, 1866, the Prince of Teck.

HER MAJESTY'S CHIEF OFFICERS OF STATE.

First Lord of the Treasury, Earl of Derby, K.G.
Lord High Chancellor, Lord Chelmsford.
Chancellor of Exchequer, Rt. Hon. B. Disraeli.
Lord President of Council, Duke of Marlborough.
Lord Privy Seal, Earl of Malcolm.
Home Secretary, Rt. Hon. G. H. Bentinck.
Foreign Secretary, Rt. Hon. Lord Stanley.
Colonial Secretary, Duke of Buckingham and Chandos.

The above form the Cabinet.

Paymaster-General, and Vice-President of the Board of Trade, Rt. Hon. S. Cave.
Master of the Mint, T. Graham, Esq., F.R.S.
Vice-President of Committee on Education, Rt. Hon. Lord Roberts.
Attorney-General, Sir John B. Karstake.
Solicitor-General, Sir J. Grey.
Judge Advocate-General, Rt. Hon. J. R. Mowbray.

CHIEF OFFICERS OF HER MAJESTY'S HOUSEHOLD.

Chamberlain, Lord Willoughby der Eresy.
Lord Chamberlain, Earl of Bradford.
Lord Steward, Earl of Tankerville.
Lord High Almoner, Bishop of Oxford.
Master of the Horse, Duke of Beaufort, K.G.
Master of the Buckhounds, Lord Colville.
Treasurer of Household, Col. Rt. Hon. P. E. Herbert.


Vice-Chamberlain, Rt. Hon. Lord Claud Hamilton.
Master of the Household, Major Sir John C. Cowell, K.C.B.
OFFICERS OF STATE AND ROYAL HOUSEHOLDS.

Captain of the Gentlemen-at-Arms, Marquis of Exeter.
Captain of the Yeomen of the Guard, Earl of Cadogan.
Assistant, Col. Charles Bagot.

FEMALE APPOINTMENTS IN HER MAJESTY'S HOUSEHOLD.

Mistress of the Robes, Duchess of Wellington.
Ladies in Waiting, Duchess of Atholl, Duchess of Roxburghe, Marchioness of Ely, Countess of Cailearn, Countess of Gainsborough, Viscountess Jocelyn, Lady Churchhill, Lady Waterpark.
Maids of Honour, Hon. Lucy M. Kerr, Hon. Caroline F. Cavendish, Hon. Flora C. I.

HOUSEHOLD OF H.R.H. THE PRINCE OF WALES.

Private Secretary, Herbert W. Fisher.
Physicians in Ordinary, W. Jenner, M.D.; E. Sieveking, M.D.
Surgeons in Ordinary, James Paget and George Pollock.

HOUSEHOLD OF H.R.H. THE PRINCESS OF WALES.

Chamberlain, Lord Harris, G.C.S.I.
Ladies of the Bedchamber, Marchioness of Carmarthen, Countess of Moira, Countess of Macclesfield, Viscountess Walden.

Physician Accoucheurs, Arthur Farre, M.D. F.R.S.; George Thompson Gream, M.D.

SCOTLAND, CHIEF OFFICERS OF.

Lord Clerk Register, Rt. Hon. Sir W. G. Craig, Bart.
Hereditary Grand Constable, Earl of Erroll.
Lord Advocate, Rt. Hon. E. S. Gordon.
Solicitor-General, John Millar.

IRELAND, CHIEF OFFICERS OF.

Lord Lieutenant, Marq. of Abercorn, K.G.
Lord Almoner, The Primate.
Lord Chancellor, Rt. Hon. A. Brewster.
Chief Secretary, Rt. Hon. Earl of Mayo.
Private Sec., Hon. L. G. Dillon.
Master of the Rolls, Rt. Hon. J. E. Walsh.
Vice-Chancellor, Rt. Hon. H. E. Chatterton.

Lord Chief Justice of Queen's Bench, Rt. Hon. James Whiteside.
Lord Chief Baron of Exchequer, Rt. Hon. David R. Pigott.
Solicitor-General, Michael Harrison.
HOUSE OF LORDS.

LIST OF THE HOUSE OF LORDS, WITH THE Surname and Year of the Birth and Accession (or Creation) of Each Peer.

The Scotch Representative Peers, 16 in number, and elected for each new Parliament, are distinguished by a *; the Irish, 28 in number, and elected for life, by a †. The Irish Representative Prelates for the Session of 1865 are marked with a ‡. Other Scotch and Irish Peers, who sit in this House as Peers of England, have their national titles assigned to them, that by which they sit being added. Such Peers as are Knights of the Garter are distinguished by G. Those marked x are Minorors.

Speaker, the Lord High Chancellor.—Deputy Speaker, Lord RedesdaLe.

PRINCES.

H.R.H. the Prince of Wales, G.
H.R.H. the Duke of Edinburgh, G.
H.R.H. the Duke of Cambridge, G.

ARCHBISHOPS.


DUKES.

Argyll (Campbell), sits as L. Sundridge, born 1823. s. 1847. Atholl (Murray), sits as E. Strange, b. 1840. s. 1864. Beaufort (Somerset), b. 1824. s. 1853. G. Bedford (Russell), b. 1809. s. 1861. Buccleuch (Scott), sits as E. Doncaster, b. 1806. s. 1810. G. Buckingham and Chandos (Grenville), b. 1823. s. 1861. Cleveland (Powlett), b. 1803. s. 1864. G. Devonshire (Cavendish), b. 1803. s. 1858. G. Grafton (Fitz-Roy), b. 1819. s. 1863. Hamilton (Hamilton), sits as D. of Brandon, b. 1845. s. 1863. Leeds (Osborne), b. 1802. s. 1859. Leinster ( Fitzgerald), sits as V. Leinster, b. 1791. s. 1804. Manchester (Montagu), b. 1823. s. 1855. Marlborough (Churchill), b. 1822. s. 1857. Mentrose (Graham), sits as E. Graham, b. 1799. s. 1836. Newcastle (Clinton), b. 1834. s. 1864. Norfolk (Howard), b. 1847. s. 1861. Northumberland (Percy), b. 1810. s. 1867. Portland (Bentinck), b. 1800. s. 1854. Richmond (Lennox), b. 1818. s. 1860. G. Roxburghe (Innes-Ker), sits as E. of Innes, b. 1816. s. 1861. Rutland (Manners), b. 1815. s. 1857. G. St. Albans (Beaucherk), b. 1840. s. 1849. Somerset (St. Maur), b. 1804. s. 1855. G. Sutherland (Leveson-Gower), b. 1828. s. 1861. G. Wellington (Wellesley), b. 1807. s. 1852. G.

MARQUESES.

Abercorn (Hamilton), b. 1811. s. 1818. G. Albermarle (Bruce), b. 1804. s. 1856. G. Alsea (Kenny), b. 1816. s. 1846. Anglesey (Pigot), b. 1797. s. 1854. G. Bath (Thynne), b. 1831. s. 1837. Bristol (Hervey), b. 1834. s. 1864. Bute (Stuart), b. 1847. s. 1848. Camden (Pratt), b. 1840. s. 1866. Cholmondeley (Cholmondeley), b. 1792. s. 1827.

Clanricarde (De Burgh), sits as L. Somerhill, b. 1802. c. 1825. Conyngham (Conyngham), sits as L. Minster, b. 1797. s. 1832. Donegal (Chichester), sits as L. Fisherwick, b. 1798. s. 1814. Downshire (Hill), sits as E. Hillsborough, b. 1812. s. 1845. Drogheda (Moore), sits as L. Moore, b. 1825. s. 1837. Ely (Loftus), sits as L. Loftus, b. 1849. s. 1857. Exeter (Cecil), b. 1825. s. 1867. Hastings (Hastings), b. 1842. s. 1851. Headfort (Taylour), sits as L. Kenlia, b. 1787. s. 1829. Hertford (Conway), b. 1800. s. 1842. G. Huntly (Gordon), sits as L. Meldrum, b. 1847. s. 1863. Lansdowne (Fitz Maurice), b. 1845. s. 1866. Londonderry (Stewart), sits as L. Stewart, b. 1805. s. 1854. [1841. Lothian (Kerr), sits as L. Kerr, b. 1832. s. Normanby (Phipps), b. 1819. s. 1863. Northampton (Compton), b. 1816. s. 1851. Ormonde (Butler), sits as L. Ormonde, b. 1844. s. 1864. Salisbury (Cecil), b. 1791. s. 1823. G. Silsoe (Brownie), sits as Lord Montague, b. 1829. s. 1845. Townshend (Townshend), b. 1831. s. 1862. Tweeddale (Hay), b. 1787. s. 1804. Waterford (Beresford), sits as L. Tyrone, b. 1844. s. 1866. Westmore (Nugent), b. 1785. c. 1822. Westminster (Grosvenor), b. 1795. s. 1845. G. Winchester (Paulet), b. 1801. s. 1843.

EARLS.

Aberdeen (Gordon), sits as V. Gordon, b. 1841 s. 1864. Abercromby (Nevill), b. 1792. s. 1845. Abingdon (Bertie), b. 1803. s. 1854. *Airlie (Ogilvy), b. 1826. s. 1849. Albermarle (Keppel), b. 1799. s. 1851. Amherst (Amhers!), b. 1805. s. 1857. ‡Annesley (Annesley), b. 1830. s. 1838. Ashburnham (Ashburnham), b. 1797. s. 1830. Aylesford (Finch), b. 1824. s. 1859. ‡Bandon (Bernard), b. 1810. s. 1856. ‡Bantry (White), b. 1800. s. 1851. Bathurst (Bathurst), b. 1791. s. 1866. Beauchamp (Lygon), b. 1830. s. 1866.
†Pembroke (Corry), b. 1835. s. 1845.
Berkeley (Berkeley), b. 1796. s. 1810.
Bessborough (Ponsonby), sits as L. Ponsonby, b. 1809. s. 1847.
Bradford (Bridgman), b. 1810. s. 1865.
Brooke and Warwick (Greville), b. 1816. s. 1863.
Brownlow (Cust), b. 1844. s. 1867.
Buckinghamshire (Hobart), b. 1793. s. 1849.
Cadogan (Cadogan), b. 1812. s. 1861.
*Calthurn (Sinclair), sits as L. Barrogill, b. 1821. s. 1865.
Camperdown (Haldane), b. 1841. s. 1867.
Cardigan (Brudenell), b. 1797. s. 1837.
Carlisle (Howard), b. 1808. s. 1864.
Carnarvon (Herbert), b. 1831. s. 1849.
Carysfort (Proby), sits as L. Carysfort, b. 1781. s. 1855.
Cathcart (Cathcart), b. 1828. s. 1859.
Cawdor (Campbell), b. 1817. s. 1860.
Charlemont (Caufield), sits as L. Charlemont, b. 1829. s. 1865.
Chesterfield (Stanhope), b. 1831. s. 1866.
Chichester (Felham), b. 1804. s. 1826.
Clancarty (Trench), sits as V. Clancarty, b. 1803. s. 1837.
Clanwilliam (Meade), sits as L. Clanwilliam, b. 1795. s. 1805.
Clarendon (Villiers), b. 1800. s. 1838.
Cork and Orrery (Boyle), sits as L. Boyle, b. 1829. s. 1856.
Cottenham (Pepys), b. 1824. s. 1851.
Courtown (Stopford), sits as L. Saltersford, b. 1825. s. 1863.
Coventry (Coventry), b. 1838. s. 1849.
Cowley (Wellesley), b. 1804. c. 1857.
Cowper (Cowper), b. 1834. s. 1856.
Craven (Craven), b. 1841. s. 1866.
Crawford and Balcarres (Lindsay), sits as L. Wigan, b. 1793. s. 1825.
Dalhousie (Macleod), sits as L. Panmure, b. 1801. s. 1860.
Darnley (Bligh), sits as L. Clifton, b. 1827. s. 1835.
Dartmouth (Legge), b. 1823. s. 1855.
Dartrey (Dawson), b. 1817. c. 1866.
De Grey and Ripon (Robinson), b. 1827. s. 1859.
De-la-Warr (West), b. 1791. s. 1795.
Denbigh (Felding), b. 1823. s. 1865.
Derby (Stanley), b. 1799. s. 1851.
Devon (Courtenay), b. 1807. s. 1859.
Donoughmore (Hutchinson), sits as V. Hutchinson, b. 1848. s. 1866.
Ducie (Moreton), b. 1827. s. 1853.
Dudley (Ward), b. 1817. c. 1860.
Dunmore (Murray), sits as L. Dunmore, b. 1841. s. 1845.
Dunraven (Wynham-Quin), sits as L. Kenry, b. 1812. s. 1860.
Durham (Lambton), b. 1828. s. 1840.
Effingham (Howard), b. 1806. s. 1845.
Eglinton (Montgomery), sits as E. Winton, b. 1841. s. 1861.
Egmont (Perceval), sits as Lord Lovel, b. 1794. s. 1841.
Elgin (Scott), b. 1845. s. 1854.
Elgin and Kincardine (Bruce), sits as L. Elgin, b. 1849. s. 1863.
Ellenborough (Law), b. 1790. s. 1844.
Ellesmere (Egerton), b. 1847. s. 1862.
Enniskillen (Cole), sits as L. Grinstead, b. 1807. s. 1810.
*Erne (Crichton), b. 1802. s. 1842.
Erroll (Hay), sits as Lord Kilmarock, b. 1823. s. 1846.
Essex (Capel), b. 1803. s. 1839.
Ferrers (Shirley), b. 1847. s. 1853.
Fife (Ungil), sits as L. Skene, b. 1814. s. 1857.
Fingall (Plunkett), sits as L. Fingall, b. 1791. s. 1836.
Fitzwilliam (Fitzwilliam), b. 1815. s. 1857.
Fortescue (Fortescue), b. 1818. s. 1866.
Gainsborough (Noel), b. 1818. s. 1866.
Galloway (Stewart), sits as L. Stewart of Garlies, b. 1800. s. 1834.
Glasgow (Boyle), sits as L. Ross, b. 1792. s. 1843.
Gosford (Acheson), sits as L. Worthingham, b. 1841. s. 1864.
Granard (Forbes), sits as L. Granard, b. 1833. s. 1857.
Granville (Leveson-Gower), b. 1815. s. 1846.
Grey (Grey), b. 1802. s. 1845.
Gullford (North), b. 1851. s. 1861.
*Haddington (Baillie), b. 1802. s. 1858.
Hardwicke (Yorke), b. 1799. s. 1834.
Harewood (Lascelles), b. 1824. s. 1857.
Harrington (Stanhope), b. 1809. s. 1866.
Harbohydry (Ryder), b. 1798. s. 1847.
*Home (Home), b. 1799. s. 1841.
Hope (Hope), sits as L. Hope, b. 1831. s. 1843.
Howe (Curzon-Howard), b. 1796. c. 1821.
Huntingdon (Hastings), b. 1808. s. 1828.
Ilchester (Strangways), b. 1847. s. 1865.
Jersey (Villiers), b. 1845. s. 1860.
Kenmare (Brown), sits as L. Kenmare, b. 1783. s. 1853.
Kimberley (Wodehouse), b. 1826. c. 1866.
Kingston (King), sits as L. Kingston, b. 1800. s. 1867.
Kinnoul (Hay), sits as L. Hay, b. 1827. s. 1866.
Kintore (Falconer), sits as L. Kintore, b. 1823. s. 1844.
*Lauderdale (Maitland), b. 1803. s. 1863.
Leicester (Cole), b. 1822. s. 1842.
Leitrim (Clements), sits as L. Clements, b. 1806. s. 1855.
*Leven and Melville (Melville), b. 1786. s. 1860.
Lichfield (Anson), b. 1825. s. 1854.
Limerick (Pery), sits as L. Foxford, b. 1840. s. 1866.
Lindsey (Bertie), b. 1814. s. 1818.
Longford (Pakenham), sits as L. Silchester, b. 1819. s. 1860.
Lonsdale (Lowther), b. 1757. s. 1844.
Lovelace (King-Noel), b. 1805. c. 1836.
*Lucan (Bingbam), b. 1800. s. 1839.
MacClesfield (Parkers), b. 1811. s. 1850.
Malmsbury (Harris), b. 1807. s. 1841.
Mansfield (Murray), b. 1806. s. 1840.
Manvers (Pierpont), b. 1825. s. 1860.
Meath (Brabazon), sits as L. Chaworth, b. 1803. s. 1851.
Minto (Kynynmound), b. 1814. s. 1859.
Moray (Stuart), sits as L. Stuart, b. 1797. s. 1839.
Morley (Parker), b. 1842. s. 1864.
*Morton (Douglas), b. 1818. s. 1858.
*Mountcudshill (Moore), b. 1792. s. 1822.
Mount Edgecumbe (Edgecumbe), b. 1832. s. 1861.

Munster (Fitzclarence), b. 1824. s. 1842.

Nelson (Nelson), b. 1823. s. 1835.

Onslow (Onslow), b. 1777. s. 1827.

Orford (Walpole), b. 1813. s. 1858.

*Orkney (Fitzmaurice), b. 1803. s. 1831.

*Pembroke (Herbert), b. 1850. s. 1862.

*Portarlington (Dawson-Damer), b. 1822. s. 1845.

Pembroke (Fellowes), b. 1825. s. 1854.

Ponet (Ponet), b. 1827. s. 1864.

Powis (Herbert), b. 1819. s. 1828.

Radnor (Bouverie), b. 1779. s. 1828.

*Ranfurly (Knox), sits as L. Ranfurly, b. 1849. s. 1858.

Roden (Jocelyn), sits as L. Clanbrassil, b. 1788. s. 1820.

Romney (Marham), b. 1808. s. 1845.

Rosebery (Primrose), sits as L. Rosebery, b. 1783. s. 1814.

Rossly (Erskine), b. 1833. s. 1866.

Russell (Russell), b. 1792. c. 1861. G.

St. Germans (Elliot), b. 1798. s. 1845.

St. Maur (St. Maur), sits as L. Seymour, b. 1835. c. 1863.

Sandwich (Montagu), b. 1811. s. 1818.

Scarbrough (Lumley), b. 1813. s. 1858.

Seaford (Grant), sits as L. Straithpey, b. 1815. s. 1853.

Selton (Molyneux), sits as L. Selton, b. 1835. s. 1856.

Seilkirk (Douglas), b. 1809. s. 1820.

Shaftsbury (Ashley-Cooper), b. 1801. s. 1851. G.

Shannon (Boyle), sits as L. Carleton, b. 1809. s. 1842.

Sheffield (Holroyd), sits as L. Sheffield, b. 1802. s. 1821.

Shrewsbury and Talbot (Talbot), b. 1803. s. 1858.

Somers (Cocks), b. 1819. s. 1852.

Spencer (Spencer), b. 1835. s. 1857. G.

Stair (Dairymple), sits as L. Oxenfoord, b. 1819. s. 1864.

Stanford and Warrington (Grey), b. 1827. s. 1845.

Stanhope (Stanhope), b. 1805. s. 1855.

Stradbroke (Rous), b. 1794. s. 1837.

Strafford (Byng), b. 1809. s. 1860.

Suffolk (Howard), b. 1804. s. 1851.

Tankerville (Bennet), b. 1810. s. 1859.

Vane (Vane-Tempest), b. 1821. s. 1854.

Vernon (Grimsmon), b. 1809. s. 1845.

*Waldegrave (Waldegrave), b. 1851. s. 1859.

Warwick, see Brooke.

Wemyss and March (Doughlas), sits as L. Wemyss, b. 1796. s. 1835.

Westmorland (Fane), b. 1825. s. 1859.

Wicklow (Howard), b. 1788. s. 1818.

Wilts (Egerton), b. 1799. s. 1814.

Winchelsea (Finch-Hatton), b. 1815. s. 1858.

York (Pelham), b. 1835. s. 1862.

Zetland (Dundas), b. 1795. s. 1839.

VIScounts.

Bangor (Ward), b. 1827. s. 1837.

Bolingbroke (St. John), b. 1820. s. 1851.

Boyle (Hamilton-Russell), sits as L. Branchpeth, b. 1797. s. 1855.

Canterbury (Sutton), b. 1812. s. 1845.

*Cliffden (Agar-Ellis), sits as L. Mendip, b. 1863. s. 1866.

*Combermere (Cotton), b. 1818. s. 1865.

*De Vere (Vesey), b. 1803. s. 1855.

*Doneraile (St. Leger), b. 1818. s. 1854.

Everley (Leveyr), b. 1794. s. 1857.

Exmouth (Pelley), b. 1811. s. 1833.

Falkland (Carly), sits as L. Huson, b. 1803. s. 1809.

Falmouth (Boscawen), b. 1819. s. 1852.

Gage (Gage), sits as L. Gage, b. 1791. s. 1808.

Gough (Gough), b. 1779. s. 1849.

Halifax (Wood), b. 1800. s. 1866.

Hardinge (Hardinge), b. 1822. s. 1856.

*Hawarden (Mauke), b. 1817. s. 1856.

Hereford (Devereux), b. 1843. s. 1855.

Hill (Hill), b. 1750. s. 1842.

Hood (Hood), b. 1836. s. 1846.

*Hilford (Hewitt), b. 1811. s. 1855.

Lismore (O’Callaghan), sits as L. Lismore, b. 1815. s. 1857.

Massereene (Skeffington), sits as L. Oriel, b. 1842. s. 1863.

Melville (Dundas), b. 1801. s. 1851.

Midleton (Brodrick), sits as L. Brodick, b. 1793. s. 1863.

Monck (Monck), sits as L. Monck, b. 1819. s. 1849.

Powerscourt (Wingfield), b. 1836. s. 1844.

St. Vincent (Jervis), b. 1825. s. 1859.

Sidmouth (Addington), b. 1824. s. 1864.

Strangford (Smythe), sits as L. Penshurst, b. 1825. s. 1857.

Stratford de Redcliffe (Canning), b. 1788. c. 1852.

*Strathallan (Drummond), b. 1810. s. 1851.

Sydney (Townshend), b. 1805. s. 1831.

*Templeton (Upton), b. 1822. s. 1863.

Torrington (Byng), b. 1812. s. 1831.

Bishops.


Durham, C. Barlow, D.D. 1861.


*Kilcloo, W. FitzGerald, C. 1862.


Lincoln, John Jackson, D.D. 1853.


Manchester, James Prince Lee, D.D. 1848.


Peterborough, F. Deane, D.C.L. 1864.

Ripon, R. Bickersteth, D.D. 1856.


St. David’s, C. Thurlow, D.D. 1840.


Barons.

Abercornby (Abercornby), b. 1838. s. 1852.

Abinger (Scarlett), b. 1826. s. 1861.
Faversham (Duncombe), b. 1835. s. 1887.
Fitzhardinge (Berkeley), b. 1835. s. 1887.
Foley (Foley), b. 1805. s. 1835.
Forester (Forester), b. 1801. s. 1823.
Gardner (Gardner), b. 1810. s. 1815.
Gifford (Gifford), b. 1817. s. 1826.
Grantley (Norton), b. 1796. s. 1822.
Harris (Harris), b. 1810. s. 1845.
Hastings (Astley), b. 1832. s. 1859.
Hatherton (Littleton), b. 1815. s. 1863.
Hawke (Hawke), b. 1799. s. 1824.
Henniker (Henniker-Major), sits as Lord
Hartismere, b. 1801. s. 1832.
Heytesbury (Holmes), b. 1809. s. 1860.
Houghton (Mines), b. 1809. s. 1863.
Howard de Walden (Ellis), b. 1799. s. 1802.
Howden (Cradock), b. 1799. s. 1830.
Julliffe (Hylton), b. 1800. s. 1866.
Inchiquin (O'Brien), b. 1800. s. 1855.
Keane (Keane), b. 1815. s. 1844.
Kenyon (Kenyon), b. 1805. s. 1855.
Kilmaline (Brown), b. 1794. s. 1825.
Kinnaird (Kinnaird), b. 1807. s. 1826.
Leconfield (Wyndham), b. 1877. c. 1859.
Leigh (Leigh), b. 1824. s. 1850.
Lilford (Powys), b. 1833. s. 1861.
Loudesborough (Denison), b. 1834. s. 1860.
Lovat (Fraser), b. 1802. s. 1837.
Lurgan (Brownlow), b. 1831. s. 1847.
Lyon (Lyons), b. 1817. s. 1856.
Lyttelton (Lyttelton), b. 1817. s. 1837.
Lyttelton (Bulwer-Lytton), b. 1805. c. 1865.
Lyveden (Vernon), b. 1800. c. 1859.
Manners (Manners-Sutton), b. 1852. s. 1861.
Methuen (Methuen), b. 1815. s. 1849.
Middletown (Willoughby), b. 1817. s. 1856.
Monson (Monson), b. 1829. s. 1862.
Monteagle (Rice), b. 1849. s. 1866.
Mostyn (Lloyd-Mostyn), b. 1795. s. 1854.
Northbrook (Baring), b. 1826. s. 1866.
Northwick (Rushout), b. 1811. s. 1859.
Overstone (Loyd), b. 1798. c. 1859.
Penrhyn (Pennant), b. 1800. c. 1866.
Petre (Petre), b. 1817. s. 1850.
Plunket (Plunket), b. s. 1856.
Pottimore (Bamfylde), b. 1837. s. 1853.
Portman (Portman), b. 1799. c. 1837.
Raglan (Somerset), b. 1817. s. 1855.
Ravensworth (Liddell), b. 1797. s. 1855.
Rayleigh (Strutt), b. 1796. c. 1821.
Redesdale (Mitford), b. 1805. s. 1830.
Ribblesdale (Lister), b. 1828. s. 1832.
Rivers (Pitt), b. 1814. s. 1867.
Rodney (Rodney), b. 1850. s. 1864.
Rolle (Rolle), b. 1835. s. 1852.
Romilly (Romilly), b. 1802. c. 1865.
Ross (Ross), b. 1855. s. 1860.
Rossmore (Westmore), b. 1851. s. 1860.
Saltoun (Fraser), b. 1820. s. 1853.
Sandy (Sandy), b. 1840. s. 1863.
St. John (St. John), b. 1811. s. 1817.
St. Leonards (Sugden), b. 1781. c. 1852.
Sayer and Sele (Wykeham-Fiennes), b. 1790.
Scairsdale (Curzon), b. 1831. s. 1856.
Seaton (Colborne), b. 1815. s. 1863.
Sherborne (Dutton), b. 1804. s. 1862.
Skebrookesdale (Wilbraham), b. 1837. s. 1853.
Sondes (Miles), b. 1794. s. 1838.
Southampton (Fitzroy), b. 1801. s. 1810.
Stafford (Stafford-Jerningham), b. 1802. s. 1851.
HOUSE OF COMMONS.

Stanley of Alderley (Stanley), b. 1802. s. 1850.
Stourton (Stourton), b. 1802. s. 1846.
Stratheden and Campbell (Campbell), b. 1824. s. 1860.
Stratham (Rose), b. c. 1866.
Stuart de Decies (Stuart), b. 1803. c. 1839.
Sudeley (Hanbury-Tracy), b. 1801. s. 1858.
Suffield (Harborough), b. 1830. c. 1853.
Tabot de Malahide (Tabot), b. 1866. s. 1850.
Taunton (Labouchere), b. 1798. c. 1858.
Templemore (Chichester), b. 1821. s. 1837.
Tenterden (Abbot), b. 1796. c. 1832.
Teynham (Curzon), b. 1794. c. 1842.
Thurloe (Thurloe), b. 1837. s. 1857.
Tregear (Morgan), b. 1792. c. 1859.

Truro (Wilde), b. 1816. s. 1855.
Vaux (Mostyn), b. 1804. s. 1838.
Vernon (Venables Vernon), b. 1829. s. 1866.
Vivian (Vivian), b. 1808. s. 1842.
Walsingham (De Grey), b. 1804. s. 1839.
Wenlock (Lawley), b. 1818. s. 1852.
Wensleydale (Parke), b. 1752. c. 1856.
Wentworth (Milbanke), b. 1839. s. 1862.
Westbury (Bethell), b. 1800. c. 1861.
Wharncliffe (Wortley), b. 1827. s. 1855.
Willoughby de Broke (Verney), b. 1844. s. 1862.
Willoughby d'Eresby (Drummond), b. 1821. s. 1865.
Wrottesley (Wrottesley), b. 1824. s. 1867.
Wynford (Best), b. 1795. s. 1845.

OFFICERS OF THE HOUSE OF PEERS.

Chairman of Committees, Lord Redesdale.

principal Clerk for Bills, W. E. Walmsley.
Principal Librarian, James Heard Pulman.
Assistant Librarian, W. J. Thomas F.S.A.
Clerk attending the Table of the House, and
Cashier, Wm. Atkinson Green.
Principal Clerk, Private Bill Office, B. S. R.
Adam.

Peers’ Printed Paper Office, O. E. Grant.

HOUSE OF COMMONS.

Third Session of the Seventh Parliament of Queen Victoria, summoned August 15, 1865.

County Members ........ English 147 ... Welsh 15 ... Scotch 30 ... Irish 64 ........ 256
Cities and Boroughs ........ 320 ........ 14 ....... 22 ....... 39 ........ 396
Universities ........ ........ 4 ........ 6

Speaker, Rt. Hon. J. E. Denison.

Chairman of Committees, J. G. Dodson, Esq.

ENGLAND AND WALES.
1 Abingdon, Col. Hon. C. H. Lindsay.
3 Anglesey, Sir R. B. W. Bulkeley, Bt.
5 Ashburton, R. Jardine.
7 Aylesbury, S. G. Smith, N. M. de Rothschild.
8 Banbury, Bernhard Samuelson.
9 Barnstaple, Sir G. S. Studeley, Bt., T. Cave.
10 Bath, W. Tite, Lt.-Col. J. M. Hogg.
11 Beaumaris, Hon. W. O. Stanley.
14 Berkshire, Richd. Benyon, Lt.-Col. R. J. Loyd Lindsay, Sir Chas. Russell, Bt.
15 Berwick-upon-Tweed, Sir D. C. Marjorybanks, Bt., A. Mitchell.
17 Beverley, Sir T. E. Wimminating, Bt.
18 Bingley, John Laird.
19 Birmingham, John Bright, Geo. Dixon.
23 Boston, J. W. Malcolm, T. Parry.
26 Brecon, Howel Gwyn.
27 Bridgnorth, J. Pritchard, H. Whitmore.
28 Bridgewater, A. W. Kinglake, P. Underbyl.
29 Bridport, T. A. Mitchell, K. D. Hodgson.
30 Brighton, James White, Henry Fawcett.
32 Buckinghamshire, C. G. Du Pré, Rt. Hon. B. Disraeli, Robert B. Harvey.
33 Buckingham, Sir Harri Verney, Bart., John G. Hubbard.
34 Bury, R. N. Philipps.
35 Bury St. Edmunds, J. A. Harcastle Edward Greene.
36 Calne, Right Hon. Robert Lowe.
37 Cambridgeshire, Lord G. Manners, Right Hon. Viscount Rothschild, Richd. Young.
39 Cambridge Borough, Francis S. Powell, John Eldon Gorst.
40 Canterbury, H. A. Butler Johnstone, J. W. Huddleston.
41 Cardiff, Lieut.-Col. J. F. D. C. Stuart.
42 Cardiganshire, Sir T. D. Lloyd, Bart.
43 Cardigan, Captain E. L. Pryse.
44 Carlisle, W. N. Hodgson, E. Potter.
45 Carmarthenshire, David Jones, David Pugh.
46 Carmarthen, W. Morris.
48 Carnarvon, W. B. Hughes.
49 Chatham, Arthur J. Otway.
50 Cheltenham, Charles Schreiber.
52 Cheshire (South), Sir P. de M. G. Egerton, Bart., J. Tollemaache.
53 Chester, Earl Grosvenor, W. H. Gladstone.
54 Chichester, Lord H. G. C. G. Lennox, J. John Smith.
55 Chippingham, Sir John Need, Bart., Gabriel Goldney.
56 Christchurch, Rear-Adml. J. E. Walcott.
57 Cirencester, A. A. Bathurst, Hon. R. H. Dutton.
58 Cirencester, R. Fort.
59 Cockermouth, J. Steel, Right Hon. Earl of Mayo.
60 Cockermouth, J. Gurdon Rebow, E. K. Karslake.
61 Cornwall (East), T. J. A. Robartes, N. Kendall.
62 Cornwall (West), R. Davey, J. St. Aubyn.
63 Coventry, H. W. Eaton, H. M. Jackson.
64 Cricklade, A. L. Goddard, Sir D. Gooch, Bt.
67 Dartmouth, J. Hardy.
68 Denbigh, Sir W. W. Wynne, Bt., Col. R. M. Biddulph.
69 Denbigh, Townshend Mainwaring.
70 Derbyshire (North), Lord G. H. Cavendish, W. Jackson.
71 Derbyshire (South), T. W. Evans, C. R. Colville.
73 Denizes, C. Darby Griffith, Sir Thomas Bateson, Bart.
74 Devizes, Col. E. G. Griffith, Sir Thomas Bateson, Bart.
75 Devonport, Lt. Col. Montagu Chambers.
76 Devonshire (North), T. Dyke Acland, Right Hon. Sir S. H. Northcote, Bart.
77 Devonshire (South), Sir Lawrence Palme, Bart., S. T. Kekewich.
78 Dorchester, R. B. Sheridan, Lt.-Col. C. N. Sturt.
80 Dover, Major A. G. Dickson, Charles K. Freshfield.
81 Droitwich, Rt. Hon. Sir J. S. Pakington, Bart., G.C.B.
82 Dudley, H. B. Sheridan.
83 Durham (North), R. P. Shafto, Sir Hedley Williamson, Bart.
84 Durham (South), J. W. Pease, Captain C. F. Surtess.
85 Essex (North), Charles Du Cane, Sir T. B. Western, Bart.
86 Essex (South), H. J. Selwin-Ibbetson, Lord Eustace Cecili.
87 Essex, E. Holland, Lt.-Col. J. Bourne.
88 Exeter, Lord Courtenay, J. D. Coleridge.
89 Eye, Viscount Barrington. Palsmuth, see Penryn.
90 Finsbury, W. T. M'Callagh-Torrens, Alderman Andrew Lusk.
91 Flintshire, Lord Richard Grosvenor.
92 Flint, J. C., Sir John Hamer, Bart.
93 Frome, Sir H. C. Rawlinson.
94 Gateshead, Right Hon. Sir W. Hutt.
96 Gloucestershire (East), R. S. Holford, Sir M. E. H. Beach, Bart.
97 Gloucestershire (West), Lt.-Col. R. N. F. Kingscote, C.B., Col. E. A. Somerset, G.B.
100 Great Grimsby, John Fildes.
102 Guildford, Guildford Osmont, Richard Garth.
103 Halifax, Jas. Sainsfeld, E. Akroyd.
104 Hampshire (North), W. W. B. Beach, Geo. Scellot-Booth.
105 Hampshire (South), Sir J. C. Jervis, Bart., Colonel H. H. Paine.
109 Helston, W. B. Brett.
112 Hertfordshire, Hon. H. F. Cowper, H. E. Surtees, Abel Smith.
113 Hertford, Right Hon. W. F. Cowper, Robert Dimsdale.
115 Hornsea, R. H. Hurst.
116 Huddersfield, T. P. Crosland.
118 Huntingdon, Right Hon. Lieut.-Gen. J. Peel, Thomas Baring.
119 Ifley, Baron M. de Rothschild.
120 Ipswich, H. E. Adair, J. C. Cobbold.
121 Kendal, G. C. Glynn.
122 Kent (East), Sir Brook W. Bridges, Bart., Sir E. C. Dering, Bart.
124 Kidderminster, Albert Grant.
125 King's Lynn, Right Hon. Lord Stanley, Sir T. Fowell Buxton, Bart.
127 Knaresborough, B. T. Woodd, Isaac Holden.
129 Lambe, Thomas Hughes, Fred. Donlon.
129 Lancashire (North), Col. Right Hon. J. W. Patten, Right Hon. Marquis of Hartington.
130 Lancashire (South), Hon. Algernon F. Egerton, Charles Turner, Right Hon. W. E. Gladstone.
132 Leicester, J. D. Harris, Peter Alp. Taylor.
132 Lincoln, Major Hon. A. H. A. Anson, Col. Richard Dyott.
132 Lincolnshire (North), J. B. Stanhope, Sir M. J. Cholmeley, Bt.
132 Lincolnshire (South), Right Hon. Sir J. Trollope, Bart., G. H. Packe.
132 Lisburn, Sir A. W. Buller.
132 Lyme Regis, J. W. Trechy.
132 Maidstone, Wm. Lee, James Whatman.
132 Malton, G. M. W. Sandford, Ralph A. Earle.
132 Malmsbury, Viscount Andover.
132 Marlborough, Right Hon. Lord Ernest Bruce, Major H. B. Baring.
132 Marlow, W. G. Williams Wynn.
132 Merthyr-Tydfil, Right Hon. A. H. Bruce.
132 Middlesex, Viscount Enfield, Henry Labouchere.
132 Midhurst, W. T. Mitford.
132 Mornmouth, C. Bailey.
132 Montgomeryshire, C. W. Williams Wynn.
132 Newport, Isle of Wight, C. W. Martin, R. W. Kennard.
132 Norfolk (W), Sir W. Bagge, Bt., Hon. Thos. de Grey.
132 Northallerton, Hon. E. W. Lascless.
132 Northamptonshire (W), G. W. Hunt, S. G. Stopford.
132 Northamptonshire (S), Sir R. Knightley, Bt., Col. H. Cartwright.
132 Northampton, Chas. Gipps, Lord Henley.
132 Northumberland (W), Sir M. W. Ridley, Bt., Lord Henry Percy.
132 Nottinghamshire (S), Wm. Hodgson Barrow, T. B. T. Hildyard.
132 Nottingham, R. Bernal Osborne, Vis. Amberley.
132 Oldham, J. T. Hibbert, John Platt.
132 Oxford University, Sir W. Heathcote, Bt., Rt. Hon. Gathorne Hardy.
132 Pembroke, J. B. Bowen.
132 Pembroke, Sir. Hugh Owen, Bt.
132 Penryn and Falmouth, Samuel Gurney, Jervoise Smith.
132 Peterborough, T. Hankey, G. H. Whalley.
132 Pontefract, Hugh C. E. Childers, Major S. Waterhouse.
132 Poole, H. D. Seymour, Charles Waterhouse.
132 Preston, Sir T. G. Hesketh, Bt., Capt. Hon. F. A. Stanley.
132 Radnorshire, Sir John Benn Walsh, Bt.
132 Radnor (New), Richard Green Price.
132 Reigate (Writ suspended).
132 Retford (E), Viscount Galway, F. J. S.
132 Rochdale, T. B. Potter.
132 Rutlandshire, Hon. G. J. Noel (one seat vacant).
132 Ryedale, Capt. L. B. Mackinnon.
132 St. Ives, Henry Paul.
132 Salisbury, J. Cheetham.
132 Salop, or Shropshire, N. J. R. Onslow Gore, Viscount Newport.
132 Salop, or Shropshire (S), R. Jasper More, Col. Rt. Hon. P. E. Herbert.
132 Sandwick, E. H., Knatchbull-Hugessen, Chas. Capper.
132 Scarborough, Sir J. V. B. Johnstone, Bt., John Dent Dent.
132 Shaftesbury, G. G. Glyn.
132 Sheffield, John A. Roebeck, G. Hadfield.
218 Shrewsbury, G. Tomline, W. J. Clement.
219 Somersetshire (E.), R. Neville Grenville, R. H. Page.
221 Southampton, Rt. Hon. Russell Gurney, G. Moffatt.
222 South Shields, Robert Ingham.
223 Southwark, John Locke, A. H. Layard.
224 Staffordshire (N.), Sir E. M. Buller, Bt., Rt. Hon. C. B. Adderley.
226 Stafford, Michael A. Bass, Walter Meller.
228 Stockport, E. W. Wakin, J. B. Smith.
229 Stoke-upon-Trent, A. J. B. Beresford Hope, H. R. Grenfell.
232 Suffolk (W.), Major Windsor Parker, Lord Augustus Hervey.
234 Surrey (E.), Hon. P. J. L. King, Charles Buxton.
235 Surrey (W.), J. I. Briscoe, George Cubitt.
236 Sussex (E.), J. G. Dodson, Lord Edward Cavendish.
238 Swansea, L. L. Dilwyn.
239 Tamworth, Rt. Hon. Sir R. Peel, Bt., G.B., John Peel.
240 Taunton, A. C. Barclay, Lord Wm. Hay.
242 Teesbury, J. R. Yorke, Sir E. A. H. Lechmere, Bt.
243 Thetford, R. J. H. Harvey, Hon. A. H. Barcley.
244 Thirsk, Sir Wm. P. Galloway, Bt.
245 Tiverton, John W. Walrond, Hon. G. Denman.
246 Totnes, Alf. Seymour. (Writ suspended.)
250 Wakefield, W. H. Leatham.
251 Wallingford, Sir C. W. Dilke, Bt.
252 Walsall, C. Forster.
253 Wardour, J. H. Calcraft.
254 Warrington, G. Grennell.
255 Warwickshire (N.), G. N. Newdegate, W. D. Bromley.
256 Warwickshire (S.), H. C. Wise, Sir Chas. Mordaunt, Bt.
257 Warrick, H. J. J. Repont, A. W. Peel.
260 Westminster, Sir Massey Lopes, Bt.
264 Whitey, Chas. Bagnall.
265 Whitehaven, G. C. Bentinck.
266 Wiggon, H. Woods, N. Eckersley.
267 Wight (Isles of), Sir John Simeon, Bt.
269 Wiltsire (N.), Lt. C. Bruce, R. P. Long.
270 Wiltsire (S.), Lord H. Thynne, T. Fraser Grove.
271 Winchester, J. Bonham-Carter, W. B. Simonds.
272 Windsor, R. Eykyn, C. Edwards.
274 Woodstock, Henry Barnett.
276 Worcestershire (W.), F. W. Knight, W. E. Dowsewell.
278 Wycombe, John Remington Mills, Hon. C. R. Carington.
279 Yarmouth, Sir E. H. K. Lacoe, Bt., Jas. Goodson.
282 Yorkshire (N.W.R.), Sir Frank Crosley, Bt., Lord F. C. Cavendish.
284 York, James Lowther, George Leeman.

SCOTLAND.

285 Aberdeen Co., W. D. Fordyce.
286 Aberdeen, Col. W. H. Sykes.
287 Andover (St.), Cupar, e., E. Ellice.
288 Argyll Co., A. S. Finlay.
289 Ayr Co., Sir James Ferguson, Bt.
290 Ayr, e., H. C. Craufurd.
292 Berwick Co., David Robertson.
293 Bute, J. Lamont.
294 Caithness, G. Traill.
295 Clackmannan and Kinross, W. P. Adam.
296 Dumbarton Co., P. B. Smollett.
298 Dumfries, W. Ewart.
299 Dundee, Sir John Ogilvy, Bt.
300 Edinburgh Co., Earl of Dalkeith.
302 Elgin Co., Major C. L. Cumming Bruce.
303 Elgin, Banff, e., M. E. G. Duff.
304 Falkirk, e., Jas. Merry.
305 Perth, Sir Robert Anstruther, Bt.
306 Forfar, Hon. C. Carnegie.
307 Glasgow, W. Graham, R. Dalgliesh.
308 Greenock, A. M. Dunlop.
309 Haddington Co., Lord Echlin.
312 Inverness, Nairn, e., A. Matheson.
314 Kincairdine, J. D. Nicol.
315 Kirkcaldy Burghs, R. S. Aytoun.
316 Kirkcudbright, James Mackie.
317 Lanark Co., Sir T. E. Colebrooke, Bt.
IRELAND.

339 Armagh, Lt.-Col. Sir W. Verner, Bt., Col. Sir J. M. Stronge, Bt.
340 Armagh Bo., J. Vance.
341 Athlone, D. J. Rearden.
343 Belfast, Saml. G. Conolly, Charles Lanyon.
345 Carlow Bo., Osborne Stock.
346 Carrickfergus, Robert Torrens.
347 Cashel, J. L. O'Herin.
349 Clare, Col. C. M. Vandeleur, Sir Colman O'Loghlin, Bt.
350 Clonmel, John Bagwell.
351 Culleraine, Sir H. H. Bruce, Bt.
352 Cork Co., N. P. Leader, A. Smith Barry.
353 Cork City, J. P. Maguire, N. D. Murphy.
355 Downpatrick, W. Keown.
357 Drogheda, B. Whitworth.
358 Dublin Co., Lt.-Col. T. E. Taylor, ion Trant Hamilton.
359 Dublin City, Sir Benj. Les Guinness, Bt., Jonathan Pim.
360 Dublin University, A. Lefroy, Rt. Hon. R. R. Warren.
361 Dundalk, Sir G. Bowyer, Bt.
363 Dunlarfan, Charles R. Barry.
364 Ennis, Capt. W. Stackpole.

ALPHABETICAL LIST OF THE MEMBERS.

The Numbers refer to the Places in the Preceding List.

Acland, 75
Adair, 120
Adams, 295
Adderley, 224
Aging, Ellis, 369
Agnew, 234
Akroyd, 163
Allen, 168
Amberley, 182
Andover, 162

Acland, 75
Adair, 120
Adams, 295
Adderley, 224
Aging, Ellis, 369
Agnew, 234
Akroyd, 163
Allen, 168
Amberley, 182
Andover, 162

Annesley, 346
Anson, 139
Anstruther, 305
Antrobus, 268
Archdall, 364
Arkwright, 137
Armstrong, 391
Ayrton, 247
Aytoun, 315

Bagnall, 264
Bagge, 172
Bagge, 348
Bagwell, 137
Bain, 313
Baines, 133
Barclay, 240
Baring, 118, 155

Barnes, 22
Barnett, 274
Barrington, 59
Barron, 396
Barr, 181
Barry, 350, 361
Bartelot, 237
Bass, 72, 226
Bateson, 73
Bathurst, 57

Baxter, 320
Bayley, 154
Beach, 96, 104
Beaumont, 178
Beecroft, 262
Bentinck, 265
Bentinck, 14
Beresford, 342
HOUSE OF COMMONS—SCOTTISH NOBILITY.

OFFICERS OF THE HOUSE OF COMMONS.

Chief Clerk, Sir Denis Le Marchant, Bt.
Clerk Assistant, Sir T. Erskine May, K.C.B.
Second Clerk Assistant, Henry Ley.
Clerk of Public Bills & Fees, W. Rose.
Accountant, G. Broome.
Assistant Accountant, W. R. Seymour.
Clerk of Committees, C. W. Pole.
Clerk, Journals, J. Collins.
Speaker's Secretary, Alfred Denison.
Counsel to Speaker, G. K. Rickards.

Examiners of Standing Orders, Chas. Frere
Reginald Palgrave.
Taxing Master, Charles Frere
Short-hand Writer, Joseph Gurney.
Serjeant-at-Arms, Lord C. J. F. Russell.
Deputy Serjeant, Capt. R. A. Gossett.
Assistant Serjeant, Lt-Col. C. W. Forester.
Deliverer of Votes, J. J. Collins.
Chaplain, Rev. C. MERIVALE, B.D.
Printer of Journals, Henry Hansard.
Printers of Votes, J. B. Nichols and Sons.
Librarian, G. Howard.

LIST OF THE SCOTTISH AND IRISH NOBILITY,

Who, not being Peers of Parliament, have no seat in the House of Lords.

SCOTTISH.

MARQUIS.
Queensberry (Douglas), b. 1844. s. 1858.

EARLS.
Breadalbane (Campbell), b. 1824. s. 1852.
Buchan (Erskine), b. 1815. s. 1857.
Carthew (Dalzell), b. 1797. s. 1839.
Dundonald (Cochrane), b. 1814. s. 1860.
Dyvat (Tollemache), b. 1794. s. 1840.
Kellie (Erskine), b. 1810. s. 1866.
Mar (Goodere-Erskine), b. 1836. s. 1866.
Northesk (Carnegie), b. 1794. s. 1831.
Perth (Drummond), b. 1807. s. 1840.
Southesk (Carnegie), b. 1827. s. 1855.
Strathmore (Bowes), b. 1824. s. 1865.

VISCOUNT.
Arbuthnot (Arbuthnott), b. 1806. s. 1830.

BARONS.
Cranstoun (Cranstoun), b. 1809. s. 1818.
Duffus (Dunbar), b. 1799. s. 1843.
Elbank (Murray), b. 1804. s. 1830.
Elphinstone (Elphistone), b. 1829. s. 1861.
Fairfax (Fairfax), b. s. 1846.
Forbes (Forbes), b. 1798. s. 1843.
Herries (Constable-Maxwell), b. 1804. s. 1858.
Napier (Napier), b. 1819. s. 1834.
Polwarth (Scott), b. 1838. s. 1867.
Reay (Mackay), b. 1813. s. 1863.
Ruthven (Hore-Ruthven), b. 1838. s. 1864.
Sinclair (St. Clair), b. 1803. s. 1863.
Somervile (Somervile), b. 1839. s. 1864.
Torpichen (Sandilands), b. 1807. s. 1862.
IRISH NOBILITY—HER MAJESTY'S PRIVY COUNCIL.

IRISH.

EARLS.

Aldborough (Stratford), b. 1808.  s. 1849.
Antrim (McJonnell), b. 1814.  s. 1855.
Arran (Dore), b. 1801.  s. 1837.
Caledon (Alexander), b. 1846.  s. 1855.
Carrick (Butler), b. 1835.  s. 1846.
Castle-Stuart (Stuart), b. 1810.  s. 1857.
Cavan (Lambart), b. 1815.  s. 1837.
Charleville (Bury), b. 1832.  s. 1859.
Clonmell (Scott), b. 1839.  s. 1866.
Desart (Cuffe), b. 1845.  s. 1846.
Howth (St. Lawrence), b. 1803.  s. 1822.
Kilmurry (Needham), b. 1787.  s. 1832.
Lanesborough (Butler-Davies), b. 1839.  s. 1866.
Lisburne (Vaughan), b. 1800.  s. 1831.
Listowel (Hare), b. 1832.  s. 1866.
Mayo (Bourke), b. 1822.  s. 1867.
Mexborough (Saville), b. 1810.  s. 1860.
Milltown (Leson), b. 1829.  s. 1866.
Norbury (Tolen), b. 1810.  s. 1839.
Normanton (Ellis-Agar), b. 1778.  s. 1809.
Rosse (Parsons), b. 1846.  s. 1867.
Winterton (Turnour), b. 1810.  s. 1833.

VISCOUNTS.

Ashbrook (Flower), b. 1806.  s. 1847.
Avonmore (Yelverton), b. 1790.  s. 1814.
Barrington (Barrington), b. 1824.  s. 1867.
Chetwynd (Chetwynd), b. 1800.  s. 1821.
Dillon (Dillon-Leece), b. 1811.  s. 1865.
Downe (Dawney), b. 1844.  s. 1857.
Frankfort (De Montmorency), b. 1806.  s. 1822.
Galway (Arundell), b. 1805.  s. 1834.
Gormanston (Preston), b. 1796.  s. 1860.
Gort (Vereker), b. 1819.  s. 1865.
Guillarmer (O'Grady), b. 1835.  s. 1869.
Herbert (Pomeroy), b. 1836.  s. 1862.
Lorton (King), b. 1804.  s. 1854.
Molesworth (Molesworth), b. 1796.  s. 1815.
Mountgarret (Butler), b. 1816.  s. 1846.
Mountmorres (De Montmorency), b. 1796.  s. 1833.
Notterville (Netterville), b. 1807.  s. 1867.
Ranelagh (Jones), b. 1812.  s. 1820.

HER MAJESTY'S PRIVY COUNCIL.

* Members of the Judicial Committee.  † Assessors in Ecclesiastical Causes.  ‡ Indian Assessor.

Wales

Princes of

Duke of Edinburgh

Duke of Cambridge

Lord High Chancellor (Ld.
Chelmsford)

Archbishop of York

Duke of Marlborough (Presi-
dent of the Council)

Earl of Malmesbury (Lord
Privy Seal)

DUKES.

Argyll

Beaufort

Buckeuch

Bucksinghain and Chandos

Berewest

Montrose

Northumberland

Richmond

Somerset

Wellington

MARQUESSES.

Abercorn

Allesbury

Anglesey

Chelmsford

Clanricarde

Conyngham

Donegal

Exeter

Londonderry

Normanby

Salisbury

Westminister

EARLS.

Bessborough

Bradford

Cadogan

Carnarvon

Clarendon

Cork and Orrery

Cowley

Dalhousie

De Grey and Ripon

De la Warr

Derby

Devon

Duke

Ellenborough

Fingall

Granville

Grey

Southwell (Southwell), b. 1836.  s. 1860.
Taaffe (Taaffe), b. 1823.  s. 1855.
Valenfla (Annales), b. 1843.  s. 1863.

BARONS.

Ashtown (Trench), b. 1804.  s. 1840.
Aylmer (Aylmer), b. 1814.  s. 1858.
Bellew (Bellew), b. 1830.  s. 1866.
Bloomfield (Bloomfield), b. 1802.  s. 1846.
Bridport (Hood), b. 1793.  s. 1814.
Carberry (Evans-Frake), b. 1801.  s. 1845.
Clanmorris (Bingham), b. 1826.  s. 1847.
De Biaquiere (De Biaquiere), b. 1812.  s. 1851.
Desies (Beresford), b. 1811.  s. 1855.
Dunalley (Prittie), b. 1807.  s. 1854.
Dunboyne (Butler), b. 1806.  s. 1850.
Fermoy (Roche), b. 1815.  s. 1856.
French (French), b. 1810.  s. 1860.
Garvagh (Canning), b. 1826.  s. 1840.
Graves (Graves), b. 1804.  s. 1830.
Headley (Winn), b. 1810.  s. 1840.
Henley (Henley), b. 1826.  s. 1841.
Hotham (Hotham), b. 1794.  s. 1814.
Huntingfield (Yanneck), b. 1818.  s. 1844.
Kensington (Edwardes), b. 1801.  s. 1852.
Kingsale (De Courcey), b. 1823.  s. 1865.
Langford (Rowley), b. 1848.  s. 1854.
Lisle (Lysaght), b. 1783.  s. 1834.
Louth (Plunkett), b. 1822.  s. 1849.
Macdonald (Macdonald), b. 1849.  s. 1863.
Massy (Massy), b. 1827.  s. 1836.
Muncaster (Pennington), b. 1834.  s. 1862.
Musker (Deane), b. 1795.  s. 1824.
Newborough (Wynn), b. 1803.  s. 1832.
Ongley (Ongley), b. 1803.  s. 1814.
Oranmore (Guthrie), b. 1819.  s. 1860.
Radstock (Waldegrave), b. 1833.  s. 1857.
Rendlesham (Thullson), b. 1840.  s. 1852.
Rokey (Montagu), b. 1798.  s. 1847.
Sherard (Sherard), b. 1804.  s. 1859.
Teignmouth (Shore), b. 1796.  s. 1834.
Trimleston (Barnewall), b. 1796.  s. 1839.
Ventry (De Moleyns), b. 1786.  s. 1827.
Willscouth (Blake), b. 1841.  s. 1849.
Waterford (Cavendish) b. 1839.  s. 1863.
<table>
<thead>
<tr>
<th>VISCOUNTS.</th>
<th>ARCHBISHOPS AND BISHOPS OF THE UNITED CHURCH OF ENGLAND AND IRELAND.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lord Ernest Bruce</td>
<td>Bishop of London</td>
</tr>
<tr>
<td>Viscount Bury</td>
<td>Athloney</td>
</tr>
<tr>
<td>Viscount Castlereose</td>
<td>Belper</td>
</tr>
<tr>
<td>Viscount Cranborne</td>
<td>Bloomfield</td>
</tr>
<tr>
<td>Lord Oto Fitzgerald</td>
<td>Broughtham</td>
</tr>
<tr>
<td>Lord Charles Fitzroy</td>
<td>Cairns</td>
</tr>
<tr>
<td>Lord Claud Hamilton</td>
<td>Cartsie, Hon. S. Waldegrave, D.D.</td>
</tr>
<tr>
<td>Marquis of Hartington</td>
<td>Chester, William Jacobson, D.D.</td>
</tr>
<tr>
<td>Lord Edward Howard</td>
<td>Chichester, Ashburn T. Gilbert, D.D.</td>
</tr>
<tr>
<td>Lord John Manners</td>
<td>Durham, Charles Barbie, D.D.</td>
</tr>
<tr>
<td>Lord Clarence Paget</td>
<td>Gloucester &amp; Bristol, C. J. Ellicott, D.D.</td>
</tr>
<tr>
<td>Lord Proby</td>
<td>Hereford, R. Dickson Hampden, D.D.</td>
</tr>
<tr>
<td>Viscount Royston</td>
<td>Lichfield,</td>
</tr>
<tr>
<td>Lord Stanley</td>
<td>Lincoln, John Jackson, D.D.</td>
</tr>
<tr>
<td></td>
<td>Llandaff, Alfred Ollivant, D.D.</td>
</tr>
<tr>
<td></td>
<td>London, Rt. Hon. A. C. Tait, D.C.L.</td>
</tr>
<tr>
<td></td>
<td>Manchester, James Prince Lee, D.D.</td>
</tr>
<tr>
<td></td>
<td>Norwich, Hon. J. T. Pelham, D.D.</td>
</tr>
<tr>
<td></td>
<td>Oxford, Samuel Wilberforce, D.D.</td>
</tr>
<tr>
<td></td>
<td>Peterborough, Francis Jeune, D.C.L.</td>
</tr>
</tbody>
</table>

**ARCHBISHOPS**

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1862</td>
<td>Canterbury, Rt. Hon. C. T. Longley, D.D.</td>
</tr>
<tr>
<td>1862</td>
<td>York, Rt. Hon. W. Thomson, D.D.</td>
</tr>
</tbody>
</table>

**BISHOPS**

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1859</td>
<td>Bangor, J. C. Campbell, D.D.</td>
</tr>
<tr>
<td>1854</td>
<td>Bath &amp; Wells, Lord Auckland, D.D.</td>
</tr>
<tr>
<td>1860</td>
<td>Carlisle, Hon. S. Waldegrave, D.D.</td>
</tr>
<tr>
<td>1865</td>
<td>Chester, William Jacobson, D.D.</td>
</tr>
<tr>
<td>1842</td>
<td>Chichester, Ashburn T. Gilbert, D.D.</td>
</tr>
<tr>
<td>1861</td>
<td>Durham, Charles Barbie, D.D.</td>
</tr>
<tr>
<td>1864</td>
<td>Ely, Edw. Harold Browne, D.D.</td>
</tr>
</tbody>
</table>
BISHOPS—UNIVERSITIES OF THE UNITED KINGDOM.

APP. SEEKS BISHOPS.
1857 Ripon, Robert Bickersteth, D.D.
1867 Rochester, Thos. Legh Clapham, D.D.
1884 Salisbury, Walter Kerr Hamilton, D.D.
1894 Sodor & Man, Hon. Horatio Fowys, D.D.

APP. SEEKS ARCHBISHOPS.
1862 Armagh, Rt. Hon. M. G. Beresford, D.D.
1864 Dublin, Rt. Hon. R. C. Trench, D.D.

BISHOPS.
1843 Cashel, Emily, d.c., Robert Daly, D.D.
1862 Cork, Cloyne, &c., John Greggs, D.D.
1897 Derry & Raphoe, W. Alexander, D.D.

IRELAND.

APP. SEEKS BISHOPS.
1849 Down, Connor, &c., Robert Knox, D.D.
1862 Killaloe, &c., Wm. Fitzgerald, D.D.
1862 Kilmac, &c., Hamilton Verschoyle, D.D.
1866 Limerick, &c., Charles Graves, D.D.
1886 Meath, Rt. Hon. S. Butcher, D.D.
1842 Ossory, &c., James Thos. O'Brien, D.D.
1866 Tuam, &c., Hon. C. G. Bernard, D.D.

COLONIAL BISHOPS.

APP. SEEKS.
1847 Adelaide, S. Aust., Augustus Short, D.D.
1850 Antigua, W. W. Jackson, D.D.
1842 Barbadoes, Thomas Parry, D.D.
1851 Bombay, John Harding, D.D.
1859 Brisbane, E. W. Telford, D.D.
1867 Calcutta, Robert Milman, D.D., Metrop.
1847 Cape Town, Robert Gray, D.D., Metrop.
1856 Christ Ch., N.Z., H. J. C. Harper, D.D.
1862 Colombo, P. C. Clough, D.D.
1859 Columbia, George Hills, D.D.
1886 Dunedin, N.Z., H. L. Jenner, D.D.
1846 Fredericton, John Medley, D.D.
1855 Goulburn, (Vacant)
1863 Goulburn, M. Thomas, D.D.
1887 Grafton & Armidale, W. C. Sawyer, D.D.
1856 Graham's Town, H. Cotterill, D.D.
1842 Guiana, W. P. Austin, D.D.
1857 Huron, Benjamin Cronyn, D.D.
1843 Jamaica, A. G. Spencer, D.D.
1846 Jerusalem, Samuel Gobat, D.D.
1856 Kingston, Reg. Courtenay, D.D.
1855 Lausanne, F. T. Macdougal, D.C.L.
1861 Madras, Frederick Geil, D.D.
1854 Mauritius, W. V. Ryan, D.D.

MISSIONARY BISHOPS.

APP. SEEKS.
1863 Central Africa, W. G. Tozer, D.D.
1881 Honolulu, T. N. Staley, D.D.
1861 Melanesia, J. C. Patteson, D.D.

APP. SEEKS.
1864 Niger Territory, S. E. Crowther, D.D.
1863 Orange River, Edward Twells, D.D.

UNIVERSITIES OF THE UNITED KINGDOM.

1.—ENGLAND.

OXFORD.

Chancellor, Earl of Derby, K.G., D.C.L. 1853
High Stew., Earl of Carnarvon, D.C.L. 1859
Vice-Chancellor, F. K. Leighton, D.D. 1866
Pro-Vice-Chancellors, see *.
Pro-Proctor, R. Faussett, M.A., Christ Church; G. J. Biore, M.A., Christ Church; W. W. Jackson, M.A., Exeter; J. R. Magrath, M.A., Queen's.
Colleges.

Founded Heads. Elected
1173 Univers., *F. C. Plumtre, D.D. 1836

Founded Heads. Elected
1262 Balliol, Robert Scott, D.D. 1854
1274 Merton, R. Marshall, D.C.L. 1826
1316 Exeter, J. P. Lightfoot, D.D. 1854
1325 Oriel, E. Hawkins, D.D. 1828
1340 Queen's, W. Jackson, D.D. 1823
1375 New Coll., J. E. Sewell, D.D. 1860
1427 Lincoln, M. Pattison, B.D. 1861
1437 All Souls, F. K. Leighton, D.D. 1868
1445 Magdalen, F. Bulley, D.D. 1855
1511 Brasenose, E. H. Cradock, D.D. 1853
1516 Corp. Christ, J. Norris, D.D. 1843
1532 Chr. Church, H. G. Liddell, D.D. 1828
1555 Trinity, S. W. Wayte, B.D. 1866
1557 St. John's, P. Wynter, D.D. 1828
### Universities of the United Kingdom

<table>
<thead>
<tr>
<th>Founded</th>
<th>Heads</th>
<th>Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1555</td>
<td>Jesus, Charles Williams, D.D.</td>
<td>1657</td>
</tr>
<tr>
<td>1613</td>
<td>Wadham, B. P. Symons, D.D.</td>
<td>1631</td>
</tr>
<tr>
<td>1620</td>
<td>Pembroke, Evan Evans, M.A.</td>
<td>1644</td>
</tr>
<tr>
<td>1717</td>
<td>Exeter, W. C. Salter, M.A.</td>
<td>1851</td>
</tr>
<tr>
<td>1729</td>
<td>St. Edmund Hall, E. Moore, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>1733</td>
<td>St. Mary Hall, D. P. Chase, M.A.</td>
<td>1857</td>
</tr>
<tr>
<td>1792</td>
<td>New Inn Hall, H. H. Cornish, D.D.</td>
<td>1862</td>
</tr>
<tr>
<td>1802</td>
<td>Magdalen Hall, J. D. Macbride, D.C.L.</td>
<td>1813</td>
</tr>
</tbody>
</table>

**Professors and Public Readers. Elected**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Head</th>
<th>Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanscrit</td>
<td>Monier Williams, M.A.</td>
<td>1860</td>
</tr>
<tr>
<td>Modern Languages and Literature</td>
<td>(Taylorian) Max Müller, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>Logic</td>
<td>H. Wall, M.A.</td>
<td>1849</td>
</tr>
<tr>
<td>Ireland's Exegetical</td>
<td>R. Scott, D.D.</td>
<td>1861</td>
</tr>
<tr>
<td>Lat. Lit.</td>
<td>John Conington, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>Mor. Phil. (Waynflete)</td>
<td>H. W. Chandler, M.A.</td>
<td>1867</td>
</tr>
<tr>
<td>International Law and Diploma (Chichele)</td>
<td>M. Bernard, B.C.L.</td>
<td>1859</td>
</tr>
<tr>
<td>Physiol. (Linacre)</td>
<td>G. Rolleston, M.D.</td>
<td>1860</td>
</tr>
<tr>
<td>Zoology (Hope)</td>
<td>J. O. Westwood, M.A.</td>
<td>1861</td>
</tr>
<tr>
<td>Modern History (Chichele)</td>
<td>M. Burrows, M.A.</td>
<td>1862</td>
</tr>
<tr>
<td>Chem. (Waynflete)</td>
<td>Sir B. C. Brodie, Bt.</td>
<td>1865</td>
</tr>
<tr>
<td>Public Orator</td>
<td>R. Michell, B.D.</td>
<td>1848</td>
</tr>
<tr>
<td>Bodleian Librarian</td>
<td>H. O. Cox, M.A.</td>
<td>1860</td>
</tr>
<tr>
<td>Custos Archiep.</td>
<td>J. Griffiths, M.A.</td>
<td>1867</td>
</tr>
<tr>
<td>Keeper of Ash Mus.</td>
<td>J. Phillips, M.A.</td>
<td>1867</td>
</tr>
<tr>
<td>Radcliffe Librarian</td>
<td>H. W. Acland, M.D.</td>
<td>1851</td>
</tr>
<tr>
<td>Radcliffe Observer</td>
<td>Robert Main, M.A.</td>
<td>1860</td>
</tr>
<tr>
<td>Hampton Lect.</td>
<td>G. Moberly, D.C.L.</td>
<td>1867</td>
</tr>
</tbody>
</table>

**Select Preachers for 1868.**


**University Officers.**


### Cambridge

**Chancellor:** Duke of Devonshire, K.G., [Elected]

<table>
<thead>
<tr>
<th>LL.D.</th>
<th>1555</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Steward, Earl of Powis, LL.D.</td>
<td>1563</td>
</tr>
<tr>
<td>Vice-Cham.</td>
<td>1552</td>
</tr>
<tr>
<td>Commissary, Sir C. J. Selwyn, M.A., M.P.</td>
<td>1556</td>
</tr>
<tr>
<td>Assessor to Cham.</td>
<td>J. Tozer, LL.D.</td>
</tr>
</tbody>
</table>

**Colleges and Halls.**

<table>
<thead>
<tr>
<th>Founded</th>
<th>Heads</th>
<th>Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1257</td>
<td>St. Peter's, W. H. Cookson, D.D.</td>
<td>1847</td>
</tr>
<tr>
<td>1326</td>
<td>Clare, E. Atkinson, D.D.</td>
<td>1856</td>
</tr>
<tr>
<td>1434</td>
<td>Pembroke, A. Alniss, M.A.</td>
<td>1828</td>
</tr>
<tr>
<td>1496</td>
<td>Gonville and Caus, Edwin Guest, L.L.D., F.R.S.</td>
<td>1592</td>
</tr>
<tr>
<td>1530</td>
<td>Trin. Hall, T. G. Geldard, I.L.D.</td>
<td>1592</td>
</tr>
<tr>
<td>1531</td>
<td>Corpus Christi, J. Pulling, D.D.</td>
<td>1550</td>
</tr>
<tr>
<td>1491</td>
<td>King's, Richard Ones, D.D.</td>
<td>1859</td>
</tr>
<tr>
<td>1446</td>
<td>Queen's, George Phillips, D.D.</td>
<td>1857</td>
</tr>
<tr>
<td>1475</td>
<td>St. Cath., C. K. Robinson, D.D.</td>
<td>1861</td>
</tr>
<tr>
<td>1475</td>
<td>Jesus College, G. E. Cortie, D.D.</td>
<td>1849</td>
</tr>
<tr>
<td>1305</td>
<td>King's, J. B. Cartmell, D.D.</td>
<td>1849</td>
</tr>
<tr>
<td>1511</td>
<td>St John's, W. H. Bateson, D.D.</td>
<td>1857</td>
</tr>
<tr>
<td>1519</td>
<td>Magdalene, Hon. L. Neville, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>1545</td>
<td>Trin., W. H. Thompson, D.D.</td>
<td>1556</td>
</tr>
<tr>
<td>1551</td>
<td>Elm., G. Archdall Gratwicke, D.D.</td>
<td>1555</td>
</tr>
<tr>
<td>1558</td>
<td>Sidney, Robert Philips, D.D.</td>
<td>1843</td>
</tr>
<tr>
<td>1609</td>
<td>Downing, T. Worsley, D.D.</td>
<td>1590</td>
</tr>
</tbody>
</table>

**Professors and Public Readers. Elected**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Head</th>
<th>Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proctors—W. H. Whitting, M.A., King's</td>
<td>T. Hewitt, M.A., Emmanuel</td>
<td></td>
</tr>
<tr>
<td>Pro-Proctors—J. Porter, M.A., St. Peter's</td>
<td>R. B. Somerset, M.A., Trinity</td>
<td></td>
</tr>
<tr>
<td>Sex Virt—Dr. Phelps, Dr. Bateson, Dr. Paget</td>
<td>Prof. Stokes, M.A., Prof. Living, M.A., J. Power, M.A.</td>
<td></td>
</tr>
<tr>
<td>Moderators—R. H. Hayward, M.A., St. John's</td>
<td>P. Frost, M.A., St. John's</td>
<td></td>
</tr>
</tbody>
</table>

**Professorships, etc.**

<table>
<thead>
<tr>
<th>Founded</th>
<th>Professors, &amp;c.</th>
<th>Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1502</td>
<td>Div. (Morys), W. Selwyn, D.D.</td>
<td>1555</td>
</tr>
<tr>
<td>1503</td>
<td>Lady Marg. Preacher, Arthur</td>
<td>1567</td>
</tr>
<tr>
<td>1522</td>
<td>Pub. Orat., W. G. Clark, M.A.</td>
<td>1557</td>
</tr>
<tr>
<td>1540</td>
<td>Div. (Reg.), J. A. Jeremie, D.D.</td>
<td>1550</td>
</tr>
<tr>
<td>1540</td>
<td>C. Law (Reg.), J. T. Abdy, LL.D.</td>
<td>1554</td>
</tr>
<tr>
<td>1540</td>
<td>Physic (Reg.), C. H. B. Bond, M.A.</td>
<td>1551</td>
</tr>
<tr>
<td>1540</td>
<td>Theolog. (Reg.), T. Harrett, M.A.</td>
<td>1551</td>
</tr>
<tr>
<td>1540</td>
<td>Gr. (Reg.), B. H. Kennedy, D.D.</td>
<td>1567</td>
</tr>
<tr>
<td>1632</td>
<td>Arabic, H. G. Williams, B.D.</td>
<td>1564</td>
</tr>
<tr>
<td>1632</td>
<td>Lid. Almo. Read. &amp; Prof. Arab.</td>
<td>Theodore Preston, M.A.</td>
</tr>
<tr>
<td>1663</td>
<td>Math., G. G. Stokes, M.A., F.R.S.</td>
<td>1849</td>
</tr>
<tr>
<td>1683</td>
<td>Mor. Philos., F. D. Maurice, M.A.</td>
<td>1866</td>
</tr>
<tr>
<td>1684</td>
<td>Mus., W. S. Bennett, Mus. D.</td>
<td>1858</td>
</tr>
</tbody>
</table>
INSTITUTIONS FROM WHICH THE UNIVERSITY RECEIVES CERTIFICATES FOR DEGREES IN ARTS AND LAWS.

The Universities of the United Kingdom.
The University of Sydney.
The University of Toronto.
University College, London.
King's College, London.
The Queen's Colleges in Ireland.
St. Cuthbert's College, Ushaw.
Stonyhurst College.
Manchester New College.
St. Mary's College, Oscott.
St. Patrick's College, Carlow.
St. Edmund's College, Ware.
Spring Hill College, Moseley, near Birmingham.
The College, Regent's Park.
College of St. Gregory the Great, Downside, near Bath.
Countess of Huntington's College at Cheshunt.
Baptist College at Bristol.
Airedale College, Undercliffe, near Bradford.
Protestant Dissenters' College at Rotherham.

Presbyterian College at Caermarthen.
St. Kyran's College, Kilkenny.
Huddersfield College.
Lancashire Independent College.
Wesley College, near Sheffield.
Queen's College, Birmingham.
Wesleyan Collegiate Institution at Taunton.
Western College, Plymouth.
West of England Dissenters' Proprietary School, Taunton.
St. Patrick's College, Thurles.
New College, London.
Owens College, Manchester.
Bedford Grammar Schools.
Brecon Independent College.
Rawdon College, near Leeds.
Hackney Theological Seminary.
Trevca College, Breconshire.
Bishop Stortford Collegiate School.
Working Men's College, London.
Queen's College, Liverpool.
UNIVERSITIES OF THE UNITED KINGDOM.

RECOGNISED MEDICAL INSTITUTIONS.

ENGLAND.

Bath.—United Hospital.
Belfast.—General Infirmary and Fever Hospital.
Birmingham.—Queen's College, General Hospital, and Sydenham College.
Bristol.—Medical School, Infirmary, St. Peter's Hospital, and General Hospital.
Cambridge.—University Medical School, and Addenbrooke's Hospital.
Exeter.—Devon and Exeter Hospital.
Halifax.—Royal Naval Hospital.
Hull and East Riding of York School of Medicine and Anatomy.
Leeds.—School of Medicine, and General Infirmary.
Leicester.—Infirmary.
Liverpool.—Infirmary School of Medicine, Infirmary, Fever Hospital, and Northern Hospital.
London.—University College, King's College, London Hospital, Middlesex Hospital, School of Anatomy adjoining St. George's Hospital, Charing Cross Hospital, St. Thomas's Hospital, St. Bartholomew's Hospital, Westminster Hospital, Guy's Hospital, St. George's Hospital, Physicians of the St. Marylebone Infirmary, Royal College of Chemistry, St. Mary's Hospital, Brompton Hospital for Consumption, South London Dispensary, Caret Street Dispensary, St. Luke's Hospital, Bethlehem Hospital, Camberwell House Asylum.
Manchester.—Royal School of Medicine and Surgery, Union Hospital, Royal Infirmary, Chatham Street School of Medicine, Owens College.
Newcastle-upon-Tyne.—College of Medicine in connection with the University of Durham, College of Medicine and Practical Science, the Infirmary.
Northampton.—General Infirmary.
Norwich.—Norfolk and Norwich Hospital.
Nottingham.—General Hospital.
Sheffield.—Medical Institution.

SCOTLAND.

Aberdeen.—King's College, and University Royal Infirmary.
Edinburgh.—University, Royal Infirmary, and Medical and Surgical School, Surgeons' Hall.
Glasgow.—University, Andersonian Institution, and Infirmary.

IRELAND.

The Queen's Colleges in Ireland.
Belfast.—General Hospital.
Cork.—Recognised School of Medicine, and North and South Infirmaries.
Dublin.—School of Physic, School of Medicine of the Roman Catholic University, Carmichael School of Anatomy, St. Vincent's Hospital, Mercer's Hospital, Jervis Street Hospital, Royal College of Surgeons, Meath Hospital, City of Dublin Hospital, Coombe Lying-In Hospital, Dr. Steeven's Hospital, the Adelaide Hospital, Mater Misericordiae Hospital, and Sir P. Dunn's Hospital.
Maryborough.—Queen's County Infirmary.

MALTA.—University.
Ceylon.—Military Hospital.
Bengal.—Medical College.
Bombay.—Grant Medical College.
Canada.—University of McGill College, Montreal, and the St. Lawrence School of Medicine.

DURHAM.

Visitor, The Bishop of Durham.
Warden, Very Rev. G. Waddington, D.D.
Subwarden, T. Chevallier, B.D.
Proctors, Rev. J. Barmby, B.D.; Rev. J. Waite, M.A.
Prof. of Divinity and Eccl. Hist., A. S. Farrar, M.A.
Prof. of Class. Lit. Rev. T. S. Evans, M.A.
Prof. of Mathematics and Astronomy, T. Chevallier, B.D.
Reader in Hebrew, T. Chevallier, B.D.
Lect. W. Gray, M.A.
History, T. Greenwood, M.A.
Medicine, D. Embledon, M.D.
Mining and Civil Engineering, A. Beanlands, M.A.
Registrar and Librarian, Rev. F. F. Walrond, M.A.

2.—SCOTLAND.

Sr. ANDREWS (Founded 1411).
Chancellor, Duke of Argyll, LL.D., K.T.
Rect. John Stuart Mill, M.P.
Dean of Faculty of Arts, John C. Shairp, B.A.

HEADS OF COLLEGES.
St. Salvator and St. Leonard, James D. Forbes, D.C.L.
St. Mary, John Tulloch, D.D.
3. IRELAND.

QUEEN'S UNIVERSITY.
Chancellor, Earl of Clarendon, K.G.
Vice-Chancellor, Right Hon. M. Brady.
President of Senate (vacant).
Secretary, G.J. Stoney, M.A. (Dublin Castle).

COLLEGES AND PUBLIC SCHOOLS.

KING'S COLLEGE, LONDON.
Principal, R.W. Jelf, D.D.
Secretary, J.W. Cunningham.
Master of the School, Rev. G.F. Maclear, B.D.

UNIVERSITY COLLEGE, LONDON.
President, Lord Brougham, D.C.L.
Secretary, John Rolson, B.A.
Master of the School, Thos. Hewitt Key, M.A.

WINCHESTER.
Warden, Rev. G.B. Lee, M.A.
Head Master, Rev. George Ridding, M.A.

ETON.
Provost, Charles Old Goodford, D.D.
Head Master, Edward Balfour, D.D.

BRITISH MUSEUM (Great Russell Street).—Monday, Wednesday, and Friday, from 10 to 4, in January, February, November, and December; from 10 to 5, in March, April, September, and October; from 10 to 6 (and on Saturday, from 12 to 5) in May, June, July, and August. The Museum is closed the first week in January, May, and September, on Ash Wednesday, Good Friday, Christmas Day, and Fast or Thanksgiving days.

DULWICH GALLERY.—Monday, Wednesday, and Saturday, Free; Thursday and Friday on payment of 6d.; from 10 to 5 in summer, and from 11 to 3 in winter.

GEOLOGICAL MUSEUM (1 Jermyn Street, Piccadilly).—Daily, except Friday, from 10 to 4, during November, December, January, and February; and from 10 to 5, during the remainder of the year, with the exception of one month of vacation, from August 10 to September 10.

GREENWICH HOSPITAL.—The Painted Hall is open every day Free after 12, before that hour on the payment of 4d.

HAMPTON COURT PALACE.—Every week-day, except Friday, from 10 to 4; on Sundays, after 2.

INDIAN MUSEUM (Whitehall Yards).—Monday, Wednesday, and Friday, 10 to 4.

KEW GARDENS.—The public are admitted to the Royal Botanic Gardens, and the Pleasure Grounds, every week-day (Christmas Day excepted), from 1 till sunset; on Sundays, from 2 till sunset.
PUBLIC INSTITUTIONS, ETC.—PRIME MINISTERS—POPULATION. 69

NATIONAL GALLERY (Trafalgar Square).—Monday, Tuesday, Wednesday, and Saturday, and the whole of Easter and Whitsun weeks, from 10 to 5; closed for six weeks, from the end of the second week in September, and on Christmas Day and Good Friday. (Thursday and Friday students' day).

NATIONAL PORTRAIT GALLERY (Great George Street, Westminster).—Monday, Wednesday, and Saturday, from 10 to 5; from April 1 to September 30; from 10 to 4, from October 1 to March 31.

ROYAL COLLEGE OF SURGEONS' MUSEUM (Lincoln's Inn Fields).—Monday, Tuesday, Wednesday and Thursday, from 12 to 4, except during the month of September.

ROYAL GEOGRAPHICAL SOCIETY (15 Whitehall Place).—11 to 4, Saturdays 11 to 2.

Admission to the Library by Fellow's order; to the Map Room, Charts, Models, &c., by giving name and address.

ROYAL UNITED SERVICE MUSEUM (Whitehall Yard).—Daily from 11 to 5, in summer, and from 11 to 4, in winter. Admission by Member's Tickets; on Fridays by personal introduction.

SOANE MUSEUM (13 Lincoln's Inn Fields).—Wednesday in February and March; Wednesday, Thursday and Friday during April, May, and June; Wednesday in July and August; from 10 to 4. Admission by ticket, which will be sent by post on application.

SOCIETY OF ARTS (John Street, Adelphi).—Daily, except Wednesday, from 10 to 4. Admission by Member's order.

SOUTH KENSINGTON MUSEUM.—Open daily, Free, Monday, Tuesday, and Saturday, from 10 to 10; by payment of 6d., Wednesday, Thursday, and Friday, from 10 to 4, 5, or 6, according to the season.

TOWER OF LONDON.—Daily; the armours and regalia, 10 to 4; 6d., to each place.

WESTMINSTER, PALACE OF.—By free Tickets, which admit any number of persons, obtained at the Lord Chamberlain's office, under the Victoria Tower, every Saturday from 10 to 4. Admission to hear the debates in the House of Lords or Commons can only be obtained by a Peer's or a Member's order.

WINDSOR CASTLE.—State apartments, Monday, Tuesday, Thursday, and Friday, 11 to 4, April to October; 11 to 3, November to March.

WOLWICH ARSENAL AND DOCKYARD.—Free, to the Arsenal, Tuesday and Saturday, by cards from the Under Secretary for War, 9 to 11, and 1 to 3; to the Dockyard, Free, daily.

ZOOLOGICAL GARDENS (Regent's Park).—Admission on Mondays, 6d.; on other days, 12.

Prime Ministers

Of the various administrations since the accession of George III.

<table>
<thead>
<tr>
<th>Prime Minister</th>
<th>Date of Entry</th>
<th>Date of Exit</th>
<th>Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earl of Bute</td>
<td>May 29, 1782</td>
<td>Aug. 10, 1827</td>
<td>Liberal</td>
</tr>
<tr>
<td>M. Grenville</td>
<td>April 16, 1783</td>
<td>Jan. 11, 1828</td>
<td>Whig</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>July 12, 1785</td>
<td>Nov. 12, 1830</td>
<td>Coalition</td>
</tr>
<tr>
<td>Duke of Grafton</td>
<td>Aug. 2, 1766</td>
<td>July 14, 1834</td>
<td>Whig</td>
</tr>
<tr>
<td>Lord North</td>
<td>Jan. 28, 1770</td>
<td>Dec. 15, 1834</td>
<td>Tory</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>Mar. 30, 1782</td>
<td>April 13, 1835</td>
<td>Coalition</td>
</tr>
<tr>
<td>Lord Shelburne</td>
<td>July 3, 1782</td>
<td>Aug. 31, 1841</td>
<td>Liberal</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>April 5, 1783</td>
<td>July 6, 1836</td>
<td>Tory</td>
</tr>
<tr>
<td>Mr. Pitt</td>
<td>Dec. 27, 1783</td>
<td>Feb. 27, 1802</td>
<td>Tory</td>
</tr>
<tr>
<td>Mr. Addington</td>
<td>Mar. 7, 1801</td>
<td>Feb. 27, 1802</td>
<td>Coalition</td>
</tr>
<tr>
<td>Mr. Pitt</td>
<td>May 12, 1804</td>
<td>Feb. 8, 1855</td>
<td>Whig</td>
</tr>
<tr>
<td>Lord Grenville</td>
<td>Jan. 8, 1806</td>
<td>Feb. 26, 1808</td>
<td>Tory</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>Mar. 13, 1807</td>
<td>June 18, 1859</td>
<td>Coalition</td>
</tr>
<tr>
<td>Mr. Perceval</td>
<td>June 23, 1810</td>
<td>Nov. 3, 1865</td>
<td>Whig</td>
</tr>
<tr>
<td>Lord Liverpool</td>
<td>June 8, 1812</td>
<td>July 6, 1866</td>
<td>Liberal</td>
</tr>
<tr>
<td>M. Canning</td>
<td>April 11, 1827</td>
<td></td>
<td>Whig</td>
</tr>
</tbody>
</table>

Population of the United Kingdom.

Census Returns, 1801—1861.

<table>
<thead>
<tr>
<th>Census</th>
<th>England and Wales</th>
<th>Scotland</th>
<th>Islands in the British Seas</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>8,895,536</td>
<td>1,608,420</td>
<td>89,508</td>
<td>6,601,827</td>
</tr>
<tr>
<td>1811</td>
<td>10,164,068</td>
<td>1,508,864</td>
<td>103,710</td>
<td>7,767,401</td>
</tr>
<tr>
<td>1821</td>
<td>11,998,322</td>
<td>2,091,521</td>
<td>124,049</td>
<td>8,175,154</td>
</tr>
<tr>
<td>1831</td>
<td>13,896,797</td>
<td>2,364,386</td>
<td>143,126</td>
<td>6,552,385</td>
</tr>
<tr>
<td>1841</td>
<td>15,914,148</td>
<td>2,620,184</td>
<td>143,779</td>
<td>7,674,543</td>
</tr>
<tr>
<td>1851</td>
<td>17,227,609</td>
<td>2,888,742</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>20,061,725</td>
<td>3,061,251</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ASSESSED TAXES.

The following Schedule contains an accurate statement of the Assessed Taxes, as fixed 16 and 17 Vict. cap. xc.

Armorial bearings.—Persons chargeable 2 s. d. able with carriage duty to the amount of £5 16s. ... 2 12 9
Persons not so chargeable ... 0 13 2

Carriages.
For every four-wheeled carriage drawn by two or more horses or mules ............. 3 10 0
For every such carriage drawn by one horse or mule .................................. 2 0 0
For every carriage with four wheels, each being of less diameter than 30 inches, if drawn by two ponies or mules not exceeding 13 hands. 1 15 0
If drawn by one horse or mule .................................................. 1 0 0
For every carriage with less than four wheels, if drawn by two or more horses or mules .................................................. 2 0 0
If drawn by one horse or mule ........................................................................ 1 15 0
If drawn by one pony or mule not exceeding 13 hands .................................. 0 10 0
When kept for hire only, a half of above.

* If used by a carrier, 2s. 6d.
† If used by a carrier, 1s. 6d.

Exemptions.—Hackney carriages, stage coaches, and carriages let for hire. Any carriage used solely in the course of trade or husbandry, and whereon the Christian name and surname, and place of abode of the owner shall be legibly painted; provided that such carriage shall not be used for any purpose of pleasure, or otherwise than as aforesaid, except for conveying the owner or his family to or from any place of worship.

Hair-powder ........................................... 1 3 6

Horses.—For every horse and mule exceeding 13 hands, kept for riding or drawing a taxable carriage .................. 1 1 0
— If kept for any other purpose ........................................................................ 0 10 6
— For every pony or mule not exceeding 13 hands: ................................. 0 10 6
— If kept for riding or driving ........................................................................ 0 5 3

Clergymen actually doing duty, dissenting ministers, medical men (if they keep no other), and farmers, bailiffs, shepherds, and herdsmen, are allowed to keep one horse, either for riding or driving, for a duty of ........................................... 0 10 6

Exemptions.—Any person keeping horses solely for purposes of husbandry, some or all of which he may occasionally use for other purposes in drawing burdens, shall not be chargeable for more than two kept at any one farm or place. Horses belonging to farmers and market gardeners; brood mares; horses which have not been used during the year, and such as are used by persons serving in any corps of yeomanry or volunteer cavalry, are exempt.

Horse-dealers' yearly Duty. £ s.
If within the bills of mortality 25 0
Elsewhere ........................................ 12 10

Exemptions.—Persons who sell only the horses bred by themselves, or kept as farming-stock at least three months.

Houses.—In lieu of the duty on window-repairable houses, a duty is substituted of 9d. in the pound on houses worth £20 as upwards per annum in rent. But dwelling houses with shop annexed on the basement floor; or houses occupied by any person duly licensed for the sale of ale, wine, and other liquor; or houses which are bona fide farm houses occupied by a tenant or farm servant are to pay 6d. in the pound. In the valuation of houses belonging to market-gardens and nursery-grounds, the garden and ground are not to be estimated.

Servants.—For every male servant of the age of 18 years and upwards ........................................ 1 1 1
— If under 18 years ........................................................................... 0 10
— Under game-keepers and under-gardeners ........................................ 0 10

Exemptions.—Servants of officers in the army or navy. Any servant employed to supply the place of a person serving in the militia or any similar force. A son or grandson under 21 years of age. A single servant employed by a licensed victualler, provided he be the only one. Grooms, ostlers, &c., employed by inn-keepers, livery-stable keepers, horse-dealers, jobmasters, &c., in the carrying on of their calling.

LICENCES.

Game Duties.—Licence to Kill Game
If taken out after April 5, and before £ s. d.
Nov. 1, to expire on April 5, in the following year. 3 0
To expire on Oct. 31, in the same year, in which taken out .................................. 2 0
If taken out on or after Nov. 1, to expire on April 5 following .......................... 2 0
Gamekeepers in Great Britain .............................................................. 2 0
To deal in game ................................................................................ 2 0

Dogs.—Licence granted by the Commissioners of Inland Revenue for every dog of whatever description £ 0 5
Horses Let for Hire.—When the person taking out licence to let horses for hire shall keep at one and the same time, £ s. d.
One horse or 1 carriage .......................................................... 5 0
Not exceeding 3 horses or 2 carriages 10 0
... 4 3 15 0
... 5 4 20 0
... 6 5 25 0
... 8 6 30 0
... 12 9 40 0
... 16 12 50 0
... 20 15 60 0

Exceeding 15 carriages ........................................ 70 0
Exceeding 20 horses, then for every additional 10 horses, or fractional part of 10, the further additional duty of ........................................ 10 0
## STAMP DUTIES.

### STAMPS.

<table>
<thead>
<tr>
<th>Stamps</th>
<th>Mortgages, Bonds, &amp;c.</th>
<th>Settlements</th>
<th>Conveyances, when the purchase-money is</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>More than</td>
<td>Not more</td>
<td>More than</td>
</tr>
<tr>
<td>0 0 6</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>0 1 0</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>0 1 3</td>
<td>...</td>
<td>...</td>
<td>50</td>
</tr>
<tr>
<td>0 1 6</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>0 2 0</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>0 2 6</td>
<td>...</td>
<td>...</td>
<td>50</td>
</tr>
<tr>
<td>0 3 9</td>
<td>...</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>0 5 0</td>
<td>150</td>
<td>200</td>
<td>...</td>
</tr>
<tr>
<td>0 6 3</td>
<td>200</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>0 7 6</td>
<td>250</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>0 10 0</td>
<td>...</td>
<td>...</td>
<td>125</td>
</tr>
<tr>
<td>0 12 5</td>
<td>...</td>
<td>...</td>
<td>150</td>
</tr>
<tr>
<td>0 15 0</td>
<td>...</td>
<td>...</td>
<td>200</td>
</tr>
<tr>
<td>0 17 6</td>
<td>...</td>
<td>...</td>
<td>225</td>
</tr>
<tr>
<td>1 0 0</td>
<td>700</td>
<td>...</td>
<td>250</td>
</tr>
<tr>
<td>1 2 6</td>
<td>...</td>
<td>800</td>
<td>...</td>
</tr>
<tr>
<td>1 5 0</td>
<td>...</td>
<td>900</td>
<td>...</td>
</tr>
<tr>
<td>1 7 6</td>
<td>1000</td>
<td>1100</td>
<td>...</td>
</tr>
<tr>
<td>1 10 0</td>
<td>1200</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

For every additional £100, or for any fractional part of £100, 2s. 6d.

### Agreements.

Under hand only, £ s. d.

1. When the matter is of the value of £2 or upwards: 0 0 6
2. And progressive duty: 0 0 6

If not stamped within a period not exceeding 14 days, when the matter is above £20, a penalty on stamping: 10 0 0

When chargeable with a duty of 6d. only, and the matter of the agreement is under £20, the penalty for stamping is: 1 0 0

If between Masters and Mariners, or for hire of menial servant, or sale of goods or merchandise, exempt.

### Bill of Exchange (Foreign)

Drawn out of, but payable within, the United Kingdom, or drawn and payable out of, but endorsed, or negotiated within, the United Kingdom:

For any sum not exceeding £500, the same duty as an Inland Bill of the same amount; or sums above £1500, an additional shilling on every additional £100, or fraction of £100.

### Bill of Lading

£2 0 6

### Bills, Foreign, drawn in, but payable out of, the United Kingdom, if drawn in set of three or more, then for each Bill:

- not exceeding £25: 0 0 1
- exceeding £25:
  - 50: 75 0 2
  - 75: 100 0 3
  - 100: 200 0 4
  - 150: 300 0 6
  - 200: 400 0 7
  - 500: 750 0 8
  - 750: 1000 0 9
  - 1000: 1500 0 10

### Bills, Inland, payable at any time otherwise than on demand:

- not exceeding £5: 0 0 2
- exceeding £5:
  - 10: 25 0 3
  - 25: 50 0 4
  - 50: 75 0 5
  - 75: 100 0 6
  - 100: 200 0 7
  - 200: 300 0 8
  - 300: 400 0 9
  - 400: 500 0 10
  - 500: 750 0 11
  - 750: 1000 0 12
  - 1000: 1500 0 13

When exceeding £1000, for every 1000, and fraction thereof, 3s. 4d.
### STAMP DUTIES.

**Fire Insurance**

- The instrument or policy itself: £ 0 s. d. 0 0 1
- And on the sum insured, per cent.
  - per annum: £ 0 s. d. 0 1 6

There are no stamp duties upon policies of insurance on public hospitals, or on agricultural produce, farming stock, and implements of husbandry, provided such insurance be effected by a separate policy relating to such produce, stock, and implements alone.

**Indentures of Apprenticeship**

- When no premium is paid: £ 0 s. d. 0 2 6
- When the premium is under £50: £ 0 s. d. 1 0 0
  - If £20 and under £50: £ 0 s. d. 2 0 0
    - 50: £ 0 s. d. 0 3 0
    - 100: £ 0 s. d. 0 6 0
    - 200: £ 0 s. d. 0 12 0
    - 300: £ 0 s. d. 0 20 0
    - 400: £ 0 s. d. 0 25 0

**Indentures of Apprenticeship in the Sea Service, the Colonies, or made at the sole expense of any parish or public charity, exempt.**

**Lease**

<table>
<thead>
<tr>
<th>Where the yearly rent does not exceed</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>£5</td>
<td>0 6</td>
<td>0 3</td>
<td>0 6</td>
</tr>
<tr>
<td>exceeding £5</td>
<td>10</td>
<td>1 0</td>
<td>0 6</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>1 6</td>
<td>0 9</td>
</tr>
<tr>
<td>15</td>
<td>20</td>
<td>2 0</td>
<td>1 2</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
<td>2 6</td>
<td>1 5</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td>3 0</td>
<td>2 0</td>
</tr>
<tr>
<td>25 and not exceeding</td>
<td>35</td>
<td>3 5</td>
<td>3 0</td>
</tr>
<tr>
<td>50</td>
<td>40</td>
<td>4 0</td>
<td>4 0</td>
</tr>
<tr>
<td>75</td>
<td>50</td>
<td>5 0</td>
<td>5 0</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>10 0</td>
<td>10 0</td>
</tr>
</tbody>
</table>

For every additional £50 and part of £50: 5 0 1 0 3 0

**Legacies** (value 20l. or more).

<table>
<thead>
<tr>
<th>Per Cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Husbands or widows, no legacy £ s. d.</td>
</tr>
<tr>
<td>Fathers and mothers: 1 0 0</td>
</tr>
<tr>
<td>To children or their descendants: 1 0 0</td>
</tr>
<tr>
<td>To brother or sister, or their descendants: 3 0 0</td>
</tr>
<tr>
<td>To uncle or aunt, or their descendants: 5 0 0</td>
</tr>
<tr>
<td>To great uncle or aunt, or their descendants: 6 0 0</td>
</tr>
<tr>
<td>To all other relations, or strangers: 10 0 0</td>
</tr>
<tr>
<td>Property left to the husband or wife of a relative pays only the duty chargeable to such relative.</td>
</tr>
</tbody>
</table>

**Licences—Hawkers travelling with £ s. d.**

- 1 horse with a licence not above six months: £ 2 0 0
- Do. above six months, and not above a year: £ 4 0 0
- Hawkers in Ireland, on foot: £ 2 2 0
- Do. for each horse used: £ 2 2 0

**Probate of Wills and Letters of Administration:**

<table>
<thead>
<tr>
<th>Will.</th>
<th>Administration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If 100</td>
<td>200... £2 0</td>
</tr>
<tr>
<td>200</td>
<td>300... 5 0</td>
</tr>
<tr>
<td>300</td>
<td>450... 8 0</td>
</tr>
<tr>
<td>450</td>
<td>600... 11 0</td>
</tr>
<tr>
<td>600</td>
<td>800... 15 0</td>
</tr>
<tr>
<td>800</td>
<td>1,000... 22 0</td>
</tr>
<tr>
<td>1,000</td>
<td>1,500... 30 0</td>
</tr>
<tr>
<td>1,500</td>
<td>2,000... 40 0</td>
</tr>
<tr>
<td>2,000</td>
<td>3,000... 50 0</td>
</tr>
<tr>
<td>3,000</td>
<td>4,000... 60 0</td>
</tr>
<tr>
<td>4,000</td>
<td>5,000... 80 0</td>
</tr>
<tr>
<td>5,000</td>
<td>6,000... 100</td>
</tr>
<tr>
<td>6,000</td>
<td>7,000... 120</td>
</tr>
<tr>
<td>7,000</td>
<td>8,000... 140</td>
</tr>
<tr>
<td>8,000</td>
<td>9,000... 160</td>
</tr>
<tr>
<td>9,000</td>
<td>10,000... 180</td>
</tr>
</tbody>
</table>

And so on progressively in an ascending scale, up to £1,000,000. Where value amounts to £1,000,000 or upwards, for every £100,000 and fractional part thereof a £1500 stamp under a will, and a £2250 stamp under Letters of Administration.

**Promissory Notes Payable on Demand and Re-issuable**

- For any Sum not exceeding £1 0 0: £ 1 1 0 5
- Above £1 1 0 0: £ 2 2 0 10
- 5 5 1 3
- 10 0 1 9
- 20 0 2 0
- 30 0 3 0
- 50 0 5 0
- 100 0 8 6

Promissory Notes not exceeding £100 payable otherwise than to the bearer on demand, and exceeding £100 and payable in any way, are charged with the same duty as Inland Bills.

*Protest of a Bill or Promissory Note* The same Note when the stamp duty duty as on the bill or note does not exceed 1s. on the bill or note does not exceed 11.

*Protest of any other Bill or Promissory Note* and payment of any other kind: 0 1 0

And for every sheet after the first, a further progressive duty of 0 1 0

*Proxy to vote at any Meeting of Shareholders: 1d.*

*Receipt for any sum amounting to £2, or upwards: 1d.*

*Script Certificate: 1d.*

**Succession Duties**—Where the whole succession derived from the same predecessor amounts to £100 or upwards; or where any succession is of the value of £20 or upwards, the whole succession being of £100 or upwards, the same as Legacy Duties.
ANSWERS TO THE QUESTIONS.

I. QUEST. (2094); by Mr. Thomas Somerscales, Schooner "Fairy."

Supposing that the velocity of a vessel, beating to the windward, varies directly as the sine of the angle by which the course exceeds 45° from the direction of the wind, determine the best angle the course can make with the direction of the wind when the vessel is plying dead to the windward.

Solution, by Mr. Stephen Watson; and Mr. Thomas Somerscales, the Proposer.

Instead of 45° take any angle α, let θ be the angle of the course, and let the velocity of the vessel be

\[ v = \lambda \sin (\theta - \alpha). \]

Then the velocity dead to the windward, that is, in the direction of the wind, \( = v \cos \theta = \lambda \cos \theta \sin (\theta - \alpha). \) Equating the differential coefficient to 0 for a maximum,

\[ 0 = \cos \theta \cos (\theta - \alpha) - \sin \theta \sin (\theta - \alpha) \]
\[ = \cos (2\theta - \alpha); \]
\[ \therefore 2\theta - \alpha = 90°, \text{ and } \theta = 45° + \frac{1}{2} \alpha. \]

When \( \alpha = 45°, \) this becomes \( \theta = 67° 30'. \)

All the solutions received were similar to the above.

II. QUEST. (2065); by Mr. Robert Amblor, Stevenage Grammar School.

A gentleman has a globular glass vessel for gold fishes, one foot in diameter and an air-circle three inches in diameter. Assuming the vessel to be of no sensible relative weight, and to be freely suspended from a point in the rim, what quantity of water will it hold in that position without overflowing?

Solution, by Mr. Thomas Dobson, Hexham.

Let \( \alpha = \) inclination AED of air-circle to horizon;
\( a = \) radius of the sphere;
\( h = DB, \) the greatest depth of water;
then
\( h = 2a \cos^2 \alpha \) .....................(1).

Now, if \( V \) be the volume of the lower segment of the sphere,
\( V = \pi h^2(a - \frac{1}{3}h) \) ................... (2).

In this case \( 2a = 1 \) foot,

\[ \sin \alpha = \frac{3}{12} = \frac{1}{4}; \therefore \cos^2 \alpha = \frac{15}{16} = h; \]

hence, \( V = \frac{3}{16} \left( \frac{15}{16} \right)^2 \pi \) cubic feet,
\[ = 894.92 \text{ cubic inches,} \]
\[ = 5.226 \text{ imperial gallons,} \]
the greatest quantity of water which the globe will hold in the assigned position without overflowing.

The other solutions received were the same in substance.

III. QUEST. (2066); by Mr. Thomas Milbourne, Riding Mill.

If \( \sigma \) be the semi-perimeter of the triangle formed by joining the feet D, E, F of the perpendiculars of the triangle ABC; and \( \sigma_0, \sigma_1, \sigma_2, \sigma_3 \) the semi-perimeters of triangles similar to ABC, and inscribed in the four circles of contact, prove that

\[
\frac{1}{\sigma} = \frac{1}{\sigma_0} = \frac{1}{\sigma_1} + \frac{1}{\sigma_2} + \frac{1}{\sigma_3}.
\]

Answered by Mr. Thomas Dobson, Hexham; and Mr. Thomas Milbourne, the Proposer.

Equating equal values of the expression \( \sin A + \sin B + \sin C \), we have

\[
\frac{s}{R} = \frac{\sigma_0}{r} = \frac{\sigma_1}{r_1} = \frac{\sigma_2}{r_2} = \frac{\sigma_3}{r_3}.
\]

Now, \( 2A, 2B, 2C \) are the angles of the triangle DEF, and \( \frac{1}{2}R \) is the radius of its circumscribing circle;

\[
\because 2\sigma = R(\sin 2A + \sin 2B + \sin 2C),
\]

\[
\therefore \sigma = 2R \sin A \sin B \sin C.
\]

But \( rs = 2R^2 \sin A \sin B \sin C = R\sigma \); hence, \( \sigma = \sigma_0 \),

and \( \frac{\sigma}{r} \left( \frac{1}{\sigma_1} + \frac{1}{\sigma_2} + \frac{1}{\sigma_3} \right) = \frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} = \frac{1}{r} ; \)

\[
\therefore \frac{1}{\sigma} = \frac{1}{\sigma_0} = \frac{1}{\sigma_1} + \frac{1}{\sigma_2} + \frac{1}{\sigma_3}.
\]

Like answers were given by "Cubic," and Messrs. Hall, McNameara, Rutherford, Traynor, Tucker, and Wilson.

Again, by Mr. Septimus TEBAY, Rivington; and Mr. Stephen Watson, Haydonbridge.

We have \( R : r : : s : \sigma_0 = \frac{rs}{R} = \frac{\Delta}{R} ; \)

And \( \sigma = \frac{1}{2}(a \cos A + b \cos B + c \cos C) \)

\[
= \frac{aR \cos A + bR \cos B + cR \cos C}{2R} = \frac{\Delta}{R} ;
\]

\[
\therefore \frac{1}{\sigma} = \frac{1}{\sigma_0} ; \text{and since} \frac{1}{r} = \frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} , \text{it is plain that}
\]

\[
\frac{1}{\sigma_0} = \frac{1}{\sigma_1} + \frac{1}{\sigma_2} + \frac{1}{\sigma_3}.
\]

Similar answers were given by "Civis," and Messrs. Barlow, Bills, Brown, Escott, Smith, and Turnbull.
IV. QUEST. (2067); by Mr. Thomas Milbourn, Riding Mill.

Let $\delta$ be the diameter of the circle about the three rectangles inscribed in a triangle, having each a side coincident with one of the sides $(a, b, c)$ of the triangle, and their diagonals all intersecting in one point, and $D$ the diameter of the circle about the triangle; prove that

\[
\frac{1}{\delta^2} + \frac{1}{D^2} = \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}.
\]

Answered by Dr. Rutherford; Mr. Thomas Milbourn, the Proposer; "Civis," and Messrs. Barlow, Brown, Dobson, Escott, Hall, M'Namara, Smith, Somerscales, Tebay, Traynor, Tucker, Turnbull, Watson, and Wilson.

Referring to the 'Diary' for 1806, p. 55, we have—

\[
\frac{1}{\delta} = \frac{a^2 + b^2 + c^2}{2abc},
\]

and 'Diary,' 1835, p. 55, $\frac{1}{D} = \frac{2\Delta}{abc} = \frac{4\Delta}{2abc}$.

Consequently, $\frac{1}{\delta^2} + \frac{1}{D^2} = \frac{(a^2 + b^2 + c^2)^2 + (4\Delta)^2}{4a^2b^2c^2} = \frac{4a^2b^2c^2}{4a^2b^2c^2} = \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}$.

V. QUEST. (2068); by Mr. T. M'Namara, Collooney, Sligo.

If $\sigma$ be the side of an equilateral triangle inscribed in a triangle $ABC$, and having one of its angular points at the middle of $AB$; and if $p_1$, $p_2$ be the perpendiculars from $A$ and $B$ on the opposite sides; prove that

\[
\sigma^2 = \frac{p_1^2 + p_2^2 + p_1p_2\cos C - \sqrt{3}\sin C}{(\sqrt{3}\cos C + \sin C)^2}.
\]

Solution, by Mr. T. M'Namara, the Proposer.

From the middle point $P$ of the side $AB$ draw PH perpendicular to $AC$, and produce it to $F$, making $PF = p_2$; next draw FG, making the angle $PFG = 30^\circ$, meeting $AC$ in $I$ and $BC$ in $G$; join $GP$, and draw $GD$, making the angle $PGD = 60^\circ$, and meeting $AC$ in $D$; join $PI$, and draw $PR$, $FE$ perpendicular to $BC$.

Then the angle $PGD = PIH = 60^\circ$, and the angle $PDG = PIG = 60^\circ$; : the triangle $PDG$ is equilateral. Now, since $PR = \frac{1}{2}p$, and the angle $PF E = C$, we have

\[
FE = p_2\cos C + \frac{1}{2}p_1;
\]

\[
FG = \frac{2p_2\cos C + p_1}{\sqrt{3}\cos C + \sin C},
\]

and hence

\[
\frac{1}{\delta^2} + \frac{1}{D^2} = \frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2}.
\]
\[ \sigma^2 = PG^2 = PF^2 + FG^2 - 2PF \cdot FG \cdot \frac{\sqrt{3}}{2} \]

\[ = p_2^2 + \left( \frac{2p_2 \cos C + p_1}{\sqrt{3} \cos C + \sin C} \right)^2 - p_2^2 \cdot \frac{2p_2 \cos C + p_1}{\sqrt{3} \cos C + \sin C} \]

\[ = p_1^2 + p_2^2 + p_1p_2 \left( \cos C - \sqrt{3} \sin C \right) \cdot \frac{1}{\left( \sqrt{3} \cos C + \sin C \right)^2} \]

A similar answer was given by Mr. James Traynor, Carrickmacross.

**Second Solution, by Mr. Thomas Dobson, and Dr. Rutherford.**

**Construction.**—From the middle point F of AB draw the right lines FG, GH, HF, meeting AC in G and BC in H, and making angles FGA, FGH each equal to 60°. About the triangle FGH describe a circle cutting AC in K. Join FK, KH; then FKH is the equilateral triangle required.

**Demonstration.**—By the circle, \( \angle FKH = \angle FGH = 60° \); and \( \angle FHK = \angle FGA = 60° \); \( \therefore \angle HKF = 60° \). Let \( \angle GFK = \angle GHK = \theta \); then \( \angle FHG = C + \theta \) and \( \angle FKA = 60° - \theta \); hence \( 2\sigma \sin (C + \theta) = p_1 \) and \( 2\sigma \sin (60° - \theta) = p_2 \).

Expanding \( \sin (C + \theta) \) and \( \sin (60° - \theta) \), and substituting in the formula \( 4\sigma^2 \sin^2 (60° - \theta) = p_1^2 + p_2^2 + 2p_1p_2 \cos (C + 60°) \),

which readily reduces to the form required.

Mr. Dobson observes—

This result shows that \( \sigma \) is the radius of the circle about the triangle of which the sides are \( p_1 \) and \( p_2 \), and the included angle 120° — \( C \).

**Third Solution, by Mr. Septimus Tebay, Rivington; and Mr. Stephen Watson, Haydonbridge.**

Let HFK be the equilateral triangle, and let the angle AFK = \( \theta \). Then

\[ \sigma = \frac{c}{2} \cdot \frac{\sin A}{\sin (A + \theta)} = \frac{c}{2} \cdot \frac{\sin B}{\sin (\theta - B + 60°)}; \]

from which, eliminating \( \theta \), we find

\[ \sigma^2 = \frac{c^4 \sin^2 A}{4} \cdot \frac{a^2 + b^2 - 2ab \cos (120° - C)}{a^2 \sin^2 (120° - C)} \]

\[ = \frac{\sin^2 C}{4} \cdot \frac{a^2 + b^2 - 2ab \cos (120° - C)}{\sin^2 (120° - C)} \]

\[ = p_1^2 + p_2^2 + p_1p_2 \left( \cos C - \sqrt{3} \sin C \right) \cdot \frac{1}{\left( \sqrt{3} \cos C + \sin C \right)^2} \]

VI. QUEST. (2089); by Mr. C. H. Brooks, C.E., London.

Two straight lines of given lengths project at given angles from the circumferences of two given concentric circles; assign geometrically their relative position, so that the projecting extremities may be joined tangentially by an arc of a circle to be found.

Answered by Mr. C. H. Brooks, the Proposer.

This problem is that of the railway switch and crossing, the two concentric circles being the outer and inner rails of the main line, and the two straight lines being the switch and the straight piece of rail at the crossing, and the circle to be found is the line of rail joining the switch and crossing.

Let \( A' \) be the point of the switch, and \( O \) the centre of curvature of the two lines of rails; make \( AA' = \) the length of the switch, and making a given angle with the tangent at \( A' \).

Draw \( OZ \) anywhere; make \( OZL = \) the complement of the angle of crossing, and, with \( O \) as centre, describe a circle to touch it at \( L \).

Produce the switch and make \( AR = LK = ZL + \) length of straight of crossing \( ZK \). Join \( OR \), and erect the perpendicular \( RE = OL \); join \( OE \), and bisect it in \( N \). Draw \( NM \) perpendicular to \( ON \), and erect the perpendicular \( MB \), which will cut the switch produced in the point \( B \). Draw \( BD \) tangential to the inner circle; make \( BF = BA \), and erect the perpendiculars \( AY \), \( FY \), meeting in \( Y \), the centre of the required circle.

Demonstration.—The arc to be found must be tangential to the extremity A of the switch; hence the centre must be in \( AY \). Also, as the tangent at the other extremity \( F \) of the arc is to cut the inner rail or concentric circle at a given angle, it must be tangential to some other interior circle, which circle \( DL \) is found by supposing \( Z \) to be the point of crossing and drawing \( ZL \) at the proper inclination to \( OZ \). If, now, \( ZK \) be made equal to the straight portion of the crossing, the point \( B \) must be found so that \( FD = KL \), or, as \( AB = BF \) and \( AR \) was made \( = KL \), to find \( B \) so that \( BR \) shall equal \( BD \), a tangent to the given circle \( DL \). Evidently \( B \) is on the radical axis of the point \( R \) and the circle \( DL \).

Let \( BM \) be that radical axis, which must be found so that \( RB^2 = BD^2 \). But \( RB^2 = RM^2 + MB^2 \), and \( BD^2 = OB^2 - OD^2 = OM^2 + MB^2 - OD^2 \); hence \( RM^2 = OM^2 - OD^2 \), or \( OM^2 - RM^2 = OD^2 \), which fixes the point \( M \), as \( OD \) is a given radius.

Now, \( OM^2 = RM^2 + OD^2 \); therefore, erect the perpendicular \( RE = OD \), then \( OM = ME \), and the problem is reduced to finding in a given line \( OR \) a point \( M \) so that \( OM \) shall equal \( ME \); hence, join \( OE \), and bisect it in \( N \), then erect the perpendicular \( NM \); the triangles \( OMN, EMN \) are equal; and if \( MB \) be erected to cut \( AR \) produced, then \( BR \) will equal \( BD \), and the centre \( Y \) is correctly found.
Particular case.—When the radii of the two concentric circles are infinite, or for a straight line, let A'B, CD be the two rails. Draw the switch A'A in its proper position, and at any point D in the other line place DE at the angle of the crossing, and equal in length thereto, and through E draw EF parallel to CD. Also draw through A a parallel AB' to A'B, and make AG parallel to DE.

Bisect the angle between AG and A'A produced, by the line AE cutting PE in E', the correct position of E, whence E'D' can be drawn; then perpendiculars to the switch and crossing at A and E' respectively will intersect in O, the centre of the arc to be found.


Construction.—Let AB be one of the given lines touching the inner circle in A. From the common centre O draw OO' equal to the other given line, and inclined to AB at the given angle. With centre O' and radius equal to that of the outer circle describe a third circle. From B draw BC to meet this circle in C, and equally inclined to AB and OO'. Draw CD parallel to OO', to meet the outer circle in D. Then CD is the second line in the required position. From B and C draw perpendiculars to AB and CD to meet in E. Then E is the centre of the circle to which AB and CD are tangents at B and C.

Demonstration.—CD is parallel to OO', and OD = O'C;
∴ CD = OO' = the second given line.

And ∠ABC = ∠BCD; ∴ ∠ECD = ∠EBC;
∴ the perpendiculars EB, EC are equal, and E is the centre of the circle touching AB and CD.

Analogous solutions were likewise given by Messrs. M'Namara, Traynor, and Wilson.

VII. QUEST. (2070); by Mr. John Collins, Ennis College.

In a given circle to inscribe a triangle ABC having its vertex A at a given point of the circumference, AB : AC a given ratio, and its area a maximum; and prove geometrically that the base BC passes always through a fixed point, whatever be the given ratio AB : AC.

Answered by Mr. Thomas Dobson; "Cubic;" and Messrs. Escott, Milbourn, Tebay, Tucker, and Watson.

Draw the diameter AD ( = 2R), dividing the angle BAC into ∠DAC = θ,
and \( \angle DAB = \theta' \), and cutting BC in E. Join BD and CD, and let

\[ AC : AB : m : n. \]

Then \( AC = 2R \cos \theta, AB = 2R \cos \theta' \);

\[ \therefore n \cos \theta = m \cos \theta' \ldots \ldots (1). \]

Differentiating and eliminating \( m \) and \( n \), this gives

\[ \tan \theta \cdot \theta' = \tan \theta' \cdot \theta' \ldots \ldots (2). \]

The variable factor in the area of the triangle \( \frac{1}{2} AC \cdot AB \sin(\theta + \theta') = \cos \theta \cdot \\
\cos \theta \sin(\theta + \theta') \); equating the differential of this to zero, and reducing, we have

\[ 3 \tan \theta \cdot \tan \theta' = 1 \ldots \ldots (3). \]

From equations (1) and (3), \( \theta \) and \( \theta' \) may be found in terms of \( m \) and \( n \).

By similar triangles, and equation (3),

\[ \frac{AE}{ED} = \frac{AE^2}{AE \cdot ED} = \frac{AE^2}{BE \cdot EC} = \frac{AC \cdot AB}{BD \cdot CD} = \frac{3}{1}. \]

Hence, whatever be the given ratio \( m : n \), the base BC always cuts the diameter AD at a distance of three-fourths of the diameter from A.

Like answers were given by Messrs. Barlow, Borradaile, Brown, Hall, M'Namara, Traynor, Turnbull, and Wilson.

VIII. QUEST. (2071); by Mr. C. H. Brooks, C.E., London.

Develop the function \( \sin a - \sin x \) into its constituent linear factors with respect to \( x \).

**Answered by Mr. Brooks, the Proposer.**

The roots of the equation \( \sin a - \sin x = 0 \) are

\[ x = a, \quad \pi - a, \quad 2\pi + a, \quad 3\pi - a, \quad 4\pi + a, \quad \text{&c.}, \]

and

\[ -(\pi + a), -(2\pi - a), -(3\pi + a), -(4\pi - a), \quad \text{&c.}; \]

hence, the factors are

\[ x - a, x - (\pi - a), x - (2\pi + a), x - (3\pi - a), x - (4\pi + a), \quad \text{&c.}, \]

and

\[ x + (\pi + a), x + (2\pi - a), x + (3\pi + a), x + (4\pi - a), \quad \text{&c.} \]

Therefore, \( \sin a - \sin x = \)

\[ (a - x) \left( 1 - \frac{a + x}{\pi} \right) \left( 1 + \frac{a + x}{\pi} \right) \left( 1 - \frac{a - x}{2\pi} \right) \left( 1 + \frac{a - x}{2\pi} \right) \]

\[ \left( 1 - \frac{a + x}{3\pi} \right) \left( 1 + \frac{a + x}{3\pi} \right) \ldots \ldots \]

\[ = (a - x) \left\{ 1 - \frac{(a + x)^2}{\pi^2} \right\} \left\{ 1 - \frac{(a - x)^2}{2^2\pi^2} \right\} \left\{ 1 - \frac{(a + x)^2}{3^2\pi^2} \right\} \]

\[ \ldots \ldots \left\{ 1 - \frac{(a - x)^2}{4^2\pi^2} \right\} \quad \text{&c.} \]

It was thus answered by "Cubic."
Again, by Mr. A. Hall, Washington, United States; and Messrs. Barlow, Brown, Dobson, Escott, McNamara, Milbourn, Tebay, Traynor, and Watson.

We can write the given function in the form
\[ 2 \cos \frac{1}{2} (\alpha + x) \sin \frac{1}{2} (\alpha - x); \]
and then by a formula given by Cauchy, in his 'Analyse Algebrique,' p. 569, and which is due, I think, to Euler, we have
\[
\sin z = (1 - \frac{z}{\pi}) (1 + \frac{z}{2\pi}) (1 - \frac{z}{3\pi}) (1 + \frac{z}{2\pi}) (1 - \frac{z}{3\pi}) \& c.,
\]
\[
\cos z = (1 - \frac{2z}{\pi}) (1 + \frac{2z}{3\pi}) (1 - \frac{2z}{3\pi}) (1 + \frac{2z}{3\pi}) (1 + \frac{2z}{5\pi}) \& c.,
\]
and therefore, by substitution,
\[
\sin \alpha - \sin x = (\alpha - x) \left(1 - \frac{\alpha + x}{\pi}\right) \left(1 + \frac{\alpha + x}{\pi}\right) \left(1 - \frac{\alpha - x}{2\pi}\right) \left(1 + \frac{\alpha - x}{3\pi}\right) \& c.
\]

IX. QUEST. (1703); by Mr. Robert Tucker, M.A., London.

Perpendiculars to the vertical and focal vectors of any point on a conic are drawn through the vertex and focus; find the loci of the two points of intersection and the areas of the loops.


Let AC, FC be the vertical and focal vectors; QAR, FPQ perpendiculars to them; and P, Q, R the intersections of these lines as in the diagram. In what follows, where the double sign occurs, the upper one applies to the ellipse, the lower to the hyperbola. Put AF = m = ± (a - c), n = a + c, n's = n + c, and denote C by (x'y').

Then the equations of the lines are the following:

\[ \text{AC} \ldots x'y = y'x, \quad \text{FC} \ldots (x' - m)y = y'(x - m) \] \[ \text{QR} \ldots y'y = -x'x, \quad \text{FP} \ldots y'y = -(x' - m)(x - m) \] 

Also by the equation of the curve

\[ a^2y'^2 = mn(2m + x)x' \] .......................... (2).

Eliminating x', y' from (2) and the appropriate pairs in (1), the equations of the loci of P, Q, R are found to be

\[ a(n'x + am)y^2 = n^2(m - x)x^2 \] .......................... (P),
\[ mn(n \pm x)y^2 = a^2(m - x)x^2 \] .......................... (Q),
\[ n^2y^2 = a(2mn - n'x)x \] .......................... (R).
When the curve is the parabola, these equations become
\[
(m + 3x)y^2 = 4(m - x)x^2 \quad \ldots \ldots \quad (p),
\]
\[
4my^2 = (m - x)x^2 \quad \ldots \ldots \quad (q), \quad y^2 = x(m - \frac{1}{3}x) \quad \ldots \ldots \quad (r).\]
From (P) and (q) it is plain that the locus of P is, in all cases, composed of a loop and two infinite branches, having an asymptote LDL, such that \( AD = \frac{a}{n}. \) AF in the case of the ellipse and hyperbola, and \( AD = \frac{1}{3} \) AF in the parabola. The form of this curve is marked by a dark line in the diagram.

In like manner the locus of Q consists, in all cases, of a loop and two infinite branches having an asymptote MEM, such that \( AE = n \) in the case of the ellipse, and \( AE = \infty \) in the hyperbola and parabola. This curve is indicated by the dotted line.

Put \( m - x = z^2, \) \( \therefore x = m - z^2 \) and \( dx = -2zdz; \) then the area of the loop in (P) is
\[
2 \int_0^m ydz = \frac{4n}{\sqrt{a}} \int_{\sqrt{m}}^{\sqrt{m}} \frac{(z^2 - m)z^2dz}{\sqrt{2mn - n^2z^2}}
\]
\[
= \frac{2n^2}{n^2} \left\{ a + n' - \frac{2n}{\sqrt{an'}} \sin^{-1} \left( \frac{n'}{2n} \right)^{\frac{1}{2}} \right\}. \]

In like manner the area of the corresponding loop in (p) is \( \frac{1}{3} mu^2. \)

Similarly, the area of the loops in (Q) and (q), for the ellipse, hyperbola, and parabola, are respectively
\[
a \left\{ a + n - \frac{2an'}{b} \sin^{-1} \left( \frac{m}{2a} \right)^{\frac{1}{2}} \right\},
\]
\[
a \left\{ n' + \frac{2c(a + n)}{b} \log \left( \frac{c - b}{c} \right) \right\} \quad \text{and} \quad \frac{4}{15} m^2. \]

Lastly, the locus of R is always an ellipse, the area of that in (R) being
\[
\pi b^2 m \sqrt{a}, \quad \text{and that in (r) is} \quad \frac{2\pi m^2}{3\sqrt{3}}. \]

Similar answers were given by Messrs. Barlow, M'Namara, Milbourn, Traynor, and Wilson. A complete solution by the proposer has been cancelled for want of space.

X. QUEST. (2073) ; by Mr. Artemas Martin, Franklin, U. S.

Required the mean distance of one corner of a rectangle from all points in its surface.

Solution, by Mr. Artemas Martin, the Proposer; and Messrs. Barlow, Brooks, Brown, "Cubic," Dobson, Escott, Hall, M'Namara, Milbourn, Traynor, and Watson.

Let \( a \) and \( b \) represent the sides of the rectangle, and \( x \) and \( y \) the coordinates of any point \( P \) in the plane of the rectangle, two adjacent sides being the axes of coordinates. Then the distance from \( A, \) the origin, to \( P \) is
\[
\sqrt{x^2 + y^2}.\]
If we suppose $y$ constant, the point $P$ will move along a line parallel to the side $a$; the mean distance of this line from $A$ is

$$\frac{1}{a} \int_0^a dx \sqrt{x^2 + y^2} = \frac{1}{a} \left\{ \frac{x \sqrt{x^2 + y^2}}{2} + \frac{y^2}{2} \log \left( x + \sqrt{x^2 + y^2} \right) \right\}_0^a$$

$$= \frac{1}{a} \left\{ \frac{a \sqrt{a^2 + y^2}}{2} + \frac{y^2}{2} \log \left( \frac{1 + \sqrt{a^2 + y^2}}{y} \right) \right\} \quad \cdots (1).$$

The mean value of $(1)$ for all values of $y$ from $y = 0$ to $y = b$ is

$$\frac{1}{ab} \int_0^b dy \left\{ \frac{a \sqrt{a^2 + y^2}}{2} + \frac{y^2}{2} \log \left( \frac{1 + \sqrt{a^2 + y^2}}{y} \right) \right\}$$

$$= \frac{1}{3} \sqrt{a^2 + b^2} + \frac{a^2}{6b} \log \left( b + \sqrt{a^2 + b^2} \right) + \frac{b^2}{6a} \log \left( \frac{a + \sqrt{a^2 + b^2}}{b} \right) \quad \cdots (2).$$

for the mean distance required.

If we put $D$ for the diagonal of the rectangle, it reduces to

$$\frac{1}{3} D + \frac{a^2}{6b} \log \left( \frac{b + D}{a} \right) + \frac{b^2}{6a} \log \left( \frac{a + D}{b} \right) \quad \cdots (3).$$

When $a = b$, the rectangle becomes a square, and the mean distance is

$$\frac{1}{3} a \sqrt{2} + \frac{1}{3} a \log \left( 1 + \sqrt{2} \right) = \frac{1}{3} a \left\{ \sqrt{2} + \log \left( 1 + \sqrt{2} \right) \right\} \quad \cdots (4).$$

*Again, by Mr. Septimus Teray; and Mr. Robert Tucker, Mathematical Master, University College School.*

Let $a$, $b$, $c$ be the sides and diagonal of the rectangle, $r \theta$ any point in the surface. Then the portion of mean distance for half the rectangle is

$$\int r^2 dr d\theta \cdot \frac{a^2}{ab} \int \sec^2 \theta d\theta = \frac{1}{6} \left( d + \frac{a^2 b}{b} \log \frac{b + d}{a} \right).$$

Similarly, for the other half we have

$$\frac{1}{6} \left( d + \frac{b^2 a}{a} \log \frac{a + d}{b} \right).$$

Hence the mean distance required is

$$\frac{1}{6} \left( 2d + \frac{a^2 b}{a} \log \frac{b + d}{a} + \frac{b^2 a}{a} \log \frac{a + d}{b} \right).$$

**XI. QUEST. (2074); by Mr. Stephen Watson, Haydonbridge.**

If perpendiculars $PD$, $PE$, $PF$ be drawn from every point $P$ in the triangle $ABC$ to meet the sides in $D$, $E$, $F$, then the average area of the triangles $DEF$ is

$$\frac{1}{12} \left( \sin^2 A + \sin^2 B + \sin^2 C \right)$$

of the triangle $ABC$. 

Solution, by Mr. Stephen Watson, the Proposer.

Put \(PD = l\), \(PE = m\), and triangle \(ABC = \Delta\). Then the triangle \(DPE = \frac{1}{2}m \sin C\); also, an element at \(P\) in the direction \(DP\) is \(dl\), and the same in a direction parallel to \(BC\) is \(\csc C \cdot dl\); moreover, the limits of \(m\) are 0 and \(\frac{2\Delta - l}{b} = m'\) (suppose), and those of \(l\) are 0 and \(b \sin C = p_1\). Hence the average area of the triangle \(DPE\) is

\[
\frac{1}{\Delta} \int_{0}^{p_1} \int_{0}^{m'} (\text{triangle } DPE) \csc C \cdot dl \cdot dm = \frac{1}{2\Delta} \int_{0}^{p_1} \int_{0}^{m'} lm \cdot dl \cdot dm
\]

\[
= \frac{1}{4b^2\Delta} \int_{0}^{p_1} (2\Delta - l)a \cdot dl = \frac{\Delta}{12} \sin^2 C.
\]

Similarly, we find the average areas of the triangles \(EPF, FPD\) are \(\frac{\Delta}{12} \sin^2 A\) and \(\frac{\Delta}{12} \sin^2 B\); hence the average area of the whole triangle \(DEF\) is

\[
\frac{\Delta}{12} (\sin^2 A + \sin^2 B + \sin^2 C).
\]

The other solutions received were similar to the preceding.

XII. QUEST. (2075); by the late Professor Hearn.

Let \(AB\) be a given line of abscissæ; two systems of curves may be found, one convex and the other concave to \(AB\), such that the radius of curvature at any point shall bear a constant ratio to the normal terminated by \(AB\). Moreover, if two individuals, one of each system, be selected, a tangent drawn at any point in one of them and a parallel tangent to the other, the rectangle of the ordinates to the points of contact will be the same throughout the curves chosen.

Answered by Mr. W. S. B. Woolhouse.

Let \(\omega\) denote the angle between the tangent and the axis of \(x\); then, by the question, if \(1 : m\) express the given ratio, we shall have, according as the curve is convex or concave to \(AB\),

\[
\frac{ds}{d\omega} = \pm m \frac{dy}{dx}, \text{ or } my = \pm \frac{dx}{d\omega}
\]

\[
\therefore \frac{dy}{y} = \pm md\omega \frac{dy}{dx} = \pm md\omega \tan \omega.
\]

Hence, by integration,

\[
\log y = \text{const.} \pm m \log \sec \omega.
\]

\[
\therefore y = c (\sec \omega)^m, \text{ for a curve convex to } AB,
\]

\[
y' = c' (\sec \omega')^{-m}, \text{ for a curve concave to } AB.
\]

For parallel tangents \(\omega = \omega'\); therefore in this case \(yy' = cc'\), which is constant and independent of the angle \(\omega\).

Let $n$ be the constant ratio of the radius of curvature to the intercepted portion of the normal; then, equating the equal values, the factor $\left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^{\frac{1}{2}}$ divides out, and we have, for the differential equation of the two systems of curves,

$$1 + \left(\frac{dy}{dx}\right)^2 \pm ny \frac{d^2y}{dx^2} = 0;$$

the positive value of $n$ corresponding to a negative value of $\rho$, and conversely.

The first integral of this is $\left\{1 + \left(\frac{dy}{dc}\right)^2\right\}^{\frac{n}{2}} = \frac{y}{c}$, where $c$ is a constant.

Now, for any two parallel tangents at points $x_1, y_1$ and $x_2, y_2$, we have

$$\frac{dy_1}{dx_1} = \frac{dy_2}{dx_2};$$

and consequently $y_1 y_2 = c^2$.

When $n = 1$, the individual curves of the two systems are the catenary and the circle.

Similar answers were likewise given by Messrs. M’Namara, Traynor, and Wilson.

XIII. QUEST. (2076); by Mr. Thomas Dobson, B.A., Hexham.

Determine the magnitude and position of the maximum and minimum values of the line of cusps during a solar eclipse, the relative rectilinear path of the moon’s centre across the sun’s disc being given.

Answered by Mr. Dobson, the Proposer; and in like manner by "Cubic," and Messrs. Barlow, Escott, M’Namara, and Milbourn.

Let $S$ and $M$ be the centres of the sun and moon, $AM$ the path of the moon’s centre, $AS$ perpendicular to $AM$, and $BC$ the common chord, the line of cusps.

Put $SB = s$, $MB = m$, $SA = a$, $BC = c$, $AM = x$, $SM = z$; then

$$z^2 = a^2 + x^2.$$

And, equating equal values of the space $SBMC$,

$$c^2 z^2 = \{(s + m)^2 - z^2\}\{(s - m)^2 - z^2\}.$$ (1)

Taking logarithms, differentiating, and equating $\frac{dc}{dx}$ to zero,

$$r \left\{ \frac{1}{z^2 - (s - m)^2} - \frac{1}{(s + m)^2 - z^2} - \frac{1}{z^2} \right\} = 0.$$
The second factor gives
\[ z^4 - (s^2 - m^2)^2 = (z^2 + s^2 - m^2)(z^2 - s^2 + m^2) = 0; \]
so that \[ z^2 = s^2 - m^2, \] which gives \( c_1 = 2m, \)
or \[ z^2 = m^2 - s^2, \] which gives \( c_1 = 2s, \)
and the value \( c_1 \) in either case, is evidently a maximum.

When \( x = 0, z = a, \) and
\[ a^2c_2 = \{(s + m)^2 - a^2\} \{a^2 - (s - m)^2\} \]
Now, the system of chords \( BC \) is divided symmetrically by \( AS, \) \( \therefore \) the maximum value \( c_2 \) of \( c \) must occur twice, once on either side of \( AS; \) and since in
every curve maxima and minima values occur alternately, the value \( c_2 \) of \( c, \) at
the middle of the eclipse, when real, is a relative minimum.

It may be shown that \( BC \) is always a tangent to a given parabola, of which
\( AS \) is the axis.

The laws which govern the successive changes in the magnitude of the
line of cusps during an annular or total eclipse are, (1) At places of obser-
vation for which \( a^2 < s^2 - m^2, \) but \( a^2 > 0, \) the distance between the cusps
will increase from zero at the point of first contact until it equals the moon's
diameter, and will then decrease to a certain minimum length at the middle
of the eclipse, after which it will pass through the same phases in a reversed
order, increasing from the central minimum up to the maximum length, the
moon's diameter, and then decreasing to zero at the point of last contact.

(2) At places for which \( a^2 \) is not less than \( s^2 - m^2, \) the distance between the
cusps will increase from zero up to a certain relative maximum length
at the middle of the eclipse, and then decrease to zero, without passing
through an intermediate minimum value.

Note.—There is a third case, in which the eclipse actually passes through the total
or annular phase; and in this case \( a < s < m. \) The value of \( c_2 \) is then imaginary, and
the line of cusps ceases to exist between the points of internal contact, and in con-
sequence does not acquire any minimum value.—Ed.

**Second Solution, by Mr. Stephen Watson; and similarly by Messrs. Brooks, Brown, Hall, and Tebay.**

Let \( S, M \) be the centres of the sun and moon, \( MA \) the path of the moon's
centre, and \( BC \) the line of cusps, cutting \( SM, MA \) in \( m, n. \) Put \( SB = R, \)
\( MB = r, SA \) a perpendicular to \( MA = a, \) and \( AM = x; \) then

\[ \sqrt{a^2 + x^2} = SM = \sqrt{R^2 - Bm^2} + \sqrt{r^2 - Bm^2}, \]
whence, cleared of radicals, the result gives

\[ 4Bm^2 = BC^2 = \left\{(R + r)^2 - a^2 - x^2\right\} \frac{a^2 + x^2 - (R - r)^2}{a^2 + x^2} \]
\[ \text{... (1).} \]

Also \( Sm = \sqrt{R^2 - Bm^2} \) and tan \( MSA = \frac{x}{a} \) \text{...... (2).} \]
Hence, (1) and (2) completely determine the magnitude and position of \( BC \)
when \( x \) is known.

When \( BC = 0, x = \pm \sqrt{(R + r)^2 - a^2}; \) these are the respective values
of \( x \) at the beginning and ending of the eclipse; also, when \( BC = 0, \)
\[ x = \pm \sqrt{(R - r)^2 - a^2}; \] hence, when \( a < R \sim r, \) between those values
of \( x, \) the moon will lie wholly on the sun's disc, the eclipse being annular,
or there will be a total eclipse, according as $R$ is $> \; or \; < r$. Moreover, in this case $a < R \sim r$, and when $m$ coincides with $M$, that is, when $x = \pm \sqrt{R^2 \sim r^2 - a^2}$, there will be two maximum values of $BC$, each equal $2r$ when $R > r$, but each equal $2R$ when $r > R$.

When $a > R \sim r$, but $< \sqrt{R^2 \sim r^2}$, there can be no annular nor total eclipse; but the maximum values $2r$ and $2R$ have place as before, and between each pair of them there lies the minimum value

$$BC = \frac{(R + r)^2 - a^2}{a} \left( \frac{a^2 - (R \sim r)^2}{2} \right), \text{ when } x = 0.$$  

When $a > \sqrt{R^2 \sim r^2}$, the maximum values $2r$ and $2R$ do not exist, and the minimum when $x = 0$ becomes a maximum.

When $a > R + r$ there can be no eclipse at all.

**Note.**—Full information on the subject of eclipses, with improved methods of calculation, may be found in an elaborated paper by W. S. B. Woolhouse, printed as an "Appendix to the "Nautical Almanac" for 1836," and since uniformly adopted for computation in the "Nautical Almanac" office.

**XIV. QUEST. (2077); by Mr. Septimus Tebay, Rivington.**

A bag contains tickets marked with the numbers 1, 2, 3, ..., 20. Required the probability that a drawing of an arbitrary number of tickets, made at random, will wholly consist of numbers in arithmetical progression.

**Answered by Mr. Septimus Tebay, the Proposer.**

From the series 1, 2, 3, ..., $n$ we can form several other series in arithmetical progression, having their first terms $= 1, 2, 3, \ldots, \&c.$, and common difference 1, 2, 3, &c., with certain limitations. For instance, with the common difference 4 we have

1, 5, 9, 13, &c.,

2, 6, 10, 14, &c.,

3, 7, 11, 15, &c.,

and so on; and these series, being all different, will furnish limited groups of terms in arithmetical progression, such as 1, 5, 9; 5, 9, 13; 1, 5, 9, 13; 5, 9, 13, 17; &c.

Let $a$ be the first term, $r$ the common difference, $n_{a,r}$ the number of terms.

Then

$$a + (n_{a,r} - 1)r = n; \therefore n_{a,r} = I \left( \frac{n + r - a}{r} \right);$$

where $I \left( \frac{n + r - a}{r} \right)$ is integer in $\frac{n + r - a}{r}$. Now, $n_{a,r}$ cannot be less than 3; therefore, as a limit, $\frac{n + r - a}{r} = 3$, and $r = I \left( \frac{n - a}{2} \right)$, so that $a$ cannot exceed $I \left( \frac{n}{3} \right)$.

$$\therefore r = 1, 2, 3, \ldots, I \left( \frac{n - 1}{2} \right),$$
\[ a = 1, 2, 3 \ldots \ldots \ldots \ldots I\left(\frac{n}{3}\right) \]

In no case must \( a \) exceed \( r \), otherwise the series after a few terms will recur. In other cases the greatest value of \( a \) is \( n - 2r \).

Now, a series of \( n_a, r \) numbers in arithmetical progression may be taken

\[
\begin{align*}
3 \text{ together in } n_{a, r} &- 2 \text{ ways}, \\
4 \text{ , , , , } n_{a, r} &- 3 \text{ , , , , } \\
5 \text{ , , , , } n_{a, r} &- 4 \text{ , , , , } \\
&\text{ &c. , , , , &c. , , , , } \\
n_{a, r} &\text{ , , , , , } 1 \text{ , , , , , } \\
\text{Sum} = \frac{1}{2} (n_{a, r} - 1)(n_{a, r} - 2) \ldots \ldots \ldots \ldots \ldots (A).
\end{align*}
\]

In this formula \( a \) can have all the values before pointed out for each value of \( r \).

**Calculation.**

\[
\begin{align*}
r = 1, & \quad n_{1,1} = 20; \\
r = 2, & \quad n_{1,2} = n_{2,2} = 10; \\
r = 3, & \quad n_{1,3} = n_{2,3} = 7, \quad n_{3,3} = 6; \\
r = 4, & \quad n_{1,4} = n_{2,4} = n_{3,4} = n_{4,4} = 5; \\
r = 5, & \quad n_{1,5} = n_{2,5} = n_{3,5} = n_{4,5} = n_{5,5} = 4; \\
r = 6, & \quad n_{1,6} = n_{2,6} = 4, \quad n_{3,6} = n_{4,6} = n_{5,6} = n_{6,6} = 3; \\
r = 7, & \quad n_{1,7} = n_{2,7} = n_{3,7} = n_{4,7} = n_{5,7} = n_{6,7} = 3; \\
r = 8, & \quad n_{1,8} = n_{2,8} = n_{3,8} = n_{4,8} = 3; \\
r = 9, & \quad n_{1,9} = n_{2,9} = 3.
\end{align*}
\]

Applying the formula (A), we find the whole number of ways in which numbers in arithmetical progression can be drawn = 344. The whole numbers of drawings = \(2^{20} - 1 = 1,048,575\), and therefore the chance required = \(\frac{344}{1,048,575} = \frac{1}{3,048}\), nearly.

A similar method of solution was followed by Messrs. McNamara and Traynor.

**Second Solution, by Mr. Stephen Watson; and in like manner by Messrs. Brooks, Dobson, Escott, and Hall.**

Let \( n \) = number of tickets, and take the arithmetical series

\[ x + (x + m) + (x + 2m) \ldots \ldots \{x + (r - 1)m\} \ldots \ldots (1). \]
Then, \( r \) and \( m \) being given, the number of values that \( x \) can take is
\[
x = n - (r - 1)m
\]
(2).

To constitute an arithmetical progression the number of terms \( r \) should not be less than 3.

Let \( m_3, m_4, \ldots, m_n \) be the whole number derived from \( \frac{n}{r - 1} \) when \( r = 3, 4, \ldots, n \); hence, taking \( m \) successively \( = 1, 2, 3, \ldots, m_r \) for any given value of \( r \), and adding the results, we have the corresponding number of cases
\[
nm_r - (r - 1)(1 + 2 + 3 + \ldots + m_r) = nm_r - (r - 1) \frac{m_r(m_r + 1)}{2}
\]

Taking the sum of these numbers for the several values of \( r \), and dividing the same by \( 2^n - 1 \), the total number of possible drawings, we have
\[
p = \frac{\sum nm_r - (r - 1) \frac{m_r(m_r + 1)}{2}}{2^n - 1}
\]
a general expression for the required chance, the summation extending from \( r = 3 \) to \( r = n \), and where \( m \) is always \( = 1 \).

In the particular case in the question \( n = 20, m_3 = 10, m_4 = 6, m_5 = 3, m_6 = 4, m_7 = 3, m_8 = m_9 = m_{10} = m_{11} = 2, m_{12} \) to \( m_{20} = 1 \) each; hence we find
\[
p = \frac{344}{1048575}.
\]

**Third Solution, by “Cubic,” M.A., Stewkley; and in like manner by Mr. John Brown, Whitwell Colliery, Durham; and Mr. Thomas Milbourn, Riding Mill.**

The probability required is the ratio of the number of arithmetical progressions that can be made out of the given numbers to the total number of combinations of them. The former number may be obtained by constructing the following table, in which the top line shows all the numbers that can be first terms, and the left-hand column all the possible common differences.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: ... ... 344
The number in the square at which the vertical and horizontal lines from these numbers meet is the number of possible arithmetical progressions with that first term and difference (e.g., with first term 3 and difference 4 we have three series, viz.

\[
3, 7, 11, 15, 19 \\
3, 7, 11, 15 \\
3, 7, 11 
\]

The total number of possible progressions is 344. The total number of combinations of 20 things is \(2^{20} - 1 = 1048575\); but from this should, perhaps, be deducted the number of ones and twos, as no progression can consist of less than three terms, in which case the total number of combinations admitting possibly of arithmetical progression will be \(1048575 - 20 - 190 = 1048365\); and the required probability is 344 : 1048365. By putting this into converging fractions it may be found that 7 : 21333 is a very near approximation. If the ones and twos are not left out, the probability will be, of course, 344 : 1048575.

XV. PRIZE QUEST. (2078); by Mr. Stephen Watson, Huydonbridge.

Let O, O₁, O₂, O₃ be the centres, and DEF, D₁E₁F₁, &c., the points of contact of the inscribed and escribed circles of the triangle ABC; and GHI the points where the interior bisectors of the angles meet the sides. Then the triads of lines (AB, DE, D₁E₁), (BC, EF, E₁F₁), (CA, FD, F₁D₁) meet in three points in a right line (L); the triads of lines (AB, D₁E₁, D₁E₂), (BC, E₁F₁, E₁F₂), (CA, F₁D₁, F₁D₂) meet in three points in a right line (M); and the triads (AB, GH, O₁O₂), (BC, HI, O₂O₃), (CA, IG, O₃O₁) meet in three points in a right line (N); and lastly, the triad of lines (L), (M), (N) meet in a point.

Solution, by Mr. Stephen Watson, the Proposer; and similarly by Messrs. Bills, Brooks, Dobson, Escott, Milbourn, Tebay, and Turnbull.

The trilinear coordinates of D, E and D₂, E₁ are

\[
\begin{align*}
D & : 0, s₁ \sin C, s₂ \sin B \\
E & : s₂ \sin C, 0, s₁ \sin A \\
D₂ & : 0, -s₁ \sin C, s₂ \sin B \\
E₁ & : -s₂ \sin C, 0, s₁ \sin A
\end{align*}
\]

Hence, the equations of DE, D₂E₁ are (substituting the sides in place of the sines of opposite angles)

\[
\begin{align*}
DE & : s₁aα + s₂bβ - s₂cγ = 0 \\
D₂E₁ & : ss₁aα + ss₂bβ + ss₂cγ = 0
\end{align*}
\]

and when γ = 0 these are identical. Therefore AB, DE, D₂, E₁ meet in a point; and similarly the concurrency of the other two triads may be proved.

Again, the equations of EF, FD are

\[
\begin{align*}
EF & : -s₁aα + s₂bβ + s₂cγ = 0 \\
FD & : s₁aα - s₂bβ + s₂cγ = 0
\end{align*}
\]

From (1) and (2) the equation of the line (L) must be

\[
(L) : s₁aα + s₂bβ + s₂cγ = 0
\]

And in like manner the equations of (M), (N), are
\[(M) \quad a\alpha + \frac{b\beta}{s_2} + \frac{c\gamma}{s_3} = 0 \quad \ldots \ldots (1).\]
\[(N) \quad \alpha + \beta + \gamma = 0 \quad \ldots \ldots (5).\]

Multiply (3) by \(s_1\), (4) by \(s_1s_3\), and add; then, since \(ss_1 + s_2s_3 = bc, \&c.,\) the result reduces to (5); and hence (L), (M), (N) are found to meet in the point

\[
\frac{a}{s_1(b-c)} = \frac{\beta}{s_2(c-a)} = \frac{\gamma}{s_3(a-b)}.
\]

Mr. Escott adds the following:

Con.—The corresponding sides of the triangles DEF, D_1E_2F_3, GHI meet in three points.

Mr. Turnbull also adds the following:

Con.—The triads \((D_1E_2, D_2E_1, O_1O_2), (E_2F_3, E_3F_2, O_2O_3), (D_1F_2, D_4F_1, O_1O_3)\) meet in three points.

Second Solution, by Mr. William Godward, Chelsea, and in like manner by Mr. A. Hall, Washington, U.S.

Adopting the usual notation for a triangle and its four circles of contact, we readily obtain the equations of

\[DE \ldots a_1a + b_2\beta - c_3\gamma = 0,\]
\[D_2E_1 \ldots a_3x + b_3\beta + c_3\gamma = 0.\]

When \(\gamma = 0\) these equations are identical; therefore \(AB, DE, D_2E_1\) intersect in a point, the coordinates of which are easily found to be

\[\alpha = \frac{2\Delta s_2}{a(s_2 - s_1)}, \beta = \frac{-2\Delta s_1}{b(s_2 - s_1)}, \gamma = 0.\]

It is likewise found that \(BC, EF, E_3F_2\) intersect in a point whose coordinates are

\[\alpha = 0, \beta = \frac{2\Delta s_3}{b(s_3 - s_2)}, \gamma = \frac{-2\Delta s_2}{c(s_3 - s_2)};\]

and that \(CA, FD, F_1D_3\) intersect in a point whose coordinates are

\[\alpha = \frac{2\Delta s_3}{a(s_3 - s_1)}, \beta = 0, \gamma = \frac{-2\Delta s_1}{c(s_3 - s_1)}.\]

Any two of these three sets of coordinates, with the relation \(a\alpha + b\beta + c\gamma = 2\Delta, \) give

\[a_1a + b_2\beta + c_3\gamma = 0 \quad \ldots \ldots (L),\]

the equation of the line containing the intersections of the triads \((AB, DE, D_2E_1), (BC, EF, E_3F_2), (CA, FD, F_1D_3).\)

Similarly it may be shown that the intersections of the triads \((AB, D_1E_2, D_4E_3), (BC, E_2F_3, E_1F_1), (CA, F_3D_4, F_2D_3)\) lie in a straight line, whose equation is

\[a_2s_2\alpha + b_3s_3\beta + c_3s_3\gamma = 0 \quad \ldots \ldots (M);\]

and that the intersections of the triads \((AB, GH, O_1O_2), (BC, HI, O_2O_3), (CA, IG, O_3O_1)\) lie in a straight line, the equation to which is

\[a + \beta + \gamma = 0 \quad \ldots \ldots (N).\]
Lastly, it will be found that
\[ s(L) + (M) - abc(N) = 0 \]
is identically zero; it hence follows that the lines \( (L), (M), (N) \) are concurrent.

Mr. Godward adds the following:

Cor.—Since \( \Omega_1 \Omega_2, \Omega_3 \Omega_4, \Omega_1 \Omega_2 \) bisect the exterior angles \( A, B, C \), it follows that \( (N) \) is the equation of the line containing the intersections of the bisectors of the exterior angles of a triangle with the opposite sides.

Third Solution, by Dr. Rutherford; and in like manner by Mr. John Grey, Westgate, Weardale; Mr. W. H. Levy, Shalbourn; and Messrs. Barlow, "Cubic," McNama, and Traynor.

Take \( CB \) and \( CA \) as the oblique axes of coordinates; draw the interior bisectors of the angles, \( AG, BH, CI \); then, referring to the diagram in the "Lady's Diary" for 1842, p. 77, we have for the equations to the sides \( AB, BC, CA \),
\[ ay + bx = ab; \quad y = 0; \quad x = 0. \]

The equations to the lines \( AB, DE, D_2E_1 \) are respectively
\[ \frac{x}{a} + \frac{y}{b} = 1; \quad \frac{x}{s_1} + \frac{y}{s_3} = 1; \quad \frac{x}{s_1} + \frac{y}{s_2} = -1 \quad \ldots \quad (1); \]
and these three lines meet in the point
\[ x = -\frac{as_1}{a - b}; \quad y = \frac{bs_2}{a - b} \quad \ldots \quad (2). \]

Again, the equations to the lines \( BC, EF, E_3F_2 \) are respectively
\[ y = 0; \quad \frac{x}{as_3} + \frac{y}{s_3} = 1; \quad \frac{x}{as_2} + \frac{y}{s} = 1; \quad \frac{x}{bs_3} + \frac{y}{b - c} = 1; \]
and these three lines intersect in the point
\[ x = \frac{as_3}{b - c}; \quad y = 0 \quad \ldots \quad (3). \]

The equations to the lines \( CA, F_3D_1, F_2D_2 \) are respectively
\[ x = 0; \quad \frac{x}{s_3} + \frac{y}{bs_3} = 1; \quad \frac{x}{s} + \frac{y}{bs_3} = 1; \quad \frac{x}{a - c} + \frac{y}{bs_3} = 1; \]
and these three lines intersect in the point
\[ x = 0; \quad y = -\frac{bs_1}{a - c} \quad \ldots \quad (4). \]

The three points \( 2, 3, 4 \) fulfil the condition of ranging in the straight line
\[ (L) \quad \ldots \quad \frac{x}{as_3} + \frac{y}{bs_3} = 1. \]
In a similar manner the second triad of lines meet in the points
\[
\left( \frac{as_2}{a - b}, - \frac{bs_1}{a - b} \right); \left( - \frac{as_2}{b - c}, 0 \right); \left( 0, - \frac{bs_1}{a - c} \right),
\]
which satisfy the condition of being in the straight line
\[
(M) \quad \frac{x}{as_2} + \frac{y}{bs_1} = 1.
\]
Lastly, the third triad of lines meet in the points
\[
\left( - \frac{ab}{a - b}, \frac{ab}{a - b} \right); \left( \frac{ab}{b - c}, 0 \right); \left( 0, \frac{ab}{a - c} \right),
\]
which, by the usual criterion, lie in the straight line
\[
(N) \quad \frac{x}{ub} + \frac{y}{ab} = 1.
\]
These three lines (L, M, N) intersect in the point
\[
\frac{x}{a b s_2} = \frac{a b s_1}{(a - b)(b - c)}; \quad \frac{y}{a b} = \frac{a b s_1}{(a - b)(a - c)};
\]
since these coordinates verify the equations to the lines L, M, N.


The straight line joining the two points \( \alpha_1, \beta_1, \gamma_1; \alpha_2, \beta_2, \gamma_2 \); and the point of intersection of the two straight lines \( l_1, m_1, n_1; l_2, m_2, n_2 \); are respectively
\[
| \beta_1 \gamma_1 |, | \gamma_1 \alpha_1 |, | \alpha_1 \beta_1 |; \quad \text{and} \quad | m_1 n_1 |, | n_1 m_1 |, | l_1 m_1 |.
\]
And the conditions that three points shall be colinear and three lines concurrent are
\[
| \alpha_1 \beta_1 \gamma_1 | = 0; \quad \text{and} \quad | l_1 m_1 n_1 | = 0.
\]
Now,
\[
\begin{align*}
O \quad &\quad 1, \quad 1, \quad 1; \quad D \quad &\quad 0, \quad c.(s - c), \quad b.(s - b) \\
O_1 \quad &\quad -1, \quad 1, \quad 1; \quad E \quad &\quad c.(s - c), \quad 0, \quad a.(s - a) \\
O_2 \quad &\quad 1, \quad -1, \quad 1; \quad F \quad &\quad b.(s - b), \quad a.(s - a), \quad 0 \\
O_3 \quad &\quad 1, \quad 1, \quad -1 \\
D_1 \quad &\quad 0, \quad c.(s - b), \quad b.(s - c) \\
E_1 \quad &\quad c.(s - b), \quad 0, \quad a.s \\
F_1 \quad &\quad b.(s - c), \quad a.s, \quad b.s \\
D_2 \quad &\quad 0, \quad c.(s - a), \quad b.s \\
E_2 \quad &\quad c.(s - a), \quad 0, \quad a.(s - c) \\
F_2 \quad &\quad b.s, \quad a.(s - c), \quad 0 \\
D_3 \quad &\quad 0, \quad c.s, \quad b.(s - a) \\
E_3 \quad &\quad c.s, \quad 0, \quad a.(s - b) \\
F_3 \quad &\quad b.(s - a), \quad a.(s - b), \quad 0.
\end{align*}
\]
\[ \therefore \quad \text{DE is...} \quad a(s-a), \quad b(s-b), \quad -c(s-c) \]
\[ \text{D}_{2}E_{1} \text{is...} \quad as(s-a), \quad bs(s-b), \quad -c(s-a)(s-b) \quad \equiv 0; \]
\[ \text{AB is...} \quad 0, \quad 0, \quad 1 \]
\[ \therefore \quad \text{these meet in a point, viz...} \quad b(s-b), \quad -a(s-a), \quad 0 \]
By symmetry, 2nd triad meet in
\[ \quad -c(s-c), \quad 0, \quad a(s-a) \quad \equiv 0. \]
By symmetry, 3rd triad meet in
\[ \quad 0, \quad c(s-c), \quad -b(s-b) \]
\[ \therefore \quad L \text{ is } a(s-a), \quad b(s-b), \quad c(s-c). \]

Again,
\[ \text{D}_{1}E_{2} \text{is...} \quad \frac{a}{s-a}, \quad \frac{b}{s-b'}, \quad \frac{c}{s-c} \quad \equiv 0; \]
\[ \text{D}_{3}E_{3} \text{is...} \quad a(s-b), \quad b(s-a), \quad -cs \quad \text{AB is...} \quad 0, \quad 0, \quad 1 \]
\[ \therefore \quad \text{these meet in a point, viz...} \quad \frac{s-a}{a}, \quad \frac{s-b}{b}, \quad 0 \]
By symmetry, 2nd triad meet in
\[ \quad -\frac{s-a}{a}, \quad 0, \quad \frac{s-c}{c} \quad \equiv 0; \]
\[ \quad 0, \quad \frac{s-b}{b}, \quad \frac{s-c}{c} \quad \text{Therefore } M \text{ is } \frac{a}{s-a}, \quad \frac{b}{s-b'}, \quad \frac{c}{s-c}. \]
\[ \text{G is...} \quad 0, \quad 1, \quad 1 \quad \text{O}_{1} \text{is...} \quad -1, \quad 1, \quad 1 \]
\[ \text{H is...} \quad 1, \quad 0, \quad 1 \quad \text{O}_{2} \text{is...} \quad 1, \quad -1, \quad 1 \]
\[ \therefore \quad \text{GH is...} \quad 1, \quad 1, \quad -1 \quad \text{O}_{1}O_{2} \text{is...} \quad 1, \quad 1, \quad 0 \]
\[ \therefore \quad \text{these meet in a point, viz...} \quad 1, \quad -1, \quad 0 \]
By symmetry, 2nd triad meet in
\[ \quad -1, \quad 0, \quad 1 \quad \equiv 0. \]
\[ \quad 0, \quad 1, \quad -1 \quad \text{Therefore } N \text{ is } 1, \quad 1, \quad 1 \text{ (the polar, to the imaginary conic } a^2 + \beta^2 + \gamma^2 = 0, \]
\[ \text{of the centre of the inscribed circle).} \]
\[ \text{L is...} \quad a(s-a), \quad b(s-b), \quad c(s-c) \]
\[ \text{M is...} \quad \frac{a}{s-a}, \quad \frac{b}{s-b'}, \quad \frac{c}{s-c} \quad \equiv 0. \]
\[ \text{N is...} \quad 1, \quad 1, \quad 1 \]
And the point of concurrence is
\[ (b-c)(s-a), \quad (c-a)(s-b), \quad (a-b)(s-c). \]

Solutions nearly the same as the preceding were also given by Mr. John Brown, and
"Civis."
LIST OF MATHEMATICAL ANSWERS.

Ambler, Robert, Stevenage Grammar School, ans. 2.
Barlow, William, 49, Edwards Square, Kensington, ans. all the Questions.
Bills, Samuel, Hawton, near Newark-upon-Trent, ans. 3, 5, 11, Prize.
Brooks, C. H., C.E., 18, Abingdon Street, Westminster, ans. 6 to 14, Prize.
Brown, John, Whitwell Colliery, Durham, ans. all the Questions.
"Civis," ans. 1 to 5, Prize.
Collins, John, Ennis College, Co. Clare, ans. 7.
"Cubic," M.A. Cantab., Stewlekey, ans. all the Questions.
Dobson, Thomas, B.A., Hexham, ans. all the Questions.
Escott, Albert, Royal Hospital Schools, Greenwich, ans. all the Questions.
Godward, William, 30, Margeretta Terrace, Oakley Street, Chelsea, ans. Prize.
Grey, John, Barrington School, Westgate, Weardale, ans. Prize.
Hall, A., Naval Observatory, Washington, United States, ans. all the Questions.
M'Namara, T., Collooney, Sligo, Ireland, ans. all the Questions.
Martin, the Rev. Hugh, Greenhill Cottage, Lasswade, Edinburgh, ans. Prize.
Mason, the Rev. William, Kirkby Maizeard, Ripon, ans. Prize.
Milbourn, Thomas, Riding Mill, Newcastle-upon-Tyne, ans. all the Questions.
Rutherford, Dr., Tweed Cottage, Maryon Road, Charlton, ans. 1 to 7, Prize.
Smith, James, Bellingham, Northumberland, ans. 2, 3, 4, 6.
Somerscales, Anthony N., Marine School, Trinity House, Hull, ans. 2.
Somerscales, Thomas, Hull, ans. 1, 4.
Teby, Septimus, Grammar School, Rivington, ans. all the Questions.
Traynor, James, Carrickmacross, Ireland, ans. 1 to 13, 14, Prize.
Tucker, Robert, M.A., University College School, ans. 3 to 7, 9, 10, 12.
Turnbull, John, Bedlington, Northumberland, ans. 3, 4, 5, 7, 11, Prize.
Watson, Stephen, Grammar School, Haydonbridge, ans. all the Questions.
Wilson, James, Government Observatory, Deesa, ans. 1 to 7, 9 to 13.

** Our correspondents will please to bear in mind, that the arranging of the matter for the printer is greatly facilitated when they obligingly write out their contributions intended for insertion, on one side of the paper only, or so that each distinct answer or subject may admit of an easy separation from other matter, without the necessity of having it re-written.

It is with the deepest regret that we have to record the death of the Rev. John Hope, on the 30th of April, 1867, aged 77 years, at Stapleton Rectory, Carlisle, where he had been Curate and Rector of the parish for nearly half a century. Mr. Hope was universally esteemed and respected; his great accomplishments, classical and mathematical, were mainly due to extraordinary innate talent and self-deny ing industry, and his life has been one of general usefulness to all around him. As an enigmatisat he maintained a distinguished pre eminence, and his poetical contributions have enriched the pages of the 'Diary' for a period of forty-eight years. Amongst the poetical contributions to the present 'Diary' several of our valued correspondents have beautifully penned their heart felt tribute of admiration and respect for his genius and worth.

We also regret to hear of the recent decease of Mr. J. W. Elliott, of Greatham, Stockton-on-Tees, formerly, for many years, an able contributor to the mathematical department. Mr. Elliott's mathematical solutions always exhibited considerable elegance of method.

On going to press we are sorry to have further to record the decease of Mr. James John Downes, the Actuary, on the 28th of November, 1867, having just completed his 77th year. In former years Mr. Downes displayed an excellent talent as a mathematical correspondent to the 'Diary,' and he was deservedly very eminent in his profession as an Actuary.
The several Prizes are allotted as follows:

For Answers to the Prize Question, to Mr. T. McNamara, Collooney, Sligo, Ireland, and Mr. Thomas Milbourn, Riding Mill, near Newcastle-upon-Tyne, each twelve Diaries.

For General Mathematical Answers, to "Cubic," and Mr. Albert Escott, Royal Hospital Schools, Greenwich, each ten Diaries.

For Poetical Answers to the Prize Enigma, to Miss Mary Smith, of Ampleforth, and "Zig Zag," each ten Diaries.

For General Answers to the Enigmas, to Mr. Joseph Furniss, Lois Weeton, Towcester; and Mr. Thomas Harrison, Abbey Holme, Carlisle, each ten Diaries.

And for Answers to the Rubies and Charades, to the "Cawkley's Laddie," and Mr. Joseph Hutchinson, near Halifax, each eight Diaries.

All letters must, as usual, be directed "To the Editor of the 'Lady's and Gentleman's Diary,' Stationers' Hall, London." They must likewise be post-paid, and arrive before May 1st, 1868, excepting letters from the United States, which will be received up to July 1st.

---

NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2079); by Mr. G. B. Whiting, C.E., Washington, U.S.

Given three points A, B, C and a circle in the same plane, described about A with a given radius: it is required to find a point P on the circumference of the circle, such that if AP, BP, CP be joined, the line AP shall bisect the angle BPC.

II. QUEST. (2080); by Mr. Septimus Tebay, Rivington.

Let BAC be a given rectilineal angle, and P a given point; then isosceles triangles can be formed by lines through P. If \( A' \) be the area of the triangle whose vertex is A, and \( A', A'' \) the areas of the other two, show that \( \sqrt{A'} + \sqrt{A''} : \sqrt{A} \) is constant whatever be the position of the point P.

III. QUEST. (2081); by Mr. T. McNamara, Collooney, Ireland.

A diameter BD of a circle and a chord AC are at right angles; BT is a tangent to a variable circle touching the chord and the given circle in R; prove that DR : AD :: RB : BT.

IV. QUEST. (2082); by Mr. W. H. Levy, Shalbourne.

External squares ACED, BCFG being described on the sides AC, BC of any plane triangle, and diagonal lines AG and BD drawn intersecting in Q, this point is in the perpendicular CP. (See Quest. 1680, 'Diary,' 1842.) Suppose interior squares ACE'D', BCFG' to be described on AC, BC, and the diagonal lines AG' and BD' to intersect in Q'; this point is also in the perpendicular CP produced if necessary; and if I be the intersection of the perpendiculars, PI is an harmonic mean between PQ and PQ'.

V. QUEST. (2083); by Dr. Rutherford, Charlton.

In a given triangle inscribe geometrically an equilateral triangle the magnitude of which shall be a minimum.

VI. QUEST. (2084); by Mr. Thomas Dobson, B.A., Hexham.

If \( a, b, c \) be the sides of the triangle \( \triangle ABC \) formed by joining the feet A, B, C of the perpendiculars from any point P in the circumference of the circle inscribed in the equilateral triangle \( \triangle A'B'C' \) of which the side is \( \sigma \), prove that
\[
16(a^2 + b^2 + c^2) = 15\sigma^2; \quad \text{and} \quad 3\sigma' = 16\sigma.
\]

VII. QUEST. (2085); by Mr. A. Hall, Washington, U.S.

It is required to find the mean or average distance from the vertex of a right cone, (1) to all the points in the base of the cone, (2) to all the points in the solid content of the cone.
VIII. QUEST. (2086); by Mr. William Godward, Chelsea.
If a straight line be drawn from the centre of any one of the four circles of contact of a plane triangle to the circumference of the circle passing through the other three centres, it will be bisected by the circumference of the circumscribed circle.

IX. QUEST. (2087); by “N’importe.”
Let AB and AE be two lines of which AB is fixed; in AE take AC of a given length, and draw CD so that the angle ECD = 3EAB and \( \frac{AC}{\sqrt{2}} \). Find the quadrature of the several portions of which the locus of D consists.

X. QUEST. (2088); by Mr. Thomas Dobson, B.A., Hexham.
Circles from three given centres have a common point P of intersection, such that the sum of the spaces common to each pair of circles is constant: show that the locus of P is a conic section.

XI. QUEST. (2089); by Mr. C. H. Brooks, London.
Prove that
\[
\frac{3}{n} = \frac{2^n}{n} - 2^{n-2} + \frac{n-3}{2} \cdot 2^{n-4} \frac{(n-4)(n-5)}{2 \cdot 3} \cdot 2^{n-6} + \frac{(n-5)(n-6)(n-7)}{2 \cdot 3 \cdot 4} \cdot 2^{n-8} \&c.
\]
continued to \(2^1\) or \(2^0\) according as \(n\) is odd or even.

XII. QUEST. (2090); by Mr. Stephen Watson, Haydonbridge.
Find the average area of the inscribed and escribed circles of the triangles formed by joining three points taken at random on the circumference of a given circle.

XIII. QUEST. (2091); by Mr. Septimus Tebay, Rivington.
Three circles whose radii are \(r_1, r_2, r_3\) touch one another externally, and a circle whose radius is \(r_1\) touches \(r_1, r_2\) externally and cuts \(r_3\) at right angles; a circle whose radius is \(r_3\) touches \(r_1, r_2\) as before, and cuts \(r_3\) at right angles; and so on. If \(\rho\) be the radius of the circle which cuts \(r_1, r_2, r_3\) at right angles, prove that
\[
\frac{1}{\rho^2} = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} \right) a^4 + \frac{\sqrt{2}}{\rho} x + \frac{1}{r_3}.
\]

XIV. QUEST. (2092); by Capt. A. R. Clarke, Southampton.
A coin held in any position is dropped, without rotation, over a grating formed of parallel equidistant wires in a horizontal plane: what is the chance that it passes through without striking?

XV. PRIZE QUEST. (2093); by Mr. Wm. Godward, Chelsea.
Let O, O_1, O_2, O_3, O_4 be the centres of the inscribed, three escribed, and nine-point circles of the triangle ABC, and a, A_1, B_1, C_1, the respective points of contact of the circles \(O_1, O_2, O_3, O_4\) with the circle \(O_5\); then the lines \(AA_1, BB_1, CC_1\) intersect in a point on the line \(O_4O_5\).

Also, if \((a\beta\gamma), (a_1\beta_1\gamma_1), (a_2\beta_2\gamma_2), (a_3\beta_3\gamma_3)\) be the coordinates of a, A_1, B_1, C_1; then
\[
\frac{a^4(a_1\beta_1\gamma_1\gamma_2)}{(\beta_2^2 - \beta_3^2)^4} = \frac{b^4(b_1\beta_1\gamma_1\gamma_2)}{(\beta_2^2 - \beta_3^2)^4} = \frac{c^4(c_1\beta_1\gamma_1\gamma_2)}{(\beta_2^2 - \beta_3^2)^4} = -\frac{\Delta^2}{2^8 \cdot O_1O_2O_3O_4O_5}.
\]
THE LADY'S AND GENTLEMAN'S DIARY,
FOR THE YEAR OF OUR LORD 1869,
Being the First after Bissextile or Leap Year.

DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF STUDENTS IN MATHEMATICS:
COMPRISING MANY USEFUL AND ENTERTAINING PARTICULARS, INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT;
AND NOW ENLARGED BY THE ADDITION OF A VARIETY OF GENERAL INFORMATION.

THE ONE HUNDRED AND SIXTY-SIXTH ANNUAL NUMBER.

LONDON:
PRINTED FOR THE COMPANY OF STATIONERS,
AND SOLD BY J. GREENHILL, AT THEIR HALL, LUDGATE HILL.

[J. E. ADLARD, BARTHOLOMEW CLOSE.]
### JANUARY, 1869.

**LUNATIONS AND PHASES.**

- Last Quar. 5th day, 6h. 22m. morn.
- New Moon 12th day, 6h. 53m. aftern.
- First Quar. 21st day, 0h. 26m. morn.
- Full Moon 28th day, 1h. 30m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>M</td>
<td>D</td>
<td>Sunrises 2 59</td>
<td>Sunsets 10 1</td>
<td>Moonrises 0 1</td>
<td>Moonsets 0 2</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>8</td>
<td>59</td>
<td>8a 0</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>9</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td>38</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td>55</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>morn.</td>
<td>11</td>
<td>56</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>9</td>
<td>4</td>
<td>44</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>5</td>
<td>47</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>14</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>13</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>15</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>17</td>
<td>8</td>
<td>54</td>
</tr>
<tr>
<td>15</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>18</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>20</td>
<td>9</td>
<td>48</td>
</tr>
<tr>
<td>17</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>21</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>18</td>
<td>7</td>
<td>59</td>
<td>4</td>
<td>23</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td>19</td>
<td>7</td>
<td>58</td>
<td>4</td>
<td>25</td>
<td>10</td>
<td>53</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>57</td>
<td>4</td>
<td>26</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>21</td>
<td>7</td>
<td>55</td>
<td>4</td>
<td>28</td>
<td>11</td>
<td>40</td>
</tr>
<tr>
<td>22</td>
<td>7</td>
<td>54</td>
<td>4</td>
<td>30</td>
<td>0a 6</td>
<td>1 42</td>
</tr>
<tr>
<td>23</td>
<td>7</td>
<td>53</td>
<td>4</td>
<td>31</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>24</td>
<td>7</td>
<td>52</td>
<td>4</td>
<td>33</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>25</td>
<td>7</td>
<td>50</td>
<td>4</td>
<td>35</td>
<td>2</td>
<td>4 9</td>
</tr>
<tr>
<td>26</td>
<td>7</td>
<td>49</td>
<td>4</td>
<td>37</td>
<td>3</td>
<td>4 6</td>
</tr>
<tr>
<td>27</td>
<td>7</td>
<td>47</td>
<td>4</td>
<td>38</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>28</td>
<td>7</td>
<td>46</td>
<td>4</td>
<td>40</td>
<td>5</td>
<td>32</td>
</tr>
<tr>
<td>29</td>
<td>7</td>
<td>45</td>
<td>4</td>
<td>42</td>
<td>6</td>
<td>55</td>
</tr>
<tr>
<td>30</td>
<td>7</td>
<td>43</td>
<td>4</td>
<td>44</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>31</td>
<td>7</td>
<td>42</td>
<td>4</td>
<td>46</td>
<td>9</td>
<td>38</td>
</tr>
</tbody>
</table>

**Day** | **Length of day** | **Day incr.** | **Day br.** | **Twilight ends** | **Sun East** | **Time on clock at Ω's noon** | **Moon's Southing**
---|---|---|---|---|---|---|---
1 | 7 51 | 0 6 | 6 m 2 | 6 a 5 | 12 3 58 | h m | 2 m 28
6 | 58 | 13 | 2 | 10 | 49 | 6 14 | 6 51
11 | 8 7 | 22 | 1 | 16 | 54 | 8 19 | 11 3
16 | 19 | 34 | 5 59 | 22 | 59 | 10 9 | 2 a 59
21 | 32 | 47 | 55 | 23 | 5 5 | 11 41 | 6 34
26 | 47 | 1 2 | 50 | 36 | 10 | 12 53 | 11 8

- Sun enters Aquarius.
- Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

**Notes:**
- Fabian
- Agnes
- Vincent
- Mars rises 6.49 aft.
- Septuagesima Sunday
- [Mar. 1858]
- Venus rises 6.28 morn.
- Mercury sets 6.9 aft.
- King Chas. I Mart. 1649
- Septuagesima Sunday
JANUARY, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td></td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>39</td>
<td>8</td>
<td>33</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
<td>2</td>
<td>37</td>
<td>21</td>
</tr>
<tr>
<td>25</td>
<td>6</td>
<td>27</td>
<td>6</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>C's age</th>
<th>High Water</th>
<th>Lond. Br.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h</td>
<td>m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>3</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>4</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>6</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>11</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>27</td>
<td>0</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>28</td>
<td>1</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>N</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>2</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>3</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>3</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>4</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>6</td>
<td>5</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>7</td>
<td>6</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>8</td>
<td>6</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>9</td>
<td>7</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>10</td>
<td>8</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>11</td>
<td>9</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>11</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>13</td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>14</td>
<td>0</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>15</td>
<td>1</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>1</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>17</td>
<td>2</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>18</td>
<td>3</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>19</td>
<td>4</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. New Year's Day. Stock Exchange closed unless otherwise specially ordered by the Committee for General Purposes. British Museum closed first week.

4. Quarter Sessions in this week.

8. Dividends payable.

9. Fire Insurance due at Christmas must be paid on or before this day.

HISTORICAL MEMORANDA.

1. Union of Great Britain and Ireland. 1801.

2. Lavater, the physiognomist, died, 1801.

3. General Monk died, 1670.

5. Attempt to assassinate Louis XV, 1757.


7. Calais surrendered to the French, 1558.


11. Sir Hans Sloane died, 1753.

12. Monastic establishments supprsd. in France, 1559.

13. Queen Elizabeth crowned, 1559.

14. Gibbon, historian, died, 1794.

15. Sir John Moore died, 1809.


17. Watt, inventor of the steam-engine, born, 1736.

18. David Garrick died, 1779.

19. Howard, philanthropist, died, 1790.


22. Frederick the Great born, 1712.

23. Dr. Jenner died, 1823.

During this month the days increase 1 h. 16 m.

Moon in apogee on the 16th January; in perigee on the 29th.

Venus is a Morning Star during the month, and will be in conjunction with Saturn on the third. Jupiter is an Evening Star.

Mars is unusually favorable for observation.

Eclipse.—Jan. 28. A partial eclipse of the Moon; begins early in the morning at 29m. past preceding midnight; middle (5½ digits eclipsed) at 1h. 38m.; ends at 2h. 47m.
## FEBRUARY, 1869.

**Sun enters Pisces,**

18 d. 1 h. 43 m.

### Lunations and Phases.
- Last Quar. ⊙ 3rd day, 4th. 56m. aftern.
- New Moon ⊙ 11th day, 1h. 54m. aftern.
- First Quar. ⊙ 19th day, 5h. 6m. aftern.
- Full Moon ○ 26th day, 0h. 5m. aftern.

### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>Day</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 W</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>2 D</td>
<td>7 40</td>
<td>4 47</td>
<td>10 a 55</td>
<td>10 m 1</td>
</tr>
<tr>
<td>3 M</td>
<td>7 39</td>
<td>4 49 morn.</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>4 Tu</td>
<td>7 37</td>
<td>4 51</td>
<td>0</td>
<td>13 10 54</td>
</tr>
<tr>
<td>5 W</td>
<td>7 36</td>
<td>4 53</td>
<td>1</td>
<td>26 11 22</td>
</tr>
<tr>
<td>6 Th</td>
<td>7 34</td>
<td>4 55</td>
<td>2</td>
<td>35 11 55</td>
</tr>
<tr>
<td>7 F</td>
<td>7 32</td>
<td>4 57</td>
<td>3</td>
<td>40 0 a 34</td>
</tr>
<tr>
<td>8 S</td>
<td>7 31</td>
<td>4 58</td>
<td>4</td>
<td>39 1 17</td>
</tr>
<tr>
<td>9 M</td>
<td>7 29</td>
<td>5 0</td>
<td>5</td>
<td>31 2 7</td>
</tr>
<tr>
<td>10 Tu</td>
<td>7 27</td>
<td>5 2</td>
<td>6</td>
<td>16 3 3</td>
</tr>
<tr>
<td>11 W</td>
<td>7 25</td>
<td>5 4</td>
<td>6</td>
<td>54 4 3</td>
</tr>
<tr>
<td>12 Th</td>
<td>7 23</td>
<td>5 6</td>
<td>7</td>
<td>26 5 5</td>
</tr>
<tr>
<td>13 F</td>
<td>7 21</td>
<td>5 8</td>
<td>7</td>
<td>54 6 9</td>
</tr>
<tr>
<td>14 S</td>
<td>7 20</td>
<td>5 9</td>
<td>8</td>
<td>17 7 12</td>
</tr>
<tr>
<td>15 M</td>
<td>7 18</td>
<td>5 11</td>
<td>8</td>
<td>39 8 15</td>
</tr>
<tr>
<td>16 Tu</td>
<td>7 16</td>
<td>5 13</td>
<td>9</td>
<td>0 9 19</td>
</tr>
<tr>
<td>17 W</td>
<td>7 14</td>
<td>5 15</td>
<td>9</td>
<td>21 10 23</td>
</tr>
<tr>
<td>18 Th</td>
<td>7 12</td>
<td>5 17</td>
<td>9</td>
<td>43 11 29</td>
</tr>
<tr>
<td>19 F</td>
<td>7 10</td>
<td>5 19</td>
<td>10</td>
<td>8 morn.</td>
</tr>
<tr>
<td>20 S</td>
<td>7 8</td>
<td>5 20</td>
<td>10</td>
<td>36 0 36</td>
</tr>
<tr>
<td>21 M</td>
<td>7 6</td>
<td>5 22</td>
<td>11</td>
<td>10 1 44</td>
</tr>
<tr>
<td>22 Tu</td>
<td>7 4</td>
<td>5 24</td>
<td>11</td>
<td>52 2 50</td>
</tr>
<tr>
<td>23 W</td>
<td>7 2</td>
<td>5 26</td>
<td>0 a 44</td>
<td>3 54</td>
</tr>
<tr>
<td>24 Th</td>
<td>7 0</td>
<td>5 28</td>
<td>1</td>
<td>47 4 52</td>
</tr>
<tr>
<td>25 F</td>
<td>6 58</td>
<td>5 29</td>
<td>2</td>
<td>59 5 42</td>
</tr>
<tr>
<td>26 S</td>
<td>6 55</td>
<td>5 31</td>
<td>4</td>
<td>20 6 24</td>
</tr>
<tr>
<td>27 M</td>
<td>6 53</td>
<td>5 33</td>
<td>5</td>
<td>44 6 59</td>
</tr>
<tr>
<td>28 Tu</td>
<td>6 51</td>
<td>5 35</td>
<td>7</td>
<td>9 7 31</td>
</tr>
<tr>
<td>29 W</td>
<td>6 49</td>
<td>5 36</td>
<td>8</td>
<td>32 7 59</td>
</tr>
</tbody>
</table>

### Day, Length of Day, Day incr., Day br., Twilight ends, Sun East, Time on clock at 9's noon, Moon's Southing.

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at 6's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m s</td>
<td>h m</td>
</tr>
<tr>
<td>2</td>
<td>9 6</td>
<td>1 21</td>
<td>5 m 43</td>
<td>6 a 45</td>
<td>5 m 17</td>
<td>12 13 53</td>
<td>3 m 56</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>39</td>
<td>36</td>
<td>52</td>
<td>23</td>
<td>14 21</td>
<td>8 9</td>
</tr>
<tr>
<td>4</td>
<td>42</td>
<td>57</td>
<td>29</td>
<td>7 0</td>
<td>29</td>
<td>14 30</td>
<td>0 a 12</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>0 15</td>
<td>20</td>
<td>9 34</td>
<td>34</td>
<td>14 19</td>
<td>3 46</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>34</td>
<td>11</td>
<td>17 40</td>
<td>40</td>
<td>13 50</td>
<td>7 50 morn</td>
</tr>
<tr>
<td>D</td>
<td>Venus</td>
<td>Mars</td>
<td>Jupiter</td>
<td>Saturn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>------</td>
<td>---------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
</tr>
<tr>
<td></td>
<td>h m</td>
<td></td>
<td>h m</td>
<td></td>
<td>h m</td>
<td></td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>6 33</td>
<td>2 a 35</td>
<td>5 a 57</td>
<td>8 m 56</td>
<td>9 m 35</td>
<td>10 a 13</td>
<td>4 m 0</td>
</tr>
<tr>
<td>13</td>
<td>6 34</td>
<td>3 6</td>
<td>4 42</td>
<td>8 2</td>
<td>8 51</td>
<td>9 39</td>
<td>3 17</td>
</tr>
<tr>
<td>25</td>
<td>6 25</td>
<td>3 41</td>
<td>3 29</td>
<td>7 4</td>
<td>8 8</td>
<td>9 6</td>
<td>2 33</td>
</tr>
</tbody>
</table>

### Notices and Historical Memoranda

**Notices.**

2. Candlemas Day. One of the Quarter Days used in Scotland.


**Historical Memoranda.**

3. "Beau" Nash died at Bath, 1761.

5. Scylla destroyed by earthquake, 1783.

6. Queen Anne born, 1665.

7. Mary, Queen of Scots, beheaded, 1587.


10. Lord Darnley murdered, 1567.

11. London University chartered, 1826.

12. Lady Jane Gray beheaded, 1554.

13. William and Mary proclaimed, 1689.


15. Capt. Cook killed, 1779.

16. Lindley Murray died, 1826.

17. Michael Angelo died, 1563.

18. Moliere died, 1673.

19. Martin Luther died, 1546.


21. Trinidad taken by the English, 1797.

22. Sir Joshua Reynolds died, 1792.

23. Earl of Essex beheaded, 1601.

24. Sir Christopher Wren died, 1723.


26. Earthquake at Lisbon, 1796.

High spring tides about the end of the month.

During this month the days increase 54m. in the morning, and 51m. in the afternoon.

Moon in apogee on the 13th day; in perigee on the 26th.

Mercury may be seen in the evenings about the 4th.

Venus is a Morning Star during the month.

Mars is in opposition to the Sun on the 13th.

Jupiter is an Evening Star during the month.

Eclipse.—Feb. 11th. An eclipse of the Sun, invisible.
MARCH, 1869.

Sun enters Aries, 20 d. 1 h. 32 m.

LUNATIONS AND PHASES.

Last Quar.  C  5th day, 5h. 43m. morn.
New Moon  O  13th day, 8h. 46m. morn.
First Quar.  D  21st day, 5h. 54m. morn.
Full Moon  O  27th day, 6h. 33m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D</th>
<th>Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>David. Least twilight</td>
<td>h m</td>
<td>6 47 5 38 9 a 51 8 m 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>Chad</td>
<td>6 44 5 40 11 9 8 53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>6 42 5 42 morn. 9 23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>Saturn rises 2.7 morn.</td>
<td>6 40 5 44 0 24 9 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>Jupiter sets 8.45 aft.</td>
<td>6 38 5 45 1 33 10 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>6 36 5 47 2 34 11 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>6 34 5 49 3 28 0 a 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>[Perpetua]</td>
<td>6 31 5 51 4 16 0 58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>T</td>
<td>6 29 5 52 4 56 1 56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>PR. WALES MAR. 1863</td>
<td>6 27 5 54 5 29 2 57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>6 25 5 56 5 57 4 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>Gregory</td>
<td>6 22 5 57 6 21 5 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>Mars sets 5.49 morn.</td>
<td>6 20 5 59 6 44 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td>5 Sunday in Lent</td>
<td>6 18 6 1 7 6 7 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>6 16 6 3 7 26 8 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>T</td>
<td>6 13 6 4 7 47 9 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td>St. Patrick [W. Sax.]</td>
<td>6 11 6 6 8 11 10 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>PRS. LOUISA B. 1848. Ed. K.</td>
<td>6 9 6 8 8 38 11 34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>Cambridge Term ends</td>
<td>6 6 6 9 9 8 morn.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>Oxford Term ends</td>
<td>6 4 6 11 9 46 0 39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>Palm Sunday. Benedict</td>
<td>6 2 6 13 10 33 1 42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>6 0 6 14 11 29 2 40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>T</td>
<td>Venus rises 5.46 morn.</td>
<td>5 57 6 16 0 a 36 3 31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>W</td>
<td>5 55 6 18 1 50 4 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>LADY DAY. Maundy Thursday</td>
<td>5 53 6 19 3 11 4 53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>GOOD FRIDAY. D. CUMB. B.1819</td>
<td>5 50 6 21 4 38 5 36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td>Mercury rises 5.18 morn.</td>
<td>5 48 6 23 5 58 5 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>Easter Sunday</td>
<td>5 46 6 24 7 21 6 23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>Easter Monday</td>
<td>5 44 6 26 8 43 6 50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>T</td>
<td>Easter Tuesday</td>
<td>5 41 6 28 10 2 7 19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>W</td>
<td>Oxford Term begins</td>
<td>5 39 6 29 11 15 7 51</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at G's noon</th>
<th>Moon's Soutling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>6</td>
<td>10 51</td>
<td>3 6</td>
<td>4 m 54</td>
<td>7 a 31</td>
<td>5 m 49</td>
<td>12 12 30</td>
<td>2 m 35</td>
</tr>
<tr>
<td>11</td>
<td>30 45</td>
<td>25 43</td>
<td>31 49</td>
<td>59</td>
<td>54 11</td>
<td>24 6 56</td>
<td>10 55</td>
</tr>
<tr>
<td>16</td>
<td>50 4 5</td>
<td>19 58</td>
<td>6 4</td>
<td>8 44</td>
<td>2 a 28</td>
<td>6 36</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>12 10</td>
<td>25 6</td>
<td>8 8</td>
<td>7 15</td>
<td>6 36</td>
<td>11 22</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>30 45</td>
<td>3 53</td>
<td>18</td>
<td>13</td>
<td>5 43</td>
<td>11 22</td>
<td></td>
</tr>
</tbody>
</table>
### MARCH, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>6 m 20</td>
<td>3 a 54</td>
<td>3 a 6</td>
<td>6 m 45</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>25</td>
<td>5</td>
<td>43</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

### Notices and Historical Memoranda.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>4 m 1</td>
<td></td>
<td></td>
<td>1. Municipal assessors appointed.</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>4 46</td>
<td></td>
<td></td>
<td>20. Spring Quarter begins.</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>6 9</td>
<td></td>
<td></td>
<td>29. Easter Monday. The Stock Exchange is closed on this day, unless otherwise specially ordered by the Committee for General Purposes.</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>6 56</td>
<td></td>
<td></td>
<td>31. Hawkers' and Pedlars' licences expire.</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>7 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>9 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>10 25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>11 47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>27</td>
<td>0 a 51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>28</td>
<td>1 34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>29</td>
<td>2 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>N</td>
<td>2 43</td>
<td></td>
<td></td>
<td>1. The present Stock Exchange opened, 1802.</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>3 15</td>
<td></td>
<td></td>
<td>2. Jno. Wesley died, 1791. [1711.</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>3 44</td>
<td></td>
<td></td>
<td>5. Dr. Arne, musician, died, 1778.</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>4 44</td>
<td></td>
<td></td>
<td>9. Rizzo assassinated, 1566.</td>
</tr>
<tr>
<td>18</td>
<td>5</td>
<td>5 16</td>
<td></td>
<td></td>
<td>10. Benjamin West, artist, died, 1820.</td>
</tr>
<tr>
<td>19</td>
<td>6</td>
<td>5 49</td>
<td></td>
<td></td>
<td>11. Tasso born, 1544.</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>6 29</td>
<td></td>
<td></td>
<td>12. First number of the 'Guardian' published.</td>
</tr>
<tr>
<td>22</td>
<td>9</td>
<td>8 27</td>
<td></td>
<td></td>
<td>15. The present London Bridge commenced.</td>
</tr>
<tr>
<td>23</td>
<td>10</td>
<td>9 57</td>
<td></td>
<td></td>
<td>17. Dr. Burnet died, 1715. [1824.</td>
</tr>
<tr>
<td>26</td>
<td>13</td>
<td>0 32</td>
<td></td>
<td></td>
<td>21. Archbishop Cranmer burnt, 1556.</td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>1 26</td>
<td></td>
<td></td>
<td>24. Queen Elizabeth died, 1603.</td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>2 11</td>
<td></td>
<td></td>
<td>25. Robert Bruce crowned, 1306.</td>
</tr>
<tr>
<td>29</td>
<td>16</td>
<td>2 55</td>
<td></td>
<td></td>
<td>26. Charity Schools instituted, 1688.</td>
</tr>
<tr>
<td>30</td>
<td>17</td>
<td>3 39</td>
<td></td>
<td></td>
<td>26. Dr. Gilbert West died, 1756.</td>
</tr>
<tr>
<td>31</td>
<td>18</td>
<td>4 20</td>
<td></td>
<td></td>
<td>31. Cockfighting prohibited by Cromwell, 1654.</td>
</tr>
</tbody>
</table>

During this month the days increase 1h. 10m. in the morning, and 53m. in the afternoon.
Moon in apogee on the 12th day; in perigee on the 27th.
Mercury may be seen in the mornings about the 18th.
Venus is a Morning Star during the month.
Mars is unusually favorable for observation.
Jupiter is an Evening Star during the month.
### APRIL, 1869.

#### Sun enters Taurus,

19 d. 13 h. 33m.

#### Lunations and Phases.

- Last Quar. 3rd day, 8h. 48m. aftern.
- New Moon 12th day, 1h. 47m. morn.
- First Quar. 19th day, 3h. 6m. aftern.
- Full Moon 26th day, 6h. 21m. morn.

<table>
<thead>
<tr>
<th>M D</th>
<th>W D</th>
<th>Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TH</td>
<td>1</td>
<td>Cambridge Term begins</td>
<td>5 37</td>
<td>6 31</td>
<td>h m</td>
<td>morn. 8 m 27</td>
</tr>
<tr>
<td>2 F</td>
<td>2</td>
<td>Rich. Bishop Chich.</td>
<td>5 34</td>
<td>6 33</td>
<td>2 14</td>
<td>10 49</td>
</tr>
<tr>
<td>3 S</td>
<td>3</td>
<td>Old Lady Day</td>
<td>5 32</td>
<td>6 34</td>
<td>0 24</td>
<td>9 9</td>
</tr>
<tr>
<td>4 SUN</td>
<td>4</td>
<td>[brose]</td>
<td>5 30</td>
<td>6 36</td>
<td>1 23</td>
<td>9 56</td>
</tr>
<tr>
<td>5 M</td>
<td>5</td>
<td>Leopold born 1853</td>
<td>5 28</td>
<td>6 38</td>
<td>2 14</td>
<td>10 49</td>
</tr>
<tr>
<td>6 Tu</td>
<td>6</td>
<td>Saturn rises 11.42 aft.</td>
<td>5 25</td>
<td>6 39</td>
<td>3 32</td>
<td>0 a 48</td>
</tr>
<tr>
<td>7 W</td>
<td>7</td>
<td>Easter Term begins</td>
<td>5 23</td>
<td>6 41</td>
<td>4 1</td>
<td>1 51</td>
</tr>
<tr>
<td>8 Th</td>
<td>8</td>
<td>2 Sunday after Easter</td>
<td>5 21</td>
<td>6 43</td>
<td>4 26</td>
<td>2 54</td>
</tr>
<tr>
<td>9 F</td>
<td>9</td>
<td>3 Sunday after Easter</td>
<td>5 19</td>
<td>6 44</td>
<td>4 50</td>
<td>3 57</td>
</tr>
<tr>
<td>10 S</td>
<td>10</td>
<td>4 Sunday after Easter</td>
<td>5 17</td>
<td>6 46</td>
<td>5 11</td>
<td>5 1</td>
</tr>
<tr>
<td>11 Sun</td>
<td>11</td>
<td>5 Sunday after Easter</td>
<td>5 14</td>
<td>6 48</td>
<td>5 31</td>
<td>6 7</td>
</tr>
<tr>
<td>12 M</td>
<td>12</td>
<td>Jupiter sets 7.3 aft.</td>
<td>5 12</td>
<td>6 49</td>
<td>5 52</td>
<td>7 12</td>
</tr>
<tr>
<td>13 Tu</td>
<td>13</td>
<td>Mars sets 3.9 morn.</td>
<td>5 10</td>
<td>6 51</td>
<td>6 16</td>
<td>8 19</td>
</tr>
<tr>
<td>14 W</td>
<td>14</td>
<td>6 Sunday after Easter, St. Mk.</td>
<td>5 8</td>
<td>6 53</td>
<td>6 40</td>
<td>9 27</td>
</tr>
<tr>
<td>15 Th</td>
<td>15</td>
<td>Easter Term begins</td>
<td>5 6</td>
<td>6 54</td>
<td>7 10</td>
<td>10 34</td>
</tr>
<tr>
<td>16 F</td>
<td>16</td>
<td>7 Sunday after Easter</td>
<td>5 3</td>
<td>6 56</td>
<td>7 45</td>
<td>11 37</td>
</tr>
<tr>
<td>17 S</td>
<td>17</td>
<td>8 Sunday after Easter</td>
<td>5 1</td>
<td>6 57</td>
<td>8 28</td>
<td>morn.</td>
</tr>
<tr>
<td>18 Sun</td>
<td>18</td>
<td>9 Sunday after Easter</td>
<td>4 59</td>
<td>6 59</td>
<td>9 20</td>
<td>0 37</td>
</tr>
<tr>
<td>19 M</td>
<td>19</td>
<td>Alpheege</td>
<td>4 57</td>
<td>7 1</td>
<td>10 22</td>
<td>1 29</td>
</tr>
<tr>
<td>20 Tu</td>
<td>20</td>
<td>1 PS. LOUIS OF HESSE B. 1843</td>
<td>4 55</td>
<td>7 3</td>
<td>11 32</td>
<td>2 14</td>
</tr>
<tr>
<td>21 W</td>
<td>21</td>
<td>1 Mars sets 3.9 morn.</td>
<td>4 53</td>
<td>7 4</td>
<td>13 54</td>
<td>2 54</td>
</tr>
<tr>
<td>22 Th</td>
<td>22</td>
<td>2 Sunday after Easter</td>
<td>4 51</td>
<td>7 6</td>
<td>2 8</td>
<td>3 25</td>
</tr>
<tr>
<td>23 F</td>
<td>23</td>
<td>St. George</td>
<td>4 49</td>
<td>7 8</td>
<td>3 29</td>
<td>3 54</td>
</tr>
<tr>
<td>24 S</td>
<td>24</td>
<td>3 Sunday after Easter</td>
<td>4 47</td>
<td>7 9</td>
<td>4 51</td>
<td>4 22</td>
</tr>
<tr>
<td>25 Sun</td>
<td>25</td>
<td>4 Sunday after Easter</td>
<td>4 45</td>
<td>7 11</td>
<td>5 52</td>
<td>5 45</td>
</tr>
<tr>
<td>26 M</td>
<td>26</td>
<td>5 Sunday after Easter</td>
<td>4 43</td>
<td>7 12</td>
<td>7 34</td>
<td>5 15</td>
</tr>
<tr>
<td>27 Tu</td>
<td>27</td>
<td>6 Venus rises 4.39 morn.</td>
<td>4 41</td>
<td>7 14</td>
<td>8 52</td>
<td>5 45</td>
</tr>
<tr>
<td>28 W</td>
<td>28</td>
<td>7 Mercury sets 7.19 aft.</td>
<td>4 39</td>
<td>7 16</td>
<td>10 5</td>
<td>6 19</td>
</tr>
<tr>
<td>29 Th</td>
<td>29</td>
<td>8 Venus rises 4.39 morn.</td>
<td>4 37</td>
<td>7 17</td>
<td>11 52</td>
<td>6 59</td>
</tr>
<tr>
<td>30 F</td>
<td>30</td>
<td>9 Mercury sets 7.19 aft.</td>
<td>4 35</td>
<td>7 19</td>
<td>12 52</td>
<td>7 45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at 9's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 54</td>
<td>5 9</td>
<td>3 m 37</td>
<td>8 a 31</td>
<td>6 m 19</td>
<td>12 3 52</td>
<td>3 m 54</td>
</tr>
<tr>
<td>6</td>
<td>13 13</td>
<td>28</td>
<td>23</td>
<td>43</td>
<td>23</td>
<td>2 23</td>
<td>8 7</td>
</tr>
<tr>
<td>11</td>
<td>32</td>
<td>47</td>
<td>8</td>
<td>55</td>
<td>28</td>
<td>0 59</td>
<td>11 43</td>
</tr>
<tr>
<td>16</td>
<td>52</td>
<td>6 7</td>
<td>2 52</td>
<td>9 7</td>
<td>33</td>
<td>11 59</td>
<td>3 a 37</td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>26</td>
<td>36</td>
<td>21</td>
<td>37</td>
<td>58 36</td>
<td>8 14</td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>44</td>
<td>19</td>
<td>36</td>
<td>42</td>
<td>57 40</td>
<td>morn.</td>
</tr>
</tbody>
</table>
### APRIL, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td>1</td>
<td>5 m 29</td>
<td>5 a 31</td>
<td>0 a 47</td>
<td>4 m 27</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td>44</td>
<td>6</td>
<td>46</td>
</tr>
</tbody>
</table>

### M D C’s age High Water

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>5 m 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>5 44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>6 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>7 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>23</td>
<td>8 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>24</td>
<td>9 51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>25</td>
<td>11 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>26</td>
<td>0 a 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>27</td>
<td>1 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>28</td>
<td>1 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>2 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>N</td>
<td>2 43</td>
<td>Lorenzo de Medici died, 1492.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>3 14</td>
<td>William and Mary crowned, 1689.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>3 45</td>
<td>Bonaparte abdicated, 1814.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>4 17</td>
<td>Handel died, 1759.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>4 50</td>
<td>Earl of Warwick slain, 1471.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>5 27</td>
<td>Buffon died, 1788.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>6</td>
<td>6 10</td>
<td>Dr. Benj. Franklin died, 1790.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>7</td>
<td>7 3</td>
<td>Judge Jeffries died, 1689.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>8</td>
<td>8 13</td>
<td>Lord Byron died, 1824.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>9</td>
<td>9 39</td>
<td>Royal Society incorporated, 1663.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>10</td>
<td>11 3</td>
<td>Shakspeare born, 1564; died, 1616.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>11 morn.</td>
<td></td>
<td>Cervantes died, 1616.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>0 9</td>
<td>Tasso expired, 1595.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>13</td>
<td>1 2</td>
<td>Oliver Cromwell born, 1599.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>1 48</td>
<td>Cowper died, 1800.</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>15</td>
<td>2 31</td>
<td>Edict of Nantes signed, 1598.</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>16</td>
<td>3 14</td>
<td>Washington inaugurated President, 1789.</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>17</td>
<td>3 57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>18</td>
<td>4 38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

**NOTICES.**

1. Hawkers' and Pedlars' licences granted.  
5. Quarter Sessions this week.  
8. Dividends payable.  
9. Fire Insurance due at Lady Day must be paid on or before this day.

**HISTORICAL MEMORANDA.**

1. Bonaparte married, 1810.  
4. Oliver Goldsmith died, 1774.  
— Lorenzo de Medici died, 1492.  
11. William and Mary crowned, 1689.  
— Bonaparte abdicated, 1814.  
— Earl of Warwick slain, 1471.  
16. Buffon died, 1788.  
17. Dr. Benj. Franklin died, 1790.  
18. Judge Jeffries died, 1689.  
19. Lord Byron died, 1824.  
22. Royal Society incorporated, 1663.  
23. Shakspeare born, 1564; died, 1616.  
— Cervantes died, 1616.  
25. Tasso expired, 1595.  
— Oliver Cromwell born, 1599.  
— Cowper died, 1800.

During this month the days increase 1 h. 4 m. in the morning, and 49 m. in the afternoon.

Moon in apogee on the 8th day; perigee on the 24th.

*Venus* is a Morning Star during the month.

*Mars* is unusually favorable for observation.

*Jupiter* is near the Sun, and an Evening Star until the 17th, and afterwards a Morning Star.
### MAY, 1869.

**LUNATIONS AND PHASES.**

- Last Quar. 〇 3rd day, 1h. 40m. aftern.
- New Moon ⬤ 11th day, 4h. 7m. aftern.
- First Quar. □ 18th day, 9h. 30m. aftern.
- Full Moon ○ 25th day, 3h. 23m. aftern.

20 d. 13 h. 34 m.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sunrises</th>
<th>Sunsets</th>
<th>Moonrises</th>
<th>Moonsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>St. Phil. &amp; Jas. Pr. Arthur</td>
<td>4 33</td>
<td>7 21</td>
<td>0 m</td>
<td>8 m 37</td>
</tr>
<tr>
<td>2</td>
<td>SuN</td>
<td>Rogation Sunday</td>
<td>4 31</td>
<td>7 22</td>
<td>0 54</td>
<td>9 34</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>Invention of Cross</td>
<td>4 30</td>
<td>7 24</td>
<td>1 33</td>
<td>10 35</td>
</tr>
<tr>
<td>4</td>
<td>Tu</td>
<td>Saturn rises 9.59 aft.</td>
<td>4 28</td>
<td>7 25</td>
<td>2</td>
<td>5 11</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td></td>
<td>4 26</td>
<td>7 27</td>
<td>2 32</td>
<td>0 a 42</td>
</tr>
<tr>
<td>6</td>
<td>Th</td>
<td>Ascen. Holy Th. Jno. Ev.</td>
<td>4 24</td>
<td>7 29</td>
<td>2 55</td>
<td>1 46</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>[a P. Lat.</td>
<td>4 22</td>
<td>7 30</td>
<td>3 17</td>
<td>2 50</td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>Easter Term ends</td>
<td>4 21</td>
<td>7 32</td>
<td>3 37</td>
<td>3 56</td>
</tr>
<tr>
<td>9</td>
<td>SuN</td>
<td>Sunday after Ascension</td>
<td>4 19</td>
<td>7 33</td>
<td>3 57</td>
<td>5 0</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td></td>
<td>4 17</td>
<td>7 35</td>
<td>4 19</td>
<td>6 8</td>
</tr>
<tr>
<td>11</td>
<td>Tu</td>
<td>Jupiter rises 3.28 morn.</td>
<td>4 16</td>
<td>7 37</td>
<td>4 43</td>
<td>7 16</td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td></td>
<td>4 14</td>
<td>7 38</td>
<td>5 11</td>
<td>8 25</td>
</tr>
<tr>
<td>13</td>
<td>Th</td>
<td>Old May Day</td>
<td>4 13</td>
<td>7 40</td>
<td>5 44</td>
<td>9 31</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>Oxf. T. ends. Cam. T. div. noon</td>
<td>4 11</td>
<td>7 41</td>
<td>6 25</td>
<td>10 33</td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td>Oxford Term begins</td>
<td>4 10</td>
<td>7 43</td>
<td>7 15</td>
<td>11 28</td>
</tr>
<tr>
<td>16</td>
<td>SuN</td>
<td>Whit Sunday</td>
<td>4 8</td>
<td>7 44</td>
<td>8 14</td>
<td>morn.</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>Whit Monday</td>
<td>4 7</td>
<td>7 46</td>
<td>9 21</td>
<td>0 15</td>
</tr>
<tr>
<td>18</td>
<td>Tu</td>
<td>Whit Tuesday</td>
<td>4 5</td>
<td>7 47</td>
<td>10 36</td>
<td>0 56</td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td>EMBER WEEK. Dunstan</td>
<td>4 4</td>
<td>7 48</td>
<td>11 52</td>
<td>1 29</td>
</tr>
<tr>
<td>20</td>
<td>Th</td>
<td>Mars sets 1.29 morn.</td>
<td>4 3</td>
<td>7 50</td>
<td>1 11</td>
<td>1 58</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td></td>
<td>4 2</td>
<td>7 51</td>
<td>2 30</td>
<td>2 25</td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td>Trinity Term begins</td>
<td>4 0</td>
<td>7 53</td>
<td>3 49</td>
<td>2 50</td>
</tr>
<tr>
<td>23</td>
<td>SuN</td>
<td>Trinity Sunday</td>
<td>3 59</td>
<td>7 54</td>
<td>5 9</td>
<td>3 16</td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>Qu. Victoria born 1819</td>
<td>3 58</td>
<td>7 55</td>
<td>6 27</td>
<td>3 43</td>
</tr>
<tr>
<td>25</td>
<td>Tu</td>
<td>Prs. Helena born 1846.</td>
<td>3 57</td>
<td>7 56</td>
<td>7 43</td>
<td>4 14</td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td>Augustin [Ven. Bede</td>
<td>3 56</td>
<td>7 58</td>
<td>8 53</td>
<td>4 50</td>
</tr>
<tr>
<td>27</td>
<td>Th</td>
<td>D. CUMB. B. 1819. Corp. Christi</td>
<td>3 55</td>
<td>7 59</td>
<td>9 56</td>
<td>5 33</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>Venus sets 8.15 aft.</td>
<td>3 54</td>
<td>8 10</td>
<td>49</td>
<td>6 23</td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td>King Charles II rest. 1660</td>
<td>3 53</td>
<td>8 11</td>
<td>11 7</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>SuN</td>
<td>1 Sunday after Trinity</td>
<td>3 52</td>
<td>8 3 morn.</td>
<td>8 21</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td>Mercury sets 10.6 aft.</td>
<td>3 51</td>
<td>8 4</td>
<td>0 6</td>
<td>9 23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ☽'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14 47</td>
<td>7 2</td>
<td>2 m 2</td>
<td>9 a 52</td>
<td>6 m 46</td>
<td>11 56</td>
<td>56 4m 22</td>
</tr>
<tr>
<td>6</td>
<td>15 4</td>
<td>19 1 44</td>
<td>10 9</td>
<td>51</td>
<td>56 26</td>
<td>8 16</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>35 24</td>
<td>29</td>
<td>56</td>
<td>56 10</td>
<td>11 53</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>35</td>
<td>50 59</td>
<td>53</td>
<td>7 0</td>
<td>56 8</td>
<td>4 18</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>49</td>
<td>8 4</td>
<td>25 11 27</td>
<td>4</td>
<td>56 21</td>
<td>8 47</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>16 2</td>
<td>17</td>
<td>No real night.</td>
<td>8</td>
<td>56 46</td>
<td>0m 20</td>
<td></td>
</tr>
</tbody>
</table>
### MAY, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>4m35</td>
<td>7 a 5</td>
<td>11m31</td>
<td>2m34</td>
<td>4m19</td>
<td>6 a 17</td>
<td>10 a 11</td>
<td>6m33</td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>19</td>
<td>7</td>
<td>43</td>
<td>11</td>
<td>11</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td>10</td>
<td>8</td>
<td>20</td>
<td>10</td>
<td>54</td>
<td>1</td>
<td>13</td>
</tr>
</tbody>
</table>

### Notices and Historical Memoranda.

**Notices.**

1. May Day. A holiday at the Stock Offices, Bank of England. The Stock Exchange closed on this day, unless otherwise specially ordered by the Committee for General Purposes. British Museum closed first week.


15. This is Whitsun-day, one of the Terms or Quarter Days used in Scotland.

17. Whit Monday. The Stock Exchange is closed on this day, unless otherwise specially ordered by the Committee for General Purposes.

24. Queen's Birthday.

### Historical Memoranda.

1. Dryden born, 1700.

3. Jamaica discovered by Columbus, 1494.

5. Napoleon I died, 1821.

11. Pitt, Earl of Chatham, died, 1778.

12. Earl of Strafford beheaded, 1641.

17. Dr. Jenner born, 1749.


15. Columbus died, 1506.

22. Entick, lexicographer, died, 1773.

24. Copernicus died, 1543.

26. First Handel Festival, 1784.

27. Countess of Salisbury beheaded, 1541.


30. Rubens died, 1640.

During this month the days increase 43m. in the morning, and 44m. in the afternoon.

Moon in apogee on the 6th day; perigee on the 21st.

Mercury may be seen in the evenings about the 29th.

Mars is in conjunction with the Moon on the 18th, at 10h. a 23m., which will be an interesting phenomenon.

Jupiter is a Morning Star during the month.

Venus is a Morning Star until the 9th.
JUNE, 1869.

LUNATIONS AND PHASES.

Last Quar. ☐ 2nd day, 7h. 21m. morn.
New Moon ● 10th day, 3h. 52m. morn.
First Quar. ○ 17th day, 2h. 15m. morn.
Full Moon ● 24th day, 1h. 39m. morn.

20 d. 22 h. 4 m.

Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>Date</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>350</td>
<td>85</td>
<td>0m36</td>
<td>10m28</td>
</tr>
<tr>
<td>2</td>
<td>349</td>
<td>86</td>
<td>1</td>
<td>01132</td>
</tr>
<tr>
<td>3</td>
<td>349</td>
<td>87</td>
<td>122</td>
<td>0a36</td>
</tr>
<tr>
<td>4</td>
<td>348</td>
<td>88</td>
<td>142</td>
<td>140</td>
</tr>
<tr>
<td>5</td>
<td>347</td>
<td>89</td>
<td>22</td>
<td>2226</td>
</tr>
<tr>
<td>6</td>
<td>347</td>
<td>810</td>
<td>223</td>
<td>352</td>
</tr>
<tr>
<td>7</td>
<td>346</td>
<td>811</td>
<td>246</td>
<td>51</td>
</tr>
<tr>
<td>8</td>
<td>346</td>
<td>812</td>
<td>313</td>
<td>610</td>
</tr>
<tr>
<td>9</td>
<td>345</td>
<td>812</td>
<td>343</td>
<td>717</td>
</tr>
<tr>
<td>10</td>
<td>345</td>
<td>813</td>
<td>422</td>
<td>824</td>
</tr>
<tr>
<td>11</td>
<td>345</td>
<td>814</td>
<td>58</td>
<td>924</td>
</tr>
<tr>
<td>12</td>
<td>345</td>
<td>815</td>
<td>6410</td>
<td>1215</td>
</tr>
<tr>
<td>13</td>
<td>344</td>
<td>815</td>
<td>71010</td>
<td>588</td>
</tr>
<tr>
<td>14</td>
<td>344</td>
<td>816</td>
<td>82311</td>
<td>333</td>
</tr>
<tr>
<td>15</td>
<td>344</td>
<td>816</td>
<td>939</td>
<td>morn.</td>
</tr>
<tr>
<td>16</td>
<td>344</td>
<td>817</td>
<td>1059</td>
<td>04</td>
</tr>
<tr>
<td>17</td>
<td>344</td>
<td>817</td>
<td>0a17</td>
<td>030</td>
</tr>
<tr>
<td>18</td>
<td>344</td>
<td>818</td>
<td>135</td>
<td>056</td>
</tr>
<tr>
<td>19</td>
<td>344</td>
<td>818</td>
<td>253</td>
<td>121</td>
</tr>
<tr>
<td>20</td>
<td>344</td>
<td>818</td>
<td>411</td>
<td>464</td>
</tr>
<tr>
<td>21</td>
<td>345</td>
<td>818</td>
<td>5225</td>
<td>215</td>
</tr>
<tr>
<td>22</td>
<td>345</td>
<td>819</td>
<td>637</td>
<td>248</td>
</tr>
<tr>
<td>23</td>
<td>345</td>
<td>819</td>
<td>742</td>
<td>326</td>
</tr>
<tr>
<td>24</td>
<td>345</td>
<td>819</td>
<td>839</td>
<td>412</td>
</tr>
<tr>
<td>25</td>
<td>346</td>
<td>819</td>
<td>926</td>
<td>56</td>
</tr>
<tr>
<td>26</td>
<td>346</td>
<td>819</td>
<td>1056</td>
<td>55</td>
</tr>
<tr>
<td>27</td>
<td>347</td>
<td>819</td>
<td>1037</td>
<td>378</td>
</tr>
<tr>
<td>28</td>
<td>347</td>
<td>819</td>
<td>1138</td>
<td>128</td>
</tr>
<tr>
<td>29</td>
<td>348</td>
<td>819</td>
<td>1126</td>
<td>917</td>
</tr>
<tr>
<td>30</td>
<td>348</td>
<td>818</td>
<td>1147</td>
<td>1021</td>
</tr>
</tbody>
</table>

Day | Length of Day | Day incr. | Day br. | Twilight ends | Sun East | Time on clock at ☉'s noon | Moon's Southing |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 14</td>
<td>8 29</td>
<td>No real night, but constant</td>
<td>7m13</td>
<td>11 57 32</td>
<td>5m28</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>23 38</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>58 22 9 1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>29 44</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td>59 20 1 a 15</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>33 48</td>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td>12 0 23 5 52</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>34 49</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td>1 27 10 10</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>33 Dec.1</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>2 31 1 m 44</td>
<td></td>
</tr>
</tbody>
</table>

Sun enters Cancer,
### JUNE, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>4m 10</td>
<td>8 a 38</td>
<td>10m 46</td>
<td>0m 50</td>
<td>2m 31</td>
<td>4 a 55</td>
<td>8 a 0</td>
<td>4m 24</td>
</tr>
<tr>
<td>13</td>
<td>4 19</td>
<td>9 3</td>
<td>10 33</td>
<td>0 11</td>
<td>1 49</td>
<td>4 23</td>
<td>7 8</td>
<td>3 34</td>
</tr>
<tr>
<td>25</td>
<td>4 41</td>
<td>9 15</td>
<td>10 23</td>
<td>11 a 31</td>
<td>1 7</td>
<td>3 49</td>
<td>6 17</td>
<td>2 43</td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

#### NOTICES.
20. On or before this day overseers to give notice to borough voters that poor rates, &c., due up to Jan. 5th must be paid before July 20th; and calling upon all persons entitled to county votes, who are not on the register, or who are on the register, but are desirous of making new claims, to send them in on or before the 20th July.

21. Summer Quarter begins.
28. Quarter Sessions held this week.

#### HISTORICAL MEMORANDA.
2. Gordon Riots commenced, 1780.
4. First stone of Somerset House laid, 1776.
7. First stone of Royal Exchange laid, 1566.
9. Reform Bill passed, 1832.
10. Edward, the Black Prince, died, 1376.
11. Wat Tyler's insurrection, 1381.
17. Addison died, 1719.
18. Battle of Waterloo, 1815.
19. Waterloo Bridge opened, 1817.
19. Magna Charta signed, 1215.
25. Battle of Bannockburn, 1314.
27. Dr. Wm. Dodd executed, 1777.
30. Earl of Argyll beheaded, 1685.

From the 1st to the 21st, the days increase 6m. in the morning, and 14m. in the afternoon.

Moon in apogee on the 2nd; in perigee 16th; in apogee 30th.

*Venus* is an Evening Star during the month.

*Mars* is favorable for observation.

*Jupiter* is a Morning Star during the month.

*Saturn* and his *Rings* are favorable for observation.
### JULY, 1869.

#### Sun enters Leo,

22 d. 9h. 1m.

#### LUNATIONS AND PHASES.

<table>
<thead>
<tr>
<th>Last Quar.</th>
<th>2nd day, 0h. 46m. morn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Moon</td>
<td>9th day, 1h. 38m. aftern.</td>
</tr>
<tr>
<td>First Quar.</td>
<td>16th day, 6h. 48m. morn.</td>
</tr>
<tr>
<td>Full Moon</td>
<td>23rd day, 1h. 54m. aftern.</td>
</tr>
<tr>
<td>Last Quar.</td>
<td>31st day, 5h. 6m. aftern.</td>
</tr>
</tbody>
</table>

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TH</td>
<td>Pres. Alice Mar. 1862</td>
<td>3 49</td>
<td>8 13</td>
<td>morn. 11m 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>Visitation Virgin Mary</td>
<td>3 50</td>
<td>8 18</td>
<td>0 8</td>
<td>0 a 31</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>Dog days begin</td>
<td>3 51</td>
<td>8 17</td>
<td>0 28</td>
<td>1 36</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>SUN</td>
<td>Sun aff. Tri. Trs. St. Martin</td>
<td>3 51</td>
<td>8 17</td>
<td>0 49</td>
<td>2 43</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>Pres. Helena Married 1866.</td>
<td>3 52</td>
<td>8 16</td>
<td>1 13</td>
<td>3 50</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tu</td>
<td>Old Mids. Day. Oxf. Act.</td>
<td>3 53</td>
<td>8 16</td>
<td>1 41</td>
<td>4 59</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>Thomas à Becket</td>
<td>3 54</td>
<td>8 15</td>
<td>2 16</td>
<td>6 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Th</td>
<td>Saturn sets 1.50 morn.</td>
<td>3 55</td>
<td>8 15</td>
<td>2 58</td>
<td>7 10</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td></td>
<td>3 56</td>
<td>8 14</td>
<td>3 51</td>
<td>8 7</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td>Oxford Term ends</td>
<td>3 57</td>
<td>8 13</td>
<td>4 55</td>
<td>8 55</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>SUN</td>
<td>7 Sun after Trinity</td>
<td>3 58</td>
<td>8 12</td>
<td>6 7</td>
<td>9 35</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td></td>
<td>3 59</td>
<td>8 12</td>
<td>7 26</td>
<td>10 8</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Tu</td>
<td>Jupiter rises 0.4 morn.</td>
<td>4 0</td>
<td>8 11</td>
<td>8 45</td>
<td>10 36</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>W</td>
<td></td>
<td>4 1</td>
<td>8 10</td>
<td>10 51</td>
<td>11 2</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Th</td>
<td>St. Swithin</td>
<td>4 2</td>
<td>8 9</td>
<td>11 24</td>
<td>11 28</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td></td>
<td>4 4</td>
<td>8 8</td>
<td>0 a 41</td>
<td>11 50</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>S</td>
<td></td>
<td>4 5</td>
<td>8 7</td>
<td>1 58 morn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>SUN</td>
<td>8 Sun after Trinity</td>
<td>4 6</td>
<td>8 6</td>
<td>3 14</td>
<td>0 17</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td></td>
<td>4 7</td>
<td>8 5</td>
<td>4 26</td>
<td>0 49</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Tu</td>
<td>Margaret</td>
<td>4 9</td>
<td>8 3</td>
<td>5 32</td>
<td>1 25</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>W</td>
<td>Mars sets 10.10 aft.</td>
<td>4 10</td>
<td>8 2</td>
<td>6 31</td>
<td>2 7</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Th</td>
<td>Magdalene</td>
<td>4 11</td>
<td>8 1</td>
<td>7 21</td>
<td>2 57</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td></td>
<td>4 13</td>
<td>8 0</td>
<td>8 23</td>
<td>3 53</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>S</td>
<td>[Drs. Camb. B. 1797]</td>
<td>4 14</td>
<td>7 58</td>
<td>8 37</td>
<td>4 55</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>SUN</td>
<td>9 Sun after Trinity. St. James.</td>
<td>4 16</td>
<td>7 57</td>
<td>9 6</td>
<td>5 58</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>M</td>
<td>St. Anne</td>
<td>4 17</td>
<td>7 56</td>
<td>9 30</td>
<td>7 4</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Tu</td>
<td></td>
<td>4 18</td>
<td>7 54</td>
<td>9 52</td>
<td>8 8</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>W</td>
<td>Venus sets 8.51 aft.</td>
<td>4 20</td>
<td>7 53</td>
<td>10 12</td>
<td>9 13</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Th</td>
<td>Mercury rises 2.59 morn.</td>
<td>4 21</td>
<td>7 51</td>
<td>10 32</td>
<td>10 16</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>F</td>
<td></td>
<td>4 23</td>
<td>7 50</td>
<td>10 52</td>
<td>11 21</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>S</td>
<td></td>
<td>4 24</td>
<td>7 48</td>
<td>11 14</td>
<td>0 a 26</td>
<td></td>
</tr>
</tbody>
</table>

#### Day Length of Day | Day decl. | Day br. | Twilight ends | Sun East | Time on clock at S's noon | Moon's Southing |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>29</td>
<td>0 5</td>
<td>No real night.</td>
<td>7m 23</td>
<td>h m</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>11</td>
<td></td>
<td></td>
<td>4 25</td>
<td>9 14</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>19</td>
<td></td>
<td></td>
<td>5 11</td>
<td>1 a 57</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>29</td>
<td>h m</td>
<td>h m</td>
<td>5 m 31</td>
<td>h m</td>
</tr>
<tr>
<td>21</td>
<td>15</td>
<td>53</td>
<td>0 m 8</td>
<td>12 a 4</td>
<td>5 45</td>
<td>6 22</td>
</tr>
<tr>
<td>26</td>
<td>39</td>
<td>55</td>
<td>1 1</td>
<td>11 12</td>
<td>6 6</td>
<td>10 44</td>
</tr>
</tbody>
</table>

---

Note: The table provides details on the phases of the moon, the rising and setting times of various celestial events, and the length of the day along with other astronomical details for the month of July in 1869.
JULY, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4m 55</td>
<td>9a 17</td>
<td>10m 18</td>
<td>11a 12</td>
<td>0m 46</td>
<td>3a 32</td>
<td>5a 51</td>
<td>5m 19</td>
</tr>
<tr>
<td>13</td>
<td>5 31</td>
<td>9 11</td>
<td>10 11</td>
<td>10 35</td>
<td>0 4</td>
<td>2 56</td>
<td>5 1</td>
<td>1 29</td>
</tr>
<tr>
<td>25</td>
<td>6 8</td>
<td>8 56</td>
<td>10 4</td>
<td>9 58</td>
<td>11a 18</td>
<td>2 19</td>
<td>4 12</td>
<td>0 40</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

6. Appraisers' Licences granted.
8. Dividends payable.
9. Fire Insurance due at Midsummer must be paid on or before this day.
20. Last day for sending in claims for county voters. Before this day also parliamentary electors in counties, cities, or boroughs, must have paid assessed taxes and poor rates to the 5th of January preceding, or else are disqualified.
31. List of electors to be completed.

HISTORICAL MEMORANDA.

2. Battle of Marston Moor, 1644.
4. Declaration of American Independence, 1776
7. Sheridan died, 1816.
8. Henry II did penance, 1174.
— Edmund Burke died, 1797.
15. Baroness de Stael died, 1817.
18. Petrarch died, 1374.
— Robert Burns expired, 1796.
22. Gibraltar taken by the English, 1704.
28. Earl of Essex beheaded, 1540.
29. Wilberforce died, 1833.
30. Gray, poet, died, 1771.
31. Savage, poet, died, 1743.

During this month the days decrease 36m. in the morning, and 32m. in the afternoon.

Moon in perigee on the 12th day; apogee on the 28th.
Mercury may be seen in the mornings about the 17th.
Venus is an Evening Star during the month.
Jupiter is a Morning Star during the month.
Saturn and his Rings are favorable for observation.
Eclipse.—July 23. An eclipse of the Moon, invisible.
## AUGUST, 1869.

**Sun enters Virgo,**

### LUNATIONS AND PHASES.

- New Moon ○ 7th day, 10th. 8 m. aftern.
- First Quart. □ 14th day, 0h. 41m. aftern.
- Full Moon ○ 22nd day, 4h. 24m. morn.
- Last Quart. □ 30th day, 7h. 58m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D</th>
<th>Sunrises</th>
<th>Sunsets</th>
<th>Moonrises</th>
<th>Moonsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SUN</td>
<td>10 Sun. after Trinity, Lam. Day</td>
<td>4 26</td>
<td>7 46</td>
<td>11 a 41</td>
<td>1 a 32</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>4 27</td>
<td>7 45</td>
<td>6 a 11</td>
<td>3 47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TU</td>
<td>Saturn sets 11.59 aft.</td>
<td>4 29</td>
<td>7 43</td>
<td>0 05</td>
<td>4 53</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>Transfiguration</td>
<td>4 30</td>
<td>7 41</td>
<td>0 50</td>
<td>4 53</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>Pr. ALFRED BORN 1844</td>
<td>4 33</td>
<td>7 38</td>
<td>2 35</td>
<td>6 45</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>Name of Jesus</td>
<td>4 35</td>
<td>7 36</td>
<td>3 44</td>
<td>7 29</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SUN</td>
<td>11 Sunday after Trinity</td>
<td>4 36</td>
<td>7 34</td>
<td>5 08</td>
<td>8 5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>4 38</td>
<td>7 32</td>
<td>6 22</td>
<td>8 36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TU</td>
<td>St. Lawrence (Meteors)</td>
<td>4 39</td>
<td>7 31</td>
<td>7 45</td>
<td>9 3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>Dog days end</td>
<td>4 41</td>
<td>7 29</td>
<td>9 09</td>
<td>9 30</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>TH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>Jupiter rises 10.8 aft.</td>
<td>4 44</td>
<td>7 25</td>
<td>11 47</td>
<td>10 22</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>SUN</td>
<td>12 Sun. after Trinity Assump.</td>
<td>4 47</td>
<td>7 21</td>
<td>2 17</td>
<td>11 25</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>Virgin Mary</td>
<td>4 49</td>
<td>7 19</td>
<td>3 24</td>
<td>morn.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>TU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>W</td>
<td>Mars sets 8.47 aft.</td>
<td>4 51</td>
<td>7 17</td>
<td>4 26</td>
<td>0 6</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>TH</td>
<td>Venus sets 8.9 aft.</td>
<td>4 52</td>
<td>7 15</td>
<td>5 19</td>
<td>0 53</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>SUN</td>
<td>13 Sunday after Trinity</td>
<td>4 53</td>
<td>7 11</td>
<td>5 7</td>
<td>5 48</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>TU</td>
<td>St. BARTHOLOMEW</td>
<td>5 2</td>
<td>7 12</td>
<td>8 18</td>
<td>7 2</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>TH</td>
<td>Mercury sets 7.28 aft.</td>
<td>5 3</td>
<td>7 0</td>
<td>8 38</td>
<td>7 8</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>St. Augustine</td>
<td>5 5</td>
<td>6 58</td>
<td>8 57</td>
<td>9 10</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>SUN</td>
<td>14 Sun. after Trinity. St. John</td>
<td>5 8</td>
<td>6 54</td>
<td>9 43</td>
<td>11 19</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>Bapt. beh.</td>
<td>5 10</td>
<td>6 52</td>
<td>10 10</td>
<td>0 26</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>TU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table:

<table>
<thead>
<tr>
<th>Day of Year</th>
<th>Length of Day</th>
<th>Day dect.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at G's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 21</td>
<td>1 13</td>
<td>1 m 23</td>
<td>10 a 40</td>
<td>7 m 6</td>
<td>12 6 1</td>
<td>6m 17</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>23 51</td>
<td>2 8</td>
<td>1 1 6 55</td>
<td>4 56</td>
<td>3 26</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>48 46</td>
<td>2 34 27</td>
<td>2 m 11</td>
<td>1 34 2 m 48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>31 2 3</td>
<td>9 44 42</td>
<td>3 54 11</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>13 21</td>
<td>3 m 27</td>
<td>2 m 11</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>13 54</td>
<td>52 35</td>
<td>1 34 2 m 48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTICES.

1. List of voters in cities and boroughs to be affixed to church and chapel doors for 14 days. Objections to county voters must be made on or before the 20th. This is Lammas Day, and is one of the Terms or Quarter Days used in the payment of rents in Scotland and some parts of England. These days are sometimes called “Cross Quarter Days,” as being near the middle of the Quarter Days in more general use in England.


25. Claims to borough votes and objections to borough electors must be made on or before this day. After the last day of July, and before this day, lodgers must send in their claims to vote.

METEORS.

11. These remarkable phenomena, commonly called Shooting Stars, may be expected to make their appearance at about 1 o’clock in the morning. Their appearance will be favoured by the Moon being below the horizon. The planet Jupiter will be ascending in the east.

HISTORICAL MEMORANDA.


15. Sir Walter Scott born, 1771.


During this month the days decrease 49m. in the morning, and 1h. 1m. in the afternoon.

Moon in perigee on the 9th day; apogee on the 25th.

Venus is an Evening Star during the month.

Jupiter is a Morning Star during the month.

Saturn and his Rings are favorable for observation.

Eclipse.—August 7. An eclipse of the Sun, invisible.
### SEPTEMBER, 1869.

#### LUNATIONS AND PHASES.
- **New Moon** ☿ 6th day, 6h. 7m. morn.
- **First Quadrant** 12th day, 9h. 23m. aftern.
- **Full Moon** ☿ 20th day, 8h. 41m. aftern.
- **Last Quadrant** ☿ 28th day, 9h. 10m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>Giles</td>
<td>5 14</td>
<td>6 45</td>
<td>3 a 37</td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td>Lond. burnt 1666. O. S.</td>
<td>5 16</td>
<td>5 18</td>
<td>6 43</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Saturn sets 9.57 aft.</td>
<td>5 19</td>
<td>6 38</td>
<td>2 32</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>15 Sunday after Trinity. Old</td>
<td>5 21</td>
<td>5 22</td>
<td>6 34</td>
</tr>
<tr>
<td>5</td>
<td>SuN</td>
<td>[Bartholomew]</td>
<td>5 22</td>
<td>6 10</td>
<td>1 48</td>
</tr>
<tr>
<td>6</td>
<td>Tu</td>
<td>Enurchus</td>
<td>5 24</td>
<td>6 22</td>
<td>0 5</td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>Nativity Virgin Mary</td>
<td>5 26</td>
<td>6 22</td>
<td>10 48</td>
</tr>
<tr>
<td>8</td>
<td>Th</td>
<td>7.27 aft.</td>
<td>5 29</td>
<td>6 22</td>
<td>10 48</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>Jupiter rises 8.22 aft.</td>
<td>5 30</td>
<td>6 22</td>
<td>0 5</td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td>16 Sunday after Trinity</td>
<td>5 32</td>
<td>6 20</td>
<td>1 16</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>17 Sunday after Trinity</td>
<td>5 34</td>
<td>6 18</td>
<td>2 11</td>
</tr>
<tr>
<td>12</td>
<td>Tu</td>
<td>Holy Cross</td>
<td>5 35</td>
<td>6 16</td>
<td>3 16</td>
</tr>
<tr>
<td>13</td>
<td>W</td>
<td>EMBER WEEK</td>
<td>5 37</td>
<td>6 13</td>
<td>4 2</td>
</tr>
<tr>
<td>14</td>
<td>Th</td>
<td>Mars sets 7.27 aft.</td>
<td>5 38</td>
<td>6 11</td>
<td>4 41</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>Lambert</td>
<td>5 40</td>
<td>6 9</td>
<td>5 13</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>Geo. I and II landed</td>
<td>5 42</td>
<td>6 6</td>
<td>5 39</td>
</tr>
<tr>
<td>17</td>
<td>Sun</td>
<td>18 Sunday after Trinity</td>
<td>5 43</td>
<td>6 4</td>
<td>6 2 3 49</td>
</tr>
<tr>
<td>18</td>
<td>M</td>
<td>17 Sunday after Trinity</td>
<td>5 45</td>
<td>6 2</td>
<td>6 23</td>
</tr>
<tr>
<td>19</td>
<td>Tu</td>
<td>ST. MATTHEW</td>
<td>5 46</td>
<td>6 0</td>
<td>6 43</td>
</tr>
<tr>
<td>20</td>
<td>W</td>
<td>Venus sets 6.57 aft.</td>
<td>5 48</td>
<td>5 57</td>
<td>7 2</td>
</tr>
<tr>
<td>21</td>
<td>Th</td>
<td>18 Sunday after Trinity. St.</td>
<td>5 50</td>
<td>5 55</td>
<td>7 20</td>
</tr>
<tr>
<td>22</td>
<td>F</td>
<td>19 Sunday after Trinity</td>
<td>5 51</td>
<td>5 52</td>
<td>7 45</td>
</tr>
<tr>
<td>23</td>
<td>S</td>
<td>20 Sunday after Trinity</td>
<td>5 53</td>
<td>5 50</td>
<td>8 11</td>
</tr>
</tbody>
</table>

#### Length of Day
<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31 h m</td>
</tr>
<tr>
<td>6</td>
<td>22 h m</td>
</tr>
<tr>
<td>11</td>
<td>53 h m</td>
</tr>
<tr>
<td>16</td>
<td>41 h m</td>
</tr>
<tr>
<td>21</td>
<td>54 h m</td>
</tr>
</tbody>
</table>

#### Day of Year
<table>
<thead>
<tr>
<th>Day</th>
<th>Day of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>11</td>
<td>53</td>
</tr>
<tr>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>21</td>
<td>54</td>
</tr>
</tbody>
</table>

#### Day to Day
<table>
<thead>
<tr>
<th>Day</th>
<th>Day to Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>11</td>
<td>53</td>
</tr>
<tr>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>21</td>
<td>54</td>
</tr>
</tbody>
</table>

#### Twilight Ends
<table>
<thead>
<tr>
<th>Day</th>
<th>Twilight Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 a 53</td>
</tr>
<tr>
<td>6</td>
<td>38</td>
</tr>
<tr>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>21</td>
<td>56</td>
</tr>
</tbody>
</table>

#### Sun East
<table>
<thead>
<tr>
<th>Day</th>
<th>Sun East</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26 h m</td>
</tr>
<tr>
<td>6</td>
<td>19 h m</td>
</tr>
<tr>
<td>11</td>
<td>11 h m</td>
</tr>
<tr>
<td>16</td>
<td>3 h m</td>
</tr>
<tr>
<td>21</td>
<td>55 h m</td>
</tr>
</tbody>
</table>

#### Time on clock at 0 of noon
<table>
<thead>
<tr>
<th>Day</th>
<th>Time on clock at 0 of noon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>59 h m</td>
</tr>
<tr>
<td>6</td>
<td>19 h m</td>
</tr>
<tr>
<td>11</td>
<td>11 h m</td>
</tr>
<tr>
<td>16</td>
<td>3 h m</td>
</tr>
<tr>
<td>21</td>
<td>55 h m</td>
</tr>
</tbody>
</table>

#### Moon's Southing
<table>
<thead>
<tr>
<th>Day</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47 h m</td>
</tr>
<tr>
<td>6</td>
<td>10 h m</td>
</tr>
<tr>
<td>11</td>
<td>28 h m</td>
</tr>
<tr>
<td>16</td>
<td>49 h m</td>
</tr>
<tr>
<td>21</td>
<td>57 h m</td>
</tr>
</tbody>
</table>

---

[Image of scales indicating Libra, and text indicating the sun enters Libra.]
**SEPTEMBER, 1869.**

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>8 m 7</td>
<td>7 41</td>
<td>9 m51</td>
<td>8 a 7</td>
</tr>
<tr>
<td>13</td>
<td>8 43</td>
<td>7 15</td>
<td>9 51</td>
<td>7 35</td>
</tr>
<tr>
<td>25</td>
<td>9 21</td>
<td>6 51</td>
<td>9 50</td>
<td>7 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>C’s age</th>
<th>High Water</th>
<th>Notices and Historical Memoranda.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lond. Br.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>25</td>
<td>8 m 40</td>
<td>1. On this day lists of claims and objections to both county and borough electors to be affixed to church doors. British Museum closed first week.</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>10 1</td>
<td>15. Revising Barristers hold their courts for the revision of borough voters’ lists between this day and Oct. 31;—for county voters’ lists between Sept. 20 and Oct. 31.</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>11 20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td>0 a 26</td>
<td>23. Autumn Quarter commences.</td>
</tr>
<tr>
<td>5</td>
<td>29</td>
<td>1 20</td>
<td>29. Michaelmas Day.</td>
</tr>
<tr>
<td>6</td>
<td>N</td>
<td>2 6</td>
<td>30. Hawkers’ and Pedlars’ licences expire.</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2 53</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>3 37</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>4 21</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>5 3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>5 46</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>6</td>
<td>6 32</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>7 27</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>8</td>
<td>8 39</td>
<td>1. Sir Rd. Steele died, 1729.</td>
</tr>
<tr>
<td>16</td>
<td>10</td>
<td>11 27</td>
<td>3. Oliver Cromwell died, 1658.</td>
</tr>
<tr>
<td>18</td>
<td>12</td>
<td>0 30</td>
<td>5. Lord Chief Justice Coke died, 1634.</td>
</tr>
<tr>
<td>19</td>
<td>13</td>
<td>1 16</td>
<td>6. Hannah More died, 1833.</td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>1 55</td>
<td>7. Sebastopol taken, 1855.</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>1 27</td>
<td>8. William the Conqueror died, 1087.</td>
</tr>
<tr>
<td>22</td>
<td>16</td>
<td>2 57</td>
<td>9. General Wolfe killed, 1759.</td>
</tr>
<tr>
<td>23</td>
<td>17</td>
<td>3 28</td>
<td>10. Fox died, 1806.</td>
</tr>
<tr>
<td>25</td>
<td>19</td>
<td>4 26</td>
<td>12. Dean Colet died, 1519.</td>
</tr>
<tr>
<td>26</td>
<td>20</td>
<td>4 58</td>
<td>13. Dr. Johnson born, 1709.</td>
</tr>
<tr>
<td>28</td>
<td>22</td>
<td>6 9</td>
<td>15. Samuel Butler died, 1680.</td>
</tr>
<tr>
<td>30</td>
<td>24</td>
<td>8 4</td>
<td>17. New River completed, 1613.</td>
</tr>
</tbody>
</table>

During this month the days decrease 48m. in the morning, and 1h. 9m. in the afternoon.

Moon in perigee on the 6th day; apogee on the 21st.

*Mercury* may be seen in the *evenings* about the 25th.

*Venus* is an Evening Star during the month.

*Jupiter* is a Morning Star during the month.

*Saturn* and his *Rings* are visible.
OCTOBER, 1869.

Sun enters Scorpio,

LUNATIONS AND PHASES.

New Moon • 5th day, 2h. 19m. aftern.
First Quarr. △ 12th day. 10h. 2m. morn.
Full Moon ○ 20th day, 1h. 57m. aftern.
Last Quarr. □ 28th day, 8h. 34m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sunrises</th>
<th>Sunssets</th>
<th>Moonrises</th>
<th>Moonssets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>Remigius. Camb. Term beg.</td>
<td>h m 6 3</td>
<td>m h 5 36</td>
<td>m h 0 8</td>
<td>m h 3 a 54</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td></td>
<td>h m 6 4</td>
<td>m h 5 34</td>
<td>m h 1 21</td>
<td>m h 4 28</td>
</tr>
<tr>
<td>3</td>
<td>S U N</td>
<td>19 Sunday after Trinity</td>
<td>h m 6 6</td>
<td>m h 5 32</td>
<td>m h 2 43</td>
<td>m h 4 59</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td></td>
<td>h m 6 8</td>
<td>m h 5 30</td>
<td>m h 4 6</td>
<td>m h 5 27</td>
</tr>
<tr>
<td>5</td>
<td>T U</td>
<td>Faith</td>
<td>h m 6 9</td>
<td>m h 5 27</td>
<td>m h 5 31</td>
<td>m h 5 54</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td></td>
<td>h m 6 11</td>
<td>m h 5 25</td>
<td>m h 6 56</td>
<td>m h 6 21</td>
</tr>
<tr>
<td>7</td>
<td>T H</td>
<td>Saturn sets 7.50 aft.</td>
<td>h m 6 13</td>
<td>m h 5 23</td>
<td>m h 8 21</td>
<td>m h 6 49</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td></td>
<td>h m 6 14</td>
<td>m h 5 21</td>
<td>m h 9 43</td>
<td>m h 7 20</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>St. Denys</td>
<td>h m 6 16</td>
<td>m h 5 18</td>
<td>m h 11 0</td>
<td>m h 7 58</td>
</tr>
<tr>
<td>10</td>
<td>S U N</td>
<td>20 Sunday after Trinity</td>
<td>h m 6 18</td>
<td>m h 5 16</td>
<td>m h 0 a 10</td>
<td>m h 8 42</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>Old Mich. Day. Oxf. T. beg.</td>
<td>h m 6 19</td>
<td>m h 5 14</td>
<td>m h 1 11</td>
<td>m h 9 32</td>
</tr>
<tr>
<td>12</td>
<td>T U</td>
<td>Least twilight</td>
<td>h m 6 21</td>
<td>m h 5 12</td>
<td>m h 2 21</td>
<td>m h 2 10 30</td>
</tr>
<tr>
<td>13</td>
<td>W</td>
<td>Tr. King Edw. Confessor</td>
<td>h m 6 23</td>
<td>m h 5 10</td>
<td>m h 2 42</td>
<td>m h 11 32</td>
</tr>
<tr>
<td>14</td>
<td>T H</td>
<td></td>
<td>h m 6 25</td>
<td>m h 5 8</td>
<td>m h 3 16</td>
<td>m h morn.</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>Jupiter rises 5.59 aft.</td>
<td>h m 6 26</td>
<td>m h 5 5</td>
<td>m h 3 44</td>
<td>m h 0 35</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td></td>
<td>h m 6 28</td>
<td>m h 5 3</td>
<td>m h 4 8</td>
<td>m h 1 40</td>
</tr>
<tr>
<td>17</td>
<td>S U N</td>
<td>21 Sun. after Trin. Etheldreda</td>
<td>h m 6 30</td>
<td>m h 5 1</td>
<td>m h 4 30</td>
<td>m h 2 44</td>
</tr>
<tr>
<td>18</td>
<td>M</td>
<td>St. Luke</td>
<td>h m 6 31</td>
<td>m h 4 59</td>
<td>m h 4 49</td>
<td>m h 3 49</td>
</tr>
<tr>
<td>19</td>
<td>T U</td>
<td></td>
<td>h m 6 33</td>
<td>m h 4 57</td>
<td>m h 5 8</td>
<td>m h 4 53</td>
</tr>
<tr>
<td>20</td>
<td>W</td>
<td></td>
<td>h m 6 35</td>
<td>m h 4 55</td>
<td>m h 5 28</td>
<td>m h 5 58</td>
</tr>
<tr>
<td>21</td>
<td>T H</td>
<td>Mars sets 6.7 aft.</td>
<td>h m 6 37</td>
<td>m h 4 53</td>
<td>m h 5 50</td>
<td>m h 7 4</td>
</tr>
<tr>
<td>22</td>
<td>F</td>
<td>Venus sets 6.19 aft.</td>
<td>h m 6 38</td>
<td>m h 4 51</td>
<td>m h 6 14</td>
<td>m h 8 9</td>
</tr>
<tr>
<td>23</td>
<td>S</td>
<td></td>
<td>h m 6 40</td>
<td>m h 4 49</td>
<td>m h 6 43</td>
<td>m h 9 15</td>
</tr>
<tr>
<td>24</td>
<td>S U N</td>
<td>22 Sunday after Trinity</td>
<td>h m 6 42</td>
<td>m h 4 47</td>
<td>m h 7 17</td>
<td>m h 10 20</td>
</tr>
<tr>
<td>25</td>
<td>M</td>
<td>Crispin</td>
<td>h m 6 44</td>
<td>m h 4 45</td>
<td>m h 8 0</td>
<td>m h 11 22</td>
</tr>
<tr>
<td>26</td>
<td>T U</td>
<td></td>
<td>h m 6 45</td>
<td>m h 4 43</td>
<td>m h 8 51</td>
<td>m h 0 a 19</td>
</tr>
<tr>
<td>27</td>
<td>W</td>
<td>St. Simon and St. Jude</td>
<td>h m 6 47</td>
<td>m h 4 41</td>
<td>m h 9 53</td>
<td>m h 1 9</td>
</tr>
<tr>
<td>28</td>
<td>T H</td>
<td>Mercury rises 5.15 morn.</td>
<td>h m 6 49</td>
<td>m h 4 39</td>
<td>m h 11 2</td>
<td>m h 1 52</td>
</tr>
<tr>
<td>29</td>
<td>F</td>
<td></td>
<td>h m 6 51</td>
<td>m h 4 37</td>
<td>m h morn.</td>
<td>m h 2 29</td>
</tr>
<tr>
<td>30</td>
<td>S</td>
<td></td>
<td>h m 6 53</td>
<td>m h 4 35</td>
<td>m h 0 19</td>
<td>m h 2 59</td>
</tr>
<tr>
<td>31</td>
<td>S U N</td>
<td>23 Sunday after Trinity</td>
<td>h m 6 54</td>
<td>m h 4 33</td>
<td>m h 1 38</td>
<td>m h 3 27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day descr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ☉'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 34</td>
<td>5 0</td>
<td>4m 9</td>
<td>7 a 31</td>
<td>h m 5 m 39</td>
<td>11 49 35</td>
<td>h m 8 m 6</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>19</td>
<td>18</td>
<td>19</td>
<td>32</td>
<td>48 4</td>
<td>0 a 45</td>
</tr>
<tr>
<td>11</td>
<td>10 55</td>
<td>39</td>
<td>26</td>
<td>7</td>
<td>24</td>
<td>46 43</td>
<td>5 22</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>58</td>
<td>35</td>
<td>56</td>
<td>17</td>
<td>45 34</td>
<td>9 22</td>
</tr>
<tr>
<td>21</td>
<td>17</td>
<td>17</td>
<td>43</td>
<td>46</td>
<td>10</td>
<td>44 40</td>
<td>0 m 10</td>
</tr>
<tr>
<td>26</td>
<td>9</td>
<td>58</td>
<td>36</td>
<td>37</td>
<td>3</td>
<td>44 2</td>
<td>4 8</td>
</tr>
</tbody>
</table>
### Notices and Historical Memoranda

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>Age</th>
<th>High Water Lond. Br.</th>
<th>Notices</th>
<th>Historical Memoranda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>9m 32</td>
<td></td>
<td>1. Hawkers' and Pedlars' licences granted.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>10 58</td>
<td></td>
<td>11. Bankers' licences granted.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>0 a 7</td>
<td></td>
<td>14. Dividends are payable. Fire Insurance due at Michaelmas must be paid on or before this day.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td>0 59</td>
<td></td>
<td>15. Quarter Sessions in this week.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>N</td>
<td>1 46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>3 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>3 56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>4 39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>6 5</td>
<td></td>
<td>6. Peace with America proclaimed, 1783.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>7</td>
<td>7 0</td>
<td></td>
<td>7. Peace of Aix-la-Chapelle, 1748.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>8</td>
<td>8 8</td>
<td></td>
<td>9. Eddystone Lighthouse completed, 1759.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>9</td>
<td>9 36</td>
<td></td>
<td>12. Columbus discovered St. Salvador, 1492.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>10 59</td>
<td></td>
<td>13. Napoleon I arrived at St. Helena, 1815.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>12</td>
<td>0 3</td>
<td></td>
<td>15. Battle of Hastings, 1066.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>13</td>
<td>0 48</td>
<td></td>
<td>16. Wm. Penn born, 1644.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>1 57</td>
<td></td>
<td>18. Battle of Leipsic, 1813.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>18</td>
<td>3 29</td>
<td></td>
<td>21. Lima destroyed by earthquake, 1687.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>19</td>
<td>3 59</td>
<td></td>
<td>22. Smollett died, 1771.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>20</td>
<td>4 30</td>
<td></td>
<td>23. Foote died, 1777.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>21</td>
<td>5 5</td>
<td></td>
<td>24. Chancer died, 1400.</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>24</td>
<td>7 42</td>
<td></td>
<td>27. John Locke died, 1704.</td>
<td></td>
</tr>
</tbody>
</table>

During this month the days decrease 53m. in the morning, and 1h. 5m. in the afternoon.

Moon in perigeo on the 5th day; apogee on the 18th.

*Venus and Mars* are in conjunction on the 6th, about which time these beautiful objects may be seen approaching the western horizon.

The superior planet *Neptune* is in opposition to the Sun on the 11th; the present month is therefore favorable for telescopic observation of this newly discovered planet.
### NOVEMBER, 1869.

#### LUNATIONS AND PHASES.

- **New Moon** ○ 3rd day, 11h. 35m. aftern.
- **First Quart.** □ 11th day, 2h. 56m. morn.
- **Full Moon** ○ 19th day, 7h. 18m. morn.
- **Last Quart.** □ 26th day, 6h. 14m. aftern.

#### M W D D

<table>
<thead>
<tr>
<th>Sun enters Sagittar.,</th>
<th>Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 M</td>
<td><strong>ALL SAINTS</strong></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>2 Tu</td>
<td>All Souls. Mich. Term begins</td>
<td>6 56</td>
<td>4 31</td>
<td>3 m 0</td>
<td>3 a 53</td>
</tr>
<tr>
<td>3 W</td>
<td></td>
<td>6 58</td>
<td>4 29</td>
<td>4 25</td>
<td>4 19</td>
</tr>
<tr>
<td>4 Th</td>
<td></td>
<td>7 0</td>
<td>4 28</td>
<td>5 49</td>
<td>4 45</td>
</tr>
<tr>
<td>5 F</td>
<td></td>
<td>7 1</td>
<td>4 26</td>
<td>7 13</td>
<td>5 16</td>
</tr>
<tr>
<td>6 S</td>
<td>Gunp. Plot, 1605. K. W. III</td>
<td>7 3</td>
<td>4 24</td>
<td>8 34</td>
<td>5 51</td>
</tr>
<tr>
<td>7 Sun</td>
<td>landed</td>
<td>7 5</td>
<td>4 22</td>
<td>9 50</td>
<td>6 31</td>
</tr>
<tr>
<td>8 M</td>
<td>24 Sunday after Trinity</td>
<td>7 7</td>
<td>4 21</td>
<td>10 58</td>
<td>7 19</td>
</tr>
<tr>
<td>9 Tu</td>
<td></td>
<td>7 9</td>
<td>4 19</td>
<td>11 56</td>
<td>8 16</td>
</tr>
<tr>
<td>10 W</td>
<td>Pr. WALES BORN 1841. Lord</td>
<td>7 10</td>
<td>4 18</td>
<td>0 a 42</td>
<td>9 18</td>
</tr>
<tr>
<td>11 Th</td>
<td>[Mayor's Day]</td>
<td>7 12</td>
<td>4 16</td>
<td>1 1910</td>
<td>22</td>
</tr>
<tr>
<td>12 F</td>
<td>St. Martin</td>
<td>7 14</td>
<td>4 15</td>
<td>1 5011</td>
<td>29</td>
</tr>
<tr>
<td>13 S</td>
<td>Jupiter sets 6.53 morn.</td>
<td>7 16</td>
<td>4 13</td>
<td>2 14 morn.</td>
<td>34</td>
</tr>
<tr>
<td>14 Th</td>
<td>Britius (Meteors)</td>
<td>7 17</td>
<td>4 12</td>
<td>2 35</td>
<td>0 34</td>
</tr>
<tr>
<td>15 F</td>
<td>25 Sunday after Trinity</td>
<td>7 19</td>
<td>4 10</td>
<td>2 56</td>
<td>1 38</td>
</tr>
<tr>
<td>16 S</td>
<td>Machutus</td>
<td>7 21</td>
<td>4 9</td>
<td>3 15</td>
<td>2 43</td>
</tr>
<tr>
<td>17 Tu</td>
<td>HUGH BISHOP OF LINCOLN</td>
<td>7 22</td>
<td>4 7</td>
<td>3 34</td>
<td>3 47</td>
</tr>
<tr>
<td>18 Th</td>
<td></td>
<td>7 24</td>
<td>4 6</td>
<td>3 55</td>
<td>4 53</td>
</tr>
<tr>
<td>19 F</td>
<td></td>
<td>7 26</td>
<td>4 5</td>
<td>4 18</td>
<td>5 59</td>
</tr>
<tr>
<td>20 S</td>
<td>Mars sets 5.24 aft.</td>
<td>7 28</td>
<td>4 4</td>
<td>4 45</td>
<td>7 5</td>
</tr>
<tr>
<td>21 Th</td>
<td>Edm. King and Martyr</td>
<td>7 29</td>
<td>4 2</td>
<td>5 18</td>
<td>8 13</td>
</tr>
<tr>
<td>22 F</td>
<td>26 Sun. after Trinity, Cr. Prs.</td>
<td>7 31</td>
<td>4 1</td>
<td>5 58</td>
<td>9 17</td>
</tr>
<tr>
<td>23 S</td>
<td>St. Cecilia [PRUSS. B. 1840]</td>
<td>7 33</td>
<td>4 0</td>
<td>6 47</td>
<td>10 17</td>
</tr>
<tr>
<td>24 Th</td>
<td>St. Clement</td>
<td>7 34</td>
<td>3 59</td>
<td>7 45</td>
<td>11 10</td>
</tr>
<tr>
<td>25 F</td>
<td>Venus sets 6.50 aft.</td>
<td>7 36</td>
<td>3 58</td>
<td>8 51</td>
<td>11 55</td>
</tr>
<tr>
<td>26 S</td>
<td>Mich. Term ends. Catherine</td>
<td>7 37</td>
<td>3 57</td>
<td>10 3</td>
<td>0 a 32</td>
</tr>
<tr>
<td>27 Th</td>
<td></td>
<td>7 39</td>
<td>3 56</td>
<td>11 21</td>
<td>1 2</td>
</tr>
<tr>
<td>28 F</td>
<td>Advent Sunday</td>
<td>7 40</td>
<td>3 55</td>
<td>11 21</td>
<td>1 2</td>
</tr>
<tr>
<td>29 S</td>
<td>Mercury rises 7.0 morn.</td>
<td>7 42</td>
<td>3 55</td>
<td>0 40</td>
<td>1 56</td>
</tr>
<tr>
<td>30 Tu</td>
<td>ST. ANDREW</td>
<td>7 43</td>
<td>3 54</td>
<td>1 59</td>
<td>2 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ∘'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m s</td>
<td>h m</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>7</td>
<td>16</td>
<td>8</td>
<td>19</td>
<td>19</td>
<td>2 a 13</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>33</td>
<td>16</td>
<td>13</td>
<td>46</td>
<td>44</td>
<td>6 35</td>
</tr>
<tr>
<td>16</td>
<td>45</td>
<td>49</td>
<td>23</td>
<td>7</td>
<td>42</td>
<td>44</td>
<td>10 7</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>39</td>
<td>46</td>
<td>1 m 13</td>
</tr>
<tr>
<td>26</td>
<td>18</td>
<td>16</td>
<td>36</td>
<td>5 59</td>
<td>37</td>
<td>47</td>
<td>5 41</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>11 m 7</td>
<td>6 a 19</td>
<td>9 m 53</td>
<td>5 a 47</td>
<td>4 a 47</td>
<td>7 m 44</td>
<td>10 m 5</td>
<td>6 a 19</td>
</tr>
<tr>
<td>13</td>
<td>11 24</td>
<td>6 30</td>
<td>9 52</td>
<td>5 30</td>
<td>3 56</td>
<td>6 48</td>
<td>9 24</td>
<td>5 36</td>
</tr>
<tr>
<td>25</td>
<td>11 26</td>
<td>6 52</td>
<td>9 49</td>
<td>5 19</td>
<td>3 6</td>
<td>5 52</td>
<td>8 44</td>
<td>4 54</td>
</tr>
</tbody>
</table>

**NOTICES AND HISTORICAL MEMORANDA.**

**NOTICES.**

1. All Saints, or All Hallows. The Stock Exchange is closed on this day, unless otherwise specially ordered by the Committee for General Purposes. Also a holiday at the Stock Offices, Bank of England.

10. Borough Councillors elected.

5. High spring tides.

9. Mayors and Aldermen of boroughs elected.


16. Attorneys’ Certificates granted.

**METEORS.**

13. The earth will pass the orbit of the November Meteors on the 13th at about 8 o’clock in the evening, when the recurrence of these phenomena may be expected. The meteors will apparently ascend like distant rockets from the eastern horizon; but they will be enfeebled as to brilliancy by the light of the Moon, then near the meridian.

**HISTORICAL MEMORANDA.**


4. Colley Cibber died, 1671.

15. Thomas Parr (Old Parr) died, 1635.

23. Perkin Warbeck hanged, 1499.


During this month the days decrease 50m. in the morning, and 39m. in the afternoon.

Moon in perigee on the 2nd; apogee, 14th; perigee, 30th.

Mercury may be seen in the mornings about the 5th.

Jupiter is in opposition to the Sun on the 8th.

Venus may be seen near to the small star η Sagittarii about the 21st, soon after sunset.
### DECEMBER, 1869.

Sun enters Capricorn.

#### LUNATIONS AND PHASES.

- **New Moon**: 3rd day, 10h. 41m. morn.
- **First Quar.**: 10th day, 11h. 12m. aftern.
- **Full Moon**: 18th day, 11h. 50m. aftern.
- **Last Quar.**: 26th day, 2h. 33m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>PR. WALES BORN 1844</td>
<td>h</td>
<td>m</td>
<td>7 46</td>
<td>3 52</td>
<td>4m 43</td>
</tr>
<tr>
<td>2</td>
<td>TH</td>
<td>Saturn sets 4.26 aft.</td>
<td>h</td>
<td>m</td>
<td>7 48</td>
<td>3 51</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Saturn sets 4.26 aft.</td>
<td>h</td>
<td>m</td>
<td>7 49</td>
<td>3 51</td>
<td>7 24</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>2 Sunday in Advent</td>
<td>h</td>
<td>m</td>
<td>7 50</td>
<td>3 51</td>
<td>8 38</td>
</tr>
<tr>
<td>5</td>
<td>SUN</td>
<td>2 Sunday in Advent</td>
<td>h</td>
<td>m</td>
<td>7 52</td>
<td>3 50</td>
<td>9 42</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>Nicholas</td>
<td>h</td>
<td>m</td>
<td>7 53</td>
<td>3 50</td>
<td>10 34</td>
</tr>
<tr>
<td>7</td>
<td>TU</td>
<td>Conception Virgin Mary</td>
<td>h</td>
<td>m</td>
<td>7 54</td>
<td>3 49</td>
<td>11 16</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Jupiter sets 4.45 morn.</td>
<td>h</td>
<td>m</td>
<td>7 55</td>
<td>3 49</td>
<td>11 51</td>
</tr>
<tr>
<td>9</td>
<td>TH</td>
<td>Jupiter sets 4.45 morn.</td>
<td>h</td>
<td>m</td>
<td>7 56</td>
<td>3 49</td>
<td>0 a 18</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>Jupiter sets 4.45 morn.</td>
<td>h</td>
<td>m</td>
<td>7 58</td>
<td>3 49</td>
<td>0 41</td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>3 Sunday in Advent</td>
<td>h</td>
<td>m</td>
<td>7 59</td>
<td>3 49</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>SUN</td>
<td>3 Sunday in Advent</td>
<td>h</td>
<td>m</td>
<td>7 59</td>
<td>3 49</td>
<td>1 21</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>Lucy</td>
<td>h</td>
<td>m</td>
<td>8 0</td>
<td>3 49</td>
<td>1 40</td>
</tr>
<tr>
<td>14</td>
<td>TU</td>
<td>EMBER WEEK</td>
<td>h</td>
<td>m</td>
<td>8 1</td>
<td>3 49</td>
<td>1 58</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>Camb. Term ends. O! Sap.</td>
<td>h</td>
<td>m</td>
<td>8 2</td>
<td>3 49</td>
<td>2 21</td>
</tr>
<tr>
<td>16</td>
<td>TH</td>
<td>Oxford Term ends</td>
<td>h</td>
<td>m</td>
<td>8 3</td>
<td>3 49</td>
<td>2 46</td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>Mars sets 5.11 aft.</td>
<td>h</td>
<td>m</td>
<td>8 4</td>
<td>3 49</td>
<td>3 16</td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>Mars sets 5.11 aft.</td>
<td>h</td>
<td>m</td>
<td>8 4</td>
<td>3 49</td>
<td>3 54</td>
</tr>
<tr>
<td>19</td>
<td>SUN</td>
<td>4 Sunday in Advent</td>
<td>h</td>
<td>m</td>
<td>8 5</td>
<td>3 50</td>
<td>4 40</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>St. THOMAS. Shortest day</td>
<td>h</td>
<td>m</td>
<td>8 6</td>
<td>3 50</td>
<td>5 37</td>
</tr>
<tr>
<td>21</td>
<td>TU</td>
<td>St. THOMAS. Shortest day</td>
<td>h</td>
<td>m</td>
<td>8 6</td>
<td>3 51</td>
<td>6 41</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>Venus sets 7.54 aft.</td>
<td>h</td>
<td>m</td>
<td>8 7</td>
<td>3 51</td>
<td>7 54</td>
</tr>
<tr>
<td>23</td>
<td>TH</td>
<td>Venus sets 7.54 aft.</td>
<td>h</td>
<td>m</td>
<td>8 7</td>
<td>3 52</td>
<td>9 10</td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>Venus sets 7.54 aft.</td>
<td>h</td>
<td>m</td>
<td>8 8</td>
<td>3 52</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>CHRISTMAS DAY</td>
<td>h</td>
<td>m</td>
<td>8 8</td>
<td>3 53</td>
<td>11</td>
</tr>
<tr>
<td>26</td>
<td>SUN</td>
<td>1 Sun. aft. Christ. St. Stephen</td>
<td>h</td>
<td>m</td>
<td>8 8</td>
<td>3 54</td>
<td>morn.</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>St. JOHN EVANGELIST</td>
<td>h</td>
<td>m</td>
<td>8 8</td>
<td>3 55</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>TU</td>
<td>INNOCENTS</td>
<td>h</td>
<td>m</td>
<td>8 8</td>
<td>3 55</td>
<td>2 24</td>
</tr>
<tr>
<td>29</td>
<td>W</td>
<td>Mercury sets 4.28 aft.</td>
<td>h</td>
<td>m</td>
<td>8 9</td>
<td>3 56</td>
<td>3 44</td>
</tr>
<tr>
<td>30</td>
<td>TH</td>
<td>Mercury sets 4.28 aft.</td>
<td>h</td>
<td>m</td>
<td>8 9</td>
<td>3 57</td>
<td>5 2</td>
</tr>
<tr>
<td>31</td>
<td>F</td>
<td>Silvester</td>
<td>h</td>
<td>m</td>
<td>8 9</td>
<td>3 58</td>
<td>6 16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at O's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
<td>h</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>28</td>
<td>5</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>57</td>
<td>37</td>
<td>48</td>
<td>5</td>
<td>55</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>44</td>
<td>52</td>
<td>55</td>
<td>5</td>
<td>56</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>46</td>
<td>48</td>
<td>56</td>
<td>58</td>
<td>38</td>
<td>58</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td>50</td>
<td>59</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
DECEMBER, 1869.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11m23</td>
<td>7a05</td>
<td>9m45</td>
<td>5a15</td>
<td>2a40</td>
<td>5m25</td>
<td>8m24</td>
<td>4a32</td>
</tr>
<tr>
<td>13</td>
<td>11</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>51</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>10</td>
<td>37</td>
<td>9</td>
<td>20</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>C’s age</th>
<th>High Water Lond. Br.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>0 a 9</td>
<td>21. Winter Quarter begins.</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>1 0</td>
<td>25. Christmas Day.</td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>1 50</td>
<td>27. Stock Exchange closed on this day, unless otherwise specially ordered by the Committee of General Purposes.</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2 35</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3 19</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>5 27</td>
<td>2. Napoleon I crowned, 1804.</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>6 12</td>
<td>3. Flaxman died, 1827.</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>7 0</td>
<td>4. Cardinal Richelieu expired, 1642.</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>7 55</td>
<td>6. Rhode Island taken, 1776.</td>
</tr>
<tr>
<td>13</td>
<td>10</td>
<td>10 10</td>
<td>10. First gold from Australia, 1851.</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>morn.</td>
<td>13. Dr. Johnson died, 1784.</td>
</tr>
<tr>
<td>16</td>
<td>13</td>
<td>0 7</td>
<td>14. General Washington died, 1799.</td>
</tr>
<tr>
<td>17</td>
<td>14</td>
<td>0 48</td>
<td>— The Prince Consort died, 1861.</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>1 28</td>
<td>16. Cromwell made Protector, 1653.</td>
</tr>
<tr>
<td>21</td>
<td>18</td>
<td>3 23</td>
<td>24. Robin Hood died, 1247.</td>
</tr>
<tr>
<td>22</td>
<td>19</td>
<td>4 3</td>
<td>— Vasco de Gama expired, 1525.</td>
</tr>
<tr>
<td>23</td>
<td>20</td>
<td>4 45</td>
<td>— Peace between England and America, 1814.</td>
</tr>
<tr>
<td>24</td>
<td>21</td>
<td>5 29</td>
<td>25. Sir Matthew Hale died, 1676.</td>
</tr>
<tr>
<td>25</td>
<td>22</td>
<td>6 19</td>
<td>— Jas. Hervey, divine, died, 1758.</td>
</tr>
<tr>
<td>26</td>
<td>23</td>
<td>7 12</td>
<td>27. Jno. Wilkes expired, 1797.</td>
</tr>
<tr>
<td>27</td>
<td>24</td>
<td>8 17</td>
<td>— Dr. Hugh Blair died, 1800.</td>
</tr>
<tr>
<td>28</td>
<td>25</td>
<td>9 27</td>
<td>— Joanna Southcott died, 1814.</td>
</tr>
<tr>
<td>29</td>
<td>26</td>
<td>10 36</td>
<td>29. Lord Stafford beheaded, 1680.</td>
</tr>
<tr>
<td>30</td>
<td>27</td>
<td>11 45</td>
<td>— Dr. Mavor died, 1837.</td>
</tr>
<tr>
<td>31</td>
<td>28</td>
<td>0 a 42</td>
<td>30. Royal Society instituted, 1660.</td>
</tr>
</tbody>
</table>

NOTICES.

HISTORICAL MEMORANDA.

From the 1st to the 21st the days shorten 20m. in the morning, and 2m. in the afternoon.

Moon in apogee on the 12th day; perigee on the 27th.

*Venus* is an Evening Star during the month; and is at her greatest *eastern elongation* on the 14th.

*Jupiter* is an Evening Star during the month.

*Uranus* will be in *opposition* to the Sun on the 5th of January, 1870, and is therefore now favorable for telescopic observation.
JEWISH CALENDAR.

The 5659th Jewish Year, ends September 6, 1869.

1869

Jan. 13, 1st of SEBAT.
Feb. 12, 1st of ADAR.
24, 13th of ditto.—Fast of Esther.
25, 14th of ditto.—Purim.
26, 15th of ditto.—Second Day.
Mar. 13, 1st of NISAN.
27, 15th of ditto.—PASSOVER.
28, 16th of ditto.—Second Day.
Apr. 12, 1st of YAR.
May 11, 1st of SIVAN.
16, 6th of ditto.—Pentecost.
17, 7th of ditto.—Second Day.
June 10, 1st of TAMUZ.
27, 18th of ditto.—Fast; Taking of Jerusalem.
July 9, 1st of AB.
18, 10th of ditto.—Fast; Destruction of the Temple.
Aug. 8, 1st of ELUL.

1869

Sept. 6, 1st of TISRI. (Year 5660 begins.)
7, 2nd of ditto.—Second Day.
8, 3rd of ditto.—Fast of Gedaliah.
15, 10th of ditto.—Fast of Expiation.
20, 15th of ditto.—Feast of Tabernacles.
21, 16th of ditto.—Second Day.
26, 21st of ditto.—Last Day of the Festival.
27, 22nd of ditto.—Feast of the 8th Day.
28, 23rd of ditto.—Rejoicing of the Law.

Oct. 6, 1st of HESHVAN.
Nov. 5, 1st of KISLEV.
29, 25th of ditto.—Dedication of the Temple.
Dec. 5, 1st of TEBET.
14, 10th of ditto.—Fast; Siege of Jerusalem.

1870, Jan. 3, 1st of SEBAT.

MAHOMETAN CALENDAR.

Employed in Turkey, Persia, Arabia, &c., and by Mahometans at Gibraltar.

Year 1285 of the Hegira began April 24, 1868; ends April 13, 1869.

1868. Dec. 16, 1st day of RAMADÁN.
Feb. 13, " " Duluwayda.
Mar. 15, " " Dukhejja.
Apr. 13, (Yr. 1286) 1st of MUKHARRAM.
May 18, 1st day of Safar.
June 11, " " Rabia I.

1869. July 11, 1st day of Rabia II.
Aug. 9, " " Jumada I.
Sept. 8, " " Jumada II.
Oct. 7, " " Rajab.
Nov. 6, " " Sha’abán.
Dec. 5, " " Ramadán.

CHRONOLOGICAL CYCLES, ETC.

Dominical Letter ... ... ... C Solar Cycle ... ... ... ... ... 2
Golden Number ... ... ... ... 8 Number of Direction ... ... ... ... ... 7
Epact ... ... ... ... 17 Julian Period ... ... ... ... ... 6582
Sundays after Trinity ... ... ... 26 Roman Indiction ... ... ... ... ... 12

ECCLESIASTICAL FEASTS.

Shrove Sunday ... ... Feb. 7 Holy Thursday ... ... ... May 6
Mid-Lent Sunday ... ... March 7 Whit Sunday ... ... May 16
Easter Day ... ... March 28 Trinity Sunday ... ... May 23
Rogation Sunday ... ... May 2 Advent Sunday ... ... Nov. 28

THE TIDES.

In the Calendar placed upon the foregoing pages, we have given only the time of the primary high water, or that which depends upon the moon’s coming to the south; having omitted the column for the secondary high water (depending upon the moon’s being on the opposite part of the meridian). The time of the secondary high water, however, may always be found with sufficient accuracy by taking the midway between any day’s high water and that of the following day. Thus, on the 25th of August, the afternoon high water will be about 4h. 12m., half way between the morning full tides of August 25th and 26th.

The column given in this Almanack is computed for just above London Bridge.
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Crest.

1. To the Winter Aconite. By Miss Helen Ogden, Shaw.

Bold winter shrill, o’er dale and hill,
Attunes his trumpet horn,
While thou, bright gem, on lowly stem,
Shrink’st not the coming storm.
Thy kindred may, with summer’s day,
Assume a higher crest;
His ardent noon enhance their bloom
To glow upon his breast.
But thou art seen, in golden mien,
To sport thy little day
When all is drear, and nature sere
Droops ’neath the chilling ray;
Bright lowly star, like hope afar,
Can cheer the passing hour
When grief and pain, like winter rain,
Their gloomy influence pour.


Can England’s ears be turn’d away
When wailing notes are heard,
Or truth and honour rest at home—
Should tyrant’s name be feared?
The British troops have safely pass’d—
By gallant Napier led—
Magdala’s rugged crested rocks,
O’er Jiddo’s stony bed;

To rescue those beloved at home,
To enforce the nation’s law,
And show the might of British power
With terror to the foe,
Now Victory’s sound at length is heard
Triumphant o’er the waves;—
Time honoured song, long waited for,
“No Britons shall be slaves.”


Once more dear Di, my hand I try,
Though humbly, ’tis contest;
But yet your prize, stript of disguise,
I think must be a crest.

Though you like me may hopeless be,
Since death has ta’en your best,
With mind and will, we’ll try our skill,
Still to sustain your crest.
4. **By Dr. Rutherford, Charlton.**

In classic strains friend Hewitt rears his **crest**;
With figured shade he strives it to invest;
His sweetly flowing lines all must admire,
Enriched with eloquence and fervent fire.

5. **By Mr. Joseph Hutchinson, Halifax.**

Accept my thanks, sir, for your prize,
With brevity express'd;
And thanks to Hewitt who supplies
**Diarians with a crest.**

6. **To the author of the Prize Enigma. By Mr. Joseph Furniss, Lois Weedon.**

All hail, thou vet'ran bard!                      And long we hope they may,
How many a pleasant song,                       And as happily express—
Both witty, pithy, prime, and good,             And as talented and clever
Of thine hath charmed us long:                   As thy present glowing **crest.**

7. **By Mr. T. T. Wilkinson, of Burnley, Lancashire.**

Proudly and high above the rest,
Poetic Hewitt rears his **crest.**

8. **By Mr. Thomas Wray, Market Weighton.**

Some men in search of dying fame,
Can take no rest;
An epanulette—a coronet,
A star upon the breast;
When after all an honest name's
The noblest **crest.**

9. **Hero and Leander. By Mr. F. A. Escott, Greenwich.**

Parting from his Hero lingeringly,
Leander leaps into the frothy sea;
Against the crested waves he strives,—in vain,
He's ne'er to see his native land again.
Poor **crest**-fallen Hero where they parted stands,
Divining mischief, weeps and wrings her hands;
Learning his fate, from off the rocky **crest**,
She plunges in to be with him at rest.

10. **By Beta, Kingston-upon-Hull.**

The Hexham bard in varied guise
Has cloth'd his interesting "**Prize,""
Yet through the veil the **crest**'s reveal'd
Of billow, mount, and battle-field.
GENERAL ANSWERS TO THE ENIGMAS.


1. To the Editor. By Miss Helen Ogden, Shaw.

Though thirty changeful years have pass'd away,
One generous muse I still remember
* Whose all-inspiring ever witty lay
   Classed her with Di a fav'rite member,
A boon desired—to see the mystic page
Enlarg'd to meet the wishes of her throng,
And give to all who might with verse engage
A space more ample for each genial song.
The gift bestow'd, each ardent vot'ry strove
   Her tow'ring crest with chaplets to adorn,
And through her ever peaceful classic grove
   In strains harmonious tun'd the vocal horn.

Though life's dark shadows frequently might cast
In turn on all their sad and gloomy ray,
And anxious care with withering blast
Bestrew with briers its devious way,
They, still devoted to thy sacred shrine,
   Where consolation's healing balm was found,
In soft and sympathetic strains divine
   Each sought to heal another's bleeding wound.
Though many lov'd and cherish'd names are gone,
   No more to circle in our mystic throng,
Fond memory lingers o'er each gifted one,
   Who like the swan in dying tun'd their song.

Survivors still at present may be found
Constant and true to her instructive page,
Who, 'mid the cares that daily life surround,
   Deem it a pleasure yearly to engage.

With bushes still of bright and vernal hue,
   With stripes as fair and dazzling to behold,
With pinks as sweet and beautiful t'view,
   While bag and pack their treasures rich unfold.

Then why curtail the long extended range
Where we have roam'd in fancy at our will,
A sacred medium of kind interchange,
   Our friendly offerings yearly to instil.

Perched up in quarters close confined,
Strict brevity the watchword and the cry,
Our harmless popularity consigned
   In dull, oblivious, gloomy shades to lie;—

* Miss Winifred Waveston, see 'Ladies' Diary,' 1836.
Oh! no, dear sir, I humbly here entreat
You not to sever those who take their stand
Beside her altar with their annual treat,
A social, friendly, and united band.

2. To my Wife on the Anniversary of our Wedding Day, January 23rd, 1869.

By Mr. James Hewitt, Hexham.

'Tis thirty years ago, dear wife,—
Just thirty years to-day,—
Since you and I, made one for life,
Set out on wedlock's way.

How proud I led you from the church!
No shadow in my sky;
The mavis, singing on the perch,
Not happier was than I.

And thou wert happy too I ween,
No doubting tears were there,
For hope portrayed a cheering scene
Of prospects bright and fair.

Proud mammon's style I envied not,
For thou wert all to me;
Our quarters were the humble cot,
Our pleasures light and free.

The blushling rose, nor lily fair,
Thy features could outvie;
The violet, in blank despair,
Hid from thy bright blue eye.

On garden seat, beneath the bush,
Thy work-bag by thy side;
How would my youthful feelings gush,
To own a husband's pride!

I looked upon that "plain gold ring,"
My heart beat wild and high,

As, silent, spoke the glittering thing,—
"Responsibility."
The squire might cheer his pampered pack,
To snatch the fleeting game;
Or, panting in ambition's track,
Seek senatorial fame.

We sighed not for their stores of wealth,
Nor grudged their gaudy crest;
Content with competence and health,
No cares disturbed our rest.

Unvarying bliss is not for man,
And clouds have dimm'd our way,—
Vicissitudes are heaven's plan,
As night succeeds the day.

The pledges of our mutual love,
Heaven claimed an equal share;
But those it left have ever strove
To lighten grief and care.

Let wants's sigh for other arms,
Ours was no transient flame,
And though age steals all youthful charms,
Our hearts are still the same.

Maintain we still earth's chequered race
In constancy and love;
And when to others we give place,
Renew our vows above.


Beneath the shadow of a tree,
One sultry day in June,
A pedlar rested with his pack,
And humm'd a merry tune.
The birds sang perched above his head,
The flowers grew around,
Says he—what a jolly life is mine,
No happier can be found,

With my bag well stored with dainty goods,
To please the ladies fair,
And colours bright, both pink and striped,
My quarters anywhere;
Beneath a bush I can lie me down,
No sorrow to break my rest,—
Can dream away in the happy hours,
Of fame and a noble crest.

4. The Smitten Bachelor's Plaint.

By Mr. Thomas Harrison, Abbey Holme, Carlisle.

Alack a-day! "What ails this heart o' mine?"
Whence comes this listlessness that saps my health?
I court not honours, neither do I pine
For Solon's wisdom, nor Peabody's wealth,
GENERAL ANSWERS TO THE ENIGMAS.

To friends, I all but cry—Avant, begone!
Tho’ modesty were graven on her brow,
There’s scarce a maiden fair, or fading one,
Demure and chaste, that I would listen to.
Erst could I rove to hear the song-bird’s lay,
Blithe caroll’d to the morn from sapling green;
At eve, where brooks meander’d would I stray,
Now, naught delights.—I sit and nurse my spleen.
O had I nursed, instead, a prattling child,
To liep its tender accents on my knee!
Dark thoughts, sad train, had vanished as it smiled:
“This, it should seem, was not reserved for me.”

I’ve made a miss, yet saw it not till now—
The answers I’ve arranged from the wrong end;
For my unsettled state you must allow,
No heart I have the blunder to amend.
Ye who would learn the cause of my despair,
Know, in this breast there burns a hopeless flame,
Fed by sweet strains from one of talents rare,
Called—may, I may not here divulge her name.

5. The Acceptance.* By Dr. Rutherford, Charlton.

Dear sir, your invitation kind
Just suits my recreative mind;
I’ll take you at your word with joy,
And all my powers to please employ.
But see the yacht is in good trim,
That nothing’s slender—nothing slim;
No shadow show in our tight craft,
Else I’d as soon perch on a raft.
Then let us pack our stores with care,
And put ourselves in good repair,
From roof to the foundation low,
Pink cap, striped coat down to the toe.
A bag for use—a brush to rub;
Remember we must have some grub;
And slip a wee drop in the bottle,
For we are not just quite teetotal.
On some fine morn rise with the lark,
And on our cruise with speed embark;
Tri-colour hoist—red, white and blue,
Haul up the anchor with the screw,
Set sail and sniff the salt sea breeze,
Snug in our quarters sit at ease.
Now though I’d like to see a Spartan,
As well as gillie in checked tartan,
Yet southward we must steer straight on,
Till round the Cape we reach Ceylon;—
There for a while let us remain,
Try popularity to gain;

* See the ‘Lady’s and Gentleman’s Diary’ for 1868, p. 33.
GENERAL ANSWERS TO THE ENIGMAS.

That we may pass some pleasant hours,
Get pearls and spices, fruit and flowers;
And ramble round old Adam's peak;
For aromatic bushes seek.
Thence to Australia shape our course,—
I really think we might do worse,—
There fill the yacht's neat little hold
With nuggets big and bright as gold.
Thus freighted turn towards the line,
Whilst wind and weather both are fine;
And should we meet with crested wave,
Or foaming billow, we would crave
Divine protection in the storm,
That we might safe our trip perform;
That all our efforts Heaven would bless,
And make our voyage a sure success.

6. To Mr. R. C.—an old Diarian.
By Mr. Joseph Hutchinson, Halifax.

Dear sir, right glad was I when, on
Your friendly note receiving,
I found, that though from Dia "gone"
For years, you still were living.
But why, dear sir, have you allow'd
Your mystic muse to slumber?
You who Diaria once was proud,
Among her bards to number.

No shadow of excuse I think,
No fame or favour lacking,
Nor themes, with perch and stripe and pink,
And bush and bag to pack in.
Then come again with honour'd crest,
And though we have new starters,
Our Editor will do his best,
To find you pleasant quarters.

7. By Mr. James Bartram, Sherburn, near Scarborough.

Di's enigmas to name, an attempt I make now,
First Mr. A. Smith gives us shadow and show;
Then Edwards a perch where the roosters may sit,
Tho' Furniss's stripe rather tickles a bit;
Then Wray at Redruth gives you quarter, but hush,
Hutchinson—a pink, and then Herdson a bush;
Then list to the doctor and Burrington's clack,
The one with a bag and the other a pack;
While Ogden the fair 's popularity's guest,
And Hewitt with honours emblazons his crest.

8. By "Zig Zag."

A shadow marks the course of time,
Which here I cannot trace;
Or give to perch or stripe a rhyme,
With only quarter space.

Yet pink and bush and bag I'll try
To pack in with the rest;
Though not for popularity,
Nor yet with fallen crest.


In snug quarters ensconc'd, no stripes do I fear
With the pink of perfection, my wife, sitting near,
And dear little Harry perch'd up on his chair;
All shadow's dispers'd—all sorrow and care:
Of such treasure possessed, no fame I desire,
No bag of the miser—no pack of the squire,
For I'm happier far than a proud crested lord
With bushels of gold, and estates rich and broad,
GENERAL ANSWERS TO THE REBUSES AND CHARADES.

1. By "Edipus."

Lamented Hope a swan-like strain upraises,
To sing our fair Miss Helen Ogden’s praises.
Hewitt his mystic train next introduces,
And in the rain and air it displays its uses.
And Herdson next mutations strange rehearses,
And tells them truly in no lisping verses.
Now Burrington his naught brings in with spirit,
Exciting notice by its headless merit.
Next Elliott, under mystical appliance,
Points out our Brooks, a worthy son of science.
And Hutchinson reminds us how, if nourished,
A sapling oft to greatest size has flourished.
The Cawley’s Laddie seems long time to tarry,
Ere lady chaste he ventures for to marry:
Yet perhaps Amanda’s waiting but to know him,
Herself with all her beauties to endow him:
Perhaps she’ll Harrison’s avaunt disown,
Nor persevere, like aunts, to “bloom alone.”
Peabody’s name, with “Zig Zag” we admire:
May many to a kindred fame aspire!
With Tebay, too, it must as truth be reckoned,
That Solon’s name’s to no Athenian second.
With Wray as guide we can but end in sorrow,
An omen threatens evil on the morrow.

2. By Mr. James Hewitt, Hexham.

“The soul of wit is brevity,”
Dundreary’s simper long;
And who would court longevity
If “all the great die young?”
But though all like publicity,
Except the knife and thief,
’Tis now a stern necessity,
Quoth Woolhouse, to be brief.
Well! half a leaf will do for me,—
’Tis little for a “swell,”—
And then I’ve something nice, ’ye see,
The editor to tell.

Miss Helen Ogden, tother day,
Came tripping by the train;
’Twas her first visit, and she may,
You know, never come again.
But, sir, she risps not like a “Miss,”
Her lips I love to hear;
Her words slip out gib as a kiss!—
Naught outré,—witty, clear.

Said she, “ain’t Brooks a clever chap?”
But, now, no sapling he;
So chaste his language, and each step
Bespeaks his modesty.”
“Avant!” said she, “vain fops and fools,
Don’t Peabody you please?”
Philanthropist sans husks or hulls,
The essence of sweet peas!”
“He’s not a Solon, lack-a-day!
We’ve plenty wise men now,
Heaven send us who like him display,
As charity avow.”

We’re boundage, pillage, hermitage,
And many “ages!” more;
The Weighton wight’s a (Wira)yelled sage,
His riddle!—what a bore!
You’ll tell Miss Ogden what I’ve said?
Well! if she angry seem,
Just whisper, “he’s a random blade,—
’Tis but a poet’s dream.”
3. By Mr. Thomas Edwards, Lois Weedon.

Alack-a-day, 'tis nearly May,
And I have not had time
To write to "Di," but I must try
And string her themes in rhyme.
Miss Helen Ogden, she comes first,
Then train and rain and air,
Now swop and slip, and naught and aught
More rebuses declare.
Next by a brook we onward pass,
And there a sapling spy,
Then chaste and haste, and seat and east,
And then comes modesty.
George Peabody's kind, gen'rous deeds
May justify our praise.
And Solon, too, was much esteemed,
We find, in bygone days.
Alack-a-day, dear Mr. Wray,
I this would have you know, sir,
Your mystic theme at first did seem
To all of us a poser.

4. By "Zig Zag."

To Helen Ogden I shall leave
The writing of a lengthy strain,
And merely doss what I conceive,
Without a saunt—is clear and plain.

Alack-a-day! I've naught for one—
But saunt, modesty, and chaste,
Are clear as brooks, and following on,
Solon and Peabody are traced.

LIST OF POETICAL ANSWERS.

Bainbridge, Thomas, Fore Street, Stanhope, ans. all.
Barrett, Michael, Well Bash, Wigton, Cumberland, ans. all.
Barthram, James, Sherburn, near Scarborough, ans. all.
Bell, Geo. J., jun., 11, Elswick Lane, Newcastle-upon-Tyne, ans. all.
Hanna, Kingston-upon-Hull, ans. all.
Betts, William, 23, Parliament Street, Hull, ans. all.
Campbell, William, jun., Tow Law Iron Works, Durham, ans. all.
Cleo, of Hexham, ans. Prize Enigma.
Edwards, Thomas, Lois Weedon, ans. all.
Elliott, J., Park Head, Stanhope, ans. all.
Escott, F. A., 4, Royal Hill, Greenwich, ans. all.
Furniss, Joseph, Lois Weedon, Towcester, ans. all.
Grey, John, Barrington School, Weardale, ans. all.
Grice, George, Wild Newton Hall, Ganton, York, ans. all.
Harrison, Thomas, Abbey Holme, Carlisle, ans. all.
Hattam, Thomas, Pulmonary Light, Lighthouse, ans. all.
Herbert, James, The Grange, Edinburgh, ans. Prize Enigma.
Heslop, Joseph, Lillawood, Northumberland, ans. all.
Heslop, Thomas G., Allendale, Northumberland, ans. all.
Heslop, William, Clifton Street, Brighten, ans. all.
Hewitt, Miss Isabella, Hexham, ans. Prize Enigma.
Hewitt, James, of Hexham, ans. all.
Hughes, Thomas, F.S.A., 2, Grove Terrace, Chester, ans. all.
Hutchinson, Joseph, Halifax, ans. all.
Mickleborough, the Rev. James, Ashill, Ilminster, ans. all.
Milburn, Thomas, Riding Mill, Newcastle-on-Tyne, ans. all.
Novitius, ans. all.
Oedipus, ans. all.
Ogden, Miss Helen, Shaw, near Oldham, ans. all.
Prettejohn, Robert Proude, Medical Hall, Torquay, ans. all.
Ridgeway, Sir, Dr., Charlton, ans. all.
Scorer, Alexander, Grainger Villa, Elswick, Newcastle-upon-Tyne, ans. all.
Smith, Miss M., Ampleforth, near York, ans. all.
Somerscales, Thomas, Hull, ans. all.
Watson, Stephen, Haydonbridge, Northumberland, ans. all.
Wray, Thomas, Market Weighton, ans. Prize Enigma.
Zig Zag, ans. all.
NEW ENIGMAS.

I. Enigma (1511); by Mr. William Campbell, jun., Durham.

I am narrow, broad, low, and high,
Down in the rocks, up in the sky,
Where’er you go you’ll surely find,
If not before, that I’m behind.
I may be right, I may be wrong,
I’m sometimes short, and sometimes long;
Whether you’re rich, whether you’re poor,
One you possess I’m very sure.
And I can say without a doubt,
I must be found ‘ere I’m found out;
Now, my dear friends, just one hint more,
Two you may find at your front door.

II. Enigma (1512); by Mr. Thomas Wray, Market Weighton.

When the wonderful mixture of water and land
Became separated at Heaven’s command,
I was, but not viewly, till earth’s barren clod,
In green garb was clad by the power of God.
My shape, I confess, is short, dumpy, and stout,
Yet when I’m unveiled you’ll quickly make out
That I’m slender and elegant, graceful, unique;
But if ’tis my colour you are wishful to seek,
I’m red, brown, or tawny, and grizzled likewise,
Yet, look at the rainbow which spans the blue skies;
I can boast of its colours and many more too,
For whiteness I’m famous, and ebon’s my hue.
My clothing’s as soft as the ermine doth wear,
Yet coarse as the badger, and rough as the bear.
You ask for my dwelling? Where orange-trees bloom,
And orient spices shed forth their perfume;
Wher’er lordly man hath fixed his abode,
Or fierce tiger prowls through the jungle abroad.
I live in the ocean as well as on land,
The famed Paganini has had me in hand.
Tho’ often caressed, yet I’ve had to feel
Pain through the contact of sharp, shining steel.
Yet, even the ladies will shelter my form
From the hot rays of summer or wintry storm.

III. Enigma (1513); by Amanda.

Diarian bards friendly, I come to tease,
Shirking a prologue, I plunge in medias res:
New in design, behold me made with art,
Fashioned to bear with you my devious part;
Formed for your comfort and your daily use,
To me you owe a gratitude profuse.
Dackd out with lace and sometimes e'en with gold,
A beauteous object you'll in me behold,
Worthy a place where England's fairest throng,
In graceful curves do waft themselves along.
Should fortune frown, from high life I must fall,
And at the lowly cottage make my call,
To please its inmates with my welcome form,
My sole design—to keep them dry and warm.
How oft with smiling face may I be seen,
Crossing at early morn the dewy green;
Enveloped in a glossy sable coat,
(An almost constant friend I here may note).
But what my mission at that early hour?
A walk commenced ere ope's the folded flow'r.
Would that my tongue could speak my woes to tell;
And on its own ill usage likewise dwell;
I would quickly state my journey o'er the dales,
Is but to carry sundry bones and nails.
Sad to relate, as grievous to be borne,
I'm pressed and tortured till I grind your corn;
Yet, to this day I've been to man a friend,
And at his will my stubborn soul I bend.
Snuff do I take? To answer I'll not flinch:
Doubtless to many I have given a pinch.

IV. Enigma (1514); by Mr. Thomas Edwards, Lois Weedon.

I cannot boast of excellence or worth,
Or say who formed me first or when I'd birth;
It might be Jabel's sons for ought I know,
But sacred history does not tell us so.
I am well known to those who dwell in tents,
And some might date my origin from thence,
Or it might be the favour'd patriarch
Required my aid when he prepared the ark;
But be that as it may, I here must own,
To many artizans, I'm now well known.
The shipwright, wheelwright, and the joiner, he
Could not at times quite well dispense with me;
St. Crispin's votaries too well know my aid,
For seldom boots without me are well made.
My use is such I can't say whether
I am mostly used in wood or leather;
Perhaps, in your wardrobe, ladies, I've a place,
In church or chapel you my form may trace.
If now my features you would like to know,
'Tis doubtful whether I my face dare show.
In various shapes I often may be found,
I may be short or long, sometimes I'm round,
But Dr. Johnson, in his 'Lexicon,'
Describes me neither square nor hexagon.
The sturdy farmer, he well knows my name,
Within his stable oft a place I claim.
I may have been my owner’s boast and pride,
On me to market he may safely ride;
Just take this closing hint Diarian bards,—
I’m oft in close companionship with cards.

V. Enigma (1515); by Mr. F. A. Escott, Greenwich.

The charms of beauty, though by all esteemed,
Can ne’er as worthy of regard be deemed
As plain utility; for ’tis too true
That useless things are beauteous oft to view:
Although I’m often brightly known to shine,
And though the richest colours, too, are mine,
Yet my intrinsic worth’s the reason why
I’m prized by all,—including Lady Di.
When she in wintry season doth appear
With all her wit, her wisdom, and good cheer,
I come with her, and she would truly be
Most strangely incomplete if without me.
Though humble, I’m to all a trusty friend,
And at each bidding willingly attend;
When you have aught to hide from prying eyes,
Or treasures to protect from prowling spies,
You seek my aid; for, in a lock and key
You know there is no safety without me.
Housekeepers, chemists, others too, well know
That many things their preservation owe
To me alone; to guard from damp and dust,
And such like things, in me they safely trust.
See yonder family assembled round
The well-spread table with abundance crowned,
The grace is said, the guests expectant sit,
And when the dinner’s brought, I come with it.
But am I welcome? Nay! I fear not so,
They only are too glad to see me go.
And this vile treatment I so oft receive,
Most truly have I ample cause to grieve.
I’ve told you of my colours rich and bright,
Yet I am sometimes seen as black as night;
But dark or gay, of this there is no doubt,
Warmth I diffuse, and bitter cold keep out.
Forget not this! your knowledge, used aright,
May oft be useful on a winter’s night.

VI. Enigma (1516); by the Rev. J. J. Wray, Exeter.

Ladies and gents, myself I introduce
At once to you, nor stay to make excuse.
Please to permit me, though, to take a seat,
For difficult it is to keep my feet;
NEW ENIGMAS.

I'm often very much inclined to lie,
Though up above your heads you've seen me fly,
A thing of beauty; gracefully I rise
Before the watcher's quick, admiring eyes.
No longer on the wing, I stoop to earth,
From thence, indeed, my elements had birth:
With you at dinner table I appear,
Look round for me, for I am surely there.
Shall I confess it? Well, I love the flagon,
a constant habitué of the Green Dragon;
Indeed I've much to do, O sin and shame!
In making men and women what I am.
Go, watch the folly of a country fair,
And I shall surely your attention share;
There gaping crowds in holiday attire
See me and laugh, and wonder and admire.
Not only laughter can I draw but tears,
Produced by pain or sympathetic fears.
When winter stern sends forth the biting frost,
And streams ice-covered may be safely crossed,
I'm often seen upon the treacherous floor,
My place, so humble, could not well be lower,
Unless, indeed, the crystal floor give way,
And then, of course, I'm gone from light of day.
When Raleigh wrote on window or on wall—
"Fain would I climb, but yet I fear to fall,"
'Tis very clear, at least, to those who see,
He had no good opinion of me.

VII. ENIGMA (1517); BY ŒDIPUS.

Diarians, may I venture to entreat,
Among your learned mysteries a seat?
Long ere my story hastens to an end,
You will not fail to recognise a friend.
When you a liability incur,
And to the sequence afterwards demur,
What form than mine can furnish more delight,
Tho' in a sombre shape it greet your sight?
Yet with no pleasure oft is heard my ban,
By erring servant maiden, or your man.
Forget not, O Diarians, the line,
"To err is human, to forgive divine!"
To penitence a ready hearing lend,
And ever mercy with your justice blend.
But tho' in spheres domestic I've a place,
It is not always to inflict disgrace.
The veteran soldier, tired of war's alarms,
The prospect of my advent mostly charms:
Forward he looks, the term of service past,
To gain his pension, and myself at last.
When the Grand Jury, in our courts of law,
Pronounce: "No bill!"—or when there seems a flaw
In evidence before the common jurymen,
I mostly play my part;—and also when
The thundering cannons utter forth their voice,
Or when the nations quarrel or rejoice,
I am the cause thereof: nay, ne'er
Rushes the arrow or the shot in air,
But my assistance, be you sure, was there.
Reader, whene'er you pay your Christmas bill,
Ere that the money settles in the till,
Take heed (excuse the good advice) and see
The Queen's loved image and moreover me.

VIII. Enigma (1518); by Dr. Rutherford, Charlton.

Young as the morning of each fleeting day,—
Fresh as the dew-drop hanging on the spray,—
Bold as the lion in his shaggy mane,
I come—all nature in my numerous train.
Then, what am I? A thing of highest worth,
Exceeding all the products of the earth?
Or trifling as a toy—scarcely worth a thought?
Yet 'tis a truth, I never can be bought:
I'm priceless as the morning's dawning rays;
Unpurchaseable as the moon's mild gaze.
In fashionable life I'm gaudy—gay;
Friend to another friend will me convey.
As time rolls onward,—year succeeds to year,
A few short years and time will disappear.
At some recurring anniversary see,
The glowing—grateful smile that plays on me;
Both young and old—the rich and poor betray
The pleasure felt when I come in their way.
The voices of the distant and the dead,
Are heard in silence as their works are read;
Doubtless they me possessed, and did employ
Their talents to increase the general joy.
Men love to speak the worth of other men;
True genius is the theme of many a pen;
My best achievements interest impart;
Divine my source, I renovate the heart.
And yet the lowest of the human race,—
The veriest vagrant shows me in his face.
At school or college where the stripling youth
Receives instruction in the ways of truth,
The welcome season of repose and rest,
Awakes fresh vigour in his hopeful breast;
Rewardede with a prize, he stands erect,
And in due form receives it with respect,
Then bows his thanks and bears it to his place,
While blushing honours mantle in his face.
NEW ENIGMAS.

Congratulating friends round me repair;
Of their laudations I receive my share.
But can the tongue of man rehearse my praise,
Or voice of highest angel ever raise
A fitting anthem in the courts above,
To show my worth, or my high value prove?
Dear friends, for me received let all rejoice;
Express their gratitude with thankful voice;
No obligation ever can attach to me,
I lose my very name unless I'm free.

IX. ENIGMA (1519); by Miss HELEN OGDEN, Shaw.

Why should we look with an unfriendly eye
Upon the fav'rites of an age gone by?
Do not the pages of the past unfold
A treasure equal to the finest gold?—
Then why refuse the antiquated string
That may to all unmixed pleasure bring.
Ancient am I, 'tis ages since my name
At first appeared upon the rolls of fame;
Who was my parent I can-not explain—
Perchance the offspring of offending Cain;
For ere the fountains of th' mighty deep
Were broken up with dreadful force, to sweep
A sinful world before th' avenging hand
Of Him who form'd it, at His high command;
Or whether in that awful scene 'twas mine
To be preserv'd, I cannot here define.
Nor doth it much avail, since I was found,
In after years, with monarchs much renown'd,
A fav'rite object of their regal choice,
Charm'd by the pow'r of my inspiring voice;
For such the nature of my soothing pow'r,
'Tis said I comfort brought in sorrow's hour;
Yea, quell'd the anguish of one troubled breast,
And hush'd his agonizing fears to rest;
While to another, blest with gifts sublime,
I lent my aid to form the song divine.
Ages have roll'd along, and still I'm found
Where highest rank and dignity abound;
Emblazon'd forth in heraldry you'll see
A high distinction is assign'd to me;
The gay saloon, where splendour reigns around,
May sometimes boast 'tis with my presence crown'd,—
The chosen fav'rite of some gifted fair,
Whose kind attentions I may freely share.
While in the annals of a noted race,
You may for me a fond affection trace;
Yet not to pomp or state confined am I,
In humble walks you may my fame espy.
But leaving earth to view the heav'nly throng,
I there am found the starry orbs among;
For sages skill’d in scientific lore, maintain
I form a portion of the sparkling train,
That shed their splendour on the gloom of night,
In matchless order, beautiful and bright.
But here to all I bid a kind adieu,
For long ere this my name you’ll surely view.

X. Prize Enigma (1520); by Mr. James Hewitt, Hexham.

Primeval night o’er ancient chaos hung,
Nor Phæbus smiled, nor Nature found a tongue
To chant her praise, when troubles gave me birth,
Deep in the bowels of the aching earth;
The records of the rocks these truths attest,
For ‘midst their dim arcana still I rest,
Nor ‘midst Time’s iron footprints shall you see
One more indelible than I may be.
Where hoary peaks invade the ethereal sky,
Or dens where savage forms delight to lie;
Where fierce volcanoes belch the living flame,
Eternal snows, too, oft reveal my name;
My form, perchance, lurks ‘neath the briny deeps,
Or, wrapt in Etna’s ashes, calmly sleeps.
But not to earth alone do I belong,
I’m oft agape amidst the gaping throng;
My features hideous, wheresoever found,
Scorned by the great, I with the poor abound;—
Oft with the good of old, ’twas mine to show
The depths of poverty, distress, and woe.
When Korah, Dathan, and Abiram fell,
Was I not there?—let holy records tell:
Or Reuben sought the pit with troubled mind,
In anxious hopes the abandoned boy to find;
Joseph was not, but witness of his grief;
There too was I, in me he found relief.
And when the prophet from the monarch fled,
Nor would invoke a blessing on his head,
For disobedience hurled from high estate,
In me, behold the symbol of his fate!—
Even now, you’ll find, I flourish far and wide—
Lank poortith’s bane, fat Dives’ hope and pride.
Mark Mammon’s minion at the polished board,
Of men austere,—more haughty than his lord,
He gloats o’er me; or should I fail to appear,
He’ll threaten doom relentless and severe,
Or thankless snatch me from the trembling thrall,
Needless though I might be his “little all.”
Yet, ’midst the scenes of everchanging time,
Stands one event o’er all the rest sublime,
When He who drank for man sin’s bitter cup,
Was like the brazen serpent “lifted up”—
Nature appalled in darkness veiled her face,
And, tranced with terror, held her breath a space;
Through all her veins a chilling tremor ran,
As pardon's stream flowed free for guilty man;—
Searce the last words the heavenly sufferer said,
And meekly bowed in death his guiltless head,
When I, to ratify the dread decree,
Proclaimed the Gentile as the Hebrew free.

NEW CHARADES, REBUSES, &c.

1. Rebús; by Mr. James Hewitt, Hexham.

To forests wild my whole resorts,
Would greedy man but leave me there;
But in his gravest, gayest courts,
He sighs for honours I confer.

Behead, transpose, behold a slave,
Condemned to toil, in murk, and gloom;
Curtail me now, and last you have
What oft has proved my living tomb.

2. Charade; by Mr. Joseph Hutchinson, Halifax.

In battle-field when front to front,
Contending armies bear the brunt,
My first is in the fray;
If e'er with quantities perplex'd,
You gents may measure with my next,
Or with my total weigh.


Hearken to me! ah, you don't understand,
And in truth it is not surprising;
Behead and transpose and now you can hear
More coherent sounds uprising.
Transpose me again, ah, that is a sound
Heard too often the wide world round.

4. Charade; by Mr. F. A. Escott, Greenwich.

My primal is often produced by a blow,
My next will include our relations, you know;
My whole is a rustic, honest no doubt,
But may equally well be described as a lout.

5. Rebús; by Mr. Joseph Hutchinson, Halifax.

My whole we do when flights of fancy seize us,
And often, too, when abstruse subjects teaze us—
Such as I am—when headless my condition,
And just revers'd—with one slight transposition.
6. Charade; by Mr. James Hewitt, Hexham.

My first, for ages dangerous reckoned,
Was ne'er so deadly as my second;
If rightly you conjoin the two,
I tell what every man should do.

7. Rebus; by Mr. James Herdson, Edinburgh.

So vast my amount, fills the mind with dismay!
Behead me, and thus take a thousand away;
Reverse what remains, and, I'll daily dispense
To thousands, the gifts of a kind Providence.

8. Charade; by Mr. Thomas Hughes, F.S.A., Chester.

My first,—yes, I'll straightway confess it,—
'Tis a hundred to one if you guess it.
But what shall I say of my second?
Just half of a title 'tis reckoned.
My third has a personal status,
A lady, indeed, may await us.
"Good for naught," without aids or abettors,
My whole is made up of odd letters.

9. Rebus; by Mr. F. A. Escott, Greenwich.

Whether backwards or forwards I'm read
Matters to me not a bit;
I am gentle and light, and transposed
Am ever ready and fit.

10. Charade; by Oedipus.

My first presents an honoured female name,
But lovingly abbreviated:
My next a man's, and treated just the same.
Now, if this couple were but mated,
And to the altar duly led,
To be my whole which might be said?

11. Rebus; by Mr. Joseph Hutton, Cumberland.

An animal tired of his kind,
Being just inclined to go astray;
One slightly changed came up behind,
And surely then it flew away.

12. Charade; by "Zig Zag."

My first, my second, and my whole,
Are every one the same
In point of meaning, each and all,
An oft repeated name.
I. Query: by the late Rev. John Hope, Stapleton.

What part of speech is the to which forms our infinitive mood?

Answered by Mr. James Hewitt, Hexham.

Dr. Johnson calls the particle to of our infinitive mood an adverb; Lindley Murray calls it a preposition. Other, more “rough and ready” grammarians, get over the difficulty by telling us, “the two together may be called the infinitive!” The last, though very convenient perhaps, is withal but a slovenly apology for a “definition.” Either the first or the second position may be correct, for, as added to a verb, to becomes an adverb; and, as placed before a noun, it becomes a preposition. I should, however, prefer the first, that of Johnson, as it preserves the verbal character of the root. Perhaps the more correct way is to distinguish the particle to simply as a modal sign, necessitated by the inflexibility of our Saxon language, and arising either from some original defect therein, or from some loss, or other verbal change, during the several mutations which the Teutonic tongue has undergone in passing from one country to another, or being amalgamated with native or aboriginal languages.

Again, by Mr. Thomas Hattam, Falmouth Lighthouse.

In Walker’s Dictionary the word to is both an adverb and a preposition: an adverb when coming between two verbs, and noting the second as the object of the first; a preposition when noting motion towards a place—opposed to from.

II. Query: by Mr. H. Harrington, London.

What is Poetry?

Answered by Mr. Septimus Tebay, Rivington.

This question has been asked a thousand times, and has received as many answers, and perhaps more. Milton has defined it in a single line:

“Thoughts that voluntary move harmonious numbers.”

Verse is the vehicle of poetry, not the poetry itself; the poetry existed in the poet’s brain before it was cast into verse.

“The rank is but the guinea stamp:
The man’s the gold for a’ that.”

Since there are but two kinds of composition, poetry and prose, perhaps an idea of both may be formed by separating one from the other. Prose contemplates but one idea; in poetry ideas fly double. Prose deals with the reality; poetry expresses that reality in a fancied form, as—

“See how the moonlight sleeps upon this bank.”

Sleeps is the poetical embodiment of the reality: the moon shines, is prose; the light is separate from the moon, and fancy makes it sleep. Fancy and imagination are the twins of poetry, but imagination is the first-born, and comes—

“Winged with red lightning and impetuous rage.”

A fair idea of poetry may be formed from such examples as these. We add one or two more from nature’s truest poet.

“Night’s candles are burnt out, and jocund day
Stands tiptoe on the misty mountain’s top.”

“But look, the morn, in russet mantle clad,
Walks o’er the dew of yon high eastern hill.”

Here imagination begets the thought; fancy clothes it in a russet mantle; the whole expressed in harmonious numbers, is poetry.

Second Answer, by Mr. James Hewitt, Hexham.

A correct definition of the word poetry has been often attempted, even by poets themselves, and yet all have fallen short of a true definition—the poet cannot define his art!—for there is still a void in these “definitions,” which no one seems competent to fill. Poetry is sometimes styled the “music of composition,” and as such bears the same relation to prose that singing
does to speaking, and dancing to walking. Dancing has indeed been termed the "poetry of
motion," from its undulating movements, I presume, or the grace and variation of its steps.
These peculiarities, however, more closely correspond to rhythm. Poetry has again been
said to consist of the "choicest ideas clothed in the choicest language." This, though some-
what vague, is perhaps as near the mark as any, and hence we must look for the true
"poetry" in the thought, as much as in the diction. Coleridge, with his usual profundity,
says, "Poetry is not the antithesis to prose, but to science. Poetry is opposed to science and
prose to metre. The proper and immediate object of science is the acquisition of truth;
the proper and immediate object of poetry is the communication of pleasure. Poetry com-
municates to the reader that pleasurable emotion, that peculiar state and degree of excitement
which arises in the poet himself in the act of composition." True poetry appears to consist
in the creation of sublimely ideal scenes, events, objects, incidents, &c., and depicting their
features in the most gorgeous colours, pleasing aspects or relationships, conveyed to the
mind of the reader in the most exciting, glowing, or pleasing and elegant diction, so as to
lead his thoughts captive, and either thrilling him with excitement or enrapturing him with
pleasurable emotions, as beautifully expressed by Gray:

"As his hands the lyre explore,
Where bright-eyed fancy hovering o'er,
Scatters from her pictured urn
Thoughts that breathe, or words that burn."

An answer agreeing in substance with the above was given by Mr. Thomas Hattam, Ful-
month Lighthouse.

III. QUERY; by Mr. Artemas Martin, Venango, U.S.

Who was Cain's wife?

Answered by Mr. Artemas Martin, the Proposer.

The written history of the world, from the creation to the flood, a period of more than
fifteen hundred years, is very brief, being comprised in six short chapters. Hence, only such
events were recorded by the sacred historian as would be of vital importance to succeeding
generations.

The only place in the Holy Scriptures that I can find containing any mention of Cain's
wife is in the fourth chapter of Genesis. "And Cain went out from the presence of the
Lord, and dwelt in the land of Nod, on the east of Eden. And Cain knew his wife, and she
conceived, and bare Enoch: and he built a city, and called the name of the city after the
name of his son Enoch." (Gen. iv. 16, 17.)

Josephus says, speaking of the banishment of Cain by the Almighty, "He also cast him,
together with his wife, out of that land. * * * * And when Cain had travelled over
many countries, he with his wife, built a city named Nod, which is a place so called, and
there he settled his abode, where he also had children."

Neither of these writers says a word about who Cain's wife was, but from the facts in the
case my conclusion is that she was a sister.

Answers agreeing with the above were likewise given by Mr. Thomas Hattam, Fulmonth, and
Mr. George Robinson, St. John's College, Cambridge. Mr. Robinson also states that "there
is an ancient tradition that Adam had thirty-three sons and twenty-seven daughters."

Again, by Mr. James Hewitt, Hexham.

The subject of this query is one of peculiar difficulty, and one which, by our present light,
can never in my humble opinion be satisfactorily solved. All Bible commentators that I have
perused, who have made any attempt at a solution, are driven to the conclusion that, as a
matter of necessity, the sons of Adam and Eve married their sisters; and without altogether
discarding the "ancient faith," I cannot see how it is possible to arrive at any other con-
clusion. The editor of the 'Alnwick Journal,' in the number for last May, says, in answer to a
correspondent, "The name 'Mahala' occurs as that of Cain's wife in a sentimental volume,
etitled the 'Death of Abel,' which was once very popular. But it is unnecessary to say that
it is not any authority on the subject." To say that he married Miss Gorilla, and origi-
nated the Dahomey dynasty, would certainly be a bold stroke, but scarcely beyond the scope
of the "Darwinian theory," or even the gaping scepticism of the present day! Thank heaven
this question involves no "essential point of faith."

IV. QUERY; by Mr. James Hewitt, Hexham.

Required the origin of the words "illuminations" and "illustrations," as applied to manu-
scripts, &c., and the precise meaning they were intended to convey?
Caligraphists, at a very early period, resorted to pictorial initial letters, and other means of ornamenting the productions of their pen; and many very beautiful ancient manuscripts are still extant which evince the high perfection to which the art of "illuminating" had attained, more especially in combination with the ease and seclusion of the cloister, where taste had its full swing, and time was regarded as a thing of very little consequence, in comparison with the beautifying of their religious documents, the development of the art itself, or the value of the manuscript when completed. I have long been of opinion that "illuminations," which appear to have been but a continuation, modification, and artistic development of the picture writing of a still earlier period, a combination in fact of the hieroglyphic, or rather iconographic, and calligraphic styles of communicating thought, in general had in view the double object of both instructing and pleasing, by throwing light—as the name seems to imply—on the subject matter of the books or other documents in which the art was introduced, as well as demonstrating the taste and ability of the scribe himself, and also ministering to his own private gratification. To "illuminate" to enlighten, to adorn—and to "illustrate"—to brighten with light, to elucidate—are clearly synonymous terms, as applied in the sense indicated in the query. There is this very proper and obvious, as well as very convenient, distinction, however, that, as applied to art, the former is strictly referable to embellishments achieved by hand, and the latter to those supplied by "plates" and "cuts," impressions from the productions of the engraver's brain. Since the query was published, I have been very agreeably surprised to find that my opinion respecting the origin and use of illuminations, coincides with that of no less an authority than the late Sir Walter Scott, who makes one of his characters (in 'Ivanhoe'), while endeavouring to escape from prison in the disguise of a monk, excuse his ignorance of Latin by confessing that he was guided in his devotions to the prayers and their subject matter chiefly by the "illuminations."

Again, by Mr. Thomas Hattam, Falmouth Lighthouse.
The term illuminated seems to be derived from the use of minium for a red colour by the artists. Hence called miniatures or illuminators. This kind of bibliographical luxury was not unknown to the ancients, and the art of illumination appears to have been practised by the monks. The Dioscorides, in the library of Vienna, and the celebrated copy of Virgil, in the Vatican at Rome, both of which are supposed to date back so far as the fourth century, are believed to be the oldest examples of illuminated manuscripts extant.

V. Query; by Mr. Thomas Hattam, Falmouth Lighthouse.
What is the origin of the terms "Whig" and "Tory."

Answered by Mr. Artemas Martin, Franklin, United States.
The term "Whig" appears to be of Scotch origin, and is derived from the Anglo-Saxon "Wwag," whey.
The Scottish Covenanters used whey as a beverage, and the name "whig" was applied to them.
Some think it is contracted from "whigam," a term used in Scotland in driving horses. A driver of horses was called a "Whigamore." In 1648, a party of these people marched to Edinburgh to oppose the king and the Duke of Hamilton; and hence the name of whig was given to the party opposed to the court.
According to others, it is from the initial letters of "We hope in God," as a motto of the club from which the whig party took its rise.
"Tory" is said to be an Irish word, denoting a robber or a savage; or from "torc," give me (s. c. your money).
In the seventeenth century, in the reign of Charles I or II, great contests existed respecting the royal prerogatives and the rights of the people. Those who supported the king in his high claims were called torics, and the advocates of popular rights were called whigs.
'The New American Cyclopaedia,' says:—"The word tory first occurs in English history in 1579, during the struggle in parliament occasioned by the introduction of the bill for the exclusion of the Duke of York from the line of succession, and was applied by the advocates of the bill to its opponents as a title of obloquy or contumely."
Similar in substance were the answers by Mr. James Hewitt, Hexham, and Mr. George J. Bell, jun., Newcastle-on-Tyne.

VI. Query; by the same.
What is the cause of the baneful qualities of the east wind?

Answered by Mr. Thomas Dobson, Hexham.
The east wind is found to be baneful when it comes from a great continent, as in Great
NEW QUERIES.

Britain, but not so when it proceeds from an ocean, as on the eastern sea-board of the United States, of Australia, New Zealand, &c. Its baneful effects on animal and vegetable life in Britain are due to the great and sudden change which it causes, from a usually moist insular, to an extremely dry and chilling continental climate. The prevailing westerly winds bring the warm vapours of the Atlantic over Britain, and make warmth and moisture to be the normal conditions of our climate—conditions to which all animal and vegetable life in our isles is necessarily habitually adapted. An east wind of a few days' duration completely changes our climate, and produces the same effect on a person as would his sudden removal to the middle of a cold, dry continent. The extreme dryness of our east wind chills the surface of the body by rapid evaporation, closes the pores of the skin, and gives a sudden check to insensible perspiration, the source of many diseases of the respiratory organs. Its drying power is often manifested in spring by the scorched appearance of the tender foliage of the rose-bush and thorn.

Second Answer, by Mr. James Hewitt, Hexham.

The cold easterly winds, which prevail during the spring months, are the greatest drawbacks to our British climate. As the sun approaches the vernal equinox, his influence becomes more sensibly felt in our high latitudes; and hence, owing to a greater rarefaction of the atmosphere taking place in the zones north of the equinoctial line than during our winter, when the sun is in the tropic of Capricorn—these winds, as it were, follow the course of the sun, and hence their direction is accounted for, by their being drawn from the cold arctic regions towards the equator, to supply the vacuum there created. Now, these winds, previously to passing over us, must necessarily cross the snowy wastes of Siberia, the stagnant swamps of Tartary, or the bleak steppes of Russia, and they inevitably become charged with the deleterious malaria of those inhospitable regions, and disseminate the baleful gases as they become more rarified in their passage through the temperate zones,—that is, in the atmospheric strata of Europe—the ameliorating influence of the narrow northern seas, over which they pass, being insufficient to disperse their deleterious aspersities. The winds from the points of the compass directly opposite to those mentioned above, in passing over warmer countries, or through milder atmospheres, become desiccated, and hence absorb immense quantities of moisture from the wide oceans which they traverse, and, therefore, our most copious and fruitful rains are from south and west, as well as from intervening points of the compass.

A like answer was given by Mr. James Wilson, Southampton.

Third Answer, by Mr. John Moore, Allendale Town, Northumberland.

My opinion is, that the baneful quality of the east wind is occasioned by the daily rotation of the earth from west to east; the same tending, undoubtedly, to compress or intensify the quality of coldness in the atmosphere.

I. QUERY; by Mr. Thomas Hattam, Falmouth Lighthouse.  
When and how did the custom originate of blessing persons when they sneeze?

II. QUERY; by Mr. John Grey, Westgate, Weardale.  
What is the derivation of the word swankey as applied to small beer?

III. QUERY; by Mr. James Herdson, Edinburgh.  
What is the reason that infants, scarcely a week old, are sometimes observed to smile?

IV. QUERY; by Mr. J. Jackson, of Sheffield.  
Was Elijah fed by ravens, as stated in Scripture, or in some other way?

V. QUERY; by Mr. Artemas Martin, Franklin, United States.  
What kind of fish was the “whale” that swallowed Jonah?

VI. QUERY; by the same.  
When, and by whom, was the magnetic needle invented?
TABLE OF THE KINGS AND QUEENS OF ENGLAND SINCE THE CONQUEST.

<table>
<thead>
<tr>
<th>Kings and Queens</th>
<th>Born A.D.</th>
<th>Crowned</th>
<th>Reigns ended</th>
<th>Age</th>
<th>Where Buried</th>
</tr>
</thead>
<tbody>
<tr>
<td>William Conquer.</td>
<td>1066 Dec. 25</td>
<td>1087 Sept. 9</td>
<td>60</td>
<td>Caen, Normandy</td>
<td></td>
</tr>
<tr>
<td>William Rufus</td>
<td>1066 Aug. 2</td>
<td>1100 Aug. 2</td>
<td>43</td>
<td>Winchester</td>
<td></td>
</tr>
<tr>
<td>Henry I</td>
<td>1088 Aug. 5</td>
<td>1135 Dec. 1</td>
<td>67</td>
<td>Reading</td>
<td></td>
</tr>
<tr>
<td>Stephen</td>
<td>1105 Dec. 25</td>
<td>1154 Oct. 25</td>
<td>49</td>
<td>Faversham</td>
<td></td>
</tr>
<tr>
<td>Henry II</td>
<td>1154 Dec. 19</td>
<td>1189 July 6</td>
<td>56</td>
<td>Fontevraud</td>
<td></td>
</tr>
<tr>
<td>Richard I</td>
<td>1157 Sept. 3</td>
<td>1199 April 6</td>
<td>43</td>
<td>Fontevraud</td>
<td></td>
</tr>
<tr>
<td>John</td>
<td>1165 May 27</td>
<td>1216 Oct. 19</td>
<td>51</td>
<td>Worcester</td>
<td></td>
</tr>
<tr>
<td>Henry III</td>
<td>1207 Oct. 28</td>
<td>1272 Nov. 16</td>
<td>65</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Edward I</td>
<td>1239 Aug. 19</td>
<td>1307 July 7</td>
<td>67</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Edward II</td>
<td>1284 July 8</td>
<td>1337 Jan. 20</td>
<td>53</td>
<td>Gloucester</td>
<td></td>
</tr>
<tr>
<td>Edward III</td>
<td>1313 Feb. 1</td>
<td>1377 June 21</td>
<td>65</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Richard II</td>
<td>1366 July 16</td>
<td>1399 Sept. 29</td>
<td>33</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Henry IV</td>
<td>1367 Oct. 13</td>
<td>1413 Mar. 20</td>
<td>46</td>
<td>Canterbury</td>
<td></td>
</tr>
<tr>
<td>Henry V</td>
<td>1389 April 9</td>
<td>1422 Aug. 31</td>
<td>33</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Henry VI</td>
<td>1421 Nov. 6</td>
<td>1461 Mar. 4</td>
<td>39</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>Edward IV</td>
<td>1442 June 28</td>
<td>1483 April 9</td>
<td>41</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>Edward V</td>
<td>1471 July 7</td>
<td>1485 Aug. 22</td>
<td>42</td>
<td>Leicester</td>
<td></td>
</tr>
<tr>
<td>Edward III</td>
<td>1483 July 7</td>
<td>1485 Aug. 22</td>
<td>42</td>
<td>Leicester</td>
<td></td>
</tr>
<tr>
<td>Queen Mary</td>
<td>1553 Nov. 30</td>
<td>1558 Nov. 17</td>
<td>42</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Queen Elizabeth</td>
<td>1559 Jan. 15</td>
<td>1603 Mar. 24</td>
<td>49</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>James I</td>
<td>1566 July 25</td>
<td>1625 Mar. 27</td>
<td>58</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Charles I</td>
<td>1600 Feb. 2</td>
<td>1649 Jan. 30</td>
<td>48</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>Charles II</td>
<td>1630 April 23</td>
<td>1685 Feb. 6</td>
<td>54</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>James II</td>
<td>1665 April 12</td>
<td>1688 Dec. 11</td>
<td>67</td>
<td>Paris</td>
<td></td>
</tr>
<tr>
<td>William III</td>
<td>1650 April 11</td>
<td>1702 Mar. 8</td>
<td>51</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Mary I</td>
<td>1602 Dec. 18</td>
<td>1694 Dec. 18</td>
<td>90</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>Queen Anne</td>
<td>1661 Apr. 23</td>
<td>1714 Aug. 1</td>
<td>49</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>George I</td>
<td>1660 July 29</td>
<td>1727 June 11</td>
<td>67</td>
<td>Hanover</td>
<td></td>
</tr>
<tr>
<td>George II</td>
<td>1683 Oct. 11</td>
<td>1760 Oct. 25</td>
<td>77</td>
<td>Westminster</td>
<td></td>
</tr>
<tr>
<td>George III</td>
<td>1738 Sept. 22</td>
<td>1820 Jan. 29</td>
<td>82</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>George IV</td>
<td>1762 July 19</td>
<td>1830 June 26</td>
<td>68</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>William IV</td>
<td>1765 Sept. 8</td>
<td>1837 June 20</td>
<td>72</td>
<td>Windsor</td>
<td></td>
</tr>
<tr>
<td>Victoria</td>
<td>1819 June 28</td>
<td>Whom God preserve</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The reign of each succeeding Sovereign of course commenced with the day of his accession to the throne on the death of his immediate predecessor, the date of which is shown in the fourth column of the above Table. It was not until the reign of Elizabeth that the principle, that “the king never dies,” was admitted. That of hereditary right, clearly, from the accession of Edward I.

Maud, the sixth child of Henry II, married Henry, surnamed the Lyon, Duke of Brunswick, who was the ancestor of the present Royal Family of England.

The three longest reigns were those of Henry III, Edward III, and George III. The reign of George III, being 59 years, 3 months, and 7 days, was 3 years longer than that of Henry III, and 8 years longer than that of Edward III.
THE QUEEN AND ROYAL FAMILY.

THE QUEEN.—Victoria, of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, was born May 24, 1819; succeeded to the throne June 20, 1837, on the death of her uncle, King William IV.; crowned June 28, 1838, and married Feb. 10, 1840, to his Royal Highness Prince Albert of Saxe-Coburg, who died Dec. 14, 1861. Her Majesty is the only daughter of his late Royal Highness Edward Duke of Kent, son of King George III.


H.R.H. ALICE MAUD MARY, b. April 25, 1843; m. July 1, 1862, Prince Louis of Hesse.


H.R.H. LOUISA CAROLINE ALBERTA, b. March 18, 1848.

H.R.H. ARTHUR WILLIAM PATRICK ALBERT, b. May 1, 1850.

H.R.H. LEOPOLD GEORGE DUNCAN ALBERT, b. April 7, 1853.

H.R.H. BEATRICE MARY VICTORIA FEDORE, b. April 14, 1857.

PRINCES AND PRINCESSES.

George Frederick Alexander Charles Ernest Augustus, K.G., Duke of Cumberland (Ex-King of Hanover), cousin to her Majesty, b. May 27, 1819; m. Feb. 18, 1843, Princess Mary of Saxe-Altenburg.

Augusta Wilhelmina Louisa, Duchess of Cambridge, niece of the Landgrave of Hesse, b. July 25, 1797; m., in 1818, the late Duke of Cambridge, by whom she has issue.


Augusta Caroline Charlotte Elizabeth Mary Sophia Louisa, cousin to her Majesty, b. July 19, 1822; m. June 28, 1843, Frederick, Grand Duke of Mecklenberg-Strelitz.

Mary Adelaide Wilhelmina Elizabeth, cousin to her Majesty, b. Nov. 27, 1833; m. June 12, 1866, the Prince of Teck.

HER MAJESTY’S CHIEF OFFICERS OF STATE.

First Lord of the Treasury, Rt. Hon. B. Disraeli.

Lord High Chancellor, Lord Cairns.

Chancellor of Exchequer, Rt. Hon. C. W. Hunt.

Lord President of Council, Duke of Marlborough, K.G.

Lord Privy Seal, Earl of Malmesbury, G.C.B.

Home Secretary, Rt. Hon. G. B. H. Hardy.

Foreign Secretary, Rt. Hon. Lord Stanley.

Colonial Secretary, Duke of Buckingham and Chandos.

The above form the Cabinet.

Commander in Chief, F.M. H.R.H. the Duke of Cambridge, K.G.

President of Poor Law Board, Earl of Devon.


Postmaster-General, Duke of Montrose.

Earl Marshal, Duke of Norfolk.


Paymaster-General, and Vice-President of the Board of Trade, Rt. Hon. S. Cave.


Attorney-General, Sir John B. Karsslake.

Solicitor-General, Richard Baggallay.

Judge Advocate-General, Rt. Hon. J. R. Mowbray.

MAJESTY’S HOUSEHOLD.


Vice-Chamberlain, Rt. Hon. Lord Claud Hamilton.

Private Sec. to Her Majesty, Gen. Hon. Chas. Grey.


Master of the Household, Major Sir John C. Cowell, K.C.B.
OFFICERS OF STATE AND ROYAL HOUSEHOLDS.

Captain of the Gentlemen-at-Arms, Marquis of Exeter.
Captain of the Yeomen of the Guard, Earl of Cadogan.


Extra Lord in Waiting.
Assistant, Col. Charles Bagot.


FEMALE APPOINTMENTS IN

Mistress of the Robes, Duchess of Wellington.

Maids of Honour, Hon. Lucy M. Kerr, Hon. Caroline P. Cavendish, Hon. Flora C. I.

HER MAJESTY'S HOUSEHOLD.

Chief Equerry and Clerk Marshal, Col. Lord Alfred Paget.
Post Laureate, Alfred Tennyson, D.G.I.
Physicians in Ordinary, Sir James Clerk Bart., M.D., K.C.B.; Sir H. Holland, Bart., M.D.; Sir William Jenner, Bt., M.D.
Physician to Household, Francis Hawkins, M.D.
Surgeons, Cesar H. Hawkins, F.R.S.; Sir W. Ferguson, Bt., F.R.S.

HOUSEHOLD OF H.R.H. THE PRINCE OF WALES.

Groom of the Stole, Vacant.
Lords of the Bedchamber, Marq. of Hamilton and Lord Alfred H. rey.
Comptroller and Treasurer, Gen. Sir W. T. Knollys K.C.B.

Private Secretary, Herbert W. Fisher.
Physicians in Ordinary, Sir W. Jenner, Bt., M.D.; E. Sieveking, M.D.
Surgeons in Ordinary, James Paget; George Pollock.

HOUSEHOLD OF H.R.H. THE PRINCESS OF WALES.

Chamberlain, Lord Harris, G.C.S.I.
Ladies of the Bedchamber, Marchioness of Carmarthen, Countess of Morton, Countess of Macclesfield, Viscountess Walden.

Physician Accoucheurs, Arthur Farre, M.D.
F.R.S.; George Thompson Gream, M.D.

SCOTLAND, CHIEF OFFICERS OF.

Hereditary Standard-bearer, Earl of Lauderdale.
Hereditary Master of Household, Duke of Argyll, K.T.
Lord Privy Seal, Earl of Dalhousie, K.T.


IRELAND, CHIEF OFFICERS OF.

Lord Lieutenant, Duke of Abercorn, K.G.
Lord Almoner, The Primate.
Lord Chancellor, Rt. Hon. A. Brewster.
Chief Secretary, Rt. Hon. J. Wilson Fatten.
Private Sec., Hon. L. G. Dillon.

Lord Chief Justice of Queen's Bench, Rt. Hon. James Whiteside.
HOUSE OF LORDS.

LIST OF THE HOUSE OF LORDS, WITH THE SURNAME AND YEAR OF THE BIRTH AND ACCESSION (OR CREATION) OF EACH PEER.

The Scotch Representative Peers, 16 in number, and elected for each new Parliament, are distinguished by a *; the Irish, 26 in number, and elected for life, by a †. The Irish Representative Prelates for the first session of the twentieth Parliament of the United Kingdom are marked with a ‡. Other Scotch and Irish Peers, who sit in this House as Peers of England, have their national titles assigned to them, that by which they sit being added. Such Peers as are Knights of the Garter, Thistle, or St. Patrick, are distinguished by G. T. P. Those marked x are Privy Councillors in England; z Privy Councillors in Ireland.

b. born; s. succeeded; c. created.

Speaker, the Lord High Chancellor.—Deputy Speaker, Lord Redesdale.

PRINCES.

|| "H.R.H. the Prince of Wales, G. T. P."|| "H.R.H. the Duke of Edinburgh, G. T."
|| "H.R.H. the Duke of Cambridge, G. P."

ARCHBISHOPS.

| Canterbury—A. C. Tait, D.C.L. | b. 1811. |

DUKES.

| Abercorn (Hamilton) | sits as M. of Abercorn, 1811. |
| Argyll (Campbell) | sits as L. Sundridge, 1823. |
| Alber (Murray) | sits as E. Strange, 1840. |
| Beaufort (Somerset) | b. 1824. |
| Bedford (Russell) | b. 1809. |
| Bruce (Scott) | sits as E. Doncaster, 1806. |
| Buckingham and Chandos (Grenville) | b. 1823. |
| Cleveland (Powlett) | b. 1803. |
| Devonshire (Cavendish) | b. 1808. |
| Grafton (Fitz-Roy) | b. 1819. |
| Hamilton (Hamilton) | sits as D. of Brandon, 1815. |
| Leeds (Osborne) | b. 1802. |
| Leinster (Plunkett) | sits as V. Leinster, 1791. |
| Manchester (Montagu) | b. 1823. |
| Marborough (Churhill) | b. 1822. |
| Montrose (Graham) | sits as E. Graham, 1799. |
| Newcastle (Clinton) | b. 1834. |
| Norfolk (Howard) | b. 1847. |
| Northumberland (Percy) | b. 1810. |
| Portland (Beaufort) | b. 1800. |
| Richmond (Lennox) | b. 1819. |
| Reuburgh (Innes-Ker) | sits as E. of Innes, b. 1816. |
| Rutland (Manners) | b. 1815. |
| St. Albans (Beauchier) | b. 1840. |
| Somerset (St. Maur) | b. 1804. |
| Sutherland (Leveson-Gower) | b. 1828. |
| Wellington (Wellesley) | b. 1807. |

MARQUESSES.

| Allies (Bruce) | b. 1804. |
| Allis (Kennedy) | b. 1816. |
| Aligsey (Paget) | b. 1797. |
| Bath (Thynne) | b. 1831. |
| Bristol (Hervey) | b. 1834. |

| Bute (Stuart) | b. 1847. |
| Camden (Pratt) | b. 1840. |
| Cholmondeley (Cholmondeley) | b. 1732. |
| Clare (De Burgh) | sits as L. Somerhill, 1802. |
| Conyngham (Conyngham) | sits as L. Minster, 1797. |
| Downe (Chichester) | b. 1798. |
| Downshire (Hill) | sits as E. Hillsborough, 1844. |
| Drogheda (Moore) | sits as L. Moore, 1825. |
| Ely (Lustus) | sits as L. Lustus, 1849. |
| Exeter (Cecil) | b. 1825. |
| Headfort (Taylor) | sits as L. Kenlis, 1829. |
| Hertford (Conway) | b. 1800. |
| Huntly (Gordon) | sits as L. Meldrum, 1847. |
| Lansdowne (Fitz Maurice) | b. 1845. |
| London (Stuart) | sits as L. Stewart, 1805. |
| Lothian (Kerr) | sits as L. Kerr, 1832. |
| Northumberland (Compton) | b. 1816. |
| Ormonde (Butler) | sits as L. Ormonde, 1844. |
| Salisbury (Cecil) | b. 1839. |
| Sligo (Browne) | sits as Lord Montague, b. 1820. |
| Townshend (Townshend) | b. 1831. |
| Tweeddale (Hay) | b. 1877. |
| Waterford (Beresford) | sits as L. Tyrone, b. 1844. |
| Westmeath (Nugent) | b. 1785. |
| Westminster (Grosvenor) | b. 1795. |

EARLS.

Aberdeen (Gordon), sits as V. Gordon, 1841. 1864.
Abergavenny (Nevill), b. 1826. 1868.
Abingdon (Bertie), b. 1806. 1864.
Airle (Ogilby), b. 1826. 1849.
Albermarle (Keppel), b. 1799. 1851.
Amherst (Amherst), b. 1805. 1867.
Annals (Annals), b. 1836. 1838.
Ashburnham (Ashburnham), b. 1797. 1830.
Aylesford (Finch), b. 1824. s. 1859.
†Bandon (Bernard), c. 1810. s. 1858.
Bathurst (Bathurst), b. 1791. s. 1866.
Beauchamp (Lygon), b. 1830. s. 1866.
†Belmore (Corry), b. 1835. s. 1845.
Berkeley (Berkeley), b. 1796. s. 1810.
Bessborough (Ponsonby), sits as L. Ponsonby, b. 1809. s. 1847.
†Biddulph (Biddulph), b. 1819. s. 1865.
Brooks and Warwick (Greville), b. 1818. s. 1853.
Brownlow (Cust), b. 1844. s. 1867.
Buckinghamshire (Hobart), b. 1793. s. 1849.
Cadogan (Cadogan), b. 1812. s. 1861.
Cathness (Sinclair), sits as L. Barrogill, b. 1821. s. 1855.
Camperdown (Haldane), b. 1841. s. 1867.
Carlisle (Howard), b. 1805. s. 1867.
†Carnarvon (Herbert), b. 1831. s. 1849.
Carysfort (Proby), sits as L. Carysfort, b. 1825. s. 1859.
Cathcart (Cathcart), b. 1828. s. 1859.
Cawdor (Campbell), b. 1817. s. 1860.
Charlemont (Caulfield), sits as L. Charlemont, b. 1820. s. 1863. P.
Chesterfield (Stanhope), b. 1831. s. 1866.
Chichester (Pelham), b. 1804. s. 1826.
Clancarty (Trench), sits as V. Clancarty, b. 1803. s. 1837.
Clanwilliam (Meade), sits as L. Clanwilliam, b. 1795. s. 1805.
Clarendon (Villiers), b. 1800. s. 1833. G.
Cork and Orrery (Boyle), sits as L. Boyle, b. 1825. s. 1856. P.
Cottenham (Pepys), b. 1825. s. 1863.
Courtown (Stopford), sits as L. Saltsford, b. 1823. s. 1859.
Coventry (Coventry), b. 1838. s. 1843.
Cowley, (Welllesley), b. 1804. c. 1857. G.
Cowper (Cowper), b. 1834. s. 1856. G.
Craven (Craven), b. 1841. s. 1866.
Crawford and Balcarres (Lindsay), sits as L. Wigan, b. 1793. s. 1825.
Dalhouse (Maule), sits as L. Panmure, b. 1801. s. 1861. T.
Darnley (Bligh), sits as L. Clifton, b. 1827. s. 1835.
Darnton (Legge), b. 1822. s. 1853.
Dartry (Dawson), b. 1817. c. 1866. P.
De Grey and Ripon (Robinson), b. 1827. s. 1859.
Delahaye (Malte), b. 1791. s. 1795.
Denbigh (Feilding), b. 1833. s. 1865.
Derry (Stanley), b. 1799. s. 1851. G.
Devon (Courtenay), b. 1807. s. 1859.
Dobaghanmore (Hutchinson), sits as V. Hutchinson, b. 1848. s. 1866.
Duchic (Moreton), b. 1827. s. 1853.
Dudley (Ward), b. 1817. c. 1860.
Dunmore (Murray), sits as L. Dunmore, b. 1841. s. 1845.
Dunraven (Wyndham-Quin), sits as L. Kenney, b. 1812. s. 1850. P.
Durham (Lambton), b. 1828. s. 1840.
Effingham (Howard), b. 1806. s. 1845.
Eglington (Montgomerie), sits as E. Winton, b. 1811. s. 1861.
Esmonde (Perceval), sits as Lord Lovel, b. 1794. s. 1841.
Elidon (Scott), b. 1845. s. 1854.
Elgin and Kincardine (Bruce), sits as L. Elgin, b. 1849. s. 1863.
Ellenborough (Law), b. 1790. c. 1844.
Enniskillen (Coke), sits as L. Grinstead, b. 1807. s. 1840.
†Erne (Crichton), b. 1802. s. 1842. P.
Erroll (Hay), sits as Lord Kilmarnock, b. 1823. s. 1846.
Essex (Cape), b. 1803. s. 1829.
Ferrers (Shirley), b. 1847. s. 1859.
Feversham (Duncombe), b. 1829. c. 1868.
Fife (Duff), sits as L. Skene, b. 1814. s. 1857. T.
Fingall (Plunkett), sits as L. Fingall, b. 1791. s. 1836. P.
Fitzwilliam (Fitzwilliam), b. 1815. s. 1857. G.
Fortescue (Fortescue), b. 1818. s. 1861.
Gainsborough (Noel), b. 1819. s. 1866.
Galloway (Stewart), sits as L. Stewart of Garlies, b. 1800. s. 1834.
Glasgow (Boyle), sits as L. Ross, b. 1792. s. 1843.
Gosford (Acheson), sits as L. Worthingham, b. 1841. s. 1864.
Granard (Forbes), sits as L. Granard, b. 1833. s. 1837. P.
Granville (Leveson-Gower), b. 1815. s. 1846. G.
Grey (Grey), b. 1802. s. 1845. G.
Guifford (North), b. 1851. s. 1861.
*Haddington (Baillie), b. 1802. s. 1858.
Harwood (Yorke), b. 1799. s. 1834.
Harwood (Lascelles), b. 1824. s. 1857.
Harrington (Stanhope), b. 1809. s. 1866.
Harrowby (Ryder), b. 1798. s. 1847. G.
*Home (Home), b. 1799. s. 1841.
Hopetoun (Hope), sits as L. Hopetoun, b. 1831. s. 1843.
Howe (Curzon-Howe), b. 1796. c. 1821.
Huntingdon (Hastings), b. 1805. s. 1825.
Ilchester (Strangways), b. 1847. c. 1866.
*Jersey (Villiers), b. 1815. s. 1853.
Kenmare (Browne), sits as L. Kenmare, b. 1789. s. 1853.
Kimerley (Wodehouse), b. 1826. c. 1866.
Kingston (King), sits as L. Kingston, b. 1800. s. 1867.
Kinnoul (Hay), sits as L. Hay, b. 1827. s. 1866.
Kintore (Falconer), sits as L. Kintore, b. 1828. s. 1844.
*Landerdale (Maitland), b. 1803. s. 1863.
Leicester (Colke), b. 1822. s. 1842.
Leitrim (Clements), sits as L. Clements, b. 1806. s. 1855.
*Leven and Melville (Melville), b. 1766. s. 1860.
Lichfield (Ashon), b. 1825. s. 1854.
Limerick (Pery), sits as L. Foxford, b. 1840. s. 1866.
Lindsey (Bertie), b. 1814. s. 1818.
Longford (Pakenham), sits as L. Silchester, b. 1819. s. 1860.
*Lonsdale (Lowther), b. 1757. s. 1844.
Lovelace (King-Noel), b. 1805. c. 1828.
†Lucan (Bingham), b. 1800. s. 1839.
Macclesfield (Parker), b. 1811. s. 1859.
*Malmesbury (Harris), b. 1807. s. 1841.
Mansfield (Murray), b. 1806. s. 1840.
Manvers (Pierrepont), b. 1825. s. 1860.
Moath (Brahazon), sits as L. Chaworth, b. 1803. s. 1851.
HOUSE OF LORDS.

Minto (Kynynmond), b. 1814. s. 1859.
Moray (Stuart), sits as L. Stuart, b. 1810. s. 1867.
Morley (Parker), b. 1843. s. 1864.
Morton (Douglas), b. 1818. s. 1858.
Mountc Cashell (Moore), b. 1792. s. 1822.
Mount Edgcumbe (Edgcumbe), b. 1832. s. 1861.
Munster (Fitclarence), b. 1824. s. 1842.
Nelson (Nelson), b. 1823. s. 1835.
Oslow (Oslow), b. 1777. s. 1827.
Orford (Walpole), b. 1813. s. 1858.
Orkney (Fitclarence), b. 1803. s. 1831.
Pembroke (Herbert), b. 1850. s. 1862.
Portarlington (Dawson-Damer), b. 1822. s. 1845.
Portsmouth (Fellowes), b. 1825. s. 1854.
Poulett (Poulett), b. 1827. s. 1845.
Powis (Herbert), b. 1816. s. 1848.
Radnor (Bouverie), b. 1778. s. 1823.
Randall (Knox), sits as L. Ranfurly, b. 1829. s. 1854.
Rod (Jocelyn), sits as L. Clanbrassil, b. 1788. s. 1820. P.
Romney (Marsham), b. 1809. s. 1845.
Rosebery (Primrose), sits as L. Rosebery, b. 1847. s. 1858.
Roslyn (Esquire), b. 1838. s. 1866.
Russell (Russell), b. 1792. c. 1801. G.
St. Germains (Elliot), b. 1798. s. 1815.
St. Maur (St. Maur), sits as L. Seymour, b. 1835. c. 1863.
Sandwich (Montagu), b. 1811. s. 1818.
Scarborough (Lumley), b. 1812. s. 1856.
Seaford (Ogilvy), sits as L. Strathpey, b. 1815. s. 1852.
Sefton (Molynneux), sits as L. Sefton, b. 1835. s. 1855.
Selkirk (Douglas), b. 1809. s. 1820.
Shaftesbury (Ashley-Cooper), b. 1801. s. 1851. G.
Shannon (Boyle), sits as L. Carleton, b. 1833. s. 1868.
Sheffield (Holroyd), sits as L. Sheffield, b. 1802. s. 1821.
Shrewsbury and Talbot (Talbot), b. 1830. s. 1859.
Somers (Cocks), b. 1819. s. 1822.
Spencer (Spencer), b. 1835. s. 1857. G.
Stair (Dalrymple), sits as L. Oxenfoord, b. 1819. s. 1864. T.
Stamford and Warrington (Grey), b. 1827. s. 1845.
Stanhope (Stanhope), b. 1805. s. 1855.
Stradbrooke (Rous), b. 1794. s. 1827.
Stradbrook (Byng), b. 1806. s. 1860.
Suffolk (Howard), b. 1804. s. 1851.
Tankerville (Bennet), b. 1810. s. 1859.
Vane (Vane-Tempest), b. 1821. s. 1854.
Vernon (Grimston), b. 1809. s. 1845.
Waldegrave (Waldegrave), sits as L. Waldegrave, b. 1851. s. 1859.
Warwick, see Brook.
Wemyss and March (Douglas), sits as L. Wemyss, b. 1796. s. 1853.
Westmoreland (Fane), b. 1825. s. 1859.
Wickham (Howard), b. 1788. s. 1818. P.
Wilton (Knight), b. 1799. s. 1814.
Winchelsea (Finch-Hatton), b. 1815. s. 1858.
Yarborough (Petham), b. 1835. s. 1862.
Zetland (Dundas), b. 1795. s. 1839. T.

VISCOUNTS.

Bangor (Ward), b. 1827. s. 1837.
Bolingbroke (St. John), b. 1820. s. 1851.
Boyne (Hamilton-Russell), sits as L. Brancepeth, b. 1797. s. 1855.
Bridport (Hood), b. 1814. c. 1863.
Canterbury (Sutton), b. 1812. s. 1845.
Clifton (Agar-Ellis), sits as L. Mendip, b. 1853. s. 1866.
Combermere (Cotton), b. 1818. s. 1865.
De Vesey (Vesey), b. 1803. s. 1855.
Doneraile (St. Leger), b. 1818. s. 1854.
Eversley (Lefevre), b. 1794. c. 1857.
Exmouth (Pellow), b. 1811. s. 1833.
Falkland (Cary), sits as L. Hunsdon, b. 1803. s. 1849.
Falmouth (Boscawen), b. 1819. s. 1852.
Gage (Gage), sits as L. Gage, b. 1791. s. 1808.
Gough (Gough), b. 1779. c. 1849. P.
Halifax (Wood), b. 1800. c. 1866.
Hardinge (Hardinge), b. 1822. s. 1856.
Hawarden (Maudle), b. 1817. s. 1856.
Hereford (Devereux), b. 1843. s. 1855.
Hill (Hill), b. 1800. s. 1842.
Hood (Hood), b. 1838. s. 1846.
Lliford (Hewitt), b. 1811. s. 1855.
Lismore (O'Callaghan), sits as L. Lismore, b. 1815. s. 1857.
Massereene (Skeffington), sits as L. Oriel, b. 1842. s. 1863.
Melville (Dundas), b. 1801. s. 1851.
Midleton (Brodrick), sits as L. Brodrick, b. 1798. s. 1863.
Monck (Monck), sits as L. Monck, b. 1819. s. 1849.
Powerscourt (Wingfield), b. 1836. s. 1844.
St. Vincent (Jervis), b. 1825. s. 1859.
Sidmouth (Addington), b. 1824. s. 1863.
Strangford (Smythe), sits as L. Penshurst, b. 1825. s. 1857.
Stratford de Redcliffe (Canning), b. 1788. c. 1852.
Strathallan (Drummond), b. 1810. s. 1851.
Sydney (Townshend), b. 1805. s. 1831.
Templeton (Upson), b. 1822. s. 1863.
Torrington (Byng), b. 1812. s. 1831.

BISHOPS.

Bangor, J. C. Campbell, D.D., b. 1813. c. 1859.
Bath & Wells, Baron Auckland, b. 1799. c. 1890.
Carlisle, Hon. S. Waldegrave, D.D., b. 1817. c. 1890.
Chester, W. Jacobson, D.D., b. c. 1865.
Derry, Wm. Alexander, D.D., b. 1824. c. 1867.
Durham, C. Baring, D.D., b. 1897. c. 1861.
Gloucester & Bristol, C. J. Elliot, D.D., b. c. 1863.
Hereford, James Atlay, D.D. c. 1868.
Lichfield, G. A. Selwyn, D.D., b. 1899. c. 1867.
Manchester, James Prince Lee, D.D., b. 1804. c. 1848.

---

---
Peterborough, W. C. Magee, D.D., b. 1821. c. 1868.
Ripon, R. Bickersteth, D.D., b. 1816. c. 1856.
St. Asaph, T. V. Short, D.D., b. 1790. c. 1846.
St. David’s, C. Thirlwall, D.D., b. 1797. c. 1840.
Winchester, C. R. Sumner, D.D., b. 1790. c. 1827.

BARONS.
Abercornby (Abercornby), b. 1828.  
Abinger (Scarlett), b. 1826.  
Annaly (White), b. 1795. c. 1863.
Arundell (Arundell), b. 1831.  
Ashburton (Baring), b. 1834.  
Azlumney (Somerville), sits as L. Meredith, b. 1802.  
Auckland (Eden), b. 1849.  
Audley (Trenchet), b. 1817. c. 1837.
Aveland (Healthco), b. 1830. c. 1867.
Bagot (Bagot), b. 1811. c. 1856.
Bateman (Hanbury), b. 1826. c. 1845.
Beaumont (Sapleton), b. 1848. c. 1854.
Belhaven (Hamilton), sits as L. Hartismere, b. 1793.  
Belper (Strutt), b. 1801. c. 1858.
Benners (Wilson), b. 1797.  
Berwick (Noel-Hill), b. 1802. c. 1861.
Blantyre (Stewart), b. 1818.  
Blayney (Blayney), b. 1803.  
Bolton (Bowlett), b. 1818. c. 1859.
Boston (Irby), b. 1802. c. 1856.
Braybrooke (Neville), b. 1823. c. 1861.
Broughton and Vaux (Broughton), b. 1785. c. 1860.
Broughton (Hobhouse), b. 1786.  
Byron (Byron), b. 1818.  
Clare (Clare), b. 1804.  
Calthorpe (Calthorpe), b. 1790. c. 1851.
Camoys (Stonor), b. 1797. c. 1839.
Carew (Carew), b. 1818.  
Carington (Carington), b. 1843. c. 1863.
Castlemaine (Hancock), b. 1791.  
Chelmford (Thessier), b. 1794. c. 1865.
Cheesham (Cavendish), b. 1815.  
Churchill (Spencer), b. 1802.  
Churston (Buller), b. 1799.  
Clarina (Massey), b. 1785. c. 1810.
Clermont (Fortsca), b. 1815. c. 1852.
Clifford (Clifford), b. 1819. c. 1858.
Clinton (Trefusis), b. 1834. c. 1866.
Colbroke (Dillon), b. 1807. c. 1826.
Cloncurry (Lawless), b. 1816.  
Colchester (Abbott), b. 1842.  
Colonsay (M’Neill), b. 1794.  
Colville (Colville), b. 1818.  
Congleton (Farnell), b. 1805. c. 1842.
Congy (Fox), b. 1847.  
Crewe (Crewe), b. 1812. c. 1835.
Crofton (Crofton), b. 1806.  
Daere (Trevor), b. 1808.  
De Freyne (French), b. 1801.  
Delamere (Cholmondeley), b. 1812.  
De Lisle and Dudley (Foulis), b. 1826. c. 1851.
De Mauley (Ponsonby), b. 1815. c. 1855.
Denman (Denman), b. 1805. c. 1854.
De Ros (De Ros), b. 1797.  
De Saumarez (Saumarez), b. 1806. c. 1863.
De Tabuley (Warren), b. 1811. c. 1827.
Digby (Digby), b. 1809.  
Dorchester (Carlton), b. 1811.  
Dormer (Dormer), b. 1790. c. 1826.
Dufferin and Claneboye (Blackwood), sits as Lord Claneboye, b. 1826. c. 1841.
Dunboyne (Butler), b. 1806. c. 1850.
Dunsmuir (Daly), b. 1810. c. 1847.
Dunsany (Plunkett), b. 1808. c. 1852.
Dynevors (Trevor), b. 1795. c. 1852.
Ebrey (Grosvenor), b. 1801. c. 1857.
Egerton (Egerton), b. 1806. c. 1859.
Elphinstone (Elphinstone), b. 1828.  
Eskine (Eskine), b. 1801. c. 1855.
Fitzhardinge (Berkeley), b. 1826. c. 1857.
Fitzwalter (Bridges), b. 1801. c. 1865.
Foley (Foley), b. 1808. c. 1833.
Forester (Forester), b. 1801.  
Gardiner (Gardiner), b. 1810.  
Gifford (Gifford), b. 1817. c. 1826.
Grantley (Norton), b. 1796.  
Harris (Harris), b. 1810. c. 1845.
Hastings (Astley), b. 1822. c. 1859.
Hatherton (Littleton), b. 1816. c. 1863.
Hawke (Hawke), b. 1799.  
Henniker (Henniker-Major), sits as Lord Hartismere, b. 1891. c. 1852.
Heytesbury (Holmes), b. 1805.  
Houghton (Milnes), b. 1809.  
Howard de Walden (Ellis), b. 1830. c. 1883.
Howden (Canadoc), b. 1799. c. 1839.
Hylton (Jolliffe), b. 1800. c. 1866.
Inchiquin (O’Brien), b. 1806. c. 1855.
Keane (Keane), b. 1815.  
Kenyon (Kenyon), b. 1805. c. 1855.
Kesteven (Trollope), b. 1800. c. 1865.
Kilmaine (Browne), b. 1794.  
Kinnaird (Kinnaird), b. 1807.  
Leconfield (Wynham), b. 1787. c. 1859.
Leigh (Leigh), b. 1824. c. 1860.
Lifford (Powsy), b. 1823.  
Londesborough (Denison), b. 1834. c. 1869.
Lovat (Fraser), b. 1802. c. 1837.  
Lurgan (Brownlow), b. 1831. c. 1847.
Lyons (Lyons), b. 1817. c. 1856.
Lyttelton (Lyttelton), b. 1817. c. 1837.
Lytton (Bulwer-Lytton), b. 1805. c. 1866.
Lyveden (Vernon), b. 1800. c. 1869.
Manners (Manners-Sutton), b. 1852. c. 1884.
Methuen (Methuen), b. 1818.  
Middleton (Willoughby), b. 1817. c. 1856.
Monson (Monson), b. 1829.  
Monteagle (Rice), b. 1849.  
Mostyn (Lloyd-Mostyn), b. 1795.  
Napier (Napier), b. 1810. c. 1866.
Northbrook (Baring), b. 1826.  
Northwick (Rushout), b. 1811.  
O’Neill (O’Neill), b. 1848.
Ormathwaite (Walke), b. 1798. c. 1868.
Overstone (Loyd), b. 1796. c. 1856.
Penkyn (Penpont), b. 1800. c. 1864.
Petre (Petre), b. 1817.  
Plunket (Plunket), b. 1846.
Poltimore (Bamfylde), b. 1837.  
Portman (Portman), b. 1799.  
Raglan (Somerset), b. 1817.  
Ravensworth (Liddell), b. 1797. c. 1855.
OFFICERS OF THE HOUSE OF COMMONS.

Chairman of Committees, Lord Redesdale.

Clerk Assistant, Sir Wm. Rose, K.C.B.
Reading Clerk and Clerk of Private Committees, Hon. Slingsby Bethell.
Counsel to Committees, Thos. F. Kent.
Chief Clerk, Henry Stone Smith.
Examiners of Standing Orders, Charles Frere and Reginald Palgrave.
Principal Clerk for Bills, W. E. Walmisley.

HOUSE OF PEERS.

First Session of the Eighth Parliament of Queen Victoria, summoned December 10, 1885.

County Members English 172...Welsh 15...Scottish 32...Irish 64...233
Cities and Boroughs 287 14...26...39...366
Universities 5...2...2...9

Speaker, Rt. Hon.

Chairman of Committees,

ENGLAND AND WALES.

1 Abingdon, Col. Hon. C. H. Lindsay.
2 Andover, Hon. D. F. Fortescue.
3 Anglesey, R. Davies.
4 Aylesbury-under-Lynn, Thomas Mellor.
5 Aylesbury, S.G. Smith, N.M.de Halschildt.
6 Banbury, Berhard Samuelson.
7 Barnstaple, T. Cave, C. H. Williams.
8 Bath, W. Tite, D. Dalrymple.
9 Beaumaris, Hon. W. O. Stanley.
10 Belfordshire, Col. R. T. Gilpin, John Walker.
11 Belford, S. Whitbread, James Howard.
12 Berkshire, Richd. Benyon, Lt.-Col. B. J. Loyd Lindsay, Sir Chas. Russell, Et.
15 Benton, Sir R. A. Glass.
16 Birkenhead, Jno. Laird. [P. H. Muntz.]
17 Birmingham, John Bright, Geo. Dixon.

55

2 Strathnairn (Rose), b. 1803. c. 1866.
3 Stuart de Deces (Stuart), b. 1803. c. 1839.
4 Sudeley (Hanbury-Tracy), b. 1837. s. 1863.
5 Suffield (Harbord), b. 1830. s. 1853.
6 Talbot de Malahide (Talbot), b. 1806. s. 1850.
7 Taunton (Labouchere), b. 1798. c. 1859.
8 Templemore (Chichester), b. 1821. s. 1857.
9 Templeden (Abbot), b. 1796. s. 1832.
10 Teynham (Curzon), b. 1794. s. 1842.
11 Thurlow (Thurlow), b. 1837. s. 1857.
12 Tredgar (Morgan), b. 1792. c. 1859.
13 Truro (Wilde), b. 1816. s. 1855.
14 Vaux (Mostyn), b. 1804. s. 1838.
15 Vernon (Yonables Vernon), b. 1829. s. 1866.
16 Vivian (Vivian), b. 1808. s. 1842.
17 Walsingham (De Grey), b. 1804. s. 1839.
18 Wentock (Lawley), b. 1816. s. 1852.
19 Wentworth (Mullanck), b. 1839. s. 1862.
20 Westbury (Bethell), b. 1800. c. 1861.
21 Willoughby de Brooke (Verney), b. 1844. s. 1862.
22 Willoughby d’Eresby (Drummond), b. 1821. s. 1885.
23 Wrottesley (Wrottesley), b. 1824. s. 1867.
24 Wynford (Best), b. 1795. s. 1845.
40 Cardiff, Lieut.-Col. J. F. D. C. Stuart.
41 Cardiganshire, E. M. Richards.
42 Cardiff, Sir T. D. Lloyd, Bart. 
43 Carlisle, E. Potter, Sir W. Lawson.
44 Carmarthenshire, John Jones, E. J. Sartoris.
45 Carnarvon, Col. C. Stepney.
46 Carnarvonshire, Capt. Jones Parry.
47 Carnarvon, W. B. Hughes.
48 Chatham, Arthur J. O'ceau.
49 Chelsea, W. Dilke, Sir H. A. Howard, Bart.
50 Cheltenham, H. B. Samuelson.
51 Cheshire (N.), W. J. Legh, E. C. Egerton.
53 Cheshire (South), Sir F. de M. G. Egerton, Bart., J. T. Tollemache.
54 Chester, Earl Grosvenor, H. C. Raikes.
55 Chichester, Lord H. G. C. G. Lennox.
56 Chippenham, Gabriel Goldney.
57 Christchurch, E. H. Burke.
58 Cirencester, A. A. Bathurst.
59 Clitheroe, R. Ashton.
60 Cockermouth, J. Fletcher.
61 Colchester, J. Gurdon Rebow, Dr. Brewer.
62 Cornwall (East), Sir J. S. Trelawny, Bart., B. Wyllyams.
63 Cornwall (West), J. St. Aubyn, A. P.
64 Coventry, H. W. Eaton, A. S. Hill.
65 Cricklade, Hon. F. W. Cadogan, Sir D. Gooc, Bart.
66 Cumberland (East), W. N. Hodgson, Hon. C. W. Howard.
68 Darlington, E. Backhouse.
69 Derbyshire (East), Sir W. W. Wynn, Bart., M., Morgan.
70 Denbigh, Watkin Williams.
71 Derbyshire (North), Lord G. H. Cavendish, H. B. Cartwright.
72 Derbyshire (South), Sir Thomas Gresley, Rowlan Smith.
73 Derbyshire (East), Hon. Capt. Egerton, Hon. H. Strutt.
74 Derby, Mich. T. Bass, S. Plimsoll.
75 Devizes, Sir Thomas Bateson, Bart.
76 Devizes, Monagu Chambers, J. D. Lewis.
77 Devonshire (North), T. Dyke Acland, Right Hon. Sir S. H. Northcote, Bart.
78 Devonshire (East), Sir Lawrence Palk, Bart., Viscount Courtenay.
79 Devonshire (South), Sir Massey Lopes, S. T. Kekewich.
80 D ruebury, Mr. Sergeant Simon.
81 Dorchester, Col. C. N. Sturt.
83 Dover, Major A. G. Dickson, J. G. Jessel.
84 Droitwich, Rt. Hon. Sir J. S. Pakington, Bart., G.C.B.
85 Dudley, H. B. Sheridan.
86 Durham (North), G. Elliott, Sir Heward Williamson, Bt. (Beaumont.
87 Durham (South), J. W. Pease, F. B.
HOUSE OF COMMONS.

238 Staffordshire (E.), M. A. Bass, R. J. McLean.
240 Stapleford, J. Sidebotham.
242 Stockport, W. Tipping, J. B. Smith.
243 Stockton, J. Dodds.
244 Stone-upon-Trent, G. Molloy, W. S. Roden.
247 Suffolk (W.), Major Windsor Parker, Lord Augustus Harvey.
249 Surrey (E.), Hon. P. J. L. King, Charles W. Peele, Hon. W. Bradrick.
251 Surrey (W.), *.
252 Sussex (E.), J. G. Dodson, G. R. Gregory.
254 Swindon, L. L. Dillwyn.
256 Taunton, A. C. Barclay, E. W. Cox.
257 Tavistock, A. E. Russell.
258 Tewkesbury, W. H. Price.
259 Thirsk, Sir Wm. P. Gallwey, Bt.
260 Tiverton, Hon. G. Denman, J. H. Amory.
261 Tower Hamlets, A. S. Ayrton, J. D. Samuda.
262 Truro, F. M. Williams, Capt. Hon. J. C. Fynn.
263 Tynemouth, T. E. Smith. [Vivian.
264 Taunton, Somerset Beaumont.
266 Walsall, C. Forster.
267 Wareham, J. H. Calcraft.
268 Warrington, P. Rylans.
269 Warwickshire (N.), C. N. Newdegate, W. Bromley Davenport.
270 Warwickshire (S.), H. C. Wise, John Hardy.
271 Warwick, A. W. Peel, E. Greaves.
272 Wednesbury, Alexander Brodie.
274 Wellington, J. L. Phipps.
276 Westmorland, Earl of Beccles, William Lowther.
278 Whitby, H. W. Gladstone.
279 Whitby, G. C. Bentinck.
280 Wigton, H. Woods, J. Lancaster.
281 Wight (Isle of), Sir John Simeon, Bt.
283 Wiltshire (N.), Lord C. Bruce, Sir G. Jenkinson.
284 Wiltshire (S.), Lord H. Thynne, T. Fraser Grove.
285 Winchester, J. Bonham-Carter, W. B. Simonds.
286 Windsor, E. Eykyn.
287 Woottonhampton, Rt. Hon. C. P. Villiers, T. M. W. B. Muslin.
288 Woodstock, Henry Barnett.
290 Worcestershire (W.), F. W. Knight, W. E. Dowdeswell.
292 Wycombe, Hon. C. R. Carlington.
293 Yorkshire (N. R.), F. A. Milbank, Hon. Octavius Duncombe.
295 Yorkshire (W. R., N.D.), Sir Frank Crossley, Bt., Lord F. C. Cavendish.
296 Yorkshire (W. R., Mid.), *.
298 York, James Lowther, J. P. B. Westhead.

SCOTLAND.

299 Aberdeen Co. (East), W. D. Fordyce.
300 Aberdeen Co. (West), W. M. McCombie.
301 Aberdeen, Col. W. H. Sykes.
302 Andrews (St.), Cupar, Capt., E. Eilicce.
303 Argyll Co., Marquis of Lorne.
304 Ayr Co. (North), — Finnie.
305 Ayr Co. (South), Sir D. Wedderburn, Bt.
308 Berwick Co., David Robertson.
309 Bute, C. Dalrymple.
310 Caithness, G. Traill.
311 Clackmannan and Kinross, W. P. Adam.
312 Dumbarton Co., Orr Ewing.
313 Dumfriesshire Co., Sir S. H. Waterlow.
314 Dumfries, Capt., R. Jardine.
315 Dunbar, Sir John Ogilvy, Bt., — Armstrong.
317 Edinburgh, Duncan McLaren, J. Miller.
318 Edinburgh & St. Andrews Universities.
319 Elgin Co., Hon. J. Grant.
320 Elgin, Banff, Capt., M. E. G. Duff.
321 Fife, Jas. Merry.
322 Fife, Sir Robert Anstruther, Bt.
323 Forfar, Hon. C. Carnegie.
325 Glasgow and Aberdeen Universities.
326 Greenock, Mr. Provost Grieve.
327 Haddington Co., Lord Elcho.
329 Hawick, Capt., G. O. Trevelyan.
330 Inverness Co., D. Cameron.
331 Inverness, Nairn, Capt., E. Macintosh.
333 Kincairdine, J. D. Nicol.
334 Kirkcaldy Burghs, R. S. Aylton.
335 Kincardine, W. H. Maxwell.
336 Lanark Co. (North), Sir T. E. Colebrooke, Bart.
337 Lanark (South), Major Hamilton.
338 Leith, Bt., — Macle.
339 Linlithgow Co., Peter McLagan.
341 Orkney and Shetland.
342 Paisley, H. E. C. Ewing.
343 Perth Co., C. S. Parker.
344 Perth, Capt., M. F. Kinnaid.
345 Perth, Capt., A. A. Spiers.
346 Ross and Cromarty, Alex. Matheson.
347 Roxburgh Co., Sir Wm. Scott, Bt.
HOUSE OF COMMONS.

349 Stirling Co., Vice-Adm. J. E. Erskine.
350 Shetland Co., C. S. Campbell.
351 Sutherland Co., Lord Ronald Leveson-Gower.
352 Wick, etc., — Loch.
353 Wigtonshire, Lord Galries.
354 Wigton, etc., George Young.

IRELAND.

356 Armagh, Col. Sir J. M. Stronge, Bt.,
357 Armagh Boro., J. Vance.
358 Athlone, Sir John Ennis.
359 Banbridge, W. Shaw.
360 Belfast, W. Johnston, T. McClure.
361 Carlow, Henry Bruen, A. Kavanagh.
362 Carlow Bo., Capt. Fagan.
363 Carrickfergus, M. R. Dalway.
364 Castle, J. L. O'Beirne.
366 Clare, Col. G. M. Vandeler, Sir Colman
367 Clonmel, John Bagwell.
368 Coleraine, Sir H. H. Bruce, Bt.
369 Cork Co., A. Smith Barry, M'C. Downing.
370 Cork City, J. F. Maguire, N. D. Murphy.
372 Downpatrick, W. Krown.
374 Drogheda, B. Whitworth.
375 Dubline, Right Hon. T. E. Taylor, Ion Trant Hamilton.
376 Dublin City, Sir A. E. Guinness, Bart., Jonathan Pin.
377 Dublin University, A. Lefroy, J. T. Ball.
378 Dundalk, P. Callam.
380 Dungarvan, H. Matthews.
381 Ennis, Capt. W. Stackepeare.
382 Ennistimon, Vist. Orchiton.
385 Galway, Lord St. Lawrence, Sir R. Blennerhasset, Bt. [Herbert.
386 Kerry, Rt. Hon. Vist. Castlecrose, H. A.

* Elections not completed when this Almanac was prepared for Press.

ALPHABETICAL LIST OF THE MEMBERS.

The Numbers refer to the Places in the Preceding List.

Acland, 77
Adair, 127
Adams, 311
Adderley, 236
Agar-Ellis, 388
Akroyd, 110
Alridge, 122
Allen, 233
Amcotts, 150
Amory, 260
Ampleforth, 289
Anderson, 365
Annesley, 365
Anstruther, 322
Antrim, 256
Archdale, 383
Artwright, 146

Armistead, 315
Ashton, 59
Ayrton, 281
Aylton, 334
Backhouse, 63
Bagge, 184
Bagwell, 367
Baker, 118
Baker, 192
Baker, 91
Ball, 377
Bally, 356
Baring, 125
Barrett, 288
Barrington, 94
Bartlett, 253
Bass, 74, 238
Bateson, 75
Bathurst, 58
Baxter, 340
Bazley, 164
Beach, 101, 111
Beaumont, 67
Beech, 26
Bective, 276
Bell, 155
Bentall, 161
Bentinck, 279
Benyon, 12
Berkley, 29
Biddulph, 12
Bingham, 401

Birley, 164
Blake, 415
Blennerhasset, 335
Bolckow, 170
Bonham-Carter, 256
Bourke, 133
Bourke, 99
Bouverie, 322
Bowring, 93
Bradly, 392
Brand, 36, 120
Brass, 119, 224
Brazer, 61
Bright, 17, 164,
Bury, 13

Brackman, 39
Brisoe, 90
Bredley, 294
Brickfield, 159
Braddock, 250
Broggen, 272
Brown, 273
Bruce, 165, 283,

Buckley, 179
Buller, 163, 236
Bulwer, 255
Burke, 57, 384
Burrell, 228
Bury, 13
Brune, 361
Bryan, 388
Buckley, 179
Buller, 163, 236
Bulwer, 255
Burke, 57, 384
Burrell, 228
Bury, 13
HOUSE OF COMMONS.

Dent, 235
Deveroux, 418
Dick, 419
Digby, 406
Dickenson, 245
Dickson, 83
Dilke, 49
Dillwyn, 254
Dinsdale, 121
Dixael, 50
Dixon, 17
Dodds, 243
Dodson, 252
Dowdeswell, 290
Dowling, 369
Dowse, 397
Druff, 307, 320
Duncombe, 293
Du Pré, 30
Dyke, 130
Dyott, 148
Eastwood, 201
Eaton, 64
Edwards, 14, 277
Edwardes, 116
Egerton, 61, 52, 53, 73, 139
Elcho, 327
Ellice, 302
Elliot, 86
Elphinstone, 207
Enfield, 171
Ennis, 358
Erskine, 349
Esmond, 414
Ewing, 312, 342
Eykin, 286
Fagan, 362
Fawcett, 28
Felluden, 171
Fellowes, 124
Figgins, 229
Finc, 247
Finnie, 304
Fitzgerald, 387
Fitzmaurice, 35
Fitzpatrick, 406
Fitzwilliam, 163, 419
Fletcher, 69
Floyer, 82
Foljambe, 212
Forde, 373
Fordyce, 299
Forest, 273
Forster, 22, 266
Fortescue, 2, 392
Fothergill, 169
Fowler, 38, 201
French, 407
Gallagher, 289
Galway, 212
Garrick, 353
Gavin, 394
Gilpin, 16, 188
Gladdone, 107, 278
Glass, 15
Glyn, 226
Goldney, 68
Goldsmith, 211
Gooch, 65
Gore, 222, 392
Gorleston, 135
Gordon, 248
Gower, 19, 351
Graham, 324
Grant, 319
Graves, 154
Gray, 20, 359
Graves, 211
Greene, 34
Gregory, 252, 334
Gresley, 72
Greville, 416
Grey, 177
Grieve, 326
Grosevenor, 54, 96, 275
Grimes, 284
Guest, 326
Guinness, 376
Gurney, 233
Gwyn, 24
Hadfield, 227
Hambo, 277
Hamilton, 171, 221, 337, 371, 375, 413
Hammer, 177
Harcourt, 197
Hardcastle, 34
Harty, 185, 218, 270
Harri, 145
Hay, 214, 241
Headlam, 180
Henderson, 88
Henley, 188, 196
Henniker-Major, 246
Henry, 139
Herbert, 223, 386
Hermon, 208
Hervey, 247
Hesketh, 208
Heygate, 396
Hibbert, 195
Hick, 20
Hildyard, 193
Hill, 64
Hillingworth, 135
Hoare, 49, 233
Hodgkinson, 178
Hodgson, 65
Holford, 101
Holmesdale, 130
Holms, 109
Hol, 138
Hood, 232
Hope, 37
Hornby, 13
Howard, 11, 66
Howes, 183
Hughes, 41, 98
Hunt, 188
Hurt, 122
Hutch, 99
Hutton, 185
Ingram, 237
Jackson, 113
Jardine, 314
Jenkins, 283
Jervis, 114
Jessel, 83
John, 380
Johnstone, 38, 91, 225
Jones, 44
Kavanagh, 361
Kekewich, 79
Kennard, 14
Keown, 372
King, 249
Kingslake, 26, 216
Kingscote, 162
Kinnaird, 344
Kirk, 404
Knatchbull-Hugessen, 224
Knight, 280
Knightley, 187
Knox, 379, 410
Lacox, 150
Laird, 16
Lambert, 30
Lancaster, 280
Langton, 232
Laslett, 291
Lawrence, 385
Lawrence, 136, 155
Lawson, 43
Layard, 235
Lea, 132
Leatham, 123
Lee, 160
Lefevre, 211
Lefroy, 377
Legat, 51, 192
Lennox, 65, 158
Leslie, 403
Lewis, 76, 167
Liddell, 190
Lindsay, 1
Lloyd, 42
Loch, 352
Locke, 325
Lopes, 79, 191
Lore, 303
Lowe, 156
Lowther, 67, 276, 298
Lush, 221
Lusk, 95
Lyttelton, 290
MacIntosh, 331
McArthur, 136
McClure, 360
McCombe, 300
Macleod, 333
M'Cloy, 402
McLagan, 230
McLaren, 317
McLean, 238
McMahon, 408
Magniac, 219
Maguire, 370
Maitland, 318
Malcolm, 21
Manners, 38, 143
Marling, 102
Martin, 181, 216
Matheson, 346
Matthews, 389
Maxwell, 335
Meller, 239
Mellor, 4
Melly, 244
Merry, 321
Meyrick, 209
Milbank, 293
Miller, 317
Milles, 129
Mills, 131
Mitton, 297
Mitchell, 27
Mitford, 172
 Monk, 103
Monsell, 333
Montagu, 124
Montgomery, 348
Moore, 401, 411
Morgan, 23, 69,
Morley, 29
Morrison, 204
Mowbray, 198
Mundella, 227
Muntz, 17
Murphy, 370
Newdegate, 290
Newport, 222
Nicholson, 203
Nicol, 333
Noel, 217
North, 115, 166
Northcote, 77
Northwood, 134
Nugent, 396, 416
O'Brien, 364
O'Brien, 390
O'Connor, 407
O'Connell, 412
O'Leary, 266
O'Neill, 355
O'Reilly, 393
Ogilvy, 315
Onslow, 108
Ottway, 48
Pakington, 84
Palk, 78
Palmer, 153, 213
Parker, 217, 343
Parry, 46
Patton, 131
Pease, 87
Peck, 250
Peele, 257, 271
Pelham, 147
Pell, 144
Penberton, 129
Percy, 199
Pitts, 38
Phillips, 374
Pinn, 376
Platt, 195
Pim, 74
Pochin, 229
Pollard, 416
Portman, 82
Potter, 42, 215
Powell, 162
HOUSE OF COMMONS—SCOTTISH NOBILITY.

OFFICERS OF THE HOUSE OF COMMONS.

Chief Clerk, Sir Denis Le Marchant, Bt.
Clerk Assistant, Sir T. Erskine May, K.C.B.
Second Clerk Assistant, Henry Ley.
Clerk of Public Bills & Fees, W. Rose.
Accountant, G. Broom.
Assistant Accountant, W. O. Mayne.
Clerk of Committees, C. W. Pole.
Clerk of Journals, C. Rowland.
Clerk, Private Bill Office, W. Hodgkin.
Speaker's Secretary, Alfred Denison.
Counsel to Speaker, G. K. Rickards.
Examiners of Petitions for Private Bills, Chas. Frere, Reginald Faggrave.

Treasurer, Charles Frere.
Short-hand Writer, Joseph Gurney.
Serjeant-at-Arms, Lord C. J. F. Russell.
Deputy Serjeant, Capt. R. A. Gossett.
Assistant Serjeant, Col. C. W. Forester.
Deliverer of Votes, J. J. Collins.
Chaplain, Rev. C. Merivale, B.D.
Printer of Journals, Henry Hansard.
Printers of Votes, J. G. Nichols and R. C. Nichols.
Librarian, G. Howard.
Assistant-Librarian, W. Hearne.

LIST OF THE SCOTTISH AND IRISH NOBILITY,
Who, not being Peers of Parliament, have no seat in the House of Lords.

SCOTTISH.

MARQUIS.
Queensberry (Douglas), b. 1844. s. 1858.

EARLS.
Breadalbane (Campbell), b. 1824. s. 1862.
Buchan (Erskine), b. 1815. s. 1857.
Carnwath (Dalzell), b. 1828. s. 1868.
Dundonald (Cochrane), b. 1814. s. 1860.
Dundee (Tollemache), b. 1794. s. 1840.
Kellite (Erskine), b. 1810. s. 1866.
Mar (Goodeve-Erskine), b. 1836. s. 1866.
Northesk (Carnegie), b. 1794. s. 1831.
Perth (Drummond), b. 1807. s. 1853.
Southesk (Carnegie), b. 1827. s. 1855.
Strathmore (Howe), b. 1804. s. 1865.

VISCOUNT.
Arbuthnott (Arbuthnott), b. 1806. s. 1860.

BARONS.
Cranston (Cranston), b. 1809. s. 1818.
Elibank (Murray), b. 1804. s. 1850.
Fairfax (Fairfax), b. 1830. s. 1846.
Forbes (Forbes), b. 1829. s. 1868.
Hermes (Constable-Maxwell), b. 1804. s. 1858.
[1] Napier (Napier), b. 1819. s. 1834. T.
Polwarth (Scott), b. 1838. s. 1867.
Reay (Mackay), b. 1813. s. 1863.
Ruthven (Hore-Ruthven), b. 1837. s. 1864.
Sinclair (St. Clair), b. 1863. s. 1863.
Somerville (Somerville), b. 1839. s. 1864.
Torpichen (Sandilands), b. 1807. s. 1862.
IRISH.

EARLS.
Aldborough (Stratford), b. 1805. s. 1849.
Antrim (McDonnell), b. 1814. s. 1855.
Arran (Gore), b. 1801. s. 1837.
Bantry (White-Hedges), b. 1801. s. 1838.
Caledon (Alexander), b. 1846. s. 1855.
Carick (Butler), b. 1835. s. 1846.
Castle-Stuart (Stuart), b. 1810. s. 1827.
Cavan (Lambart), b. 1815. s. 1837.
Carlell (Bury), b. 1852. s. 1859.
Clonmel (Scott), b. 1839. s. 1866.
Dart (Cuffe), b. 1815. s. 1865.
Hotham (St. Lawrence), b. 1863. s. 1822.
Kilmory (Nedham), b. 1787. s. 1832.
Lanesborough (Butler-Dawers), b. 1839. s. 1866.
Lisle (Vaughan), b. 1800. s. 1831.
Listowel (Hare), b. 1833. s. 1856.
Lazar (Burke), b. 1822. s. 1857.
Memborough (Saville), b. 1810. s. 1860.
Milltown (Leson), b. 1829. s. 1866.
Norbury (Tiler), b. 1810. s. 1839.
Normanton (Ellis-Agar), b. 1818. s. 1865.
Rosse (Parsons), b. 1840. s. 1867.
Wintoneton (Turnour), b. 1810. s. 1833.

VIScounts.
Ashbrook (Flower), b. 1806. s. 1847.
Avonmore (Yelverton), b. 1790. s. 1814.
Barrington (Barrington), b. 1824. s. 1867.
Chetwynd (Chetwynd), b. 1800. s. 1821.
Dillon (Hilton-Lee), b. 1811. s. 1865.
Dowse (Dawney), b. 1844. s. 1857.
Frankfort (De Montmorency), b. 1806. s. 1822.
Galway (Arundell), b. 1805. s. 1834.
Gormanston (Preston), b. 1796. s. 1860.
Gort (Vereker), b. 1819. s. 1865.
Guillemore (O'Grady), b. 1835. s. 1860.
Harborton (Pomeroy), b. 1836. s. 1862.
Lorto (King), b. 1804. s. 1855.
Molesworth (M-Iesworth), b. 1786. s. 1815.
Mountgarret (Butler), b. 1816. s. 1846.
Mountmorrs (De Montmorency), b. 1796. s. 1833.
Netterville (Netterville), b. s. 1867.
Ranelagh (Jones), b. 1812. s. 1820.
Southwell (Southwell), b. 1836. s. 1860.
Taff (Taffe), b. 1823. s. 1835.
Valentia (Annesley), b. 1843. s. 1863.

BARONES.
Ashtown (Trench), b. 1804. s. 1840.
Aylmer (Aylmer), b. 1814. s. 1856.
Bellew (Bellew), b. 1830. s. 1866.
Bloomfield (Bloomfield), b. 1802. s. 1846.
Carbery (Evans-Frere), b. 1801. s. 1845.
Clamoror (Bingham), b. 1826. s. 1847.
De Blaquiere (Delbliquiere), b. 1812. s. 1831.
Decies (Beresford), b. 1811. s. 1855.
Dulacly (Prittie), b. 1807. s. 1854.
Farnham (Maxwell), b. 1803. s. 1868.
Fermoy (Roche), b. 1815. s. 1856.
Garvagh (Canning), b. 1826. s. 1840.
Graves (Graves), b. 1804. s. 1830.
Headley (Winn), b. 1810. s. 1840.
Henley (Henley), b. 1825. s. 1841.
Hotham (Hotham), b. 1794. s. 1814.
Huntingfield (Vannick), b. 1815. s. 1844.
Kensington (Edwardes), b. 1801. s. 1852.
Kingsale (De Courcy), b. 1828. s. 1868.
Langford (Rowley), b. 1848. s. 1854.
Lisle (Lysaght), b. 1811. s. 1868.
Louth (Plunket), b. 1832. s. 1849.
Macdonald (Macdonald), b. 1849. s. 1865.
Masey (Masey), b. 1827. s. 1866.
Muncaster (Pennington), b. 1834. s. 1853.
Muskerry (Deane), b. 1854. s. 1868.
Newborough (Wynn), b. 1803. s. 1832.
Ogley (Ongley), b. 1803. s. 1814.
Oranmore (Guthrie), b. 1819. s. 1860.
Radstock (Waldegrave), b. 1833. s. 1857.
Rendlesham (Thellusson), b. 1840. s. 1852.
Rokey (Montagu), b. 1798. s. 1847.
Sherard (Sherard), b. 1804. s. 1853.
Teignmouth (Shore), b. 1795. s. 1824.
Trumelson (Barnewall), b. 1796. s. 1833.
Ventry (De Moleyns), b. 1825. s. 1863.
Wallscoft (Blake), b. 1841. s. 1849.
Waterpark (Cavendish), b. 1839. s. 1863.

PEERESSSES IN THEIR OWN RIGHT.

ENGLISH.

DUCHESS.
Inverness (Underwood), b. 1789. c. 1840.

CONTMESS.
Cromartie (Gower), b. 1829. c. 1861.

BARONESSES.
Buckhurst (Webb), b. 1796. c. 1844.
De Clifford (Russell), b. 1791. c. 1833.

BARONESSES.
Le Despencer (Boscawen), b. 1822. s. 1831.
Lucas (Cowper), b. 1806. s. 1859.
North (North), b. 1797. s. 1841.
Weeman (Wykeham), b. 1793. s. 1834.
Windsor (Clive), b. 1797. s. 1855.
Zouch (Curzon), b. 1757. s. 1829.

SCOTCH.

CONTMESSSES.
Loudoun (Clifton), b. 1833. s. 1868.
Newmraith (Gaspara), b. 1796. s. 1858.
Rothes (Leslie), b. 1832. s. 1869.

BARONESSES.
Gray (Gray), b. 1799. s. 1867.
Simpill (Sempill). s. 1835.
HER MAJESTY'S PRIVY COUNCIL.

* Members of the Judicial Committee.  † Assessors in Ecclesiastical Causes.  ‡ Indian Assessor.

Prince of Wales
Duke of Edinburgh
Duke of Cambridge
† Archbishop of Canterbury.
* Lord High Chancellor (Ld. Cairns)
† Archbishop of York
† Duke of Marlborough (President of the Council)
Earl of Malmesbury (Lord Privy Seal)

DUKES,

Abercorn
Argyll
Beaufort
Bedeleigh
Buckingham and Chandos
Leinster
Montrose
Northumberland
Richmond
Somerset
Wellington

MARRIQUESSES,

Alnwick
Anglesy
Caernarvon
Caernarfon
Coningsby
Exceter
London
Norfolk
Salisbury
Westminster

EARLS,

Bessborough
Bracken
Cadogan
Carnarvon
Caernarfon
Clarendon
Cork and Orrery
Cowley
Dulwich
De Grey and Ripon
De la Warr
Derby
Devon
Duke
Ellenborough
Granville
Grey
Hardwicke
Harrowby
Howe
Kimberley
Londonderry
Mayo
Roden
Russell
Sandwich
Spencer
St. Germans
Stafford

Tankerville
Wilton

VISCONTS.

Evesham
Falkland
Gough
Halifax
Stratford
Sydney

Lord Ernest Bruce
Viscount Bury
Viscount Castlereagh
Lord Odo Fitzgerald
Lord Claud Hamilton
Marquis of Hartington
Lord Edward Howard
Lord Augustus Loftus
Lord John Manners
Lord Robert Montagu
Lord Clarence Paget
Viscount Royston
Lord Stanley

BARONS.

† Bishop of London
Athenham
Belvoir
Blenheim
Broughton
Chelmsford
Colonsay
Colville
De Ros
Ebury
Evelyn
Forester
Hilston
Kesteven
Kinnaird
Lyons
Lyttleton
Lytton
Napier

Romilly
Stanley of Alderley
St. Leonards
Taunton
Westbury

J. Evelyn Denton (Speaker of the House of Commons)
C. B. Adderley
H. U. Addington
H. J. Ballie
W. Beresford
Hon. E. P. Bouvier
*Sir W. Bovill
Hon. H. W. B. Brand
H. A. Bruce
Sir A. Buchanan
Sir H. L. E. Bulwer
Edward Cardwell
Stephen Cave
*Sir A. J. E. Cockburn, Bt.
*Sir J. T. Coleridge
*Sir James W. Colvile

Hon. H. T. L. Corry
Hon. W. F. Cowper
Sir W. G. Craig, Bt.
B. Disraeli
Sir David Dundas
Hon. H. G. Elliot
*Sir William Erle
T. H. S. Sotheron-Euston
Sir James Fergusson, Bt.
Sir W. R. S. V. FitzGerald
Hon. G. C. W. Forster
C. S. Fortescue
Sir T. F. Fremantle, Bt.
Thomas Milner Gibson
W. Ewart Gladstone
G. J. Gussen
Sir G. Grey, Bt.
Russell Gurney
R. A. C. Nisbet Hamilton
Edmund Hammond
Gathorne Hardye
Sir W. G. Hayter, Bt.
Sir Frans. B. and Head, Bt.
T. E. Headlam
J. W. Henley
Hon. P. E. Herbert
Edward Horniman
Geo. Ward Hunt
Sir William Hutt
John Inglis
*Sir Fitzroy Kelly
Sir R. T. Kindersley
Sir J. L. M. Lawrence, Bt.
Robert Lowe
*Stephen Luxton
Holt Mackenzie
W. N. Massey
Sir John McNee
William Mounell
J. R. Mowbray
Sir Joseph Napier, Bt.
Sir S. H. Northcote, Bt.
R. More O'Ferrall
Sir J. S. Pakington, Bt.
John Parker
J. Wilson Patten
George Patton
*Sir Laurence Peel
Frederick Peel
Sir Robert Peel, Bt.
Jonathan Peel
*Sir R. J. Phillimore
Sir Frederick Pollock, Bt.
*Sir John Polt
Sir E. Ryan
*Sir C. Jasper Selwyn
Sir G. H. Seymour
Sir H. K. Storrs
Thomas E. Taylor
Hon. C. P. Villiers
S. H. Walpole
*Sir J. P. Wilde
*Sir E. V. Williams
*Sir W. Page Wood
Hon. J. A. S. Wortley
Sir John Young, Bt.
ARCHBISHOPS AND BISHOPS.

ENGLAND.

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>ARCHBISHOPS.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>BISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1854</td>
<td>Bath &amp; Wells, Lord Auckland, D.D. b. 1799.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>ARCHBISHOPS.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>BISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1843</td>
<td>Cashel, dc, Robert Daly, D.D. b. 1763.</td>
<td></td>
</tr>
<tr>
<td>1863</td>
<td>Cork, dc, John Gregg, D.D. b. 1798.</td>
<td></td>
</tr>
<tr>
<td>1849</td>
<td>Down, dc, Robert Knox, D.D. b. 1808.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>BISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1866</td>
<td>Limrick, dc, Chas. Graves, D.D. b. 1812.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>ARCHBISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td>Adelaide, S. Aust., Augustus Short, D.D.</td>
<td></td>
</tr>
<tr>
<td>1860</td>
<td>Antigua, W. W. Jackson, D.D.</td>
<td></td>
</tr>
<tr>
<td>1842</td>
<td>Barbados, Thomas Parry, D.D.</td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>Bombay, Henry A. Douglas, D.D.</td>
<td></td>
</tr>
<tr>
<td>1869</td>
<td>Brixton, E. W. Toutain, D.D.</td>
<td></td>
</tr>
<tr>
<td>1867</td>
<td>Calcutta, Robert Milman, D.D., Metrop.</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>Cape Town, Robert Gray, D.D., Metrop.</td>
<td></td>
</tr>
<tr>
<td>1856</td>
<td>Christ Ch., N.Z., H. J. C. Harper, D.D.</td>
<td></td>
</tr>
<tr>
<td>1862</td>
<td>Columbus, P. C. Clauoht, D.D.</td>
<td></td>
</tr>
<tr>
<td>1858</td>
<td>Columbia, George Hills, D.D.</td>
<td></td>
</tr>
<tr>
<td>1846</td>
<td>Dundee, N.Z., H. L. Jenmer, D.D.</td>
<td></td>
</tr>
<tr>
<td>1845</td>
<td>Fredericton, John Medley, D.D.</td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>Gisbaltar, Hon. C. A. Harris, D.D.</td>
<td></td>
</tr>
<tr>
<td>1863</td>
<td>Goulburn, M. Thomas, D.D.</td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>Grafton &amp; Armidale, J. F. Turner, D.D.</td>
<td></td>
</tr>
<tr>
<td>1856</td>
<td>Graham's Town, H. Cotterill, D.D.</td>
<td></td>
</tr>
<tr>
<td>1842</td>
<td>Guiana, W. P. Austin, D.D.</td>
<td></td>
</tr>
<tr>
<td>1857</td>
<td>Hexham, Benjamin Cronyn, D.D.</td>
<td></td>
</tr>
<tr>
<td>1843</td>
<td>Jamaica, A. G. Spencer, D.D.</td>
<td></td>
</tr>
<tr>
<td>1846</td>
<td>Jerusalem, Samuel Gobat, D.D.</td>
<td></td>
</tr>
<tr>
<td>1856</td>
<td>Kingston, Reg. Courtenay, D.D.</td>
<td></td>
</tr>
<tr>
<td>1868</td>
<td>Laibian, Walter Chambers, D.D.</td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>Madras, Frederick Geil, D.D.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>BISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td>Mauritius, D.D.</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>Melbourne, Charles Perry, D.D.</td>
<td></td>
</tr>
<tr>
<td>1850</td>
<td>Montreal, D.D., Metrop.</td>
<td></td>
</tr>
<tr>
<td>1863</td>
<td>Nassau, Baha, A. R. P. Venables, D.D.</td>
<td></td>
</tr>
<tr>
<td>1853</td>
<td>Natal, J. W. Colenso, D.D.</td>
<td></td>
</tr>
<tr>
<td>1866</td>
<td>Nelson, N.Z., A. B. Suter, D.D.</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>Newcastle, N.S.W., Wm. Tyrell, D.D.</td>
<td></td>
</tr>
<tr>
<td>1844</td>
<td>Newfoundland, Edward Field, D.D.</td>
<td></td>
</tr>
<tr>
<td>1851</td>
<td>Nova Scotia, Hbbert Binney, D.D.</td>
<td></td>
</tr>
<tr>
<td>1862</td>
<td>Ontario, J. T. Lewis, D.D., LL.D.</td>
<td></td>
</tr>
<tr>
<td>1857</td>
<td>Perth, W. Australia, M. B. Hale, D.D.</td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>Rupert's Land, R. Machray, D.D.</td>
<td></td>
</tr>
<tr>
<td>1863</td>
<td>Quebec, J. W. Williams, D.D.</td>
<td></td>
</tr>
<tr>
<td>1860</td>
<td>Sierra Leone, E. H. Beckles, D.D.</td>
<td></td>
</tr>
<tr>
<td>1882</td>
<td>St. Helena, T. E. Welby, D.D.</td>
<td></td>
</tr>
<tr>
<td>1854</td>
<td>Sydney, F. Barker, D.D., Metrop.</td>
<td></td>
</tr>
<tr>
<td>1864</td>
<td>Tasmania, C. H. Bromby, D.D.</td>
<td></td>
</tr>
<tr>
<td>1867</td>
<td>Toronto, A. N. Bethune, D.D., D.C.L.</td>
<td></td>
</tr>
<tr>
<td>1867</td>
<td>Victoria, C. R. Alford, D.D.</td>
<td></td>
</tr>
<tr>
<td>1859</td>
<td>Waiapu, N.Z., W. Williams, D.C.L.</td>
<td></td>
</tr>
<tr>
<td>1858</td>
<td>Wellington, N.Z., C. J. Abraham, D.D.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>ARCHBISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1865</td>
<td>Central Africa, W. G. Tozer, D.D.</td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>Honolulu, T. N. Staley, D.D.</td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>Melanesia, J. C. Patteson, D.D.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APP.</th>
<th>SEES</th>
<th>BISHOPS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>Niger Territory, S. E. Crowther, D.D.</td>
<td></td>
</tr>
<tr>
<td>1863</td>
<td>Orange River, Edward Twells, D.D.</td>
<td></td>
</tr>
</tbody>
</table>
### Universities of the United Kingdom

#### England

**Oxford.**

<table>
<thead>
<tr>
<th>College</th>
<th>Professor/Guest</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chancellor</strong></td>
<td>Earl of Derby, K.G., D.C.L.</td>
<td>1852</td>
</tr>
<tr>
<td><strong>High Stew.</strong></td>
<td>Earl of Carnarvon, D.C.L.</td>
<td>1859</td>
</tr>
<tr>
<td><strong>Vice-Chancellor</strong></td>
<td>F. K. Leighton, D.D.</td>
<td>1866</td>
</tr>
<tr>
<td><strong>Pro-Vice-Chancellors</strong></td>
<td>Dr. Plumptre, Master of University; Dr. Lightfoot, Rector of Exeter; Dr. Liddell, Dean of Christ Church; Dr. Sewell, Warden of New.</td>
<td></td>
</tr>
<tr>
<td><strong>Pro-Professors</strong></td>
<td>G. S. Ward, M.A., Mag. Hall; H. Hansell, M.A., Mag. College; T. H. Shand, M.A., Brasenose; Charles Elyot, M.A., Queen's.</td>
<td></td>
</tr>
</tbody>
</table>

**Founders:**
- **Founded Heads:**
  - 672: Univers. F. C. Plumptre, D.D. | 1838 |
  - 1258: Balliol, Robert Scott, D.D. | 1854 |
  - 1274: Merton, R. B. Marshall, D.C.L. | 1826 |
  - 1316: Exeter, J. P. Lightfoot, D.D. | 1854 |
  - 1325: Oriel, E. Hawkins, D.D. | 1824 |
  - 1340: Queen's, W. Jackson, D.D. | 1862 |
  - 1427: Linnaeum, M. Pattison, B.D. | 1861 |
  - 1437: All Souls, F. K. Leighton, D.D. | 1858 |
  - 1449: Magdalen, F. Bulley, D.D. | 1855 |
  - 1532: Christ Church, H. G. Liddell, D.D. | 1853 |
  - 1555: Trinity, S. W. Wayte, B.D. | 1866 |
  - 1557: St. John's, P. Wynter, D.D. | 1829 |
  - 1571: Jesus, Charles Williams, D.C.L. | 1857 |
  - 1613: Wadham, B. P. Symsons, D.D. | 1831 |
  - 1620: Pembroke, Evan Evans, M.A. | 1864 |
  - 1547: St. John's Hall, W. C. Salter, M.A. | 1861 |
  - 1268: St. Edmund Hall, E. Moore, B.D. | 1864 |
  - 1233: New Hall, D. P. Chase, M.A. | 1857 |
  - 1602: Magdalen Hall, R. Michell, D.D. | 1866 |

**Professors and Public Readers.**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Professor/Guest</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>M. A. Lawson</td>
<td>1867</td>
</tr>
<tr>
<td>Poetry</td>
<td>Sir F. H. Doyle, Bt.</td>
<td>1863</td>
</tr>
<tr>
<td>Med. Hist. (Reg.)</td>
<td>W. Stubbs, M.A.</td>
<td>1866</td>
</tr>
<tr>
<td>Anglo-Saxon</td>
<td>J. Bosworth, D.D.</td>
<td>1853</td>
</tr>
<tr>
<td>Law (Viner.)</td>
<td>J. R. Kenyon, D.C.L.</td>
<td>1843</td>
</tr>
<tr>
<td>Vinerian Reader</td>
<td>K. E. Digby, M.A.</td>
<td>1868</td>
</tr>
<tr>
<td>Clinical Medicine</td>
<td>H. W. Acland, M.D.</td>
<td>1857</td>
</tr>
<tr>
<td>Arab. (L. Alm.)</td>
<td>T. G. Kenyon, M.A.</td>
<td>1863</td>
</tr>
<tr>
<td>Experim. Philos.</td>
<td>R. B. Clifton, M.A.</td>
<td>1865</td>
</tr>
<tr>
<td>Mineralogy</td>
<td>H. S. H. Maseklyne, M.A.</td>
<td>1856</td>
</tr>
<tr>
<td>Geology</td>
<td>J. Phillips, M.A.</td>
<td>1856</td>
</tr>
<tr>
<td>Pol. Econ.</td>
<td>Bonamy Price, M.A.</td>
<td>1863</td>
</tr>
<tr>
<td>Sanscrit</td>
<td>Montier Williams, M.A.</td>
<td>1860</td>
</tr>
<tr>
<td>Modern Languages and Literature (Taylorton), (vacant)</td>
<td>Max Miller, M.A.</td>
<td>1863</td>
</tr>
<tr>
<td>Logic</td>
<td>H. Wall, M.A.</td>
<td>1849</td>
</tr>
<tr>
<td>Ireland's Exegetical</td>
<td>R. Scott, D.D.</td>
<td>1861</td>
</tr>
<tr>
<td>Lat. Lit.</td>
<td>John Conington, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>Mor. Phil. (Waynflete)</td>
<td>H. W. Chandler, M.A.</td>
<td>1867</td>
</tr>
<tr>
<td>International Law and Diplomacy (Chichele)</td>
<td>M. Bernard, B.C.L.</td>
<td>1859</td>
</tr>
<tr>
<td>Physiol. (Linacre)</td>
<td>G. Rolleston, M.D.</td>
<td>1860</td>
</tr>
<tr>
<td>Zoology (Hooke)</td>
<td>J. O. Westwood, M.A.</td>
<td>1861</td>
</tr>
<tr>
<td>Modern History (Chichele)</td>
<td>M. Burrows, M.A.</td>
<td>1862</td>
</tr>
<tr>
<td>Chem. (Waynflete)</td>
<td>S. C. Brodie, Bt.</td>
<td>1865</td>
</tr>
<tr>
<td>Public Orator</td>
<td>R. Michell, D.D.</td>
<td>1849</td>
</tr>
<tr>
<td>Bodleian Libr.</td>
<td>H. O. Cox, M.A.</td>
<td>1860</td>
</tr>
<tr>
<td>Custos Archiv.</td>
<td>J. Griffiths, M.A.</td>
<td>1857</td>
</tr>
<tr>
<td>Keeper of Ash. Mus.</td>
<td>J. Phillips, M.A.</td>
<td>1854</td>
</tr>
<tr>
<td>Radcliffe Libra.</td>
<td>H. W. Acland, M.I.</td>
<td>1851</td>
</tr>
<tr>
<td>Radcliffe Observer, Robert Main, M.A.</td>
<td>1860</td>
<td></td>
</tr>
<tr>
<td>Bampton Lect.</td>
<td>R. P. Smith, D.D.</td>
<td>1863</td>
</tr>
</tbody>
</table>

**Select Professors for 1869**


**University Officers.**

- **Assessor:** M. Bernard, B.C.L. — **University Registrar:** E. W. Rowden, D.C.L. — **Proctors in the Court:** F. J. Morrell, J. C. Dudley, T. Mallam, J. M. Davenport, Attorneys-at-Law. — **Coroners:** F. Symonds, M.R.C.S., F. P. Morrell, M.A. — **Crown:** Sir R. Palmer, D.C.L. — **Solicitor:** F. J. Morrell.
- **Clerks of the Market:** E. W. Rowden, D.C.L.; C. Neate, M.A. — **Esquire Bedells:** Wm. Waters Harrison, M.A., Divin. and Law. — **Yeomen Bedells:** H. S. Harper, Physic and Arts; John Haines, Law. — **Clerk of the University:** G. Harper. — **Verger:** Moses Hollday. — **Bailiff:** Wm. F. Perkins.
CAMBRIDGE.

High Steward, Earl of Powis, LL.D. 1863.
Commissary, Wm. Forsyth, M.A., Q.C. 1868.
Assessor to Chan., James Tozer, LL.D. 1862.

COLLEGES AND HALLS.

Founded Heads Elected
1257 St. Peter's, H. W. Cookson, D.D. 1847
1362 Clare, E. Atkinson, D.D. 1856
1343 Pembroke, G. Ainslie, D.D. 1828
1348 Gonville and Caius, Edwin Guest, LL.D., F.R.S. 1865
1350 Trinity, T. C. Geldart, LL.D. 1850
1351 Corpus Christi, J. Pulling, D.D. 1859
1441 King's, Richard Oakes, D.D. 1850
1446 Queen's, George Phillips, D.D. 1857
1475 St. Cath., C. K. Robinson, D.D. 1861
1496 Jesus College, G. E. Corrie, D.D. 1849
1505 Christ's, James Cartmill, D.D. 1849
1511 St. John's, W. H. Bateson, D.D. 1857
1519 Magdalene, Hon. L. Neville, M.A. 1864
1546 Trinity, W. H. Thompson, D.D. 1866
1584 Em. G. Archdall Gratwicke, D.D. 1835
1598 Sidney, Robert Phelps, D.D. 1843
1600 Downing, T. Worsley, D.D. 1836
Proctors—James Porter, M.A., St. Peter's;
R. B. Somerset, M.A., Trinity.
Pro-Proctors—Peter H. Mason, M.A., St. John's; G. F. Browne, M.A., St. Cath.
Sez Viri—Dr. Phelps, Dr. Bateson, Dr. Paget, Prof. Stokes, M.A., Prof. Living, M.A.,
J. Power, M.A.
Moderators—Joseph Wolstenholme, M.A.,
Christ's; J. C. Maxwell, M.A., Trinity.

PROFESSORS, ETC.

Founded Professors, &c. Elected
1502 Div. (Mag.), W. Selwyn, D.D. 1855
1503 Lady Marg. preacher, W. G. Clark, M.A. 1858

Founded Professors, &c. Elected
1522 Pub. Orat., W. G. Clark, M.A. 1837
1540 Div. (Reg.), J. A. Jeremie, D.D. 1850
1540 C. Law (Reg.), J. T. Abdy, LL.D. 1854
1540 Physic (Reg.), H. J. H. Bond, M.D. 1851
1540 Heb. (Reg.), T. Jarrett, M.A. 1854
1540 Gr. (Reg.), B. H. Kennedy, D.D. 1867
1632 Arabic, H. G. Williams, D.D. 1854
1632 Id. Almo. Read. & Prof. Arab., Theodore Preston, M.A. 1855
1663 Math., G. G. Stokes, M.A., F.R.S. 1849
1683 Mor. Philos., F. D. Maurice, M.A. 1856
1884 Mus., W. S. Bennett, Mus. D. 1856
1702 Chem., G. D. Living, M.A. 1861
1704 Astron. (Plum.), J. Challis, M.A., F.R.S. 1839
1707 Anat. G. M. Humphry, M.D. 1865
1724 Mod. Hist., Chas. Kingsley, M.A. 1880
1724 Botany, C. C. Babington, M.A. 1881
1727 Geol., A. Sedgwick, LL.D., F.R.S. 1813
1740 Lovens, Astron., J. C. Adams, M.A., F. R.S. 1858
1769 R. Lee, J. J. S. Peroune, B.D. 1858
1783 Nat. & Exp. Pha., R. Willis, M.A., F.R.S. 1837
1806 Law (Down), W. L. Birkbeck, M.A. 1880
1804 Med. (Down), W. W. Fisher, M.B. 1841
1808 Min. W. H. Miller, M.A., F.R.S. 1832
1851 Arch. (Disc.), C. Babington, B.D. 1885
1860 Div. (Hulls), J. B. Lightfoot, D.D. 1881
1863 Math. (Sadlerian), A. Cayley, M.A. 1883
1863 Polit. Econ., H. Fawcett, M.A. 1882
1866 Zoology and Comp. Anat., A. Newton, M.A. 1886
1867 Sanscrit, E. B. Cowell, M.A. 1887
1867 International Law (vacant)
Librarian, H. Bradshaw, M.A. 1847
Registrar, H. R. Laard, M.A. 1882
Examiner (H. Godfray, M.A.) 1844
Bedells (W. H. Besant, M.A. 1865

LONDON. CHARTER, 1837.


EXAMINERS.

Chem.—H. Debus, Ph.D.; A. W. Williamson, Ph.D.
Bot. and Veg. Phys.—M. J. Berkeley, M.A.; T. Thomson, M.D.
Geology and Palaeontology.—A. Geikie, Prof. T. Rupert Jones.
Law and Prin. of Legis.—M. Bernard, B.C.L., M.A.; J. R. Quain, LL.B.
Med.—J. R. Reynolds, M.D.; S. Williams, M.D.
Surgery—F. Le Gros Clark; J. E. Enichem;
Anatomy—W. Turner, M.B.; John Wood;
Physiology, Comp. Anat., and Zoology—T. B. Huxley, Ph.D.; H. Power, M.B.
Midw.—J. B. Hicks, M.D.; W. O. Priestley, M.D.
Mat. Med. and Pharm. Chem.—A. B. Garve, M.D.; S. O. Habershon, M.D.
Forensic Med.—E. H. Greenhow, M.D.; T. Stevenson, M.D.
UNIVERSITIES OF THE UNITED KINGDOM.—COLLEGES AND SCHOOLS. 67

DURHAM.

Visitor, The Bishop of Durham.
Warden, Very Rev. G. Waddington, D.D.
Subwarden, J. Chevalier, B.D.
Proctors, Rev. J. Barnby, B.D.; Rev. J. Waite, M.A.
Heads of Houses, University College, Rev. Joseph Waite, M.A.; Bp. Hatfield’s Hall, J. Barnby, B.D.
Prof. of Divinity and Eccl. Hist., A. S. Farrar, Prof. of Class. Lit., Rev. T. S. Evans, M.A.

Prof. of Mathematics and Astronomy, T. Chevalier, B.D.
Reader in Hebrew, T. Chevalier, B.D.
Law, W. Gray, M.A.
History, T. Greenwood, M.A.
Medicine, D. Embledon, M.D.
Mining and Civil Engineering, A. Beanlands, M.A.
Chemistry and Mineralogy, A. F. Marreo.
Registrar, Rev. T. Thornton.
Librarian, Rev. T. F. Dodd.

SCOTLAND.

St. ANDREWS (Founded 1411).
Chancellor, Duke of Argyll, LL.D., K.T.
Rector, John Stuart Mill.
Dean of Faculty of Arts, John C. Shairp, B.A.

Heads of Colleges.
St. Salvator and St. Leonard, James D. Forbes, D.C.L.
St. Mary, John Tulloch, D.D.

GLASGOW (Founded 1450).
Chancellor, Duke of Montrose, K.T.
Rector, Right Hon. John Inglis.

Dean of Faculties, Sir J. Ferguson, Bt.
Principal, Thomas Barclay, D.D.

ABERDEEN (Founded 1494).
Chancellor, Duke of Richmond, K.G.
Vice-Chancellor, Principal Campbell.
Rector, M. E. Grant Duff.
Principal, P. C. Campbell, D.D.
Secretary, David Thomson, M.A.

EDINBURGH (Founded 1583).
Chancellor, (vacant).
Rector, Thomas Carlyle.
Principal, Sir Alex. Grant.
Secretary, John Wilson.

IRELAND.

DUBLIN.
Chancellor, Lord Cairns.
Vice-Chancellor, Rt. Hon. Joseph Napier.
Provost of Trinity College, Humphry Lloyd, D.D.
Vice-Provost, J. L. Moore, D.D.

QUEEN’S UNIVERSITY.
Chancellor, Earl of Clarendon, K.G.
Vice-Chancellor, Right Hon. M. Brady.
Secretary, G. J. Stoney, M.A. (Dublin Castle).
Clerk of Convocation, James Wilson, M.A.

COLLEGES AND PUBLIC SCHOOLS.

KING’S COLLEGE, LONDON.
Principal, A. Barry, B.D.
Secretary, J. W. Cunningham.
Master of the School, G. F. Maclear, B.D.

UNIVERSITY COLLEGE, LONDON.
President, George Grote, Esq., LL.D.
Secretary, John Robson, B.A.
Master of the School, Thos. Hewitt Key, M.A.

WINCHESTER.
Warden, G. B. Lee, M.A.
Head Master, George Ridding, M.A.

ETON.
Provost, Charles Old Goodford, D.D.
Head Master, J. J. Hornby, M.A.

St. PAUL’S, Master, Herbt. Kynaston, D.D.
CHRIST’S HOSPITAL, — G. C. Bell, M.A.
WESTMINSTER — Charles B. Scott, D.D.
MERCHANT TAYLORS — J. A. Hessey, D.C.L.
HARROW, — H. M. Butler, D.D.
CHARTER HOUSE, — W. Haig Brown, LL.D.
BEDFORD, — F. Faneshaw, M.A.
BIRMINGHAM, — C. Evans, M.A.
BURY ST. EDMUNDS — A. H. Wrailes, M.A.
DULWICH COLLEGE, — A. J. Carver, D.D.
GUERNSEY, — J. Oates, M.A.
HIGHGATE, — J. B. Dyne, D.D.
ISWICK, — H. A. Holden, M.A.
LEEDS, — W. G. Henderson, D.C.L.
MANCHESTER, — F. W. Walker, M.A.
MARLBOROUGH COLLEGE, — G. G. Bradley, M.A.
REPTON, — S. A. Pears, D.D.
RUGBY, — Fredk. Temple, D.D.
SHERBORNE, — H. D. Harper, M.A.
SOUTHWAKE, — A. Johnson, M.A.
SHREWSBURY, — H. W. Moss, M.A.
TONBRIDGE, — J. L. Weildon, D.C.L.
LIST OF THE PRINCIPAL PUBLIC INSTITUTIONS,
MUSEUMS, GARDENS, &c., IN LONDON AND ITS NEIGHBOURHOOD,
and the Mode of Admission thereto: many of them being open to the Public Free.

BRITISH MUSEUM (Great Russell Street).—Monday, Wednesday, and Friday, from 10 to 4, in January, February, November, and December; from 10 to 5, in March, April, September, and October; from 10 to 6 (and on Saturday, from 12 to 5) in May, June, July, and August. The Museum is closed the first week in January, May, and September, on Ash Wednesday, Good Friday, Christmas Day, and Fast or Thanksgiving days.

DULWICH GALLERY.—Monday, Wednesday, and Saturday, Free; Thursday and Friday on payment of 6d.; from 10 to 5 in summer, and from 11 to 3 in winter.

GEOLOGICAL MUSEUM (Jermyn Street, Piccadilly).—Daily, except Friday, from 10 to 4, during November, December, January, and February; and from 10 to 5, during the remainder of the year, with the exception of one month of vacation, from August 10 to September 10. On Mondays and Saturdays it remains open till 10 P.M.

GREENWICH HOSPITAL.—The Painted Hall is open every day Free from 10 to 6, from March 16 to Sept. 18; and until sunset during the rest of the year.

HAMPION COURT PALACE.—Every week-day, except Friday, from 10 to 4; on Sundays, after 2.

INDIAN MUSEUM (Whitehall Yard).—Monday, Wednesday, and Friday, 10 to 4.

KEW GARDENS.—The public are admitted to the Royal Botanic Gardens, and the Pleasure Grounds, every week-day (Christmas Day excepted), from 1 till sunset; on Sundays, from 2 till sunset.

NATIONAL GALLERY (Trafalgar Square).—Monday, Tuesday, Wednesday, and Saturday; closed during the month of October, and on Christmas Day and Good Friday. (Thursday and Friday students' days).

NATIONAL PORTRAIT GALLERY (Great George Street, Westminster).—Monday, Wednesday, and Saturday, from 10 to 6 in summer; and from 10 to 4 in winter.

ROYAL BOTANIC SOCIETY OF LONDON Gardens, Offices, and Museum (Inner Circle, Regent's Park).—Admission by Fellow's Order.

ROYAL COLLEGE OF SURGEONS' MUSEUM (Lincoln's Inn Fields)—Monday, Tuesday, Wednesday, and Thursday, from 12 to 4, October to February inclusive; and from 12 to 5, March to August inclusive, except during the month of September, when the Museum is closed.

ROYAL GEOGRAPHICAL SOCIETY (15 Whitehall Place).—Half-past 10 to half-past 4; Saturdays, half-past 10 to half-past 2. Admission to the Library by Fellow's order; to the Map Room, Charts, Models, &c., by giving name and address.

ROYAL HORTICULTURAL SOCIETY (South Kensington).—Open daily to the Public (Sundays excepted), Mondays, 6d.; Tuesdays and Saturdays, 2s. 6d.; other days, 1s.

ROYAL UNITED SERVICE MUSEUM (Whitehall Yard).—Daily from 11 to 5, in summer, and from 11 to 4, in winter. Admission by Member's Tickets; on Fridays by personal introduction.

SOANE MUSEUM (13 Lincoln's Inn Fields).—Wednesday in February and March; Wednesday, Thursday and Friday during April, May, and June; Wednesday in July and August; from 10 to 4. Admission by tickets, which will be sent by post on application.

SOCIETY OF ARTS (John Street, Adelphi).—Daily, except Wednesday, from 10 to 4. Admission by Member's order.

SOUTH KENSINGTON MUSEUM.—Open daily, Free, Monday, Tuesday, and Saturday, from 10 to 10; by payment of 6d., Wednesday, Thursday, and Friday, from 10 to 4, or 6, according to the season.

TOWER OF LONDON.—Daily, the armories and regalia, 10 to 4; 6d. to each place.

WESTMINSTER, PALACE OF.—By free Tickets, which admit any number of persons, obtainable at the Lord Great Chamberlain's office, under the Victoria Tower, every Saturday from 10 to 4. Admission to hear the debates in the House of Lords or Commons can only be obtained by a Peer's or a Member's order.

WINDSOR CASTLE.—State apartments, Monday, Tuesday, Thursday, and Friday, 11 to 4, April to October; 11 to 3, November to March.

WOOLWICH ARSENAL AND DOCKYARD.—Free, to the Arsenal, Tuesday and Saturday, by cards from the Under Secretary for War, 9 to 11, and 1 to 3; to the Dockyard, Free, daily; 8 to 11 A.M., 1:30 to 4:30 P.M., in summer; 1:15 to 3:15 P.M., in

ZOLOGICAL GARDENS (Regent's Park).—Admission on Mondays, 6d.; on other days, 1s.
PRIME MINISTERS.—POPULATION.

PRIME MINISTERS
OF THE VARIOUS ADMINISTRATIONS SINCE THE ACCESSION OF GEORGE III.

<table>
<thead>
<tr>
<th>Prime Minister</th>
<th>Date of Administration</th>
<th>Date of Accession to Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earl of Bute</td>
<td>May 29, 1762</td>
<td>Aug. 10, 1762</td>
</tr>
<tr>
<td>Mr. Grenville</td>
<td>April 16, 1763</td>
<td>Jan. 11, 1762</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>July 12, 1765</td>
<td>Nov. 12, 1765</td>
</tr>
<tr>
<td>Duke of Grafton</td>
<td>Aug. 2, 1766</td>
<td>July 14, 1764</td>
</tr>
<tr>
<td>Lord North</td>
<td>Jan. 28, 1770</td>
<td>Dec. 15, 1773</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>Mar. 30, 1782</td>
<td>April 18, 1785</td>
</tr>
<tr>
<td>Lord Shelburne</td>
<td>July 3, 1782</td>
<td>Aug. 31, 1781</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>April 5, 1783</td>
<td>July 6, 1786</td>
</tr>
<tr>
<td>Mr. Pitt</td>
<td>Dec. 27, 1783</td>
<td>Feb. 27, 1785</td>
</tr>
<tr>
<td>Mr. Addington</td>
<td>Mar. 7, 1801</td>
<td>Dec. 28, 1801</td>
</tr>
<tr>
<td>Mr. Pitt</td>
<td>May 28, 1804</td>
<td>Feb. 8, 1805</td>
</tr>
<tr>
<td>Lord Grenville</td>
<td>Jan. 8, 1806</td>
<td>Feb. 26, 1808</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>Mar. 13, 1807</td>
<td>June 18, 1809</td>
</tr>
<tr>
<td>Mr. Perceval</td>
<td>June 23, 1810</td>
<td>Nov. 3, 1815</td>
</tr>
<tr>
<td>Lord Liverpool</td>
<td>June 8, 1812</td>
<td>July 6, 1816</td>
</tr>
<tr>
<td>Mr. Canning</td>
<td>April 11, 1827</td>
<td>Feb. 25, 1828</td>
</tr>
</tbody>
</table>

The population of the different counties of England and Wales in 1861; with the number of members of Parliament returned by each by the reformed Parliament of 1868.

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
<th>Members of Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedford</td>
<td>135,265</td>
<td>4</td>
</tr>
<tr>
<td>Berks</td>
<td>176,103</td>
<td>8</td>
</tr>
<tr>
<td>Buckingham</td>
<td>166,597</td>
<td>8</td>
</tr>
<tr>
<td>Cambridge</td>
<td>175,950</td>
<td>7</td>
</tr>
<tr>
<td>Chester</td>
<td>505,153</td>
<td>13</td>
</tr>
<tr>
<td>Cornwall</td>
<td>369,232</td>
<td>13</td>
</tr>
<tr>
<td>Cumberland</td>
<td>205,293</td>
<td>8</td>
</tr>
<tr>
<td>Derby</td>
<td>339,377</td>
<td>8</td>
</tr>
<tr>
<td>Devon</td>
<td>584,531</td>
<td>17</td>
</tr>
<tr>
<td>Dorset</td>
<td>188,651</td>
<td>10</td>
</tr>
<tr>
<td>Durham</td>
<td>509,018</td>
<td>13</td>
</tr>
<tr>
<td>Essex</td>
<td>404,644</td>
<td>10</td>
</tr>
<tr>
<td>Gloucester</td>
<td>405,592</td>
<td>11</td>
</tr>
<tr>
<td>Hereford</td>
<td>123,659</td>
<td>6</td>
</tr>
<tr>
<td>Hertford</td>
<td>173,294</td>
<td>4</td>
</tr>
<tr>
<td>Huntingdon</td>
<td>64,297</td>
<td>3</td>
</tr>
<tr>
<td>Kent</td>
<td>733,675</td>
<td>21</td>
</tr>
<tr>
<td>Lancaster</td>
<td>2,428,744</td>
<td>33</td>
</tr>
<tr>
<td>Leicester</td>
<td>237,402</td>
<td>6</td>
</tr>
<tr>
<td>Lincoln</td>
<td>319,097</td>
<td>12</td>
</tr>
<tr>
<td>Middlesex</td>
<td>2,205,771</td>
<td>19</td>
</tr>
<tr>
<td>Monmouth</td>
<td>174,670</td>
<td>3</td>
</tr>
<tr>
<td>Norfolk</td>
<td>435,422</td>
<td>10</td>
</tr>
<tr>
<td>Northampton</td>
<td>227,727</td>
<td>8</td>
</tr>
<tr>
<td>Northumberland</td>
<td>343,028</td>
<td>10</td>
</tr>
<tr>
<td>Nottingham</td>
<td>293,784</td>
<td>10</td>
</tr>
<tr>
<td>Oxford</td>
<td>172,266</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
<th>Members of Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutland</td>
<td>21,559</td>
<td>2</td>
</tr>
<tr>
<td>Salop</td>
<td>240,876</td>
<td>10</td>
</tr>
<tr>
<td>Somerset</td>
<td>444,725</td>
<td>15</td>
</tr>
<tr>
<td>Southampton</td>
<td>481,435</td>
<td>16</td>
</tr>
<tr>
<td>Stafford</td>
<td>746,584</td>
<td>19</td>
</tr>
<tr>
<td>Suffolk</td>
<td>326,271</td>
<td>9</td>
</tr>
<tr>
<td>Surrey</td>
<td>829,649</td>
<td>13</td>
</tr>
<tr>
<td>Sussex</td>
<td>363,648</td>
<td>15</td>
</tr>
<tr>
<td>Warwick</td>
<td>561,728</td>
<td>11</td>
</tr>
<tr>
<td>Westmorland</td>
<td>60,809</td>
<td>3</td>
</tr>
<tr>
<td>Wilts</td>
<td>249,455</td>
<td>15</td>
</tr>
<tr>
<td>Worcester</td>
<td>367,601</td>
<td>11</td>
</tr>
<tr>
<td>York</td>
<td>2,033,551</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wales</th>
<th>Population</th>
<th>Members of Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anglesey</td>
<td>54,564</td>
<td>2</td>
</tr>
<tr>
<td>Brecon</td>
<td>61,627</td>
<td>2</td>
</tr>
<tr>
<td>Cardigan</td>
<td>72,255</td>
<td>2</td>
</tr>
<tr>
<td>Carmarthen</td>
<td>111,757</td>
<td>3</td>
</tr>
<tr>
<td>Carmarvon</td>
<td>30,497</td>
<td>2</td>
</tr>
<tr>
<td>Denbigh</td>
<td>160,862</td>
<td>3</td>
</tr>
<tr>
<td>Flint</td>
<td>69,870</td>
<td>2</td>
</tr>
<tr>
<td>Glamorgan</td>
<td>317,751</td>
<td>6</td>
</tr>
<tr>
<td>Merioneth</td>
<td>38,888</td>
<td>1</td>
</tr>
<tr>
<td>Pembroke</td>
<td>66,083</td>
<td>3</td>
</tr>
<tr>
<td>Radnor</td>
<td>25,403</td>
<td>2</td>
</tr>
</tbody>
</table>

TOTAL POPULATION OF THE UNITED KINGDOM.
CENSUS RETURNS, 1801—1861.

<table>
<thead>
<tr>
<th>Census</th>
<th>England and Wales</th>
<th>Scotland</th>
<th>Islands in the British Seas</th>
<th>Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>8,892,536</td>
<td>1,698,420</td>
<td>89,508</td>
<td>6,801,287</td>
</tr>
<tr>
<td>1811</td>
<td>10,184,063</td>
<td>1,805,864</td>
<td>103,710</td>
<td>7,767,401</td>
</tr>
<tr>
<td>1821</td>
<td>11,999,322</td>
<td>2,091,221</td>
<td>124,040</td>
<td>8,735,724</td>
</tr>
<tr>
<td>1831</td>
<td>13,886,797</td>
<td>2,384,386</td>
<td>143,126</td>
<td>6,552,865</td>
</tr>
<tr>
<td>1841</td>
<td>15,914,149</td>
<td>2,620,184</td>
<td>143,779</td>
<td>5,764,543</td>
</tr>
<tr>
<td>1851</td>
<td>17,927,609</td>
<td>2,888,742</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>20,061,725</td>
<td>3,061,251</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ASSESSED TAXES

The following Schedule contains an accurate statement of the Assessed Taxes, as fixed by 15 and 17 Vict. cap. xc.

### Armorial bearings.
- Persons chargeable with carriage duty to the amount of £3 10s. 0d. 2 12 9d.
- Persons not so chargeable 0 13 2d.

### Carriages.
- For every four-wheeled carriage drawn by two or more horses or mules 3 10s. 0d.
- For every such carriage drawn by one horse or mule 2 0s. 0d.
- For every carriage with four wheels, each being of less diameter than 30 inches, if drawn by two ponies or mules not exceeding 13 hands 1 15 0d.
- If drawn by one 1 0 0d.
- For every carriage with less than four wheels, if drawn by two or more horses or mules 2 0s. 0d.
- If drawn by one 0 15 0d.
- If drawn by one pony or mule not exceeding 13 hands 0 10 0d.
- When kept for hire only, a half of above.

* If used by a carrier, £2 6s. 8d.
† If used by a carrier, 21 6s. 8d.

### Exemptions.
- Hackney carriages, stage coaches, and carriages let for hire. Any carriage wholly in the course of trade or husbandry, and whereon the Christian name and surname, and place of abode of the owner shall be legibly painted; provided that such carriage shall not on any occasion be used for any purpose of pleasure, or otherwise than as aforesaid, except for conveying the owner or his family to or from any place of worship.

<table>
<thead>
<tr>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair-powder</td>
<td>1 3 6</td>
<td></td>
</tr>
</tbody>
</table>

### Horses.
- For every horse and mule exceeding 13 hands, kept for riding or drawing a taxable carriage 1 1 0d.
- If kept for any other purpose 0 10 6d.
- For every pony or mule not exceeding 13 hands:
  - If kept for riding or driving 0 10 6d.
  - If kept for any other purpose 0 5 3d.

### Clergymen actively doing duty, dissenting ministers, medical men (if they keep no other), and farmers, bailiffs, shepherds, and herdsman, are allowed to keep one horse, either for riding or driving, for a duty of 0 10 6d.

### Exemptions.
- Any person keeping horses solely for purposes of husbandry, some or all of which he may occasionally use for other purposes in drawing burdens, shall not be chargeable for more than two kept at any one farm or place. Horses belonging to farmers and market gardeners; brood mares; horses which have not been used during the year and such as are used by persons serving in any corps of yeomanry or volunteer cavalry, are exempt.

<table>
<thead>
<tr>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse-dealers’ yearly Duty</td>
<td>2 10 0d.</td>
<td></td>
</tr>
</tbody>
</table>
- If within the bills of mortality 55 0s. 0d.
- Elsewhere 12 10 0d.

### Exemptions.
- Persons who sell only the horses bred by themselves, or kept as farming stock at least three months.
- Houses. In lieu of the duty on windows, repealed in 1851, a house duty is substituted of 9d. in the pound on houses worth £20 and upwards per annum in rent. But dwelling houses with shop annexed on the basement floor; or houses occupied by any person duly licensed for the sale of ale, wine, and other liquors; or houses which are bond fide farm houses occupied by a tenant or farm servant, are to pay 6d. in the pound. In the valuation of houses belonging to market-gardens and nursery-grounds, the garden and grounds are not to be estimated.
- Servants. For every male servant of the age of 18 years and upwards 1 1 0d.
- Under game-keepers and under-gardeners 0 10 6d.

### Exemptions.
- Servants of officers in the army or navy. Any servant employed to supply the place of a person serving in the militia or any similar force. A son or grandson under 21 years of age. A single servant employed by a licensed victualler, provided he be the only one. Grooms, ostlers, &c., employed by inn-keepers, livery-stable keepers, horse-dealers, jobmasters, &c., in the carrying on of their calling.

### LICENCES.

#### Game Duties—Licence to Kill Game
- If taken out after April 5, and before 25 5 0d.
- Nov. 1, to expire on April 5, in the following year 3 0 0d.
- To expire on Oct. 31, in the same year in which taken out 2 0 0d.
- If taken out or after Nov. 1, to expire on April 5 following 2 0 0d.
- Gamekeepers in Great Britain 2 0 0d.
- To deal in game 2 0 0d.

#### Dogs.
- Licence granted by the Commissioners of Inland Revenue for every dog of whatever description 0 5 0d.

### Horses let for Hire.
- When the person taking out licence to let horses for hire shall keep at one and the same time:
  - One horse or 1 carriage 5 0 0d.
  - Not exceeding 3 horses or 2 carriages 10 0 0d.
  - 4 3 15 0 0d.
  - 5 4 20 0 0d.
  - 6 5 25 0 0d.
  - 8 6 30 0 0d.
  - 12 9 40 0 0d.
  - 15 12 50 0 0d.
  - 20 15 60 0 0d.

### Exemptions.
- Exceeding 15 carriages 70 0 0d.
- Exceeding 20 horses, then for every additional 10 horses, or fractional part of 10, the further additional duty of 10 0 0d.
## STAMP DUTIES.

### TABLE

<table>
<thead>
<tr>
<th>STAMPS</th>
<th>MORTGAGES, BONDS, &amp;C.</th>
<th>SETTLEMENTS</th>
<th>CONVEYANCES, when the purchase-money is</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>More than</td>
<td>Not more</td>
<td>More than</td>
</tr>
<tr>
<td>£ s. d.</td>
<td>£</td>
<td></td>
<td>£</td>
</tr>
<tr>
<td>2 6</td>
<td>£</td>
<td></td>
<td>£</td>
</tr>
<tr>
<td>0 0 6</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 1 0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 1 3</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 2 0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 2 6</td>
<td>50</td>
<td>100</td>
<td>..</td>
</tr>
<tr>
<td>0 3 9</td>
<td>100</td>
<td>150</td>
<td>..</td>
</tr>
<tr>
<td>0 5 0</td>
<td>150</td>
<td>200</td>
<td>..</td>
</tr>
<tr>
<td>0 6 5</td>
<td>200</td>
<td>250</td>
<td>..</td>
</tr>
<tr>
<td>0 7 6</td>
<td>250</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>0 8 7</td>
<td>300</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>1 0 0</td>
<td>300</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>1 2 6</td>
<td>400</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>1 5 0</td>
<td>500</td>
<td>800</td>
<td>400</td>
</tr>
<tr>
<td>1 7 6</td>
<td>600</td>
<td>1000</td>
<td>500</td>
</tr>
<tr>
<td>1 1 0</td>
<td>1000</td>
<td>1200</td>
<td>600</td>
</tr>
</tbody>
</table>

For every additional £100, or for any fractional part of £100, 2s. 6d.

### Agreements.

- Under hand only, £ s. d.
- Bills, Foreign, drawn in, but payable out of the United Kingdom, if drawn in set of three or more, then for each Bill—
  - not exceeding £25: £ 0 1
  - exceeding £25: (50 .. 0 2)
  - 50: 75 .. 0 3
  - 100: 100 .. 0 4
  - 200: 200 .. 0 8
  - 300: 300 .. 0 1 0
  - 400: 400 .. 0 1 4
  - 500: 500 .. 0 1 8
  - 750: 750 .. 0 2 6
  - 1000: 1000 .. 0 3 4
  - 1500: 1500 .. 0 5 0
  - 2000: 2000 .. 0 8 0
  - 2500: 2500 .. 0 1 0
  - 3000: 3000 .. 0 1 3 4

When exceeding £1000, for every 1000, and fraction thereof, 3s. 4d.

### Bills, Inland, payable at any time otherwise than on demand—

- not exceeding £5: £ 0 1
- exceeding £5: (10 .. 0 2)
- 10: 25 .. 0 3
- 25: 50 .. 0 6
- 50: 75 .. 0 9
- 75: 100 .. 0 1 0
- 100: 200 .. 0 2 0
- 200: 300 .. 0 3 0
- 300: 400 .. 0 4 0
- 400: 500 .. 0 5 0
- 500: 750 .. 0 7 6
- 750: 1000 .. 0 1 0
- 1000: 1500 .. 0 1 5 0
- 1500: 2000 .. 1 0 0
- 2000: 2500 .. 1 1 0
- 2500: 3000 .. 2 0 0

When exceeding £1000, for every £1000, and fraction thereof, 10s.

### Bills of Exchange (Foreign) drawn out of, but payable within the United Kingdom, or drawn and payable out of, but endorsed, or negotiated within, the United Kingdom:

- For any sum not exceeding £500, the same duty as an Inland Bill of the same amount; or sums above £500, an additional shilling on every additional £100, or fraction of £100.

### Bill of Lading

- £ 0 6

### Certified Copy or Extract of any Register of Births, Baptisms, Marriages, Deaths, or Burials

- £ 0 1

### Charter Party

- £ 0 6

### Contract Note

- £ 0 1

### Cost Book Mines

- £ 0 6

### Delivery Order

- £ 0 1

### Dock Warrant

- £ 0 3

### Draft, payable to order, or to Bearer on demand

- £ 0 1
**Stamp Duties.**

- **Fire Insurance:**
  - The instrument or policy itself: £ 0 0 1
  - And on the sum insured, per cent. per annum: £ 0 0 1
  - There are no stamp duties upon policies of insurance on public hospitals, or on agricultural produce, farming stock, and implements of husbandry, provided such insurance be effected by a separate policy relating to such produce, stock, and implements alone.

- **Indentures of Apprenticeship:**
  - When no premium is paid: £ 0 2 6
  - When the premium is under £30: £ 0 0 0
  - If £30 and under £50: £ 2 0 0
  - If £50 and under £100: £ 0 0 0
  - If £100 and under £200: £ 6 0 0
  - If £200 and under £300: £ 0 0 0
  - If £300 and under £400: £ 0 0 0
  - If £400 and under £500: £ 0 0 0

- **Indentures of Apprenticeship in the Sea Service, the Colonies, or made at the sole expense of any parish or public charity, exempt.**

- **Lesse—**
  - Where the yearly rent does not exceed £5:
    - £ 0 0 0
    - £ 0 0 0
    - £ 0 0 0
  - Exceeding £5:
    - If the term does not exceed 36 years: £ 0 0 0
    - If the term exceeds 36, but not 60 years: £ 0 0 0
    - If the term exceeds 60 years: £ 0 0 0

- **For every additional £50 and fraction of £30:**
  - £ 0 1 0
  - £ 1 0 0
  - £ 1 0 0

- **Licences—Hawkers travelling with:**
  - 1 horse with a licence: £ 2 0 0
  - not above six months: £ 0 0 0
  - Do. above six months, and not above a year: £ 0 0 0
  - Hawkers in Ireland, on foot: £ 2 2 0
  - Do. for each horse used: £ 2 2 0

- **Probate of Wills and Letters of Administration:**
  - Wills: £ 2 2 0
  - Administrations: £ 3 0 0

<table>
<thead>
<tr>
<th>Class</th>
<th>£</th>
<th>s</th>
<th>d</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>If not exceeding 36 years</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If exceeding 36, but not exceeding 60 years</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If exceeding 60 years</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Legacies (value £100 or more).**

- **Per Cent.**
  - Husbands or widows, no legacy: £ 2 6 0
  - Fathers and mothers: 1 0 0
  - To children or their descendants: 1 0 0
  - To brother or sister, or their descendants: 3 0 0
  - To uncle or aunt, or their descendants: 5 0 0
  - To great uncle or aunt, or their descendants: 6 0 0
  - To all other relations, or to strangers: 10 0 0

- **Property left to the husband or wife of a relative pays only the duty chargeable to such relative.**

- **Licences—Hawkers and pedlars on foot (Great Britain):**
  - For any period not above £5: £ 0 0 0
  - six months: £ 1 0 0
  - Above six months, and not above a year: £ 2 0 0

- **Probate of a Bill or Promissory Note.**
  - Note when the stamp duty (duty on the bill or note does not exceed £1) is:
    - Above £1: 2 2 0
    - £1 1 0
    - 5 5 0
    - 10 0 0
    - 50 0 0

- **Protest of any other Bill or Promissory Note.**
  - £ 2 0 0

- **Proxy to vote at any Meeting of Shareholders.**
  - 1 0 0

- **Scrip Certificate.**
  - 1 0 0

- **Succession Duties.**
  - Where the whole succession derived from the same predecessor amounts to £100 or upwards: £ 10 0 0
  - Where any succession is of the value of £20 or upwards, the whole succession being £100 or upwards, the same as Legacy Duties.
ANSWERS TO THE QUESTIONS.

I. QUEST. (2079); by Mr. G. B. Whiting, C.E., Washington, U.S.

Given three points A, B, C and a circle in the same plane, described about C with a given radius; it is required to find a point P on the circumference of the circle, such that if AP, BP, CP be joined, the line CP shall bisect the angle APB.

Solution, by Mr. Thomas Dobson, B.A., Hexham; and Messrs. Barlow, Brooks, Escott, Evans, Hall, Martin, Milbourn, Rutherford, Smith, Traynor, and Wilson.

Let CP = r, AB = 2a, and α, β the semi-axes of an ellipse touching the circle in P, and having its foci at A and B. Then, by the property of the ellipse, the normal CP bisects the angle APB.

Bisect AB in O, and refer the figure to the axis OB and origin O; then, if h, k be the known coordinates of C, we have

\[(x-h)^2 + (y-k)^2 = r^2 \ldots \ldots \ldots \ldots (1)\]
\[a^2y^2 + \beta^2x^2 = a^2\beta^2 \ldots \ldots \ldots \ldots (2)\]
\[x-h = \frac{dy}{dx} = \frac{\beta^2x}{a^2y} \ldots \ldots \ldots \ldots (4)\]

From which α, β, α, and y may be determined.

Note.—This was the Prize Question in the ‘Diary’ for the year 1727-8; and three solutions are given at pp. 167-9 of vol. 1 of ‘Leybourne’s Diary Questions.’ It had been previously solved by some eminent mathematicians as the famous optical problem of Alhazen, viz.: to find a ray of light which, issuing from a given point, shall be reflected by a spherical surface to the eye in any given position.

Mr. Watson also refers to the ‘Ladies’ Diary’ for 1727-8.

Mr. Hall, of Washington, observes:—This question occurs in the construction of steam boilers; the brace of the form AP, PB, PC is stronger when the angle APB is bisected.

Second Solution, by Mr. W. S. B. Woolhouse, London.

Let A, B, C denote the angles which AP, BP, CP (produced) make with AB; OA = OB = a, and CP = r. Then, h, k being the coordinates of C, those of P are \(h - r \cos C, k - r \sin C\); and

\[\tan A = \frac{k - r \sin C}{h + a - r \cos C}; \tan B = \frac{k - r \sin C}{h - a - r \cos C}\]

Since CP bisects the angle at P, \(A + B = 2C\) and \(\tan (A + B) = \tan 2C = 0\), that is,

\[\frac{\tan A + \tan B}{1 - \tan A \tan B} = \frac{2 \cos C \sin C}{\cos^2 C - \sin^2 C} = 0,

which, after substituting the values of \(\tan A, \tan B\), reduces to

\[hk(\cos^2 C - \sin^2 C) - (h^2 - k^2 - a^2) \cos C \sin C - r(k \cos C - h \sin C) = 0 \ldots \ldots \ldots (1)\]

By putting \(x = r \cos C, y = r \sin C\), the equation becomes

\[hk(x^2 - y^2) - (h^2 - k^2 - a^2)xy - r^2(kx - hy) = 0 \ldots \ldots \ldots \ldots (2)\]

D
and shows that \( P \) is on the arc of a given equilateral hyperbola. It is, in fact, one of the four intersections of the hyperbola \( (x^2 + y^2 - \rho^2 = 0) \), the two equations being equivalent to a biquadratic in \( x \) or \( y \).

Otherwise, a good practical and easy method of calculation may be suggested as follows:—Let \( CO \) be joined, making the angle \( \alpha \) with \( AB \); let \( CM \) bisecting the angle \( ACB \) make the angle \( \gamma \) with \( AB \); and let a tangent drawn from \( O \) to the circle make the angle \( \gamma \) with \( OC \).

The equation (1) doubled may be written

\[
2hk \cos 2C - (h^2 - k^2 - a^2) \sin 2C - 2r(k \cos C - h \sin C) = 0.
\]

Now, \( 2m \) is the sum of two angles the tangents of which are \( \frac{k}{h + a}, \frac{k}{h - a} \), so

\[
\tan 2m = \frac{2hk}{k^2 - a^2}.
\]

Therefore, substituting the values \( h^2 - k^2 - a^2 \)

\[
= 2hk \cot 2m, \quad h = \frac{r}{\cos \alpha}, \quad k = \frac{r}{\sin \gamma}, \quad \text{reducing and putting}
\]

\[
\gamma = \frac{2m}{\sin 2\alpha} \sin \gamma, \quad \text{we get}
\]

\[
\sin 2(C - M) - 2q \sin (C - \alpha) = 0.
\]

Here the difference angles \( C - M, C - \alpha \) are so small that, practically, they may be substituted for their sines, and the equation then gives \( C - M = q(C - \alpha) \), or

\[
C = \alpha + \frac{M - \alpha}{1 - q}.
\]

Geometrical Solution, from 'LEYBOURN'S DIARY QUESTIONS.'

Let \( P \) be the point required, and divide \( CA, CB \) in \( a, b \), so that

\[
AC \cdot CA = BC \cdot CB = CP^2.
\]

Join \( aP, bP, ab \); and draw \( Pm \parallel AB \), meeting \( BC \) in \( n \) and \( ab \) in \( m \).

Then, since \( AC : CP = CP : Ca \)

and \( BC : CP = CP : Cb \),

the triangle \( CPA \) is similar to \( CbP \); and the triangle \( CPB \) is similar to \( CbP \). Therefore, \( \angle CPA = \angle CbP \). But by hypothesis the angle \( CPA = CPB \). Therefore, \( \angle CPA = \angle CbP \). Also, since \( AC \cdot CA = BC \cdot Cb \), the four points \( A, a, b, B \) are on the circumference of a circle. Therefore, the angle \( \angle Cba = \angle CBA = CbP \). And \( baP = CaP - CbP - CbP = bPn \). Therefore, the triangles \( mPa \) and \( mbP \) are similar,

\[
\text{and} \quad mP : mP = mb = mP^2 = ma : mb,
\]

a property of the equilateral hyperbola \( PbP' \), whose diameter is \( ab \), and ordinates parallel to \( AB \). If the opposite hyperbola be described, it will cut the given circle in two other points, so that, with an obvious and more general interpretation, there are four points answering the proposed condition.

II. QUEST. (2080); by Mr. SEPTIMUS TEBAY, Rivington.

Let \( BAC \) be a given rectilinear angle, and \( P \) a given point; then isosceles triangles can be formed by lines through \( P \). If \( A \) be the area of the triangle whose vertex is \( A \), and \( A' \) the areas of the other two, show that \( \sqrt{A} + \sqrt{A'} = \sqrt{A} \) is constant whatever be the position of the point \( P \).
ANSWERS TO THE QUESTIONS. 75

Answered by Mr. James Dale, of Aberdeen; and Messrs. Borradaile, Brooks, Rutherford, Tebay, and Watson.

Draw PM = h parallel to AB, and PN = k parallel to AC; then, if BC be drawn through P perpendicular to the internal bisector of A, ABC will be an isosceles triangle having its vertex in A, and its area is

\[ A = \frac{(h + k)^2 \sin A}{2} . \]

Through P draw A'C' so as to make the angle C' = A, then A'AC' is isosceles and the area \( A' = \frac{(2h \cos A + k)^2 \sin A}{4 \cos A} \).

Again, through P draw A''B' so as to make the angle B' = A, then A''AB' is isosceles and the area \( A'' = \frac{(2k \cos A + h)^2 \sin A}{4 \cos A} \).

Therefore \( \frac{\sqrt{A} + \sqrt{A''}}{\sqrt{A}} = \frac{1 + 2 \cos A}{\sqrt{2} \cos A} \),

which is independent of h and k.

The question was similarly answered by Messrs. Barlow, Evans, Hall, Martin, Smith, Traynor, and Wilson.

Another Solution, by Mr. Thomas Dobson; and Messrs. Escott, Milbourn, and Vullen.

Through P draw BPC cutting off AB = AC, and inflect PB', PC' equal to PB and PC respectively. The triangles ABC, PBB', PCC', are evidently similar, and their areas are therefore proportional to the squares of their like sides; hence

\[ \frac{\sqrt{A}}{\sqrt{A'}} = \frac{\sqrt{A''}}{\sqrt{BC}} = \frac{\sqrt{A'} + \sqrt{A''}}{BB'} = \frac{CC'}{BB' + CC'} . \]

And if p, p' be the perpendiculars from P on AB and AC, and \( \angle BAC = 2\alpha \),

\[ BC = \,(p + p') \sec \alpha , \quad BB' = 2p \tan \alpha , \quad CC' = 2p' \tan \alpha ; \quad \text{whence} \]

\[ \sqrt{A'} + \sqrt{A''} = 2 \sin \alpha \sqrt{A} , \]

which is independent of p and p', and therefore holds good for every position of P.

Note.—If PB', PC' be drawn parallel to AC and AB respectively,

then \( \sqrt{A'} + \sqrt{A''} = \sqrt{A} \).

III. QUEST. (2081); by Mr. T. McNamara, Collooney, Ireland.

A diameter BD of a circle and a chord AC are at right angles; BT is a tangent to a variable circle touching the chord and the given circle in B; prove that DR : AD :: RB : BT.
Answered by Mr. Thomas Dobson; Mr. T. M’Namara, the Proposer; and Messrs. Milbourn, Rutherford, Turrell, Vullen, Watson, and Wilson.

Let the variable circle touch AC and the parallel semichord HK, perpendicular to BD, in E and F; then EF is a diameter parallel to BD. Also,

\[ AD^2 = DE^2 + AE \cdot EC \]

\[ = DE^2 + DE \cdot ER = DE \cdot DR \; ; \text{and} \]

\[ DR^2 = DR \cdot BR = RB^2 = RB \cdot BF = BT^2. \]

\[ \therefore DR : DA :: BR : BT. \]

**Note.**—The circle, centre D and radius DA, cuts at right angles all the variable circles.

Similar answers were given by Messrs. Barlow, Escott, Evans, Hall, Rutter, Smith, Traynor, and Turnbull.

**IV. QUEST. (2082); by Mr. W. H. Levy, late of Shalbourne.**

External squares ACED, BCFG being described on the sides AC, BC of any plane triangle, and diagonal lines AG and BD drawn intersecting in Q, this point is in the perpendicular CP. (See Quest. 1690, ‘Diary,’ 1842.) Suppose interior squares ACE/4, BCFG/4 to be described on AC, BC, and the diagonal lines AG’ and BD’ to intersect in Q; this point is also in the perpendicular CP produced if necessary; and if I be the intersection of the perpendiculars, PI is an harmonic mean between PQ and PQ’.

**Solution, by Dr. Rutherford, Charlton; and Messrs. Barlow, Escott, Rutter, Turrell, and Watson.**

Draw DM and GN each perpendicular to AB produced; then, since by equal figures BN = CP = AM, we have AN = BM; also, if AG and BD cut off from CP the respective segments PQ, PQ’, we have NG = BP, DM = AP, and therefore

\[ AN : NG :: AP : PQ; \]

\[ BM : AP :: BP : PQ'; \]

therefore \[ PQ = PQ' = \frac{AP \cdot PB}{AB + CP}. \]

Again, if perpendiculars be drawn from D’ and G’ upon AB, we have

\[ AB - CP : BP :: AP : PQ'; \]

\[ AB - CP : AP :: BP : PQ'; \]

therefore \[ PQ' = PQ' = \frac{AP \cdot BP}{AB - CP} \; \text{and} \; \frac{1}{PQ} = \frac{1}{PQ'} = \frac{2CP}{AP \cdot PB}. \]

Now, PI is evidently \[ \frac{AP \cdot PB}{CP}, \] and consequently

\[ \frac{2}{PI} = \frac{1}{PQ} - \frac{1}{PQ'}. \]

Similar answers were given by Messrs. Borradaile, Brooks, Dale, Dobson, Evans, Hall, M’Namara, Milbourn, Smith, Traynor, and Wilson.
V. QUEST. (2083); by Dr. Rutherford, Charlton.

In a given triangle inscribe geometrically an equilateral triangle the magnitude of which shall be a minimum.

General Solution, by Mr. C. H. Brooks, C.E., London.

Let ABC be the triangle in which to describe a minimum triangle similar to abc.

Solution.—Take any triangle a'b'c' similar to abc, and on its sides describe circles containing angles equal to those of the triangle ABC, as follows. Describe a circle round ABC, and suppose abc to be the required triangle; then C is subtended by ab and AB; hence make O'a'b' = O'b'a' = OAB, and describe a circle through a', b' with centre O'. Similarly, O'' is found by making O''b'c' = O'c'b' = OCB, and O''a'c' = O''c'a' = OAC. These circles intersect in one point. Now, any triangle having its angles upon these circles and its sides passing through a', b', c' will be similar to ABC; and these sides will evidently be greatest when parallel to the lines joining the centres. Hence, join the centres O'O''O'', and parallel to the sides of the triangle so formed draw lines through a', b', c' meeting in and terminated by the circles, forming the triangle ABC. If this figure so formed be reduced till ABC = the given triangle, then a'b'c' will = abc, the minimum triangle required.

[Note.—If P be the common point of intersection of the three circles, and Pa', Pb', Pc' be joined, these lines are perpendiculars to the sides of ABC; also if PA, PB, PC be drawn, these will obviously be diameters to the several circles. Hence, the point P being found such that the lines Pa', Pb', Pc' form angles round P, which are respectively the supplements of A, B, C, the sides of ABC are to be drawn at right angles to those lines.—Ed.]

Mr. William Barlow, of Richmond Hill; Mr. John Brown, Whitwell Colliery, Durham; and Mr. George Robinson, St. John's College, Cambridge, apply a similar method to the particular case of the equilateral triangle as proposed.

Second Solution, by Mr. Thomas Dobson, Hexham; Mr. Albert Escott, Royal Hospital School, Greenwich; Mr. Thomas Milbourn, Riding Mill, Newcastle-on-Tyne; and Mr. Stephen Watson, Haydonbridge.

This may be conveniently separated into two propositions.

1. Through three given points A, B, C to draw right lines which shall include an equilateral triangle of maximum area. Find the point O such that the angle AOB = BOC = COA. Through A, B, C draw right lines intersecting in D, E and F, and perpendicular to OA, OB, OC respectively. Each of the quadrilaterals having a common vertex at O is inscribable in a circle, and the angles at O are equal; therefore the angles at D, E and F are equal, and the triangle is equilateral.

An equilateral triangle is a maximum when its perpendicular is so.

And AO + BO + CO = perpendicular of Δ DEF.
Now, AO is obviously the greatest perpendicular that can be drawn from O on any right line through A, &c.; hence AO + BO + CO is a maximum, and therefore DEF is the maximum equilateral triangle required.

II. To inscribe the minimum equilateral triangle in any triangle ABC.

About ABC describe the maximum equilateral triangle DEF, and through D, E, F draw right lines B'C', C'A', A'B' parallel to BC, CA, AB respectively. Divide the corresponding sides of ABC in d, e, f in the same ratio as those of A'B'C' are divided in D, E, F, and join de, ef, fd. The sides of the triangle def are respectively parallel to those of the triangle DEF, and def is therefore equilateral.

Also, de(AO + BO + CO) = 2(OdCe + OeAf + OfBd) = 2ΔABC.
But AO + BO + CO is a maximum. Hence de, and therefore the Δ def, is a minimum.

Mr. Escott adds the following Corollary:

Cor.—If equilateral triangles be thus circumscribed about and inscribed in a given triangle, the area of the given triangle will be their geometrical mean.

Good analytical solutions were given by Dr. Rutherford, the Proposer; and Messrs. Borradaile, Evans, Hall, M'Namara, Somerscales, Traynor, and Wilson.

VI. QUEST. (2084); by Mr. Thomas Dobson, B.A., Hexham.

If a, b, c be the sides of the triangle (Δ) formed by joining the feet A, B, C of the perpendiculars from any point P in the circumference of the circle inscribed in the equilateral triangle A'B'C' (Δ') of which the side is σ, prove that

\[16(a^2 + b^2 + c^2) = 15σ^2; \text{ and } 3Δ' = 16Δ.\]

Answered by Mr. Dobson, the Proposer; Mr. C. H. Brooks; and Mr. James Wilson, Southampton.

Let \(aβγ\) be the trilinear coordinates, with reference to the equilateral triangle Δ', of any point P in the circumference of the inscribed circle; then the equation to this circle is

\[\sqrt{a} + \sqrt{β} + \sqrt{γ} = 0;\]

also,

\[(a + β + γ)σ = 2Δ' = \frac{1}{4}σ^2 \cdot \sqrt{3};\]

whence

\[8(a^2 + β^2 + γ^2) = 3σ^2 = 16(aβ + aγ + βγ).\]

Now,

\[a^2 = β^2 + γ^2 + 2βγ;\]
\[b^2 = a^2 + γ^2 + 2aγ;\]
\[c^2 = a^2 + β^2 + 2aβ;\]
\[\therefore \ 16(a^2 + b^2 + c^2) = 15σ^2.\]

Again,

\[2Δ = (aβ + βγ + γa) \frac{1}{2} \sqrt{3};\]

whence \[16Δ = 3Δ'.\]

It was answered in like manner by Messrs. Bills, Escott, Hall, Rutherford, Traynor, and Tarrell.
Again, by Mr. Stephen Watson, Haydonbridge; Mr. John Brown, Whitwell Colliery, Durham; Mr. James Dale, Aberdeen; Mr. Edward Rutter, Sunderland; and Mr. John Turnbull, of Bedlington, Northumberland.

Since \( \angle BPC = \angle CPA = \angle APB = 120^\circ \), we have, using trilinear coordinates,

\[ a^2 = b^2 + y^2 + \beta \gamma, \quad b^2 = y^2 + a^2 + \gamma x, \quad c^2 = a^2 + b^2 + a \beta; \]

\[ \therefore \quad a^2 + b^2 + c^2 = 2(a^2 + b^2 + y^2) + a \beta + b \gamma + c \alpha \ldots \ldots \ldots (1). \]

Also the locus of \( P \) and the area of the triangle \( A'B'C' \) give

\[ a^2 + b^2 + c^2 = 0, \quad a^2 + b^2 + y^2 - 2(a \beta + b \gamma + c \alpha) = 0, \]

and \( a + b + \gamma = \frac{1}{2} \sigma \sqrt{3} \), or \( a^2 + b^2 + y^2 = 2(a \beta + b \gamma + c \alpha) = \frac{3}{4} \sigma^2 \);

hence \( a^2 + b^2 + y^2 = \frac{3}{4} \sigma^2 \) and \( a \beta + b \gamma + c \alpha = \frac{3}{16} \sigma^2 \);

and (1) becomes \( a^2 + b^2 + c^2 = \frac{15}{16} \sigma^2 \); also \( \frac{\Delta}{\Delta'} = \frac{a \beta + b \gamma + c \alpha}{\sigma^2} = \frac{3}{16} \).

Nearly thus were the solutions by Messrs. Evans, M'Namara, and Vullen.

VII. QUEST. (2085); by Mr. A. Hall, Washington, U.S.

It is required to find the mean or average distance from the vertex of a right cone, (1) to all the points in the base of the cone, (2) to all the points in the solid content of the cone.

Solution, by Mr. Stephen Watson; Mr. Hall, the Proposer; Mr. Artemas Martin, Franklin, U.S.; and Messrs. Brooks, Brown, Escott, Rutherford, and Traynor.

Let the axis \( AV = a \),

radius of base \( VC = b \),

slant side \( AC = s \);

and \( AD = x \), \( DP = y \), coordinates of any point \( P \) in the cone. Then, an elemental ring of the volume at \( P \) is \( 2\pi ydx \); the limits of \( y \) are \( 0 \ldots \frac{bx}{a} \), and of \( x \), \( 0 \ldots a \); also the number of positions of \( P \) is \( \frac{1}{4} ab^2 \pi \); hence, the average in (2) is

\[
\frac{6}{a b^2} \int_0^a dx \int_0^{\frac{bx}{a}} \left(x^2 + y^2\right)^{\frac{1}{2}} ydy = \frac{2}{a b^2} \int_0^a (s^3 - a^3) x^2dx
\]

\[
= \frac{s^3 - a^3}{2b^2} = \frac{1}{2} \cdot \frac{s^3 - a^3}{s^2 - a^2} = \frac{1}{2} \cdot \frac{s^2 + sa + a^2}{s + a} = \frac{1}{2} \left( s + \frac{a^2}{s + a} \right).
\]

When \( P \) is on the base, an element at \( P \) is \( 2\pi ydy \), the limits of \( y \) are \( 0 \ldots b \), and the number of positions of \( P \) is \( b^2 \pi \); hence, the average in (1) is

\[
\frac{2}{b^2} \int_0^b \left(a^2 + y^2\right)^{\frac{1}{2}} ydy = \frac{2(s^3 - a^3)}{3b^2} = \frac{2}{3} \frac{s^2 + sa + a^2}{s + a} = \frac{2}{3} \left( s + \frac{a^2}{s + a} \right).
\]

Cor.—The averages in (1) and (2) are in the constant ratio \( 4:3 \).

It was similarly answered by Messrs. Barlow, Dobson, M'Namara, and Milbourne.
VIII. QUEST. (2086); by Mr. WILLIAM GODWARD, Chelsea.

If a straight line be drawn from the centre of any one of the four circles of contact of a plane triangle to the circumference of the circle passing through the other three centres, it will be bisected by the circumference of the circumscribed circle.

Solution, by Mr. GODWARD, the Proposer; and in like manner by MESSRS. BROOKS, DALE, ESCOTT, EVANS, HALL, MILBOURN, RUTHERFORD, TUNSTALL, and WATSON.

Let $O_1, O_2, O_3$ be the centres of the four circles of contact of the triangle $ABC$, and $Q$ the centre of the circumscribed circle, of which $G_1, G_2, G_3, G_4$ are diameters bisecting the sides $BC, CA, AB$ respectively.

Join $OQ$ and produce it to $S$, making $QS = OQ$, and join $SO_1, SO_2, SO_3$; then, since $OH_1 = H_1O_1, OH_2 = H_2O_2, OH_3 = H_3O_3$, we have $SO_1 = 2QH_1, SO_2 = 2QH_2, SO_3 = 2QH_3$; hence, $S$ is the centre of the circle passing through $O_1, O_2, O_3$, and its radius is equal to the diameter of the circle $(Q)$.

Again, join $O_1Q$, which produce to $S_1$, making $QS_1 = O_1Q$, and join $S_1O_2, S_1O_3, S_1O_4$; then as $O_1G_2 = G_2O_3, O_1H_1 = H_1O_1, O_1G_1 = G_1O_3$, we have $S_1O_2 = 2QG_3, S_1O_3 = 2QG_2$; therefore $S_1$ is the centre of the circle passing through $O_2, O_3, O_4$, and its radius is also equal to the diameter of the circle $(Q)$.

Take any point $F$ in the circumference of the circle $(S)$; join $OF$, bisect it in $E$ and draw $QE, SE$. Then, $QE = \frac{1}{2}SF = \frac{1}{2}SO_1 = QH_1$. Therefore, $E$, the middle point of $OF$, lies on the circumference of the circumscribed circle.

Again, take any point $F_1$ in the circumference of $(S_1)$; join $O_1F_1$, bisect it in $E_1$, and draw $QE_1, S_1F_1$. Then, similarly, we have $QE_1 = \frac{1}{2}S_1F_1 = \frac{1}{2}SO_1 = QG_1$; and hence, $E_1$, the middle point of the line $O_1F_1$, is also upon the circumference of the circumscribed circle.

In the same manner it may be proved that lines drawn from $O_2$ and $O_3$ to the circumferences of the circles passing through $O_3, O_1, O_1$ and $O_1, O_2, O_2$, will be bisected by the circumference of the circle $(Q)$.

Cor. 1.—Circles described through every three of the four centres $O_1, O_2, O_3, O_4$ are all equal, and the radius of each is equal to the radius of the circle $(Q)$. (See 'Diary,' 1842, p. 30.)

Cor. 2.—It is also manifest that $O_1A, O_2B, O_3C$ are the perpendiculars of the triangle $O_1O_2O_3$, that $O$ is their point of intersection, and that the circle $(Q)$ is the nine-point circle of the said triangle. It therefore follows that if
ANSWERS TO THE QUESTIONS.

a line be drawn from the point of intersection of the perpendiculars of a triangle to the circumference of the circumscribed circle, it will be bisected by the circumference of the nine-point circle. (See Whitworth’s ‘Anal. Geom.,’ art. 309.)

Cor. 3.—If a straight line be drawn from any one of the four centres S, S₁, S₂, S₃ of the four circles O₁O₃O₂, O₂O₀O₂, O₃O₀O₁, O₁O₀O₂, to the circumference of the circle passing through the other three of these centres, it will be bisected by the circumference of the circumscribed circle.

Again, by Mr. Thomas Dobson, Hexham; and Messrs. Barlow, McNamara, Robinson, Rutter, Smith, Traynor, Vullen, and Wilson.

Let right lines from O to O₁, O₂, O₃ cut the circumscribing circle in H₁, H₂, H₃ and those joining O₂O₃, O₃O₁, and O₁O₂ in A, G₁; B, G₂; and C, G₃. It is known that G₁, G₂, G₃, H₁, H₂, H₃ are the middle points of the respective lines. Take any point E₁ in the circumference of the circumscribing circle; join O₁E₁, produce it to F₁, making E₁F₁ = O₁E₁, and conceive lines to connect other points in the diagram.

Since H₃, H₁ are the middle points of O₂O₃, O₀O₁, H₃H₁ is parallel to BG₂ and therefore the arc H₁G₂ = the arc BH₂ and hence the angle H₁E₁G₂ = the angle BH₂H₃; that is, by parallels, OF₁O₃ = OO₂O₃;

... F₁ lies in the circle about O₀O₁O₂.

A similar proof will apply to the other cases.

[The most remarkable properties of the “nine-point circle” are shown in the printed solutions to Mr. T. T. Wilkinson’s Prize Question (1888), ‘Diary’ for 1855. See also the solutions given to Mr. W. H. Levy’s Question (1992), in the ‘Diary’ for 1863.—Ed.]

IX. QUEST. (2087); by “N’IMPORTE.”

Let AB and AE be two lines of which AB is fixed; in AE take AC of a given length, and draw CD so that the angle ECD = 3EAB and CD = \( \frac{AC}{\sqrt{3}} \). Find the quadrature of the several portions of which the locus of D consists.

Solution, by Mr. Stephen Watson; and Messrs. Brooks, Brown, Dobson, Escott, Evans, and Hall.

Put AC = \( a \), AD = \( \rho \), \( \angle EAB = \phi \), and \( \angle DAE = \alpha \); then the equation of the locus of D is \( \rho^2 = a^2 + \frac{1}{2}a^2 + \frac{2a^2}{\sqrt{3}} \cos 3\phi \)

\[ = \frac{a^2}{2} (3 + 2\sqrt{3} \cos 3\phi) \ldots \ldots (1); \]

and if we draw lines BAR, PAP’, QAQ making equal angles of 60° with each other, the curve (1) is found to consist of three equal portions, PR, RQ’, Q’P, symmetrical with respect to the lines AQ, AP’, AR’, and three loops bisected by the lines AP, AR, AQ’; where \( AQ = AP’ = AR’ = a \left(1 + \frac{1}{\sqrt{3}}\right) \), and \( Am = Ar = Ao = a \left(1 - \frac{1}{\sqrt{3}}\right) \). This curve is denoted by the continuous line in the diagram.

\( \text{D} \) §
Now, by the triangle ACD,
\[ a : \sin (3\phi - a) : : \frac{a}{\sqrt{2}} : \sin a ; \text{ hence} \]
\[ \tan a = \frac{\sin 3\phi}{\sqrt{2} + \cos 3\phi} ; \ldots \quad dx = \frac{3(1 + \sqrt{2} \cos 3\phi)}{3 + 2\sqrt{2} \cos 3\phi} d\phi \ldots \ldots (2). \]

From (1) and (2), the expression for the area of a sector, commencing at AR', is
\[ \frac{1}{2} \int \rho^2 d(a + \phi) = \frac{a^2}{2} \int (3 + \frac{5\sqrt{2}}{6} \cos 3\phi) d\phi \]
\[ = \frac{a^2}{2} (3\phi + \frac{5\sqrt{2}}{6} \sin 3\phi) \ldots \ldots (3). \]

Now, when D is at P, \( a + \phi = 60^\circ ; \ldots \quad \tan a = \frac{\sin 3a}{\sqrt{2} - \cos 3a} \), and hence
\[ 8 \cos^3 a - 4 \cos a = \sqrt{2}, \text{ from which } \pm a = 32^\circ 35' 38\frac{1}{4}'' \approx 568872. \]

Denoting this arc by \( a' \), and substituting \( \frac{1}{4} \pi - a' \) and \( \frac{1}{4} \pi + a' \) for \( \phi \) in (3), we obtain
\[ \text{Area of the sector PAR'} = \frac{a^2}{2} (\pi - 3a' + \frac{5\sqrt{2}}{6} \sin 3a'). \]
\[ \text{Sector PAR'} + \frac{1}{2} \text{ of a loop} = \frac{a^2}{2} \pi. \]

Hence the whole enclosed area
\[ = a^2 \{3\pi - 9a' + \frac{3}{2} \sqrt{2} \sin 3a'\} = a^2 \times 7.807904, \]

and of the three loops
\[ = a^2 \{9a' - \frac{3}{2} \sqrt{2} \sin 3a'\} = a^2 \times 1.616874. \]

The loop at P is generated when \( \phi \) passes from \( \frac{1}{4} \pi - a' \) to \( \frac{1}{4} \pi + a' \).

If the angle ECD be taken on the other side of AE, as ECD', then the locus of D' is that marked by dotted lines in the diagram; touching the loops in the former case in \( m, n, o \), and having also three loops bisected by AR', AQ, AP', such that \( Am' = An' = Ao' = \frac{a}{\sqrt{2}} \). Since a semi-loop is described between the limits \( \phi = 0, \phi = \frac{\pi}{4} \), its area is
\[ \frac{1}{2} \int \rho^2 d(a - \phi) = \frac{a^2}{4} \int \cos 3\phi d\phi = \frac{a^2}{12}; \]
\[ \ldots \quad \text{that of the 3 loops} = \frac{a^2}{2}. \]

In like manner the sectorial area \( Am'm \) is described between \( \phi = \frac{\pi}{4} \) and \( \phi = \frac{\pi}{3} \); hence it is
\[ \frac{1}{2} \int \rho^2 d(\phi - a) = \frac{a^2}{4} \int -\cos 3\phi d\phi = \frac{a^2}{12} ; \]
... triangular area \( \frac{\alpha^2}{2} \), being the same as that of the 3 loops.

Cor.—It is plain that while \( \phi \) increases from 0 to \( \frac{\pi}{3} \), the points D and D' will pass from the same point R' till they again unite at the point m, and the area thus enclosed by them is \( \frac{\alpha^2 \pi}{2} \) semicircle described by the point C. Also the total enclosed area, including a repetition of the three principal loops, is \( 3 \alpha^2 \pi = \) three times the area of the same circle.

X. QUEST. (2088); by Mr. Thomas Dobson, B.A., Hexham.

Circles from three given centres have a common point P of intersection, such that the sum of the spaces common to each pair of circles is constant: show that the locus of P is a conic section.

Solution, by Mr. Stephen Watson; and Messrs. Barlow, Dale, Dobson, Milbourn, Robinson, and Smith.

Let A, B, C be the centres, and \( r_1, r_2, r_3 \) the radii of the three circles. Denote the triangle ABC by \( \Delta \), and let \( 2 \lambda \Delta \) be the constant. Then it is easily seen that

\[
\frac{1}{4} r_1^2 A + \frac{1}{4} r_2^2 B + \frac{1}{4} r_3^2 C = \Delta = \lambda \Delta \ldots \ldots (1).
\]

Now, if \( \alpha \beta \gamma \) be the trilinear coordinates of P, then \( \gamma = r_1 \sin (A - \angle PAC) \)

\[
= \sin A \sqrt{r_1^2 - \beta^2 - \cos \alpha \beta};
\]

\[
= \sin^2 A r_1^2 = \beta^2 + \gamma^2 + 2 \beta \gamma \cos A;
\]

and similar expressions may be found for \( \sin^2 B r_2^2 \) and \( \sin^2 C r_3^2 \); hence (1) becomes

\[
\frac{A}{\sin^2 A} (\beta^2 + \gamma^2 + 2 \beta \gamma \cos A) + \frac{B}{\sin^2 B} (\gamma^2 + \alpha^2 + 2 \alpha \gamma \cos B)
\]

\[
+ \frac{C}{\sin^2 C} (\alpha^2 + \beta^2 + 2 \alpha \beta \cos C) = 2(1 + \lambda) \Delta,
\]

the equation of the locus of P, which is evidently a conic.

Again, by Mr. C. H. Brooks, London; Mr. Albert Escott, Greenwich; and Mr. A. Hall, Washington, U.S.

Let \( r_1, r_2, r_3 \) be the radii of the circles described from A, B and C respectively; and let \( \alpha, \beta \) and \( \gamma \) be the perpendiculars from the locus P upon the sides AB, BC and AC respectively. Then

\[
r_1^2 \sin^{-1} \frac{\alpha}{r_1} - \alpha \sqrt{r_1^2 - \alpha^2} + r_2^2 \sin^{-1} \frac{\alpha}{r_2} - \alpha \sqrt{r_2^2 - \alpha^2}
\]

\[
+ r_1^2 \sin^{-1} \frac{\gamma}{r_1} - \gamma \sqrt{r_1^2 - \gamma^2} + r_3^2 \sin^{-1} \frac{\gamma}{r_3} - \gamma \sqrt{r_3^2 - \gamma^2}
\]

\[
+ r_2^2 \sin^{-1} \frac{\beta}{r_2} - \beta \sqrt{r_2^2 - \beta^2} + r_3^2 \sin^{-1} \frac{\beta}{r_3} - \beta \sqrt{r_3^2 - \beta^2} = \text{const.}
\]
Now, the sum of the expressions under the radicals is double the area of the triangle ABC.

\[ r_1^2 \sin^{-1} \frac{a}{r_1} + r_1^2 \sin^{-1} \frac{y}{r_1} = r_1^2 A, \&c. \]

Hence \[ r_1^2 A + r_2^2 B + r_3^2 C = \text{const} \ldots \ (1) \]

Now, taking the point A as the origin of rectangular coordinates, putting AB = a and C = m, n, (1) becomes

\[ (x^2 + y^2) A + \left( \frac{a - x^2}{2} + y^2 \right) B + \left( \frac{m - x^2}{2} + \frac{n - y^2}{2} \right) C = \text{const.}, \]

which denotes a conic.

XI. QUEST. (2089); by Mr. C. H. Brooks, London.

Prove that

\[ \frac{2}{n} = \frac{2^n}{n} - 2n - 2 + \frac{n - 3}{2} + \frac{n - 6}{2} \cdot \frac{(n - 5)(n - 5)}{2 \cdot 3} \cdot \frac{n - 6}{2} \cdot \frac{(n - 5)(n - 5)(n - 7)}{2 \cdot 3 \cdot 4} \cdot \frac{n - 8}{\&c.} \]

continued to \( 2^3 \) or \( 2^9 \) according as \( n \) is odd or even.

Answered by Mr. Brooks, the Proposer; Mr. William Barlow, Richmond Hill; and Mr. Asher B. Evans, A.M., Lockport, U.S.

Developing \( \log (1 - x)^2 \) in the two forms

\[ \log \left\{ 1 - (2x - x^2) \right\} = -2x - x^2 - \frac{(2x - x^2)^2}{2} \]

\[ - \frac{(2x - x^2)^3}{3} - \frac{(2x - x^2)^4}{4} \&c., \]

and \( 2 \log (1 - x) = -2x - \frac{2x^2}{2} - \frac{2x^3}{3} - \frac{2x^4}{4} \&c., \)

and then equating the values of the coefficient of \( x^n \), we deduce the theorem stated.

Mr. Brooks adds:
Mr. Escott has pointed out to me that the question is a particular case of a more general theorem proved in the 'Mathematician,' vol. ii, p. 106. The above solution is similar to the fourth there given.

Second Solution, by Mr. A. Hall, Naval Observatory, Washington, U.S.; and Mr. Artemas Martin, Franklin, U.S.

This may be deduced from the known formula for the cosine of a multiple arc, viz.

\[ 2 \cos nx = (2 \cos x)^n - n(2 \cos x)^{n-2} + \frac{n(n - 3)}{1 \cdot 2} (2 \cos x)^{n-4} \]

\[ - \frac{n(n - 4)(n - 5)}{1 \cdot 2 \cdot 3} (2 \cos x)^{n-6} + \&c. \]

If we make \( x = 0 \), whence \( \cos x = 1 \), we get the proposed series by dividing by \( n \).
Third Solution, by Mr. Thomas Dobson, Hexham; and Messrs. Escott, McNamara, and Traynor.

If \( y = x + \frac{1}{x} \), it is well known that

\[
x^n + \frac{1}{x^n} = y^n - ny^{n-2} + \frac{n(n-3)}{1 \cdot 2} y^{n-4} - \frac{n(n-4)(n-5)}{1 \cdot 2 \cdot 3} y^{n-6} + \text{&c.}
\]

(See the 'Mathematician,' vol. ii, p. 105.)

Let \( x = 1 \), then \( y = 2 \), and dividing both sides by \( n \), we get

\[
\frac{2}{n} = \frac{2^n}{n} - 2n^{n-2} + \frac{n-3}{2} \cdot 2^{n-4} - \frac{(n-4)(n-5)}{2 \cdot 3} 2^{n-6} + \text{&c.}
\]

Mr. Watson also observes—This is a particular case of question 58, proposed and solved in the 'Mathematician.'

XII. QUEST. (2090); by Mr. Stephen Watson, Haydonbridge.

Find the average area of the inscribed and escribed circles of the triangles formed by joining three points taken at random on the circumference of a given circle.

Solution, by Mr. Watson, the Proposer; and in like manner by Mr. C. H. Brooks, London.

It is plain one of the points, as \( A \), may be taken as fixed; let \( P \), \( Q \) be the other two. Also, let \( O \) be the centre, \( AB \) a diameter, and join \( AP \), \( AQ \), \( OP \), \( OQ \). Put \( AO = a \),

\[
\angle QAB = \phi, \ PAQ = \theta; \text{ then, if } m \text{ be the point of contact of the inscribed circle},
\]

\[
Am = \frac{1}{2} (AQ + AP - PQ)
\]

\[
= a \{ \cos \phi + \cos(\phi + \theta) - \sin \theta \}.
\]

\[
\therefore \quad r = Am \tan \frac{1}{2} \theta
\]

\[
= 2a \sin \frac{1}{2} \theta \{ \cos(\phi + \frac{1}{2} \theta) - \sin \frac{1}{2} \theta \}.
\]

Now, an element at \( P \) is \( ad(2\theta) \), and at \( Q \)

\[
= ad(2\phi).
\]

The whole number of positions

of \( P \) and \( Q \) is \( 4a^2\pi^2 \). The limits are \( \theta \) from 0 to \( \frac{1}{2} \pi - \phi \) and \( \phi \) between

\[-\frac{1}{2} \pi \text{ and } \frac{1}{2} \pi. \]

Hence, doubling because \( P \) may lie on either side of \( Q \), the average area of the inscribed circle is

\[
\frac{2}{\pi} \int_{\phi}^{\phi+\pi} r^2 d\phi d\theta = \frac{2a^2}{\pi} \int_{-\frac{1}{2} \pi}^{\frac{1}{2} \pi} d\phi \int_{0}^{\pi} \left\{ \cos \phi \sin \theta - 2(1 + \sin \phi) \sin^2 \frac{1}{2} \theta \right\}^2 d\theta
\]

\[
= \frac{2a^2}{\pi} \int_{-\frac{1}{2} \pi}^{\frac{1}{2} \pi} \left\{ (2 + 3 \sin \phi + \sin^2 \phi) \left( \frac{\pi}{2} - \phi \right) - 3(1 + \sin \phi) \cos \phi \right\}^2 d\phi
\]

\[
= \frac{2a^2}{\pi} \left( \frac{5}{4} \pi^2 - 12 \right) = \left( \frac{5}{2} - \frac{24}{\pi^2} \right) \text{ of the area of the given circle.}
In like manner, if \( r_1 \) be the radius of the escribed circle touching \( PQ \) externally, then \( r_1 = 2a \sin \frac{1}{2} \theta \{ \cos (\phi + \frac{1}{2} \theta) + \sin \frac{1}{2} \theta \} \); hence, proceeding as before, the average of this circle is \( \left( \frac{5}{2} + \frac{8}{\pi^2} \right) \) of the given circle, and it is obvious that the average area of each of the other escribed circles will be the same.

*Again, by Mr. Thomas Dobson, Hexham; and Messrs. Brown, Escott, Evans, and Hall.*

Let \( APQ \) be a triangle formed by joining any three points \( A, P, Q \) in the circumference of the given circle, centre \( O \).

Put the angle \( OAQ = \theta \), \( PAQ = \theta' \), \( AO = a \), and \( a'b'c' \) for the sides of the triangle; then

\[
a' = 2a \sin \theta', \quad b' = 2a \cos \theta, \quad c' = 2a \cos (\theta + \theta');
\]

\[
\therefore \quad s = a \{ \cos (\theta + \theta') + \cos \theta + \sin \theta' \};
\]

\[
s - a' = a \{ \cos (\theta + \theta') + \cos \theta - \sin \theta' \}.
\]

And since \( r = (s - a') \tan \frac{1}{2} \theta', \quad r_1 = s \tan \frac{1}{2} \theta' \), we have

\[
r = 2a \{ \cos \frac{1}{2} (2\theta + \theta') - \sin \frac{1}{2} \theta' \sin \frac{1}{2} \theta',
\]

\[
r_1 = 2a \{ \cos \frac{1}{2} (2\theta + \theta') + \sin \frac{1}{2} \theta' \sin \frac{1}{2} \theta' \}.
\]

Now, \( 2a\theta' \) and \( 2a\theta \) are elements of the curve at \( P \) and \( Q \). The limits of \( \theta' \) are \( 0 \ldots \frac{\pi}{2} - \theta \); and the limits of \( \theta \) are \( -\frac{\pi}{2} \ldots + \frac{\pi}{2} \). Also, the point \( B \) may be on either side of \( AC \). Therefore, the sum of all the values of \( \pi r^2 \) is

\[
32 \pi a^4 \int \{ \cos \frac{1}{2} (2\theta + \theta') - \sin \frac{1}{2} \theta' \sin \frac{1}{2} \theta', \quad d\theta \cdot d\theta',
\]

and the number of positions of \( B \) and \( C \) is \( 4\pi^2a^2 \);

\[
\therefore \quad \text{the average area of the inscribed circles is}
\]

\[
\frac{8a^2}{\pi} \int \{ \cos \frac{1}{2} (2\theta + \theta') - \sin \frac{1}{2} \theta' \sin \frac{1}{2} \theta', \quad d\theta \cdot d\theta',
\]

which, expanded, integrated, and corrected for the above limits, is

\[
\left( \frac{5}{2} - \frac{24}{\pi^2} \right) \pi a^2.
\]

Proceeding in the same manner, we get

\[
\left( \frac{5}{2} + \frac{8}{\pi^2} \right) \pi a^2
\]

for the average area of all the circles \( (r_1) \); and this must also evidently express the average area of the circles \( (r_2) \), as well as of the circles \( (r_3) \).

Hence, the average area of the inscribed circle and of the escribed circles, added together, is ten times the area of the given circumscribing circle.

*Mr. Asher B. Evans, of Lockport, United States, annexes to his solution the following—*

**Scholium.**—The average area of the triangle \( ABC \) is

\[
\frac{\int \int 2R^2 \sin A \sin B \sin (A+B) \, dA \, dB}{\int \int dA \, dB} = \frac{3R^2}{2\pi}.
\]
XIII. QUEST. (2091); by Mr. Septimus Tebay, Rivington.

Three circles whose radii are \( r_1, r_2, r_3 \) touch one another externally, and a circle whose radius is \( r_1 \) touches \( r_1, r_2 \) externally and cuts \( r_3 \) at right angles; a circle whose radius is \( r_3 \) touches \( r_1, r_2 \) as before, and cuts \( r_1 \) at right angles; and so on. If \( \rho \) be the radius of the circle which cuts \( r_1, r_2, r_3 \) at right angles, prove that

\[
\frac{1}{\rho_s} = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} \right)x^2 + \frac{\sqrt{2}}{\rho}x + \frac{1}{r_3}.
\]

Answered by Mr. Tebay, the Proposer; and similarly by Mr. C. H. Brooks, London.

Let the angle \( r_1 r_2 r_3 \) be denoted by \( \Omega \), and let the line \( l \) which joins the centres of the circles \( \rho_x, \rho_{x+1} \) divide \( \Omega \) into the two angles \( \Theta_x \) and \( \Omega_x - \Theta_x \).

Then, \((r_1 + \rho_x)^2 - 2l_x(r_1 + \rho_x) \cos \Theta_x + l_x^2 = (r_1 + \rho_{x+1})^2,\)

\((r_2 + \rho_x)^2 - 2l_x(r_2 + \rho_x) \cos (\Omega_x - \Theta_x) + l_x^2 = (r_2 + \rho_{x+1})^2,\)

\[\rho_x^2 + \rho_{x+1}^2 = l_x^2.\]

These equations give

\[(r_1 + \rho_x) \rho_x - l_x(r_1 + \rho_x) \cos \Theta_x = r_1 \rho_{x+1},\]

\[(r_2 + \rho_x) \rho_x - l_x(r_2 + \rho_x) \cos (\Omega_x - \Theta_x) = r_2 \rho_{x+1}.\]

Substituting the values of \( \cos \Theta_x, \cos (\Omega_x - \Theta_x) \) in the equation

\[\cos^2 \Theta_x + \cos^2 (\Omega_x - \Theta_x) - 2 \cos \Omega_x \cos \Theta_x \cos (\Omega_x - \Theta_x) = \sin^2 \Omega_x,\]

we find

\[
\left( \rho_x - \frac{r_1}{r_1 + \rho_x} \rho_{x+1} \right)^2 + \left( \rho_x - \frac{r_2}{r_2 + \rho_x} \rho_{x+1} \right)^2
\]

\[- 2 \cos \Omega_x \left( \rho_x - \frac{r_1}{r_1 + \rho_x} \rho_{x+1} \right) \left( \rho_x - \frac{r_2}{r_2 + \rho_x} \rho_{x+1} \right)
\]

\[= l_x^2 \sin^2 \Omega_x = \left( \rho_x^2 + \rho_{x+1}^2 \right) \sin^2 \Omega_x ;\]

\[
\therefore \left\{ \frac{r_1^2}{(r_1 + \rho_x)^2} + \frac{r_2^2}{(r_2 + \rho_x)^2} - \frac{2r_1 r_2 \cos \Omega_x}{(r_1 + \rho_x)(r_2 + \rho_x)} - \sin^2 \Omega_x \right\} \rho_{x+1}^2
\]

\[- 2(1 - \cos \Omega_x) \left( \frac{r_1}{r_1 + \rho_x} + \frac{r_2}{r_2 + \rho_x} \right) \rho_x \rho_{x+1} + (1 - \cos \Omega_x)^2 \rho_{x+1}^2 = 0.\]

Now, \( \cos \Omega_x = \frac{\rho_x(r_1 + r_2 + \rho_x) - r_1 r_2}{(r_1 + \rho_x)(r_2 + \rho_x)} \), \( 1 - \cos \Omega_x = \frac{2r_1 r_2}{(r_1 + \rho_x)(r_2 + \rho_x)} \).

\[\sin^2 \Omega_x = \frac{4r_1 r_2 \rho_x(r_1 + r_2 + \rho_x)}{(r_1 + \rho_x)(r_2 + \rho_x)}.\]

Substituting and reducing, we find

\[
\left( \frac{1}{\rho_{x+1}^2} - \frac{1}{\rho_x^2} \right)^2 - \left( \frac{1}{r_1^2} + \frac{1}{r_2^2} \right) \left( \frac{1}{\rho_{x+1}^2} + \frac{1}{\rho_x^2} \right) + \frac{1}{4} \left( \frac{1}{r_1^2} + \frac{1}{r_2^2} - \frac{6}{r_1 r_2} \right) = 0 \ldots (A).
\]

Similarly for the next two circles we have

\[
\left( \frac{1}{\rho_{x+2}^2} - \frac{1}{\rho_{x+1}^2} \right)^2 - \left( \frac{1}{r_1^2} + \frac{1}{r_2^2} \right) \left( \frac{1}{\rho_{x+2}^2} + \frac{1}{\rho_{x+1}^2} \right) + \frac{1}{4} \left( \frac{1}{r_1^2} + \frac{1}{r_2^2} - \frac{6}{r_1 r_2} \right) = 0.
\]
Subtracting, and dividing by $\frac{1}{\rho_{x+2}} - \frac{1}{\rho_x}$, we get

$$\frac{1}{\rho_{x+2}} - \frac{2}{\rho_{x+1}} + \frac{1}{\rho_x} = \frac{1}{r_1} + \frac{1}{r_2}, \quad \text{or} \quad \Delta^2 \frac{1}{\rho_x} = \frac{1}{r_1} + \frac{1}{r_2}.$$  

Assume $\frac{1}{\rho_x} = Ax^2 + Bx + C,$

$$\therefore \Delta^2 \frac{1}{\rho_x} = 2A = \frac{1}{r_1} + \frac{1}{r_2}, \quad \text{and} \quad \frac{1}{\rho_0} = \frac{1}{r_3} = C;$$

and putting $x = 0$ in (A), we find

$$\frac{1}{\rho_1} = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} + \frac{2}{r_3} \right) + \sqrt{\frac{2}{r_2 r_3}} \left( \frac{2}{r_2 r_3} + \frac{2}{r_3 r_1} + \frac{2}{r_1 r_2} \right)$$

$$= \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} + \frac{2}{r_3} \right) + \frac{\sqrt{2}}{\rho}$$

$$= A + B + C.$$  

$$\therefore A = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} \right), \quad B = \frac{\sqrt{2}}{\rho}, \quad C = \frac{1}{r_3}.\quad \therefore \frac{1}{\rho_x} = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} \right) x^2 + \frac{\sqrt{2}}{\rho} x + \frac{1}{r_3}.$$

*Again, by Mr. Thomas Dobson, Hexham; Mr. Stephen Watson, Haydonbridge; and Messrs. Barlow, Escott, Evans, Hall, Turnbull, and Wilson.*

Let $A$, $B$, $C$ and $O$ denote the centres of the circles $r_1, r_2, r_3, \rho_1$. Bisect $AB$ in $D$, and draw $CP, OQ$ perpendicular to $AB$.

Since $AC^2 - BC^2 = AP^2 - PB^2 = 2AB \cdot DP$,

$$\frac{DP}{r_1 - r_2} = \frac{1}{2} + \frac{r_3}{r_1 + r_2};$$

$$\frac{DQ}{r_1 - r_2} = \frac{1}{2} + \frac{\rho_1}{r_1 + r_2}.$$  

Hence

$$(r_1 + r_2)PQ = (r_1 - r_2) \left( r_3 - \rho_1 \right).$$

$$(r_1 + r_2)CP = 2 \sqrt{(r_1 + r_2 + r_3) r_1 r_2 r_3};$$

$$(r_1 + r_2)OQ = 2 \sqrt{(r_1 + r_2 + \rho_1) r_1 r_2 \rho_1}.$$  

Now, $r_3^2 + \rho_1^2 = CO^2 = PQ^2 + (CP - OQ)^2$; which, by a little reduction becomes

$$\frac{(r_1 + r_2)^2}{2r_1 r_2} = \left\{ \frac{\sqrt{r_1 + r_2 + \rho_1}}{\rho_1} - \frac{\sqrt{r_1 + r_2 + r_3}}{r_3} \right\}^2;$$

whence,

$$\sqrt{\frac{r_1 + r_2 + \rho_1}{r_1 r_2 \rho_1}} = \frac{1}{\rho} + \frac{1}{\sqrt{2}} \left( \frac{1}{r_1} + \frac{1}{r_2} \right),$$

where

$$\frac{1}{\rho} = \sqrt{\frac{r_1 + r_2 + r_3}{r_1 r_2 r_3}}.$$
Answers to the Questions.

Replacing $\rho_1$ by $\rho_2$, and $r_3$ by $\rho_1$, we have, for the second circle,

$$\sqrt{\frac{r_1 + r_2 + \rho_2}{r_1 r_2 \rho_2}} = \frac{1}{\rho} + \frac{2}{\sqrt{2}} \left( \frac{1}{r_1} + \frac{1}{r_2} \right);$$

and, so generally for the $x$th circle,

$$\sqrt{\frac{r_1 + r_2 + \rho_x}{r_1 r_2 \rho_x}} = \frac{1}{\rho} + \frac{x}{\sqrt{2}} \left( \frac{1}{r_1} + \frac{1}{r_2} \right),$$

which gives

$$\frac{1}{\rho_x} = \frac{1}{2} \left( \frac{1}{r_1} + \frac{1}{r_2} \right) x^2 + \frac{\sqrt{2}}{\rho} x + \frac{1}{r_3}.$$  

XIV. Quest. (2092); by Capt. A. R. Clarke, Southampton.

A coin held in any position is dropped, without rotation, over a grating formed of parallel equidistant wires in a horizontal plane: what is the chance that it passes through without striking?

Answered by Mr. W. S. B. Woolhouse, London; and in like manner by Captain Clarke, the Proposer; and Messrs. Brooks, Dobson, Escott, and Rutter.

The angular positions being referred to the surface of a sphere concentric with the coin, let $Z$ be the zenith, $ZQ$ a vertical great circle the plane of which is parallel to the lines of grating, $P$ the pole of a great circle $QR$, which represents the plane of the coin. Also let $\phi$ denote the polar distance $ZP$, and $\theta$ the azimuth $QZP$. All the possible positions of the coin will be uniformly represented if the pole $P$ be supposed to traverse equally all the positions on the surface of the sphere. By reason of symmetry, however, it will be sufficient to consider only a quadrant portion upon which $0$ to $\frac{1}{2} \pi$ are the limits of $\phi$ and $\theta$. Take $QR$ equal to a quadrant, and join $PR$ intersecting $ZQ$ in $D$. Then $PQ = QR = PR = \frac{1}{2} \pi$, $PQR$ is a quadrant portion of the surface of the sphere, $R$ is obviously the point in the circle $QR$ which is most remote from the vertical plane of $ZQ$, and the angles at $D$ are right angles. Therefore, if $a$ denote the diameter of the coin, the extreme width occupied by it in a direction perpendicular to the parallel lines of grating is

$$w = a \sin RD = a \cos PD = a \sqrt{1 - \sin^2 \phi \sin^2 \theta} \ldots \ldots (1).$$

Moreover, an element of the surface at $P$ is $d\phi d\theta \sin \phi$; and the total quadrant surface $= \int d\phi d\theta \sin \phi = \frac{1}{2} \pi$. Now, if $b$ denote the central distance of the wires and $c$ their thickness, the probability that the coin shall pass through without striking will, according to the position stated, be

$$p = \frac{b - c - w}{b} = \frac{b - c}{b} - \frac{a}{b} \sqrt{1 - \sin^2 \phi \sin^2 \theta} \ldots \ldots (2).$$

Hence, to include all positions, the required probability is to be determined from the following formula:
\[ P = \iint \frac{n^i d\theta \sin \phi}{\frac{1}{2} \pi} \]

\[ = -\frac{2}{\pi} \int d\theta \, d\cos \phi \left( \frac{b - c}{b} - \frac{a}{b} \sqrt{\cos^2 \theta + \sin^2 \theta \cos^2 \phi} \right) \]

\[ = \frac{a}{b \pi} \int d\theta \left\{ -2 \frac{b - c}{a} \cos \phi + \cos \phi \sqrt{\cos^2 \theta + \sin^2 \theta \cos^2 \phi} + \frac{\cos^2 \theta}{\sin \theta} \log \left( \sqrt{\cos^2 \theta + \sin^2 \theta \cos^2 \phi} + \sin \theta \cos \phi \right) \right\} \ldots \ldots (3) \]

When \( b - c < a \), the limits of integration depend on the relation \( \varphi = \frac{b - c}{a} \); or if \( \cos a = \frac{b - c}{a} \), then \( \sin \theta \sin \varphi = \sin a \). But as the final result is somewhat complicated, we shall here proceed with the other case, in which the width between the openings of the grating exceeds the diameter of the coin; that is, when \( b - c > a \). In this case \( \varphi \) and \( \theta \) extend over the full limits 0 to \( \frac{1}{2} \pi \), and by giving these limits to \( \varphi \) in (3) we get

\[ P = \frac{a}{b \pi} \int d\theta \left( 2 \frac{b - c}{a} - 1 - \frac{\cos^2 \theta}{\sin \theta} \log \frac{1 + \sin \theta}{\cos \theta} \right) \]

\[ = \frac{a}{b \pi} \int d\theta \left\{ 2 \frac{b - c}{a} - 1 - \left( \frac{1}{\sin \theta} - \sin \theta \right) \int \frac{d\theta}{\cos \theta} \right\} \]

\[ = \frac{b - c}{b} - \frac{a}{b \pi} \log \frac{1 + \sin \theta}{\cos \theta} - \frac{a}{b \pi} \int \frac{d\theta}{\sin \theta \cos \theta}. \]

The second of these terms vanishes at both limits, and therefore disappears. If \( t \) denote \( \tan \frac{1}{2} \theta \), the third term is

\[ \frac{a}{b \pi} \int dt \int \frac{2 dt}{1 - t^2} = \frac{2a}{b \pi} \int \frac{dt}{t} \left( t + \frac{t^3}{3} + \frac{t^5}{5} + \&c. \right) \]

\[ = \frac{2a}{b \pi} \left( 1 + \frac{1}{3^2} + \frac{1}{5^2} + \&c. \right) = \frac{a}{4b} \pi; \]

\[ \therefore P = \frac{b - c}{b} + \frac{\pi a}{4b}. \]

The probability of striking is therefore \( \frac{c}{b} + \frac{\pi a}{4b} \).

The term \( \frac{\pi a}{4b} \) is the average value of \( \frac{v}{b} \) in (2), and we conclude that the chances of striking and not striking would be precisely the same if the coin were replaced by a solid spherical ball the diameter of which is \( \frac{\pi}{4} a \), or one-fourth of the periphery of the coin.

Like methods of solution were also given by Messrs. Evans, Hall, Hendricks, and Teboy. Mr. Watson and other correspondents refer to the 'Educational Times,' Quest. (116), which is, indeed, virtually the same as the question proposed.

* An investigation of both cases of the problem is given by Mr. W. J. Miller, in the Reprint from the 'Educational Times,' vol. i, page 56.
XXV. PRIZE QUEST. (2003) ; by Mr. Wm. Godward, Chelsea.

Let O, O₁, O₂, O₃, O₄ be the centres of the inscribed, three escribed, and nine-point circles of the triangle ABC, and A₁, B₁, C₁, the respective points of contact of the circles (O), (O₁) (O₂), (O₃), with the circle (O₄), then the lines A₁A, B₁B, C₁C intersect in a point on the line O₄O₉.

Also, if (a₂γ₁), (a₁β₁γ₁), (a₂β₂γ₂), (a₃β₃γ₃) be the coordinates of a, A₁, B₁, C₁; then
\[
\begin{align*}
\frac{\alpha^2(a_1a_2a_3)}{\beta^2(b_1b_2b_3)} &= \frac{\gamma^2(\gamma_1\gamma_2\gamma_3)}{\delta^2(\delta_1\delta_2\delta_3)} = \frac{\Delta^2}{2\alpha \cdot O_9 \cdot O_1 \cdot O_2 \cdot O_3 \cdot O_4}.
\end{align*}
\]

Solution, by Mr. Godward, the Proposer; and in like manner by Messrs. Brooks, Dale, McNamara, Rutherford, and Turnbull.

Let O be the centre of the circle circumscribing the triangle ABC; G₁H₁, G₂H₂, G₃H₃ the diameters bisecting BC, CA, AB; and AK₁, BK₂, CK₃ parallels to the sides meeting the said diameters in K₁, K₂, K₃. Denote the radii of the circles (O) and (O₉) by R and ρ respectively, and the coordinates of O₉ by α₁β₁γ₁; then it is well known that R = 2ρ, QK₁ = 2α₁, QK₂ = 2β₁, and QK₃ = 2γ₁.

We shall first find the coordinates of A₁.

Since O₉A₂O₃ is a straight line, we have the analogy
\[
\beta_1 - \beta_2 : r_1 = \beta_2 : (O_9A_1 : A_1O_3) : : \rho : r_1,
\]

which gives
\[
\begin{align*}
\beta_1 &= \frac{r_1(\rho + \beta_2)}{\rho + r_1} = \frac{r_1(R + 2\beta_2)}{2(\rho + r_1)} = \frac{r_1(H_2Q + QK_2)}{2O_1O_9} = \frac{r_1 \cdot H_2K_2}{2O_1O_9}.
\end{align*}
\]

Similarly, \( \gamma_1 = \frac{r_1(R + 2\gamma_2)}{2(\rho + r_1)} = \frac{r_1 \cdot H_3K_3}{2O_1O_9} \)
and \( \alpha_1 = \frac{r_1(R - 2\alpha_2)}{2(\rho + r_1)} = \frac{r_1 \cdot G_1K_1}{2O_1O_9} \).

The coordinates of all four points, thus determined, are as follows:

\[
\begin{align*}
\alpha &= \frac{r(R - 2\alpha_2)}{2(\rho - r)} = \frac{r \cdot G_1K_1}{2O_9} & \alpha_1 &= \frac{r_1(R - 2\alpha_2)}{2(\rho + r_1)} = \frac{r_1 \cdot G_1K_1}{2O_1O_9} \\
\beta &= \frac{r(R - 2\beta_2)}{2(\rho - r)} = \frac{r \cdot G_2K_2}{2O_9} & \beta_1 &= \frac{r_1(R + 2\beta_2)}{2(\rho + r_1)} = \frac{r_1 \cdot H_2K_2}{2O_1O_9} \\
\gamma &= \frac{r(R - 2\gamma_2)}{2(\rho - r)} = \frac{r \cdot G_3K_3}{2O_9} & \gamma_1 &= \frac{r_1(R + 2\gamma_2)}{2(\rho + r_1)} = \frac{r_1 \cdot H_3K_3}{2O_1O_9} \\
\alpha_2 &= \frac{r_2(R + 2\alpha_2)}{2(\rho + r_2)} = \frac{r_2 \cdot H_1K_1}{2O_9} & \alpha_3 &= \frac{r_3(R + 2\alpha_2)}{2(\rho + r_3)} = \frac{r_3 \cdot H_1K_1}{2O_9} \\
\beta_2 &= \frac{r_2(R - 2\beta_2)}{2(\rho + r_2)} = \frac{r_2 \cdot G_2K_2}{2O_9} & \beta_3 &= \frac{r_3(R + 2\beta_2)}{2(\rho + r_3)} = \frac{r_3 \cdot H_2K_2}{2O_9} \\
\gamma_2 &= \frac{r_2(R + 2\gamma_2)}{2(\rho + r_2)} = \frac{r_2 \cdot H_3K_3}{2O_9} & \gamma_3 &= \frac{r_3(R - 2\gamma_2)}{2(\rho + r_3)} = \frac{r_3 \cdot G_3K_3}{2O_9}.
\end{align*}
\]
The coordinates \((\beta_1, \gamma_1), (\gamma_2, \alpha_2), (\alpha_3, \beta_3)\) give respectively the equations of the following lines, viz.:

\[
\begin{align*}
AA_1 & : \beta(R + 2\gamma_9) = \gamma(R + 2\beta_9) = 0, \\
BB_1 & : \gamma(R + 2\alpha_2) = \alpha(R + 2\gamma_9) = 0, \\
CC_1 & : \alpha(R + 2\beta_3) = \beta(R + 2\alpha_3) = 0.
\end{align*}
\]

If we compound together the equalities here indicated, there will result an identity, implying that \(AA_1, BB_1, CC_1\) are concurrent. Let \(I\) be this concurrent point, and \(\alpha' \beta' \gamma'\) its coordinates, then any two of the preceding equations with the fundamental relation \(a\alpha + b\beta + c\gamma = 2\Delta\), give

\[
\begin{align*}
\alpha' = \frac{r(R + 2\alpha_2)}{R + 2r}, & \quad \beta' = \frac{r(R + 2\beta_3)}{R + 2r}, & \quad \gamma' = \frac{r(R + 2\gamma_9)}{R + 2r}.
\end{align*}
\]

The similarity of these coordinates to those given above is remarkable.

The determinant of which the coordinates of \(O_9\), \(I\), \(O\) are the constituents is easily shown to be zero, which is the necessary condition that \(O_9I\) \(O\) should be a straight line, and \(O_9O\) passes through \(a\), so that \(I\) is a point on \(O_9O\).

Lastly, we have

\[
\begin{align*}
\alpha_1 \alpha_2 \alpha_3 &= -\frac{rr_1 r_2 r_3}{2^4 \cdot O_0 \cdot O_1 \cdot O_2 \cdot O_3} \cdot \frac{G_1^2 K_1^2 \cdot H_1^2 K_1^2}{O_0 \cdot O_1 \cdot O_2 \cdot O_3} = \frac{\Delta^2 \cdot A K_1^4}{2^4 \cdot O_0 \cdot O_1 \cdot O_2 \cdot O_3}, \\
\beta \beta_1 \beta_2 \beta_3 &= -\frac{O_2^2 - O_3^2}{2^5 \cdot b^4 \cdot O_0 \cdot O_1 \cdot O_2 \cdot O_3 \cdot O_9}, \\
\gamma \gamma_1 \gamma_2 \gamma_3 &= -\frac{O_2^2 - O_3^2}{2^4 \cdot c^4 \cdot O_0 \cdot O_1 \cdot O_2 \cdot O_3 \cdot O_9}, \\
\alpha^4 (\alpha \alpha_1 \alpha_2 \alpha_3) &= \frac{b^4 (\beta \beta_1 \beta_2 \beta_3)}{(O_2^2 - O_3^2)^4} = \frac{c^4 (\gamma \gamma_1 \gamma_2 \gamma_3)}{(O_2^2 - O_3^2)^4} = \frac{\Delta^2}{2^5 \cdot O_0 \cdot O_1 \cdot O_2 \cdot O_3 \cdot O_9}.
\end{align*}
\]

Again, by Mr. Thomas Dobson, B.A., Hexham; and Messrs. Rutter and Traynor.

Let \(a_0 \beta_0 \gamma_0, a_0 \beta_0 \gamma_9\), be the trilinear coordinates of \(a\) and \(O_9\), and \(\rho = 1\), the radius of the nine-point circle. Then, subjecting the equation \(la + m\beta + n\gamma = 0\) to the conditions of passing through \(O(rrr)\) and \(O_9(alpha_0 beta_9)\), we get for the equation to \(OO_9a\)

\[(\beta_9 - \gamma_9)\alpha + (\gamma_9 - \alpha_9)\beta + (\alpha_9 - \beta_9)\gamma = 0 \ldots \ldots (1)\]

By similar triangles,

\[
\begin{align*}
\alpha_0 &= \rho - \alpha_9; \quad \alpha_1 = \rho - \alpha_9; \quad \alpha_2 = \rho + \alpha_9; \quad \alpha_3 = \rho + \alpha_9; \\
\rho &= \rho - r; \quad \rho_1 = \rho + r_1; \quad \rho_2 = \rho + r_2; \quad \rho_3 = \rho + r_3.
\end{align*}
\]

with analogous equations for \(beta_0 beta_9, \&c., gamma_0 gamma_9, \&c.\)
Now, the equations to \( AA_1, BB_1, CC_1 \) are obviously
\[
\gamma_1 \beta_1 - \beta_1 \gamma = 0, \quad \gamma_2 \alpha - \alpha_2 \gamma = 0, \quad \beta_3 \alpha - \alpha_3 \beta = 0,
\]
which become, by substitution from equations (2),
\[
\begin{align*}
( AA_1 ) & \quad ( \rho + \gamma_9 ) \beta - ( \rho + \beta_9 ) \gamma = 0 \\
( BB_1 ) & \quad ( \rho + \alpha_9 ) \gamma - ( \rho + \gamma_9 ) \alpha = 0 \\
( CC_1 ) & \quad ( \rho + \beta_9 ) \alpha - ( \rho + \alpha_9 ) \beta = 0
\end{align*}
\] (3),
which meet in the point \( \frac{\alpha}{\rho + \alpha_9} = \frac{\beta}{\rho + \beta_9} = \frac{\gamma}{\rho + \gamma_9} \).

By taking the sum of the equations (3) we reproduce equation (1); hence the point of intersection of \( AA_1, BB_1, CC_1 \) lies in the line \( O_9 O_a \).

Observing that the distance between the middle point of \( BC \) and the foot of the perpendicular from \( A \) is bisected by \( \alpha_9 \), we have, by a right-angled triangle, \( 16a^2 ( \rho^2 - \alpha_9^2 ) = (b^2 - c^2)^2 \). Taking the product of equations (2), writing \( O_9 O_a \) for \( r - r', \&c., \Delta^2 \) for \( r r' r'' \), and employing the principle of

\[
\Delta^2 = \frac{a_1 \alpha_1 a_2 \alpha_3 a_4}{(b^2 - c^2)^4} = \frac{b_1 \beta_1 \beta_2 \beta_3}{(c^2 - a^2)^4} = \frac{c_1^4 \gamma_1 \gamma_2 \gamma_3}{(a^2 - b^2)^4}.
\]

Third Solution, by Mr. Stephen Watson, Haydonbridge; and Messrs. Barlow, Bills, Escott, Evans, Hall, and Tebay.

Let \( D, E, F \) be the middle points of the sides, through which the circle \( (O_9) \) passes, and let \( O_9 D, O_9 E \) be joined. Then \( \angle O_9 D E = 2 \angle D F E = 2 \pi; \)
\( \therefore \triangle CD O_9 = 90^\circ + \beta - C \), and \( O_9 D = \frac{1}{2} R \); hence, the distance of \( O_9 \) from

\[ R = r = a O_9 : a O = \alpha - \frac{1}{2} R \cos (B - C) : \alpha - r \therefore \alpha = \frac{R r \sin^2 \frac{1}{2} (B - C)}{O_9 O_9} \]

Proceding in this way, we find
\[
\begin{align*}
O_9 & = R \sin \frac{1}{2} (B - C) \quad O_1 O_9 = - R^1 \sin \frac{1}{2} (B - C) \\
O_9 & = R \sin \frac{1}{2} (C - A) \quad O_1 O_9 = \frac{R^1}{2} \sin \frac{1}{2} (C - A) \\
O_9 & = R \sin \frac{1}{2} (A - B) \quad O_1 O_9 = \frac{R^1}{2} \sin \frac{1}{2} (A - B) \\
O_2 & = - R^3 \cos \frac{1}{2} (B - C) \quad O_3 O_9 = - R^3 \cos \frac{1}{2} (B - C) \\
O_3 & = - R^3 \cos \frac{1}{2} (C - A) \quad O_3 O_9 = - R^3 \cos \frac{1}{2} (C - A) \\
O_2 & = - R^3 \cos \frac{1}{2} (A - B) \quad O_3 O_9 = - R^3 \cos \frac{1}{2} (A - B).
\end{align*}
\]

From these equations it is plain that \( AA_1, BB_1, CC_1 \) intersect in the point determined by
\[
\frac{\alpha}{\cos^2 \frac{1}{2} (B - C)} = \frac{\beta}{\cos^2 \frac{1}{2} (C - A)} = \frac{\gamma}{\cos^2 \frac{1}{2} (A - B)} \quad \ldots \quad (1).
\]

Putting the coordinates of \( a, O, \) and (1) in \( P a + Q \beta + R \gamma = 0 \), the results are
\[
\begin{align*}
P & \sin^2 \frac{1}{2} (B - C) + Q \sin^2 \frac{1}{2} (C - A) + R \sin^2 \frac{1}{2} (A - B) = 0, \\
P & + Q + R = 0,
\end{align*}
\]
any one of which is a sequence of the other two; hence (1) is a point on the line \( O_9 O_a \).
Again, from the above we easily see that
\[
\frac{a_1^2 a_2^2 a_3^2}{\sin^4(b - c)} = \frac{\beta_3^2 \beta_3 \beta_3}{\sin^4(c - a)} = \frac{YY_1 Y_2 Y_3}{\sin^4(a - b)} = \frac{\Delta^2 R^4}{2^4 \cdot O_1 O_2 \cdot O_2 O_3 \cdot O_3 O_9};
\]
and this readily reduces to the form in the question, since
\[
\frac{\sin^4(b - c)}{a^8} = \left(\frac{b^2 - c^2}{2a R}\right)^4, \text{ &c.}
\]

(The angular points A, B, C are the exterior poles of similitude of the pairs of circles \((O_1 O_2) (O_2 O_3) (O_3 O_9)\), and they are also the interior poles of the pairs \((O_4 O_5) (O_5 O_6) (O_6 O_9)\) respectively. It is also evident that the points of contact \(a, \Lambda_1, B, \Gamma_1\) are poles to the respective pairs \((O_1 O_9) (O_2 O_9) (O_3 O_9)\). Hence, since for each triad of circles, a line passing through poles of two pairs must also pass through a pole of the third pair, we at once deduce from purely geometrical considerations, the following complete statement of Mr. Godward’s elegant theorem of 1734. If three straight lines be drawn from the three angular points \(A, B, C\) through the four points of contact \(a, \Lambda_1, B, \Gamma_1\), the twelve lines so drawn will meet, three and three, in four points \(I, I, I, I\), which are respectively the remaining poles of similitude of the pairs of circles \((O_1 O_9) (O_2 O_9) (O_3 O_9)\).—Ed.)

**List of Mathematical Answers.**

Barlow, William, Grafton Lodge, Richmond Hill, ans. all the Questions.
Bill, Samuel, Hawton, near Newark-upon-Trent, ans. 6, Prize.
Brown, John, Whitwell Colliery, Durham, ans. 1, 5, 6, 7, 9, 12.
Dale, James, Aberdeen, ans. 2, 4, 6, 8, 9, 10, Prize.
Dobson, Thomas, B.A., Hexham, ans. all the Questions.
Escott, Albert, F. R. A. S., Royal Hospital School, Greenwich, ans. all the Questions.
Evans, Asher B., A.M., Lockport, N.Y., United States, ans. all the Questions.
Godward, William, 30, Marguerita Terrace, Oakley Street, Chelsea, ans. 8, Prize.
Hall, A., Naval Observatory, Washington, United States, ans. all the Questions.
Hendricks, Joel E., A.M., Des Moines, Iowa, United States, ans. 14.
Levy, W. H., late of Shalbourne, near Hungerford, Berkshire, ans. 4.
M’Namara, T., Ballymote, Sligo, Ireland, ans. 3 to 8, 11, Prize.
Martin, Artemus, Franklin, Venango Co., Pa., United States, ans. 1, 2, 7, 11.
Mibourn, Thomas, Riding Mill, Newcastle-upon-Tyne, ans. 1 to 8, 10, 11.
"N. Imp.," ans. 9.
Robinson, George, St. John’s College, Cambridge, ans. 5, 8, 10.
Rutherford, Dr., Tweed Cottage, Maryon Road, Charlton, ans. 1 to 8, Prize.
Rutter, Edward, Darcy Terrace, Sunderland, ans. 1 to 11, 14, Prize.
Shelton, W. M., Carlton, near Nottingham, ans. 5.
Smith, James, Surveyor, 51, King Street, Manchester, ans. 1.
Smith, James, Bellingham, Northumberland, ans. 2, 3, 4, 8, 10.
Somerset, Thomas, Hull, ans. 5.
Tehay, Septimus, Grammar School, Rivington, ans. 2, 13, Prize.
Tennyson, James, C.E., Siercock, Ireland, ans. 1 to 9, 11, Prize.
Turnbull, John, Bedlington, Northumberland, ans. 2, 3, 6, 8, 13, Prize.
Turrell, Isaac H., Harrison, Ohio, United States, ans. 1, 3, 4, 6.
Vullien, Ennis, G.H.S., ans. 2, 3, 6, 8.
Watson, Stephen, Grammar School, Haydonbridge, ans. all the Questions.
Wilson, James, Southampton, ans. 1 to 6, 8, 9, 11, 13, Prize.

**••** The arranging of the matter for the printer is greatly facilitated when contributions intended for insertion, are written on one side of the paper only.
NEW MATHEMATICAL QUESTIONS.

We regret to have to record the decease of three esteemed correspondents:—1. The Rev. Hammond Holtitch, M.A., died on the 12th of December, 1867, aged about 68 years. He took his B.A. degree at Cambridge in the year 1832, obtaining the high distinction of Senior Wrangler and first Smith’s Prizeman. He afterwards became Senior Fellow and President of his College (Caius), which he held until his death. The Diaries were for many years enriched by his remarkably able and ingenious mathematical contributions under the signature of “Petrarch.”

2. Mr. Robert Clemiston, of Morpeth, where, for a period of about forty years, he was a successful and highly respected teacher, died on the 27th of February, 1868.

3. Mr. John White, of Birmingham, where he was for upwards of twenty years a confidential clerk in the Post Office, died on the 13th of August, 1868, aged 48.

The two last-named gentlemen were natives of Allendale, Northumberland.

The several Prizes are allotted as follows:

For Answers to the Prize Question, to Mr. William Godward, of Chelsea, and Mr. James Traynor, C. E., Shercock, Ireland, each twelve Diaries.

For General Mathematical Answers, to Mr. C. H. Brooks, C. E., London, and Mr. Stephen Watson, Haydonbridge, Northumberland, each ten Diaries.

For Poetical Answers to the Prize Enigma, to Dr. Rutherford, Charlton, and Mr. T. T. Wilkinson, Burnley, Lancashire, each ten Diaries.

For General Answers to the Enigmas, to Miss Helen Ogden, Shaw, near Oldham, and Mr. James Hewitt, of Hexham, each ten Diaries.

And for Answers to the Rebusese and Charades, to “Edipus,” and Mr. Thomas Hughes, of Chester, each eight Diaries.

All letters must, as usual, be directed “To the Editor of the ‘Lady’s and Gentleman’s Diary,’ Stationers’ Hall, London.” They must likewise be post-paid, and arrive before May 1st, 1869, excepting letters from the United States, which will be in time if received before July 1st.

NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2094); by the Rev. Wm. Mason, Kirkby Malzeard.

Given the straight line PAO drawn through the circumference to the centre of a circle, and also the chord BA produced indefinitely, to find by means of the compasses only, and with two openings, two points in the circumference, to which straight lines drawn from P shall form chords each equal to AB.

II. QUEST. (2095); by Mr. T. McNamara, Ballymote, Ireland.

If from any point P in the hypothenuse AB of a right-angled spherical triangle ABC, perpendiculars PE, PD are drawn to CB, CA; and if the segments CE, CD be denoted by α, β respectively, prove that

\[
\frac{\tan \alpha}{\tan \alpha} + \frac{\tan \beta}{\tan \beta} = 1;
\]

where α, β are the sides.

III. QUEST. (2096); by Mr. Thomas Dobson, B.A., Hexham.

If r denote the radius of the circle inscribed in the triangle formed by joining the feet of the perpendiculars of any triangle ABC, then

\[
4R(2R - r) = r_1^2 + r_2^2 + r_3^2.
\]

IV. QUEST. (2097); by Mr. Albert Escott, Greenwich.

If from any point on the circle circumscribing a triangle, perpendiculars be drawn to the sides and to the tangents at the angular points, the product of the perpendiculars on the sides is equal to the product of the perpendiculars on the tangents.
V. QUEST. (2098); by Mr. A. HALL, Washington, U.S.

In Hansen's 'Theory of Perturbations' he makes use of what he calls the "arithmetico-geometrico mean." Thus, if \(A\) and \(B\) are two values, we have

\[
\begin{align*}
\frac{1}{2}(A + B) &= \text{arith. mean} = A_1; \\
\sqrt[\nu]{AB} &= \text{geom. mean} = B_1.
\end{align*}
\]

Show that, by repeating this process on \(A_1\) and \(B_1\), and so on, the results \(A_n\) and \(B_n\) approach each other without limit.

VI. QUEST. (2099); by Mr. ROBERT TUCKER, M.A., University College School.

\(A\) is a fixed point, \(Q\) moves along a fixed straight line, and \(AQ + QP\) is constant; find the locus of \(P\) when \(\angle AQP\) is also constant.

VII. QUEST. (2100); by Mr. THOMAS DOBSON, B.A., Hexham.

Prove that the volume of any wedge is equal to the product of the area of a transverse section and the line joining the centres of gravity of the two triangular faces of the wedge.

VIII. QUEST. (2101); by Mr. ARTEMAS MARTIN, Franklin, U.S.

Suppose 13 pennies are thrown up, and those that come up heads are taken away, and the remaining ones thrown up again, and so on, till all the pennies have been thrown up heads. Required the probability of this will be effected in 10 throws.

IX. QUEST. (2102); by Mr. STEPHEN WATSON, Haydonbridge.

Find the average length of the perimeter of the triangle formed by joining three points taken at random, one on each side of a given triangle.

X. QUEST. (2103); by Mr. SEPTIMUS TEBAY, Rivington.

If the centre of gravity of a triangle be on the circumference of the inscribed circle, prove that

\[
\frac{5 \cos A - 3}{\sin A} + \frac{5 \cos B - 3}{\sin B} + \frac{5 \cos C - 3}{\sin C} = 0.
\]

XI. QUEST. (2104); by Mr. STEPHEN WATSON, Haydonbridge.

Through any two points \(O, O_1\), within the triangle \(ABC\), lines from \(A, B, C\) are drawn meeting \(BC, CA, AB\) in \(D, E, F\) and \(D_1, E_1, F_1\); then a conic will pass through these six points. If tangents to this conic at \(D\) and \(D_1\) meet in \(P\), at \(E\) and \(E_1\) meet in \(Q\), and at \(F\) and \(F_1\) meet in \(R\); then \(AP, BQ, CR\) meet in one point.

XII. QUEST. (2105); by Mr. SEPTIMUS TEBAY, Rivington.

A triangle is drawn at random on a plane; determine the probability that the inscribed circle contains the centre of the circumscribed circle.

XIII. QUEST. (2106); by Mr. ASHER B. EVANS, Lockport, U.S.

Prove that

\[
x(x + 1)(x + 2)(x + 3)(x + 4)(x + 5) = t^4
\]

is impossible in integers.

XIV. QUEST. (2107); by Mr. ARTEMAS MARTIN, Franklin, U.S.

In a given triangle inscribe three circles tangential to each other, and each of them touching two sides of the triangle. A geometrical solution is required.

XV. PRIZE QUEST. (2108); by the late Professor HEARN.

To find the axis of a paraboloid of revolution, the latus rectum being given, so that the attraction of the solid on a point in the focus may be zero. Also determine the same for a paraboloidal surface.
THE LADY'S AND GENTLEMAN'S
DIARY,
FOR THE YEAR OF OUR LORD
1870,
Being the Second after Bisextile or Leap Year.

DESIGNED PRINCIPALLY FOR THE AMUSEMENT AND INSTRUCTION OF
STUDENTS IN MATHEMATICS:
COMPRISING
MANY USEFUL AND ENTERTAINING PARTICULARS,
INTERESTING TO ALL PERSONS ENGAGED IN THAT DELIGHTFUL PURSUIT;
AND NOW ENLARGED BY THE
ADDITION OF A VARIETY OF GENERAL INFORMATION.

THE ONE HUNDRED AND SIXTY-SEVENTH ANNUAL NUMBER.

LONDON:
PRINTED FOR
THE COMPANY OF STATIONERS,
AND SOLD BY J. GREENHILL, AT THEIR HALL, LUDGATE HILL.

[J. E. ADLARD, BARTHOLOMEW CLOSE.]
JANUARY, 1870.

Sun enters Aquarius,

LUNATIONS AND PHASES.

New Moon ☿ 2nd day, 0h. 5m. morn.
First Quart. ☿ 9th day, 9h. 2m. aftern.
Full Moon ☿ 17th day, 2h. 45m. aftern.
Last Quart. ☿ 24th day, 10h. 23m. morn.
New Moon ☿ 31st day, 3h. 41m. aftern.

19d. 16h. 57m.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>3</td>
<td>Circumcision</td>
<td>h</td>
<td>h</td>
<td>h</td>
</tr>
<tr>
<td>2</td>
<td>Su</td>
<td>6</td>
<td>Sunday after Christmas</td>
<td>8</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>6</td>
<td>Saturn rises 6.30 morn.</td>
<td>8</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Tu</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>8</td>
<td>Epiphany: 12th Day</td>
<td>8</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Th</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>2</td>
<td>Pr. All. Vict. of Wales born [1864]</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Su</td>
<td>3</td>
<td>Sunday after Epiphany</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>3</td>
<td>Plough Monday</td>
<td>8</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Tu</td>
<td>4</td>
<td>Hilary Term begins.</td>
<td>8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>3</td>
<td>Jupiter sets 2.29 morn.</td>
<td>8</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>Th</td>
<td>4</td>
<td>Hilary: Camb. Term begins</td>
<td>8</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>4</td>
<td>Oxford Term begins</td>
<td>8</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td>4</td>
<td>Prisca</td>
<td>8</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>7</td>
<td>Fabian</td>
<td>7</td>
<td>59</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Tu</td>
<td>7</td>
<td>Vincent</td>
<td>7</td>
<td>58</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td>7</td>
<td>Sunday after Epiphany</td>
<td>7</td>
<td>57</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>Th</td>
<td>7</td>
<td>Agnes</td>
<td>7</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>7</td>
<td>Sunday after Epiphany</td>
<td>7</td>
<td>54</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>7</td>
<td>Sunday after Epiphany</td>
<td>7</td>
<td>53</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>7</td>
<td>Oxford Term begins</td>
<td>7</td>
<td>52</td>
<td>4</td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>7</td>
<td>Venus sets 8.8 aft.</td>
<td>7</td>
<td>49</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>Th</td>
<td>7</td>
<td>Mercury sets 5.54 aft.</td>
<td>7</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>7</td>
<td>Sunday after Epiphany</td>
<td>7</td>
<td>47</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>7</td>
<td>[Chas. I Mart. 1649]</td>
<td>7</td>
<td>45</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>Su</td>
<td>7</td>
<td>Sunday after Epiphany, K.</td>
<td>7</td>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>7</td>
<td>Hilary Term ends</td>
<td>7</td>
<td>42</td>
<td>4</td>
</tr>
</tbody>
</table>

Day | Length of day | Day incr. | Day br. | Twilight ends | Sun East | Time on clock at Q's noon | Moon's Southing |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 50</td>
<td>0 6</td>
<td>6 m 2</td>
<td>6 a 5</td>
<td>4m 45</td>
<td>12 3 51</td>
<td>11m 35</td>
</tr>
<tr>
<td>6</td>
<td>58</td>
<td>14</td>
<td>2</td>
<td>10</td>
<td>49</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>7 8</td>
<td>7</td>
<td>3</td>
<td>11</td>
<td>54</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>7 8</td>
<td>34</td>
<td>5</td>
<td>59</td>
<td>59</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>47</td>
<td>55</td>
<td>28</td>
<td>5</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>26</td>
<td>46</td>
<td>1 2</td>
<td>50</td>
<td>35</td>
<td>10</td>
<td>12</td>
<td>49</td>
</tr>
</tbody>
</table>
### JANUARY, 1870.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus rises</th>
<th>Venus sets</th>
<th>Mars rises</th>
<th>Mars sets</th>
<th>Jupiter rises</th>
<th>Jupiter sets</th>
<th>Saturn rises</th>
<th>Saturn sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 m 17</td>
<td>8 a 9</td>
<td>9 m 9</td>
<td>5 a 15</td>
<td>0 a 34</td>
<td>3 m 12</td>
<td>6 m 40</td>
<td>2 a 44</td>
</tr>
<tr>
<td>13</td>
<td>9 36</td>
<td>8 18</td>
<td>8 48</td>
<td>5 20</td>
<td>11 m 46</td>
<td>2 26</td>
<td>5 59</td>
<td>2 3</td>
</tr>
<tr>
<td>25</td>
<td>8 45</td>
<td>8 11</td>
<td>8 23</td>
<td>5 27</td>
<td>10 0</td>
<td>1 42</td>
<td>5 18</td>
<td>1 20</td>
</tr>
</tbody>
</table>

### NOTICES AND HISTORICAL MEMORANDA.

**NOTICES.**

1. New Year’s Day. Stock Exchange closed unless otherwise specially ordered by the Committee for General Purposes. British Museum closed first week.

2. Quarter Sessions in this week.

3. Dividends payable.

4. Fire Insurance due at Christmas must be paid on or before this day.

5. Hilary Term begins.

6. Cambridge Lent Term begins.


8. Hilary Term ends.

**HISTORICAL MEMORANDA.**

- Union of Great Britain and Ireland, 1801.
- General Monk died, 1670.
- Attempt to assassinate Louis XV, 1757.
- Calais surrendered to the French, 1558.
- Penny Post commenced, 1840.
- Sir Hans Sloane died, 1753.
- Queen Elizabeth crowned, 1559.
- Gibbon, historian, died, 1794.
- Battle of Corunna, 1809.
- Watt, inventor of the steam-engine, born, 1736.
- Howard, philanthropist, died, 1790.
- Sir Fras. Bacon born, 1560.
- Royal Exchange opened, 1571.
- Frederick the Great born, 1712.
- Dr. Jenner died, 1823.
- Charles I beheaded, 1649.

Moon in apogee on the 9th; in perigee on the 21st.

*Venus* is an *Evening Star* during the month; *Jupiter* is a prominent *Evening Star*.

**Eclipses.**—Jan. 17. A total eclipse of the Moon, visible only in part. The chief portion of the eclipse will take place below the horizon. The Moon will rise partially eclipsed at 4 h. 1 m. in the afternoon, and the eclipse will end at 4 h. 36 m.

Jan. 31. A partial eclipse of the Sun, invisible in Great Britain. The planet *Uranus* is in *opposition* on the 10th.
### FEBRUARY, 1870.

**Sun enters Pisces,**

![Fish illustrations](image)

**LUNATIONS AND PHASES.**

- First Quar. ♆ 8th day, 6h. 19m. aftern.
- Full Moon ○ 16th day, 3h. 28m. morn.
- Last Quar. ♄ 22nd day, 6h. 46m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>W</th>
<th>D</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tu</td>
<td>PURIF. CANDL. DAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Th</td>
<td>Blase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>Agatha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Su</td>
<td>5 Sunday after Epiphany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>Saturn rises 4.28 morn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Th</td>
<td>QUEEN VICTORIA MAR. 1840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Su</td>
<td>Septuagesima Sunday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>Valentine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Tu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td>Jupiter sets 0.23 morn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Th</td>
<td>Mars sets 5.42 aft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Su</td>
<td>Sexagesima Sunday. PRS. [Louise born 1867]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Tu</td>
<td>Venus sets 6.5 aft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Th</td>
<td>ST. MATTHIAS. [Camb. Term. div. mid.]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>Mercury rises 5.57 morn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Su</td>
<td>Shrove Sunday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Noon of Day

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at Ω's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 h 5 m</td>
<td>1 h 21 m</td>
<td>5 m 44</td>
<td>6 m 44</td>
<td>5 m 17</td>
<td>12 h 13 m 52</td>
<td>0 h a 57</td>
</tr>
<tr>
<td>6</td>
<td>23 h</td>
<td>39 h</td>
<td>37 h</td>
<td>7 h</td>
<td>23</td>
<td>14 h 21 m 4</td>
<td>8 h 34</td>
</tr>
<tr>
<td>11</td>
<td>41 h</td>
<td>57 h</td>
<td>29 h</td>
<td>7 h</td>
<td>29</td>
<td>14 h 29 m 8</td>
<td>8 h 25</td>
</tr>
<tr>
<td>16</td>
<td>0 h</td>
<td>2 h</td>
<td>16 h</td>
<td>8 h</td>
<td>34</td>
<td>14 h 19 m 0 m 10</td>
<td>8 h 11</td>
</tr>
<tr>
<td>21</td>
<td>19 h</td>
<td>35 h</td>
<td>11 h</td>
<td>17 h</td>
<td>40</td>
<td>13 h 50 m 4</td>
<td>9 h 39</td>
</tr>
<tr>
<td>26</td>
<td>38 h</td>
<td>54 h</td>
<td>1 h</td>
<td>25 h</td>
<td>13</td>
<td>6 h 9 h 10</td>
<td>3 h 30</td>
</tr>
</tbody>
</table>
FEVERUARY, 1870.

**NOTICES AND HISTORICAL MEMORANDA.**

**NOTICES.**

2. Candlemas Day. One of the Quarter Days used in Scotland.


**HISTORICAL MEMORANDA.**

1. New River commenced, 1608.

5. Scylla destroyed by earthquake, 1783.

10. Lord Darnley murdered, 1567.

11. London University chartered, 1826.

12. Emmanuel Kant died, 1804.

13. William and Mary proclaimed, 1689.


15. Capt. Cook killed, 1779.

16. Lindley Murray died, 1826.

17. Michael Angelo died, 1563.

18. Moliere died, 1673.

19. Martin Luther died, 1546.


21. Trinidad taken by the English, 1797.


23. Sir Joshua Reynolds died, 1792.

24. Proclamation of Republic in France, 1848.

25. Earl of Essex beheaded, 1601.

26. Sir Christopher Wren died, 1723.


28. Benjamin Disraeli Prime Minister, 1868.

**During this month the days increase 54m. in the morning, and 51m. in the afternoon.**

**Moon in apogee on the 6th; in perigee on the 18th.**

**Mercury** may be seen in the mornings about the 28th.

**Venus** is an Evening Star till the 23rd.

**Jupiter** is a prominent Evening Star during the month, and is in conjunction with the Moon on the 8th.
### March, 1870

#### Sun enters Aries

#### Lunations and Phases

- **New Moon** • 2nd day, 8h. 40m. morn.
- **First Quart.** † 10th day, 1h. 12m. aftern.
- **Full Moon** ○ 17th day, 1h. 52m. aftern.
- **Last Quart.** ‡ 24th day, 4h. 37m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>20th</td>
<td>7h. 32m.</td>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
</tbody>
</table>

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Rising time</th>
<th>Setting time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tu</td>
<td>Shrove Tuesday, David</td>
<td>6:47</td>
<td>5:38</td>
</tr>
<tr>
<td>2 W</td>
<td>Lent begins, Ash Wed. Chad</td>
<td>6:45</td>
<td>5:39</td>
</tr>
<tr>
<td>3 Th</td>
<td></td>
<td>6:43</td>
<td>5:41</td>
</tr>
<tr>
<td>4 F</td>
<td>Saturn rises 3.1 morn.</td>
<td>6:41</td>
<td>5:43</td>
</tr>
<tr>
<td>5 S</td>
<td></td>
<td>6:39</td>
<td>5:45</td>
</tr>
<tr>
<td>6 Sun</td>
<td>1 Sunday in Lent</td>
<td>6:36</td>
<td>5:47</td>
</tr>
<tr>
<td>7 M</td>
<td>Perpetua</td>
<td>6:34</td>
<td>5:48</td>
</tr>
<tr>
<td>8 Tu</td>
<td></td>
<td>6:32</td>
<td>5:50</td>
</tr>
<tr>
<td>9 W</td>
<td>Ember Week</td>
<td>6:30</td>
<td>5:52</td>
</tr>
<tr>
<td>10 Th</td>
<td>Pr. Wales mar. 1863</td>
<td>6:27</td>
<td>5:54</td>
</tr>
<tr>
<td>11 F</td>
<td></td>
<td>6:25</td>
<td>5:55</td>
</tr>
<tr>
<td>12 S</td>
<td>Gregory</td>
<td>6:23</td>
<td>5:57</td>
</tr>
<tr>
<td>13 Sun</td>
<td>2 Sunday in Lent</td>
<td>6:21</td>
<td>5:59</td>
</tr>
<tr>
<td>14 M</td>
<td></td>
<td>6:18</td>
<td>6:0</td>
</tr>
<tr>
<td>15 Tu</td>
<td>Jupiter sets 11.3 aft.</td>
<td>6:16</td>
<td>6:2</td>
</tr>
<tr>
<td>16 W</td>
<td></td>
<td>6:14</td>
<td>6:4</td>
</tr>
<tr>
<td>17 Th</td>
<td>St. Patrick [W. Sax.]</td>
<td>6:12</td>
<td>6:5</td>
</tr>
<tr>
<td>18 F</td>
<td>Prs. Louisa B. 1848, Ed. K.</td>
<td>6:09</td>
<td>6:7</td>
</tr>
<tr>
<td>19 S</td>
<td></td>
<td>6:07</td>
<td>6:9</td>
</tr>
<tr>
<td>20 Sun</td>
<td>3 Sunday in Lent</td>
<td>6:05</td>
<td>6:10</td>
</tr>
<tr>
<td>21 M</td>
<td>Benedict</td>
<td>6:02</td>
<td>6:12</td>
</tr>
<tr>
<td>22 Tu</td>
<td></td>
<td>6:0</td>
<td>6:14</td>
</tr>
<tr>
<td>23 W</td>
<td>Mars rises 5.59 morn.</td>
<td>5:58</td>
<td>6:16</td>
</tr>
<tr>
<td>24 Th</td>
<td></td>
<td>5:56</td>
<td>6:17</td>
</tr>
<tr>
<td>25 F</td>
<td>Lady Day</td>
<td>5:53</td>
<td>6:19</td>
</tr>
<tr>
<td>26 S</td>
<td>Duke of Cumberland B. 1819</td>
<td>5:51</td>
<td>6:21</td>
</tr>
<tr>
<td>27 Sun</td>
<td>4th, or Midlent Sunday</td>
<td>5:49</td>
<td>6:22</td>
</tr>
<tr>
<td>28 M</td>
<td></td>
<td>5:46</td>
<td>6:24</td>
</tr>
<tr>
<td>29 Tu</td>
<td></td>
<td>5:44</td>
<td>6:26</td>
</tr>
<tr>
<td>30 W</td>
<td>Venus rises 4.8 morn.</td>
<td>5:42</td>
<td>6:27</td>
</tr>
<tr>
<td>31 Th</td>
<td>Mercury rises 5.31 morn.</td>
<td>5:40</td>
<td>6:29</td>
</tr>
</tbody>
</table>

#### Length of Day, Day Increase, Day Decrease, Twilight ends, Sun East, Time on clock at ☉'s noon, Moon's Southing

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day Increase</th>
<th>Day Decrease</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ☉'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 50</td>
<td>3 6</td>
<td>4m 55</td>
<td>7 a 30</td>
<td>5m 48</td>
<td>12 32</td>
<td>11m 40</td>
</tr>
<tr>
<td>6</td>
<td>11 9</td>
<td>25</td>
<td>44</td>
<td>39</td>
<td>39</td>
<td>11 27</td>
<td>3 a 12</td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>45</td>
<td>32</td>
<td>48</td>
<td>58</td>
<td>10 11</td>
<td>7 6</td>
</tr>
<tr>
<td>16</td>
<td>49 4</td>
<td>5</td>
<td>20</td>
<td>58</td>
<td>6 3</td>
<td>8 47</td>
<td>11 44</td>
</tr>
<tr>
<td>21</td>
<td>12 9</td>
<td>25</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>7 18</td>
<td>3m 24</td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>45</td>
<td>3 54</td>
<td>18</td>
<td>13</td>
<td>5 46</td>
<td>8 0</td>
</tr>
</tbody>
</table>
### Venus

<table>
<thead>
<tr>
<th>D</th>
<th>rises</th>
<th>sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5m36</td>
<td>5 a 14</td>
</tr>
<tr>
<td>13</td>
<td>4 49</td>
<td>3 59</td>
</tr>
<tr>
<td>25</td>
<td>4 19</td>
<td>3 11</td>
</tr>
</tbody>
</table>

### Mars

<table>
<thead>
<tr>
<th>D</th>
<th>rises</th>
<th>sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 m 58</td>
<td>5 a 48</td>
</tr>
<tr>
<td>13</td>
<td>6 25</td>
<td>5 55</td>
</tr>
<tr>
<td>25</td>
<td>5 53</td>
<td>6 1</td>
</tr>
</tbody>
</table>

### Jupiter

<table>
<thead>
<tr>
<th>D</th>
<th>rises</th>
<th>sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 m 50</td>
<td>11 a 44</td>
</tr>
<tr>
<td>13</td>
<td>8 7</td>
<td>11 9</td>
</tr>
<tr>
<td>25</td>
<td>7 25</td>
<td>10 35</td>
</tr>
</tbody>
</table>

### Saturn

<table>
<thead>
<tr>
<th>D</th>
<th>rises</th>
<th>sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 m 12</td>
<td>11 m 14</td>
</tr>
<tr>
<td>13</td>
<td>2 28</td>
<td>10 30</td>
</tr>
<tr>
<td>25</td>
<td>1 42</td>
<td>9 44</td>
</tr>
</tbody>
</table>

### Notices and Historical Memoranda

#### Notices

1. Municipal assessors appointed.

#### Historical Memoranda

- 1. First reading of Irish Church Bill, 1869.
- 2. Czar Nicholas died, 1855.
- 3. Jno. Wesley died, 1791.
- 4. Dr. Arne, musician, died, 1778.
- 5. Covent Garden Theatre burnt, 1856.
- 6. Rizzo assassinated, 1566.
- 7. Benjamin West, artist, died, 1820.
- 8. Tasso born, 1544.
- 10. London Bridge commenced, 1824.
- 11. Dr. Burnet died, 1715.
- 16. Robert Bruce crowned, 1306.
- 17. Charity Schools instituted, 1688.
- 18. Dr. Gilbert West died, 1756.
- 20. Chaucer died, 1400.
- 21. Declaration of War against Russia, 1854.

During this month the days increase 1h. 10m. in the morning, and 52m. in the afternoon.

Moon in apogee on the 6th; in perigee on the 18th.

*Venus* is a *Morning Star* during the month; most bright on the 31st.

*Jupiter* is an *Evening Star* during the month; and in conjunction with the Moon on the 7th.

*Mars* is in conjunction with the Sun on the 12th, and is generally unfavorable for observation this year.
AUGUST, 1870.

Sun enters Taurus.

19 d. 19 h. 33 m.

LUNATIONS AND PHASES.

New Moon • 1st day, 1 h. 58 m. morn.
First Quar. □ 9th day, 4 h. 25 m. morn.
Full Moon □ 15th day, 10 h. 26 m. aftern.
Last Quar. ◊ 22nd day, 4 h. 25 m. aftern.
New Moon ◊ 30th day, 6 h. 37 m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>53</td>
<td>[Bishop of Chich.]</td>
<td>5 37</td>
<td>6 m 30</td>
<td>6 m 18</td>
<td>6 a 52</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>55</td>
<td>St. Ambrose</td>
<td>5 35</td>
<td>6 32</td>
<td>6 36</td>
<td>7 58</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>5</td>
<td>Sunday in Lent. Richard,</td>
<td>5 33</td>
<td>6 34</td>
<td>6 56</td>
<td>9 3</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>53</td>
<td>Old Lady Day</td>
<td>5 30</td>
<td>6 35</td>
<td>7 18</td>
<td>10 8</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
<td>5</td>
<td>Saturn rises 0.59 morn.</td>
<td>5 28</td>
<td>6 37</td>
<td>7 43</td>
<td>11 12</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>53</td>
<td>Pr. Leopold born 1853</td>
<td>5 26</td>
<td>6 39</td>
<td>8 14</td>
<td>14 15</td>
</tr>
<tr>
<td>7</td>
<td>T</td>
<td>5</td>
<td>Cambridge Term ends</td>
<td>5 22</td>
<td>6 42</td>
<td>9 36</td>
<td>1 13</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>53</td>
<td>Oxford Term ends</td>
<td>5 19</td>
<td>6 44</td>
<td>10 32</td>
<td>2 5</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>5</td>
<td>Palm Sunday</td>
<td>5 17</td>
<td>6 45</td>
<td>11 37</td>
<td>2 51</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>5</td>
<td>M</td>
<td>5 15</td>
<td>6 47</td>
<td>0 a 49</td>
<td>3 30</td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>5</td>
<td>Jupiter sets 9.45 aft.</td>
<td>5 13</td>
<td>6 49</td>
<td>2 10</td>
<td>4 1</td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td>5</td>
<td>[Thursday]</td>
<td>5 10</td>
<td>6 50</td>
<td>3 32</td>
<td>4 31</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>5</td>
<td>Prs. Beet. born 1857. Maund.</td>
<td>5 8</td>
<td>6 52</td>
<td>4 57</td>
<td>4 56</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>5</td>
<td>Good Friday. Easter Term</td>
<td>5 6</td>
<td>6 54</td>
<td>6 22</td>
<td>5 20</td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td>5</td>
<td>[begins]</td>
<td>5 4</td>
<td>6 55</td>
<td>7 49</td>
<td>5 47</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>5</td>
<td>Easter Sunday</td>
<td>5 2</td>
<td>6 57</td>
<td>9 15</td>
<td>6 13</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>5</td>
<td>Easter Monday</td>
<td>5 0</td>
<td>6 59</td>
<td>10 37</td>
<td>6 46</td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>5</td>
<td>Easter Tuesday. Alphege</td>
<td>4 58</td>
<td>7 0</td>
<td>11 52</td>
<td>7 23</td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td>5</td>
<td>Oxford Term begins</td>
<td>4 55</td>
<td>7 2</td>
<td>1 8</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>T</td>
<td>5</td>
<td>Mars rises 4.41 morn.</td>
<td>4 53</td>
<td>7 4</td>
<td>0 54</td>
<td>9 4</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>5</td>
<td>Cambridge Term begins</td>
<td>4 51</td>
<td>7 5</td>
<td>1 47</td>
<td>10 6</td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td>5</td>
<td>St. George</td>
<td>4 49</td>
<td>7 7</td>
<td>2 27</td>
<td>11 12</td>
</tr>
<tr>
<td>23</td>
<td>S</td>
<td>5</td>
<td>1st, or Low Sunday [B. 1843]</td>
<td>4 47</td>
<td>7 9</td>
<td>3 0</td>
<td>0 a 19</td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>5</td>
<td>St. Mark. Ps. Louis of Hesse</td>
<td>4 45</td>
<td>7 10</td>
<td>3 25</td>
<td>1 27</td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>4</td>
<td>43</td>
<td>7 12</td>
<td>3 48</td>
<td>2 32</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td>4</td>
<td>41</td>
<td>7 14</td>
<td>4 7</td>
<td>3 38</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>T</td>
<td>4</td>
<td>Venus rises 8.19 morn.</td>
<td>4 39</td>
<td>7 15</td>
<td>4 26</td>
<td>4 44</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>4</td>
<td>Mercury sets 9.2 aft.</td>
<td>4 37</td>
<td>7 17</td>
<td>4 44</td>
<td>5 48</td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td>4</td>
<td>36</td>
<td>7 19</td>
<td>5 26</td>
<td>5 54</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at @’s noon</th>
<th>Moon’s Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 52</td>
<td>5 8</td>
<td>3 m 37</td>
<td>8 a 31</td>
<td>6 m 18</td>
<td>12 3 56 0 a 29</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>13 12</td>
<td>28</td>
<td>23</td>
<td>42</td>
<td>23</td>
<td>2 27 4 9</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>31</td>
<td>47</td>
<td>8</td>
<td>54</td>
<td>28</td>
<td>1 3 8 33</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>51</td>
<td>6 7</td>
<td>2 53</td>
<td>9 7</td>
<td>32</td>
<td>11 59 46 0m 11</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>10</td>
<td>26</td>
<td>37</td>
<td>37</td>
<td>58 38 4 59</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>28</td>
<td>44</td>
<td>21</td>
<td>35</td>
<td>42</td>
<td>57 41 9 5</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Venus rises</td>
<td>Venus sets</td>
<td>Mars rises</td>
<td>Mars sets</td>
<td>Jupiter rises</td>
<td>Jupiter sets</td>
<td>Saturn rises</td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>---------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1</td>
<td>4 m 5</td>
<td>2 a 57</td>
<td>5 m 35</td>
<td>6 a 5</td>
<td>7 m 1</td>
<td>10 a 15</td>
<td>1 m 15</td>
</tr>
<tr>
<td>13</td>
<td>3 44</td>
<td>2 46</td>
<td>5 2</td>
<td>6 10</td>
<td>6 20</td>
<td>9 42</td>
<td>0 28</td>
</tr>
<tr>
<td>25</td>
<td>3 24</td>
<td>2 50</td>
<td>4 31</td>
<td>6 15</td>
<td>5 40</td>
<td>9 10</td>
<td>11 a 36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>C's age</th>
<th>High Water Lond. Br.</th>
<th>NOTICES AND HISTORICAL MEMORANDA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>h m</td>
<td>1. Hawkers' and Pedlars' licences granted.</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>3 20</td>
<td>4. Quarter Sessions this week.</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4 46</td>
<td>15. Easter Term begins.</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>5 16</td>
<td>17. High spring tides.</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>5 53</td>
<td>18. Easter Monday. The Stock Exchange is now closed on this day, unless otherwise specially ordered.</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>6 34</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>8 46</td>
<td>22. Cambridge Easter Term begins.</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>10 15</td>
<td>24. Historical Memoranda.</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>11 35</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>morn.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>13</td>
<td>0 34</td>
<td>4. Oliver Goldsmith died, 1774.</td>
</tr>
<tr>
<td>17</td>
<td>16</td>
<td>2 49</td>
<td>11. Lorenzo de' Medici died, 1492.</td>
</tr>
<tr>
<td>18</td>
<td>17</td>
<td>3 33</td>
<td>13. William and Mary crowned, 1689.</td>
</tr>
<tr>
<td>19</td>
<td>18</td>
<td>4 15</td>
<td>15. Napoleon I abdicated, 1814.</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
<td>5 1</td>
<td>16. Handel died, 1759.</td>
</tr>
<tr>
<td>21</td>
<td>20</td>
<td>5 45</td>
<td>18. Buffon died, 1788.</td>
</tr>
<tr>
<td>22</td>
<td>21</td>
<td>6 37</td>
<td>19. Franklin died, 1790.</td>
</tr>
<tr>
<td>24</td>
<td>23</td>
<td>8 51</td>
<td>23. Royal Society incorporated, 1663.</td>
</tr>
<tr>
<td>26</td>
<td>25</td>
<td>11 33</td>
<td>27. Cervantes died, 1616.</td>
</tr>
<tr>
<td>27</td>
<td>26</td>
<td>0 a 29</td>
<td>29. Oliver Cromwell born, 1599.</td>
</tr>
<tr>
<td>28</td>
<td>27</td>
<td>1 10</td>
<td>30. Cowper died, 1800.</td>
</tr>
<tr>
<td>29</td>
<td>28</td>
<td>1 46</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>N</td>
<td>2 16</td>
<td>30. Edict of Nantes signed, 1598.</td>
</tr>
</tbody>
</table>

During this month the days increase 1h. 4m. in the morning, and 50m. in the afternoon.

Moon in apogee on the 2nd; perigee on the 15th; apogee on the 29th.

*Venus* is a *Morning Star* during the month, and becomes in conjunction with the Moon on the 26th.

*Jupiter* is chiefly an *Evening Star* during the month.
### MAY, 1870.

#### Lunations and Phases.

- **First Quadrant:** 8th day, 3h. 38m. aftern.
- **Full Moon:** 15th day, 6h. 3m. morn.
- **Last Quadrant:** 22nd day, 6h. 9m. morn.
- **New Moon:** 30th day, 9h. 57m. morn.

#### Sun enters Gemini,

<table>
<thead>
<tr>
<th>W</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SUN</td>
<td>2 Sunday after Easter. St. Phil. &amp; Jas. P. Arth. B. 1850</td>
<td>4 34</td>
<td>7 20</td>
<td>5 32</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>Invention of the Cross</td>
<td>4 32</td>
<td>7 22</td>
<td>5 46</td>
</tr>
<tr>
<td>3</td>
<td>Tu</td>
<td>Saturn rises 10.59 aft.</td>
<td>4 30</td>
<td>7 23</td>
<td>6 15</td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>The rising of the Cross</td>
<td>4 28</td>
<td>7 25</td>
<td>6 50</td>
</tr>
<tr>
<td>5</td>
<td>Th</td>
<td>John Evan. à P. Lat.</td>
<td>4 26</td>
<td>7 27</td>
<td>7 32</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>3 Sunday after Easter</td>
<td>4 25</td>
<td>7 28</td>
<td>8 24</td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>Jupiter sets 8.30 aft.</td>
<td>4 23</td>
<td>7 30</td>
<td>9 25</td>
</tr>
<tr>
<td>8</td>
<td>Sun</td>
<td>Easter Term ends</td>
<td>4 21</td>
<td>7 31</td>
<td>10 33</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>Old May Day</td>
<td>4 19</td>
<td>7 33</td>
<td>11 48</td>
</tr>
<tr>
<td>10</td>
<td>Tu</td>
<td>Venus rises 2.37 morn.</td>
<td>4 18</td>
<td>7 35</td>
<td>1 a 6</td>
</tr>
<tr>
<td>11</td>
<td>W</td>
<td>Easter Term begins</td>
<td>4 16</td>
<td>7 36</td>
<td>2 27</td>
</tr>
<tr>
<td>12</td>
<td>Th</td>
<td>Mars rises 3.35 morn.</td>
<td>4 15</td>
<td>7 38</td>
<td>3 51</td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>Cambridge Term divides mid.</td>
<td>4 13</td>
<td>7 39</td>
<td>5 15</td>
</tr>
<tr>
<td>14</td>
<td>S</td>
<td>Ascend. Holy Th. T. T. beg.</td>
<td>4 11</td>
<td>7 41</td>
<td>6 42</td>
</tr>
<tr>
<td>15</td>
<td>Sun</td>
<td>Regation Sun</td>
<td>4 10</td>
<td>7 42</td>
<td>8 6</td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>Cambridge Term begins</td>
<td>4 9</td>
<td>7 44</td>
<td>9 28</td>
</tr>
<tr>
<td>17</td>
<td>Tu</td>
<td>Sun</td>
<td>4 7</td>
<td>7 45</td>
<td>10 40</td>
</tr>
<tr>
<td>18</td>
<td>W</td>
<td>Sun</td>
<td>4 6</td>
<td>7 47</td>
<td>11 39</td>
</tr>
<tr>
<td>19</td>
<td>Th</td>
<td>Sun</td>
<td>4 5</td>
<td>7 48</td>
<td>morn.</td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>Sun</td>
<td>4 3</td>
<td>7 49</td>
<td>0 26</td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>Sun</td>
<td>4 2</td>
<td>7 51</td>
<td>1 21</td>
</tr>
<tr>
<td>22</td>
<td>Sun</td>
<td>Sun</td>
<td>4 1</td>
<td>7 52</td>
<td>2 29</td>
</tr>
<tr>
<td>23</td>
<td>M</td>
<td>Cambridge Term divides mid.</td>
<td>3 59</td>
<td>7 54</td>
<td>1 54</td>
</tr>
<tr>
<td>24</td>
<td>Tu</td>
<td>Qu. Victoria born 1819</td>
<td>3 58</td>
<td>7 55</td>
<td>2 13</td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>Prs. Helena born 1846.</td>
<td>3 57</td>
<td>7 56</td>
<td>2 33</td>
</tr>
<tr>
<td>26</td>
<td>Th</td>
<td>Ascend. Holy Th. T. T. beg.</td>
<td>3 56</td>
<td>7 57</td>
<td>3 51</td>
</tr>
<tr>
<td>27</td>
<td>F</td>
<td>D. Cumb. B. 1819. Ven. Bede</td>
<td>3 55</td>
<td>7 59</td>
<td>3 9</td>
</tr>
<tr>
<td>28</td>
<td>S</td>
<td>[Chas. II rest. 1660</td>
<td>3 54</td>
<td>8 0</td>
<td>3 27</td>
</tr>
<tr>
<td>29</td>
<td>Sun</td>
<td>Sun</td>
<td>3 53</td>
<td>8 1</td>
<td>3 51</td>
</tr>
<tr>
<td>30</td>
<td>M</td>
<td>Sun</td>
<td>3 52</td>
<td>8 2</td>
<td>4 16</td>
</tr>
<tr>
<td>31</td>
<td>Tu</td>
<td>Mercury sets 8.26 aft.</td>
<td>3 51</td>
<td>8 3</td>
<td>4 49</td>
</tr>
</tbody>
</table>

#### Day Length of Day Day incr. Day br. Twilight ends Sun East Time on clock Moon's Southing

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at Sun's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>46</td>
<td>7</td>
<td>2 m 3</td>
<td>9 a 51</td>
<td>6m 46</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>3</td>
<td>19</td>
<td>1 45</td>
<td>10 8</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>19</td>
<td>35</td>
<td>24</td>
<td>28</td>
<td>55</td>
<td>56 10 9 2</td>
</tr>
<tr>
<td>16</td>
<td>34</td>
<td>50</td>
<td>0 1</td>
<td>51</td>
<td>7 0</td>
<td>56 7 0 m 44</td>
</tr>
<tr>
<td>21</td>
<td>48</td>
<td>8 4</td>
<td>28</td>
<td>11 25</td>
<td>4</td>
<td>56 19 5 30</td>
</tr>
<tr>
<td>26</td>
<td>16</td>
<td>1</td>
<td>17</td>
<td>No real night.</td>
<td>8</td>
<td>56 44 9 9</td>
</tr>
</tbody>
</table>
May, 1870.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>1</td>
<td>3 m 14</td>
<td>2 a 56</td>
<td>4 m 15</td>
<td>6 a 17</td>
</tr>
<tr>
<td>13</td>
<td>2 52</td>
<td>3 12</td>
<td>3 45</td>
<td>6 21</td>
</tr>
<tr>
<td>25</td>
<td>2 30</td>
<td>3 34</td>
<td>3 17</td>
<td>6 25</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. May Day.
2. A holiday at the Stock Offices, Bank of England. The Stock Exchange closed on this day, unless otherwise specially ordered by the Committee for General Purposes.
3. British Museum closed first week.
5. Easter Term ends.
6. This is Whit'sun-day, one of the Terms or Quarter Days used in Scotland.
7. High spring tides.
8. Queen's Birthday.
9. Trinity Term begins.

HISTORICAL MEMORANDA.

1. Londonderry proclaimed, 1869.
2. Jamaica discovered by Columbus, 1494.
3. Napoleon I died, 1821.
4. Humboldt died, 1859.
5. Earl of Chatham died, 1778.
7. Melbourne founded, 1837.
8. Dr. Jenner born, 1749.
10. Columbus died, 1506.
11. Entick, lexicographer, died, 1773.
12. Copernicus died, 1543.
13. Countess of Salisbury beheaded, 1541.
15. Rubens died, 1640.
16. Dr. Livingstone reached Loanda, 1854.

During this month the days increase 44 m. in the morning, and 44 m. in the afternoon.

Mercury may be seen near the western horizon about the 11th. Moon in perigee on the 14th; apogee on the 26th.

Jupiter is a Morning Star until the 25th, and becomes in conjunction with the Moon on the 2nd and 30th.

Venus is a Morning Star during the month, and becomes in conjunction with the Moon on the 26th.
## JUNE, 1870.

### LUNATIONS AND PHASES.

- **First Quar.** 6th day, 11h. 16m. aftern.
- **Full Moon** 13th day, 11h. 47m. aftern.
- **Last Quar.** 20th day, 9h. 34m. aftern.
- **New Moon** 28th day, 11h. 33m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>Nicomedes</td>
<td>h 3 50 m 8 5 m 28 a 10 m 0</td>
<td>h 3 50 m 8 5 m 28 a 10 m 0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Th</td>
<td>[Oxf. Term ends]</td>
<td>h 3 50 m 8 6 m 19 a 10 m 51</td>
<td>h 3 50 m 8 6 m 19 a 10 m 51</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Pr. Geo. Fr. of Wales B. 1865</td>
<td>h 3 49 m 8 7 m 17 a 11 m 33</td>
<td>h 3 49 m 8 7 m 17 a 11 m 33</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>Oxford Term begins</td>
<td>h 3 48 m 8 8 m 22 morn.</td>
<td>h 3 48 m 8 8 m 22 morn.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sun</td>
<td>Whit Sunday. Boniface</td>
<td>h 3 48 m 8 9 m 34 0</td>
<td>h 3 48 m 8 9 m 34 0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>Whit Monday</td>
<td>h 3 47 m 8 10 m 51 0</td>
<td>h 3 47 m 8 10 m 51 0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tu</td>
<td>Whit Tuesday</td>
<td>h 3 46 m 8 10 m 0 a 8 1</td>
<td>h 3 46 m 8 10 m 0 a 8 1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Ember Week.</td>
<td>h 3 46 m 8 11 m 27 1</td>
<td>h 3 46 m 8 11 m 27 1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Th</td>
<td>Saturn rises 8.28 aft.</td>
<td>h 3 46 m 8 12 m 49 1</td>
<td>h 3 46 m 8 12 m 49 1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td></td>
<td>h 3 45 m 8 13 m 13 2</td>
<td>h 3 45 m 8 13 m 13 2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>S</td>
<td>St. Barnabas</td>
<td>h 3 45 m 8 14 m 37 2</td>
<td>h 3 45 m 8 14 m 37 2</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Sun</td>
<td>Trinity Sunday</td>
<td>h 3 45 m 8 14 m 7 3</td>
<td>h 3 45 m 8 14 m 7 3</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td></td>
<td>h 3 44 m 8 15 m 17 3</td>
<td>h 3 44 m 8 15 m 17 3</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Tu</td>
<td>Jupiter rises 2.56 morn.</td>
<td>h 3 44 m 8 16 m 9 4</td>
<td>h 3 44 m 8 16 m 9 4</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td></td>
<td>h 3 44 m 8 16 m 10 5</td>
<td>h 3 44 m 8 16 m 10 5</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Th</td>
<td>Corpus Christi. Trin. Term ends</td>
<td>h 3 44 m 8 17 m 17 5</td>
<td>h 3 44 m 8 17 m 17 5</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>F</td>
<td>St. Alban</td>
<td>h 3 44 m 8 17 m 32 7</td>
<td>h 3 44 m 8 17 m 32 7</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>S</td>
<td>Mars rises 2.26 morn.</td>
<td>h 3 44 m 8 17 m 57 8</td>
<td>h 3 44 m 8 17 m 57 8</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Sun</td>
<td>1 Sunday after Trinity</td>
<td>h 3 44 m 8 18 m 10 7</td>
<td>h 3 44 m 8 18 m 10 7</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>Qu. Victoria Accession, 1837</td>
<td>h 3 44 m 8 18 m 20 11 5</td>
<td>h 3 44 m 8 18 m 20 11 5</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Tu</td>
<td>Qu. Vict. Proc. Camb. Com.</td>
<td>h 3 44 m 8 18 m 38 0</td>
<td>h 3 44 m 8 18 m 38 0</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>[Longest day]</td>
<td>h 3 45 m 8 18 m 57 1</td>
<td>h 3 45 m 8 18 m 57 1</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Th</td>
<td></td>
<td>h 3 45 m 8 19 m 15 2</td>
<td>h 3 45 m 8 19 m 15 2</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>F</td>
<td>Mids. Day. Nat. J.Bap. Com.</td>
<td>h 3 45 m 8 19 m 33 3</td>
<td>h 3 45 m 8 19 m 33 3</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>S</td>
<td>Venus sets 1.41 morn. T. ends</td>
<td>h 3 46 m 8 19 m 55 4</td>
<td>h 3 46 m 8 19 m 55 4</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Sun</td>
<td>2 Sunday after Trinity</td>
<td>h 3 46 m 8 19 m 50</td>
<td>h 3 46 m 8 19 m 50</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td></td>
<td>h 3 47 m 8 19 m 49 6</td>
<td>h 3 47 m 8 19 m 49 6</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Tu</td>
<td>Qu. Victoria Coron. 1838</td>
<td>h 3 47 m 8 19 m 26 7</td>
<td>h 3 47 m 8 19 m 26 7</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>W</td>
<td>St. Peter</td>
<td>h 3 48 m 8 19 m 48</td>
<td>h 3 48 m 8 19 m 48</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Th</td>
<td>Mercury rises 2.38 morn.</td>
<td>h 3 48 m 8 18 m 9 33</td>
<td>h 3 48 m 8 18 m 9 33</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day of Day</th>
<th>Day incr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ☉'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 14</td>
<td>8 30</td>
<td>No real night, but constant</td>
<td>h 7 13 m 11 57 s 30 a 1 m 43</td>
<td>h 1 43</td>
<td>No real night, but constant</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>39</td>
<td></td>
<td>h 16 m 58 m 20 s 4</td>
<td>h 6 m 4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>29</td>
<td>45</td>
<td></td>
<td>h 19 m 59 m 17 s 27</td>
<td>h 10 m 27</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>33</td>
<td>49</td>
<td></td>
<td>h 21 m 12 m 0 s 19</td>
<td>h 2 m 34</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>34</td>
<td>50</td>
<td></td>
<td>h 22 m 1 m 24 s 6</td>
<td>h 6 m 25</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>33</td>
<td>0 Dec. 1</td>
<td></td>
<td>h 23 m 2 s 28 s 9</td>
<td>h 9 m 58</td>
<td></td>
</tr>
</tbody>
</table>
## Notices and Historical Memoranda

### Notices

3. Whit Monday. The Stock Exchange is closed on this day, unless otherwise specially ordered. 16. Trinity Term ends.
4. On or before this day overseers to give notice to borough voters that poor rates, &c., due up to Jan. 5th must be paid before July 20th; and calling upon all persons entitled to county votes, who are not on the register, or who are on the register, but are desirous of making new claims, to send them in on or before the 20th July.
5. Summer Quarter begins.
7. Quarter Sessions held this week.

### Historical Memoranda

1. Spanish Constitution voted, 1869.
2. First stone of Somerset House laid, 1776.
3. Lord Anson died, 1762.
4. Reform Bill passed, 1832.
5. Edward, the Black Prince, died, 1376.
6. Wat Tyler's insurrection, 1381.
7. Battle of Marengo, 1800.
9. Addison died, 1719.
11. Waterloo Bridge opened, 1817.
12. Magna Charta signed, 1215.

---

From the 1st to the 21st, the days increase 6m. in the morning, and 14m. in the afternoon.

Moon in perigee on the 11th; apogee 23rd.

Venus will be a Morning Star during the month.

Jupiter will be a Morning Star during the month. He will be in conjunction with Mars on the 27th.

Eclipse.—June 28. A partial eclipse of the Sun, but not visible in this country.

Mercury may be seen in the mornings about the 29th.
### JULY, 1870.

**LUNATIONS AND PHASES.**

- First Quar. 6th day, 4h. 30m. morn.
- Full Moon 12th day, 10h. 35m. aftern.
- Last Quar. 20th day, 2h. 17m. aftern.
- New Moon 28th day, 11h. 18m. morn.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>Prs. Alice Married, 1862</td>
<td>h m</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>Visitation Virgin Mary</td>
<td>3 49</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>Sunday after Trinity Dog</td>
<td>3 50</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>Transl. St. Martin</td>
<td>3 51</td>
</tr>
<tr>
<td>5</td>
<td>Tu</td>
<td>Prs. Helena Married 1866.</td>
<td>3 52</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>Old Mids. Day. [Oxf. Act.</td>
<td>3 53</td>
</tr>
<tr>
<td>7</td>
<td>Th</td>
<td>Thomas à Becket</td>
<td>3 54</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>Saturn sets 2.32 morn.</td>
<td>3 55</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>Oxford Term ends</td>
<td>3 56</td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td>4 Sunday after Trinity</td>
<td>3 57</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td></td>
<td>3 58</td>
</tr>
<tr>
<td>12</td>
<td>Tu</td>
<td></td>
<td>3 59</td>
</tr>
<tr>
<td>13</td>
<td>W</td>
<td>Jupiter rises 1.23 morn.</td>
<td>4 0</td>
</tr>
<tr>
<td>14</td>
<td>Th</td>
<td></td>
<td>4 1</td>
</tr>
<tr>
<td>15</td>
<td>F</td>
<td>St. Swithin</td>
<td>4 2</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td></td>
<td>4 3</td>
</tr>
<tr>
<td>17</td>
<td>S</td>
<td>5 Sunday after Trinity</td>
<td>4 4</td>
</tr>
<tr>
<td>18</td>
<td>M</td>
<td></td>
<td>4 6</td>
</tr>
<tr>
<td>19</td>
<td>Tu</td>
<td>Mars rises 1.38 morn.</td>
<td>4 7</td>
</tr>
<tr>
<td>20</td>
<td>W</td>
<td>Margaret</td>
<td>4 8</td>
</tr>
<tr>
<td>21</td>
<td>Th</td>
<td></td>
<td>4 10</td>
</tr>
<tr>
<td>22</td>
<td>F</td>
<td>Magdalene</td>
<td>4 11</td>
</tr>
<tr>
<td>23</td>
<td>S</td>
<td></td>
<td>4 12</td>
</tr>
<tr>
<td>24</td>
<td>S</td>
<td>6 Sunday after Trinity</td>
<td>4 14</td>
</tr>
<tr>
<td>25</td>
<td>M</td>
<td>St. James. Ds. Camb. B. 1797</td>
<td>4 15</td>
</tr>
<tr>
<td>26</td>
<td>Tu</td>
<td>St. Anne</td>
<td>4 16</td>
</tr>
<tr>
<td>27</td>
<td>W</td>
<td></td>
<td>4 18</td>
</tr>
<tr>
<td>28</td>
<td>Th</td>
<td>Venus rises 1.36 morn.</td>
<td>4 19</td>
</tr>
<tr>
<td>29</td>
<td>F</td>
<td>Mercury sets 8.11 aft.</td>
<td>4 21</td>
</tr>
<tr>
<td>30</td>
<td>S</td>
<td></td>
<td>4 22</td>
</tr>
<tr>
<td>31</td>
<td>S</td>
<td>7 Sunday after Trinity</td>
<td>4 24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day dece.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at Q's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 29</td>
<td>0 5</td>
<td>No real night.</td>
<td>7m23 h m</td>
<td>12 3 30</td>
<td>h m</td>
<td>2 a 18</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>11</td>
<td></td>
<td>22</td>
<td>4 24</td>
<td>6 32</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>19</td>
<td></td>
<td>20</td>
<td>5 10</td>
<td>11 10</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>29</td>
<td></td>
<td>18</td>
<td>5 44</td>
<td>2m49</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>15 53</td>
<td>41</td>
<td>h m</td>
<td>15</td>
<td>6 6 6 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>40</td>
<td>54</td>
<td>0m59 11 a 13</td>
<td>12</td>
<td>6 14 10 21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Notices and Historical Memoranda

#### Notices
- **6.** Appraisers' Licences granted.
- **8.** Dividends payable.
- **9.** Fire Insurance due at Midsummer must be paid on or before this day. Oxford Trinity Term ends.
- **20.** Last day for sending in claims for county voters. Before this day also parliamentary electors in counties, cities, or boroughs, must have paid assessed taxes and poor rates to the 5th of January preceding, or else are disqualified.
- **30.** List of electors to be completed.

#### Historical Memoranda
- **2.** Sir Robert Peel died, 1850.
- **4.** Declaration of American Independence, 1776.
- **5.** Algiers occupied by the French, 1830.
- **6.** John Huss burnt, 1415.
- **7.** Sheridan died, 1816.
- **8.** Edmund Burke died, 1797.
- **12.** West India Docks opened, 1806.
- **14.** Bastille destroyed, 1789.
- **15.** Baroness de Stael died, 1817.
- **18.** Petrarch died, 1374.
- **21.** Lord Russell beheaded, 1683.
- **22.** Robert Burns died, 1796.
- **22.** Gibraltar taken by the English, 1704.
- **28.** Earl of Essex beheaded, 1540.
- **29.** Wilberforce died, 1833.
- **30.** Gray, poet, died, 1771.
- **31.** Trinidad discovered by Columbus, 1498.

During this month the days decrease 1h. 7m.
Moon in perigee on the 9th; apogee on the 21st.

*Venus and Jupiter* are near to each other and will be *Morning Stars* during the month.

**Eclipses.**—July 12. A total and visible eclipse of the Moon. It begins in the evening at 8h. 45m.; total eclipse begins at 9h. 44m.; middle at 10h. 34m.; total eclipse ends at 11h. 24m.; eclipse ends at 24m. past midnight.

On the 28th. A slight partial eclipse of the Sun, invisible.
### August, 1870

**Lunations and Phases.**
- First Quart. D 4th day, 8h. 51m. morn.
- Full Moon O 11th day, 9h. 13m. morn.
- Last Quart. C 19th day, 7h. 50m. morn.
- New Moon ⊙ 26th day, 9h. 26m. aftern.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>Sunrises</th>
<th>Sunsets</th>
<th>Moonris</th>
<th>Moonsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>Lammas Day</td>
<td>425</td>
<td>747</td>
<td>9m 410 a 0</td>
</tr>
<tr>
<td>2</td>
<td>Tu</td>
<td>Saturn sets 0.44 morn.</td>
<td>427</td>
<td>745</td>
<td>10 2310 22</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>[Transfiguration]</td>
<td>428</td>
<td>744</td>
<td>11 4310 44</td>
</tr>
<tr>
<td>4</td>
<td>Th</td>
<td>Pr. ALFRED BORN 1844</td>
<td>430</td>
<td>742</td>
<td>1 a 4111 11</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>Sun aft. Trinit. Name of Jesus</td>
<td>431</td>
<td>740</td>
<td>2 2311 40</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>Sun aft. Trinit. Name of Jesus</td>
<td>433</td>
<td>738</td>
<td>3 41 morn.</td>
</tr>
<tr>
<td>7</td>
<td>Sun</td>
<td>8 Sun aft. Trinit. Name of Jesus</td>
<td>434</td>
<td>737</td>
<td>4 53 0 17</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>St. Lawrence</td>
<td>436</td>
<td>735</td>
<td>5 55 1 4</td>
</tr>
<tr>
<td>9</td>
<td>Tu</td>
<td>Jupiter rises 11.53 aft.</td>
<td>438</td>
<td>733</td>
<td>6 46 2 1</td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>Dog days end (Meteors, a. m.)</td>
<td>439</td>
<td>731</td>
<td>7 28 3 5</td>
</tr>
<tr>
<td>11</td>
<td>Th</td>
<td>Dog days end (Meteors, a. m.)</td>
<td>441</td>
<td>729</td>
<td>8 0 4 17</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>Dog days end (Meteors, a. m.)</td>
<td>442</td>
<td>727</td>
<td>8 25 5 29</td>
</tr>
<tr>
<td>13</td>
<td>S</td>
<td>Dog days end (Meteors, a. m.)</td>
<td>444</td>
<td>725</td>
<td>8 47 6 40</td>
</tr>
<tr>
<td>14</td>
<td>Sun</td>
<td>10 Sunday after Trinity</td>
<td>445</td>
<td>723</td>
<td>9 5 7 50</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>Assumption of Virgin Mary</td>
<td>447</td>
<td>721</td>
<td>9 24 8 57</td>
</tr>
<tr>
<td>16</td>
<td>Tu</td>
<td>Mars rises 1.11 morn.</td>
<td>449</td>
<td>719</td>
<td>9 42 10 4</td>
</tr>
<tr>
<td>17</td>
<td>W</td>
<td>Venus rises 2.12 morn.</td>
<td>450</td>
<td>717</td>
<td>10 11 11</td>
</tr>
<tr>
<td>18</td>
<td>Th</td>
<td>Venus rises 2.12 morn.</td>
<td>452</td>
<td>716</td>
<td>10 23 0 a 16</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>Venus rises 2.12 morn.</td>
<td>453</td>
<td>714</td>
<td>10 48 1 21</td>
</tr>
<tr>
<td>20</td>
<td>S</td>
<td>Venus rises 2.12 morn.</td>
<td>455</td>
<td>712</td>
<td>11 18 2 26</td>
</tr>
<tr>
<td>21</td>
<td>Sun</td>
<td>10 Sunday after Trinity</td>
<td>457</td>
<td>711</td>
<td>11 57 3 29</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>St. Bartholomew</td>
<td>458</td>
<td>710</td>
<td>7 morn. 4 27</td>
</tr>
<tr>
<td>23</td>
<td>Tu</td>
<td>St. Bartholomew</td>
<td>50</td>
<td>70</td>
<td>0 47 5 20</td>
</tr>
<tr>
<td>24</td>
<td>W</td>
<td>St. Bartholomew</td>
<td>51</td>
<td>70</td>
<td>1 42 6 5</td>
</tr>
<tr>
<td>25</td>
<td>Th</td>
<td>St. Bartholomew</td>
<td>53</td>
<td>71</td>
<td>2 49 6 42</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>St. Bartholomew</td>
<td>55</td>
<td>659</td>
<td>4 5 7 12</td>
</tr>
<tr>
<td>27</td>
<td>S</td>
<td>St. Bartholomew</td>
<td>56</td>
<td>657</td>
<td>5 23 7 39</td>
</tr>
<tr>
<td>28</td>
<td>Sun</td>
<td>11 Sunday after Trinity. St.</td>
<td>58</td>
<td>654</td>
<td>6 45 8 3</td>
</tr>
<tr>
<td>29</td>
<td>M</td>
<td>St. John Baptist beheaded</td>
<td>59</td>
<td>652</td>
<td>8 7 8 26</td>
</tr>
<tr>
<td>30</td>
<td>Tu</td>
<td>St. John Baptist beheaded</td>
<td>511</td>
<td>650</td>
<td>9 30 8 48</td>
</tr>
<tr>
<td>31</td>
<td>W</td>
<td>St. John Baptist beheaded</td>
<td>512</td>
<td>648</td>
<td>10 51 9 13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decl.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at 7’s noon</th>
<th>Moon’s Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 22</td>
<td>1 12</td>
<td>1m 30</td>
<td>10 a 42</td>
<td>7m 6</td>
<td>12 6 4 3 a 39</td>
<td>h m</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>23</td>
<td>50</td>
<td>21</td>
<td>1</td>
<td>5 39 8 2</td>
<td>h m</td>
</tr>
<tr>
<td>11</td>
<td>14 49</td>
<td>45</td>
<td>2 8</td>
<td>2</td>
<td>6 55</td>
<td>4 59 morn.</td>
<td>h m</td>
</tr>
<tr>
<td>16</td>
<td>32 2</td>
<td>224</td>
<td>9 45</td>
<td>49</td>
<td>4 5</td>
<td>3 33</td>
<td>h m</td>
</tr>
<tr>
<td>21</td>
<td>14 20</td>
<td>38</td>
<td>23</td>
<td>43</td>
<td>2 58</td>
<td>7 19</td>
<td>h m</td>
</tr>
<tr>
<td>26</td>
<td>13 55</td>
<td>39</td>
<td>51</td>
<td>12</td>
<td>1 40</td>
<td>11 46</td>
<td>h m</td>
</tr>
</tbody>
</table>
### AUGUST, 1870.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td>1</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>1m</td>
<td>40</td>
<td>6 a 0</td>
<td>1m23</td>
<td>6 a 3</td>
</tr>
<tr>
<td>13</td>
<td>2 0</td>
<td>6 8</td>
<td>1 14</td>
<td>5 48</td>
</tr>
<tr>
<td>25</td>
<td>2 30</td>
<td>6 6</td>
<td>1 6</td>
<td>5 28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>C’s age</th>
<th>High Water</th>
<th>Lond. Br.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>h m</td>
<td>4 a 54</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>6 38</td>
<td>6 24</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>7 15</td>
<td>8 14</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>9 27</td>
<td>10 42</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>11 58</td>
<td>12 morn.</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>13 1</td>
<td>14 F</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>15 2</td>
<td>16 3</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>17 3</td>
<td>18 4</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td>19 5</td>
<td>20 6</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>21 7</td>
<td>22 8</td>
</tr>
<tr>
<td>11</td>
<td>14</td>
<td>23 9</td>
<td>24 10</td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td>25 11</td>
<td>26 12</td>
</tr>
<tr>
<td>13</td>
<td>16</td>
<td>27 13</td>
<td>28 14</td>
</tr>
<tr>
<td>14</td>
<td>17</td>
<td>29 15</td>
<td>30 16</td>
</tr>
<tr>
<td>15</td>
<td>18</td>
<td>31 17</td>
<td>32 18</td>
</tr>
<tr>
<td>16</td>
<td>19</td>
<td>33 19</td>
<td>34 20</td>
</tr>
<tr>
<td>17</td>
<td>20</td>
<td>35 21</td>
<td>36 22</td>
</tr>
<tr>
<td>18</td>
<td>21</td>
<td>37 23</td>
<td>38 24</td>
</tr>
<tr>
<td>19</td>
<td>22</td>
<td>39 25</td>
<td>40 26</td>
</tr>
<tr>
<td>20</td>
<td>23</td>
<td>41 27</td>
<td>42 28</td>
</tr>
<tr>
<td>21</td>
<td>24</td>
<td>43 29</td>
<td>44 30</td>
</tr>
<tr>
<td>22</td>
<td>25</td>
<td>45 31</td>
<td>46 32</td>
</tr>
<tr>
<td>23</td>
<td>26</td>
<td>47 33</td>
<td>48 34</td>
</tr>
<tr>
<td>24</td>
<td>27</td>
<td>49 35</td>
<td>50 36</td>
</tr>
<tr>
<td>25</td>
<td>28</td>
<td>51 37</td>
<td>52 38</td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>53 39</td>
<td>54 40</td>
</tr>
<tr>
<td>27</td>
<td>30</td>
<td>55 41</td>
<td>56 42</td>
</tr>
<tr>
<td>28</td>
<td>31</td>
<td>57 43</td>
<td>58 44</td>
</tr>
<tr>
<td>29</td>
<td>32</td>
<td>59 45</td>
<td>60 46</td>
</tr>
<tr>
<td>30</td>
<td>33</td>
<td>61 47</td>
<td>62 48</td>
</tr>
<tr>
<td>31</td>
<td>34</td>
<td>63 49</td>
<td>64 50</td>
</tr>
</tbody>
</table>

\[NOTICES AND HISTORICAL MEMORANDA.\]

1. List of voters in cities and boroughs to be affixed to church and chapel doors for 14 days. Objections to county voters must be made on or before the 20th. This is Lammas Day, and is one of the Terms or Quarter Days used in the payment of rents in Scotland and some parts of England. These days are sometimes called “Cross Quarter Days,” as being near the middle of the Quarter Days in more general use in England.


25. Claims to borough votes and objections to borough electors must be made on or before this day. After the last day of July, and before this day, lodgers must send in their claims to vote.

11. The earth will come into the neighbourhood of these phenomena, commonly called Shooting Stars, on the morning of the 11th, some time after sunrise, when daylight will prevent their being visible.

\[HISTORICAL MEMORANDA.\]

8. First ascent of Mont Blanc, 1786.

15. Sir Walter Scott born, 1771.

31. John Bunyan died, 1688.

During this month the days decrease 49 m. in the morning, and 1 h 1 m. in the afternoon.

Moon in perigee on the 3rd; apogee on the 18th; perigee on the 29th.

\[Venus and Jupiter will be Morning Stars during the month.\]

\[Saturn’s Rings will be favorable for telescopic observation in the evenings.\]

\[Mars will be in conjunction with the Moon on the 23rd.\]
### SEPTEMBER, 1870.

Sun enters Libra,

#### LUNATIONS AND PHASES.
- First Quar. 2nd day, 1h. 58m. aftern.
- Full Moon 9th day, 10h. 12m. aftern.
- Last Quar. 18th day, 1h. 30m. morn.
- New Moon 25th day, 6h. 34m. morn.

#### Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &c.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH</td>
<td>Giles</td>
<td>5 14</td>
<td>6 46</td>
<td>0 a 12</td>
<td>9 a 42</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Lond. burnt 1666. O.S.</td>
<td>5 16</td>
<td>6 43</td>
<td>1 31</td>
<td>10 18</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Saturn sets 10.35 aft.</td>
<td>5 17</td>
<td>6 41</td>
<td>2 45</td>
<td>11 0</td>
<td></td>
</tr>
<tr>
<td>STN</td>
<td>12 Sunday after Trinity</td>
<td>5 19</td>
<td>6 39</td>
<td>3 50</td>
<td>11 53</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Old Bartholomew</td>
<td>5 20</td>
<td>6 37</td>
<td>4 44</td>
<td>morn.</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>W</td>
<td>5 22</td>
<td>6 34</td>
<td>5 27</td>
<td>0 54</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Enurcharus</td>
<td>5 24</td>
<td>6 32</td>
<td>6 0</td>
<td>2 3</td>
<td></td>
</tr>
<tr>
<td>TH</td>
<td>Nativity Virgin Mary</td>
<td>5 25</td>
<td>6 30</td>
<td>6 27</td>
<td>3 14</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5 27</td>
<td>6 28</td>
<td>6 51</td>
<td>4 24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Jupiter rises 10.4 aft.</td>
<td>5 28</td>
<td>6 25</td>
<td>7 10</td>
<td>5 35</td>
<td></td>
</tr>
<tr>
<td>STN</td>
<td>13 Sunday after Trinity</td>
<td>5 30</td>
<td>6 23</td>
<td>7 29</td>
<td>6 43</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5 32</td>
<td>6 21</td>
<td>7 47</td>
<td>7 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>5 33</td>
<td>6 18</td>
<td>8 4</td>
<td>8 57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Holy Cross</td>
<td>5 35</td>
<td>6 16</td>
<td>8 25</td>
<td>10 3</td>
<td></td>
</tr>
<tr>
<td>TH</td>
<td>5 36</td>
<td>6 14</td>
<td>8 48</td>
<td>11 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Mars rises 0.55 morn.</td>
<td>5 38</td>
<td>6 12</td>
<td>9 16</td>
<td>0 a 14</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Lambert [I and II l.]</td>
<td>5 40</td>
<td>6 9</td>
<td>9 51</td>
<td>1 17</td>
<td></td>
</tr>
<tr>
<td>STN</td>
<td>14 Sunday after Trinity, Geo.</td>
<td>5 41</td>
<td>6 7</td>
<td>10 32</td>
<td>2 17</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5 43</td>
<td>6 5</td>
<td>11 26</td>
<td>3 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>5 44</td>
<td>6 2 morn.</td>
<td>3 58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>St. Matthew. Ember Week</td>
<td>5 46</td>
<td>6 0</td>
<td>0 28</td>
<td>4 38</td>
<td></td>
</tr>
<tr>
<td>TH</td>
<td>Venus rises 3.53 morn.</td>
<td>5 48</td>
<td>5 58</td>
<td>1 39</td>
<td>5 11</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5 49</td>
<td>5 55</td>
<td>2 56</td>
<td>5 39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>5 51</td>
<td>5 53</td>
<td>4 16</td>
<td>6 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STN</td>
<td>15 Sunday after Trinity</td>
<td>5 53</td>
<td>5 51</td>
<td>5 41</td>
<td>6 26</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>St. Cyprian</td>
<td>5 54</td>
<td>5 48</td>
<td>7 6</td>
<td>6 50</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>5 56</td>
<td>5 46</td>
<td>8 31</td>
<td>7 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Mercury sets 5.41 aft.</td>
<td>5 57</td>
<td>5 44</td>
<td>9 55</td>
<td>7 43</td>
<td></td>
</tr>
<tr>
<td>TH</td>
<td>Michaelmas Day</td>
<td>5 59</td>
<td>5 42</td>
<td>11 19</td>
<td>8 16</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>St. Jerome</td>
<td>6 1</td>
<td>5 39</td>
<td>0 a 37</td>
<td>8 56</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day decl.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at ☉'s noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13 32</td>
<td>3 2</td>
<td>3 m 6</td>
<td>8 a 53</td>
<td>6 m 27</td>
<td>11 59 54</td>
<td>5 a 2</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>21</td>
<td>18</td>
<td>38</td>
<td>19</td>
<td>58 17</td>
<td>9 42</td>
</tr>
<tr>
<td>11</td>
<td>54</td>
<td>40</td>
<td>29</td>
<td>24</td>
<td>11</td>
<td>56 34</td>
<td>0 m 51</td>
</tr>
<tr>
<td>16</td>
<td>35</td>
<td>59</td>
<td>40</td>
<td>10</td>
<td>4</td>
<td>54 48</td>
<td>4 25</td>
</tr>
<tr>
<td>21</td>
<td>15</td>
<td>19</td>
<td>50</td>
<td>7 57</td>
<td>5 56</td>
<td>53 3</td>
<td>8 33</td>
</tr>
<tr>
<td>26</td>
<td>11 55</td>
<td>39</td>
<td>59</td>
<td>44</td>
<td>48</td>
<td>51 20</td>
<td>1 a 5</td>
</tr>
<tr>
<td>D</td>
<td>Venus</td>
<td>Mars</td>
<td>Jupiter</td>
<td>Saturn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>------</td>
<td>---------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
</tr>
<tr>
<td>1</td>
<td>2 m 49</td>
<td>6 a 1</td>
<td>1 m 2</td>
<td>5 a 14</td>
<td>10 a 35</td>
<td>3 a 3</td>
<td>2 a 41</td>
</tr>
<tr>
<td>13</td>
<td>3 25</td>
<td>5 47</td>
<td>0 56</td>
<td>4 50</td>
<td>9 54</td>
<td>2 21</td>
<td>1 55</td>
</tr>
<tr>
<td>25</td>
<td>4 2</td>
<td>5 28</td>
<td>0 50</td>
<td>4 22</td>
<td>9 11</td>
<td>1 38</td>
<td>1 10</td>
</tr>
</tbody>
</table>

**NOTICES AND HISTORICAL MEMORANDA.**

**NOTICES.**

1. On this day lists of claims and objections to both county and borough electors to be affixed to church doors. British Museum closed first week.

15. Revising Barristers hold their courts for the revision of borough voters' lists between this day and Oct. 31;—for county voters' lists between Sept. 20 and Oct. 31.

23. Autumn Quarter commences.

27. High spring tides.

29. Michaelmas Day.

30. Hawkers' and Pedlars' licences expire.

**HISTORICAL MEMORANDA.**

1. East India Company dissolved, 1858.


3. Oliver Cromwell died, 1658.


8. Sebastopol taken, 1855.

9. William the Conqueror died, 1087.


— Fox died, 1806.


15. Dean Colet died, 1519.

18. Dr. Johnson born, 1709.


30. Flight of Queen Isabel II from Spain, 1868.

During this month the days decrease 48m. in the morning, and 1h. 9m. in the afternoon.

**Mercury** may be seen in the evenings about the 8th.

Moon in apogee on the 14th; perige on the 26th.

**Jupiter** will be a *Morning Star* during the month, and will be in conjunction with the Moon on the 18th.

**Venus** will be a *Morning Star* during the month, and will be in conjunction with the Moon on the 23rd.
### OCTOBER, 1870.

**Sun enters Scorpio,**

**LUNATIONS AND PHASES.**
- First Quar.  D  1st day, 9h. 19m. aftern.
- Full Moon  O  9th day, 1h. 43m. aftern.
- Last Quar.  C  17th day, 6h. 13m. aftern.
- New Moon  O  24th day, 3h. 36m. aftern.
- First Quar.  D  31st day, 8h. 1m. morn.

29 d. 2 h. 34 m.

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>Sunrises</th>
<th>Sunsets</th>
<th>Moonrises</th>
<th>Moonsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>Remigius. Camb. Term beg.</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>16 Sunday after Trinity</td>
<td>6 2</td>
<td>5 37</td>
<td>1 a 46</td>
<td>9 a 47</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td></td>
<td>6 4</td>
<td>5 35</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>Saturn sets 8.38 aft.</td>
<td>6 6</td>
<td>5 33</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td></td>
<td>6 7</td>
<td>5 30</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>Faith</td>
<td>6 8</td>
<td>5 28</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td></td>
<td>6 9</td>
<td>5 26</td>
<td>4</td>
<td>57</td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td></td>
<td>6 10</td>
<td>5 24</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>17 Sun. after Trin. St. Denys</td>
<td>6 11</td>
<td>5 22</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>Oxford Term begins</td>
<td>6 12</td>
<td>5 21</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>Old Michaelmas Day</td>
<td>6 13</td>
<td>5 20</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>12</td>
<td>W</td>
<td></td>
<td>6 14</td>
<td>5 19</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>Trs. King Edw. Confessor</td>
<td>6 15</td>
<td>5 18</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>Jupiter rises 7.59 aft.</td>
<td>6 16</td>
<td>5 17</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>15</td>
<td>S</td>
<td></td>
<td>6 17</td>
<td>5 16</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>18 Sunday after Trinity</td>
<td>6 18</td>
<td>5 15</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>Etheldreda</td>
<td>6 19</td>
<td>5 14</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>St. Luke</td>
<td>6 20</td>
<td>5 13</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>19</td>
<td>W</td>
<td></td>
<td>6 21</td>
<td>5 12</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>20</td>
<td>T</td>
<td>Mars rises 0.37 morn.</td>
<td>6 22</td>
<td>5 11</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>Venus rises 5.24 morn.</td>
<td>6 23</td>
<td>5 10</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>22</td>
<td>S</td>
<td></td>
<td>6 24</td>
<td>5 9</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>23</td>
<td>S</td>
<td>19 Sunday after Trinity</td>
<td>6 25</td>
<td>5 8</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td></td>
<td>6 26</td>
<td>5 7</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>Crispin</td>
<td>6 27</td>
<td>5 6</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>26</td>
<td>W</td>
<td></td>
<td>6 28</td>
<td>5 5</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>27</td>
<td>T</td>
<td>Mercury rises 5.10 morn.</td>
<td>6 29</td>
<td>5 4</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>St. Simon and St. Jude</td>
<td>6 30</td>
<td>5 3</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>29</td>
<td>S</td>
<td></td>
<td>6 31</td>
<td>5 2</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>30</td>
<td>S</td>
<td>20 Sunday after Trinity</td>
<td>6 32</td>
<td>5 1</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>31</td>
<td>M</td>
<td></td>
<td>6 33</td>
<td>5 0</td>
<td>5</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Sun East</th>
<th>Time on clock at ☿’s noon</th>
<th>Moon’s Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 35 4 59</td>
<td>h m</td>
<td>11 49 41</td>
<td>5 a 57</td>
</tr>
<tr>
<td>6</td>
<td>16 5 18</td>
<td>h m</td>
<td>11 44 41</td>
<td>10 5</td>
</tr>
<tr>
<td>11</td>
<td>10 56 38</td>
<td>h m</td>
<td>11 44 41</td>
<td>10 5</td>
</tr>
<tr>
<td>16</td>
<td>37 57</td>
<td>h m</td>
<td>11 44 41</td>
<td>10 5</td>
</tr>
<tr>
<td>21</td>
<td>18 6 16</td>
<td>h m</td>
<td>11 44 41</td>
<td>10 5</td>
</tr>
<tr>
<td>26</td>
<td>9 59 35</td>
<td>h m</td>
<td>11 44 41</td>
<td>10 5</td>
</tr>
</tbody>
</table>
OCTOBER, 1870.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>4 m 21</td>
<td>5 a 17</td>
<td>0 m 47</td>
<td>4 a 7</td>
</tr>
<tr>
<td>13</td>
<td>4 59</td>
<td>4 55</td>
<td>0 42</td>
<td>3 36</td>
</tr>
<tr>
<td>25</td>
<td>5 37</td>
<td>4 33</td>
<td>0 33</td>
<td>3 3</td>
</tr>
</tbody>
</table>

NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. Cambridge Michaelmas Term begins.
2. Hawkers’ and Pedlars’ licences granted.
14. Dividends are payable. Fire Insurance due at Michaelmas must be paid on or before this day.
17. Quarter Sessions in this week.
26. High spring tides.

HISTORICAL MEMORANDA.

2. Peace with America proclaimed, 1783.
4. Eddystone Lighthouse completed, 1759.
5. Columbus discovered St. Salvador, 1492.
6. Napoleon I arrived at St. Helena, 1815.
7. Murat shot, 1815.
10. Ridley and Latimer burnt, 1555.
15. Lima destroyed by earthquake, 1687.
16. Battle of Trafalgar, 1805.
17. Battle of Edgehill, 1642.
19. Hogarth died, 1764.
20. John Locke died, 1704.

During this month the days decrease 53 m. in the morning, and 1 h. 5 m. in the afternoon.

Moon in apogee on the 12th; perigee on the 25th.
The newly discovered planet Neptune is in opposition on the 13th.
Mercury may be seen near the eastern horizon about the 19th.
Venus and Jupiter will be Morning Stars during the month.
Mars will be in conjunction with the Moon on the 20th.
### NOVEMBER, 1870.

**Sun enters Sagittar...**

**LUNATIONS AND PHASES.**

- Full Moon ○ 8th day, 7h. 32m. morn.
- Last Quar. C 16th day, 8h. 59m. morn.
- New Moon ● 23rd day, 1h. 21m. morn.
- First Quar. D 29th day, 10h. 33m. aftern.

**21 d. 23 h. 20 m.**

<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TU</td>
<td>ALL SAINTS</td>
<td>6 56</td>
<td>4 32</td>
<td>2 a 39</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>All Souls. Mich. Term begins</td>
<td>6 57</td>
<td>4 30</td>
<td>3 4</td>
</tr>
<tr>
<td>3</td>
<td>TH</td>
<td>Saturn sets 6.49 aft.</td>
<td>6 59</td>
<td>4 28</td>
<td>3 24</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>[lapsed]</td>
<td>7 1</td>
<td>4 26</td>
<td>3 42</td>
</tr>
<tr>
<td>6</td>
<td>SUN</td>
<td>Ganp. Plot, 1605. K. W. III</td>
<td>7 3</td>
<td>4 25</td>
<td>4 0</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>21 Sun. after Trin. Leonard</td>
<td>7 5</td>
<td>4 23</td>
<td>4 17</td>
</tr>
<tr>
<td>8</td>
<td>TU</td>
<td>Camb. Term div. noon</td>
<td>7 6</td>
<td>4 21</td>
<td>4 34</td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>Pr. WALES BORN 1841. Lord [Mayor's Day]</td>
<td>7 8</td>
<td>4 20</td>
<td>4 55</td>
</tr>
<tr>
<td>10</td>
<td>TH</td>
<td>12</td>
<td>4 16</td>
<td>5 48</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>St. Martin</td>
<td>7 13</td>
<td>4 15</td>
<td>6 23</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>Jupiter rises 5.59 aft.</td>
<td>7 15</td>
<td>4 13</td>
<td>7 11</td>
</tr>
<tr>
<td>13</td>
<td>SUN</td>
<td>22 Sun. after Trin. Britius</td>
<td>7 17</td>
<td>4 12</td>
<td>8 0</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>(Meteors a. m.)</td>
<td>7 19</td>
<td>4 11</td>
<td>9 2</td>
</tr>
<tr>
<td>15</td>
<td>TU</td>
<td>Machutus</td>
<td>7 20</td>
<td>4 9</td>
<td>10 11</td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td></td>
<td>7 22</td>
<td>4 8</td>
<td>11 25</td>
</tr>
<tr>
<td>17</td>
<td>TH</td>
<td>Hugh Bishop of Lincoln</td>
<td>7 24</td>
<td>4 6</td>
<td>6 morn.</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>Mars rises 0.14 morn.</td>
<td>7 25</td>
<td>4 5</td>
<td>0 41</td>
</tr>
<tr>
<td>19</td>
<td>S</td>
<td>[and Martyr]</td>
<td>7 27</td>
<td>4 2</td>
<td>2 2</td>
</tr>
<tr>
<td>20</td>
<td>SUN</td>
<td>23 Sun. after Trin. Edm. K.</td>
<td>7 29</td>
<td>4 3</td>
<td>3 24</td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>Cr. Pus. Pruss. B. 1840</td>
<td>7 30</td>
<td>4 2</td>
<td>4 48</td>
</tr>
<tr>
<td>22</td>
<td>TU</td>
<td>St. Cecilia</td>
<td>7 32</td>
<td>4 0</td>
<td>6 16</td>
</tr>
<tr>
<td>23</td>
<td>W</td>
<td>St. Clement</td>
<td>7 34</td>
<td>3 59</td>
<td>7 46</td>
</tr>
<tr>
<td>24</td>
<td>TH</td>
<td>Venus rises 7.14 morn.</td>
<td>7 35</td>
<td>3 58</td>
<td>9 5 23</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>Mich. Term ends. Catherine</td>
<td>7 37</td>
<td>3 57</td>
<td>10 21</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td></td>
<td>7 39</td>
<td>3 56</td>
<td>11 22</td>
</tr>
<tr>
<td>27</td>
<td>SUN</td>
<td>Advent Sunday</td>
<td>7 40</td>
<td>3 55</td>
<td>0 a 8</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td></td>
<td>7 42</td>
<td>3 55</td>
<td>0 43</td>
</tr>
<tr>
<td>29</td>
<td>TU</td>
<td>Mercury sets 3.57 aft.</td>
<td>7 43</td>
<td>3 54</td>
<td>1 9</td>
</tr>
<tr>
<td>30</td>
<td>W</td>
<td>St. ANDREW</td>
<td>7 45</td>
<td>3 53</td>
<td>1 31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length</th>
<th>Day deer.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
<td>h</td>
<td>m</td>
<td>4 m 57</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>7</td>
<td>15</td>
<td>8</td>
<td>20</td>
<td>51</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>32</td>
<td>15</td>
<td>13</td>
<td>46</td>
<td>44</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>46</td>
<td>48</td>
<td>23</td>
<td>7</td>
<td>42</td>
<td>44</td>
<td>55</td>
</tr>
<tr>
<td>21</td>
<td>31</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>39</td>
<td>46</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>18</td>
<td>16</td>
<td>36</td>
<td>5</td>
<td>59</td>
<td>37</td>
<td>47</td>
</tr>
</tbody>
</table>
NOTICES AND HISTORICAL MEMORANDA.

NOTICES.

1. All Saints, or All Hallows. The Stock Exchange is closed on this day, unless otherwise specially ordered by the Committee for General Purposes. Also a holiday at the Stock Offices, Bank of England.

2. Michaelmas Term begins.

3. Mayors and Aldermen of boroughs elected.

4. Martinmas, one of the Terms or Quarter Days used in Scotland and the north of England. Half-Quarter Day.

5. Attorneys’ Certificates granted.

6. Michaelmas Term ends.

METEORS.

14. The earth will pass the orbit of the November Meteors on the 14th, very early in the morning, that is, soon after midnight of the 13th, when the recurrence of these phenomena may be expected. The meteors will apparently proceed from the south-eastern quarter of the heavens; but they will be somewhat enfeebled as to brilliancy by the light of the Moon, then on her way towards the meridian.

HISTORICAL MEMORANDA.

1. Great earthquake at Lisbon, 1755.

4. Colley Cibber died, 1671.

10. Milton died, 1674.


During this month the days decrease 50m. in the morning, and 40m. in the afternoon.

Moon in apogee on the 8th; perigee on the 22nd.

Venus and Jupiter will be Morning Stars during the month.

Mars will be in conjunction with the Moon on the 17th.


<table>
<thead>
<tr>
<th>M</th>
<th>W</th>
<th>D</th>
<th>D D</th>
<th>Sundays, Festivals, Anniversaries, Rising and Setting of the Planets, &amp;c.</th>
<th>Sun rises</th>
<th>Sun sets</th>
<th>Moon rises</th>
<th>Moon sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TH</td>
<td>PR. WALES BORN 1844</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td>h m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 F</td>
<td>Saturn sets 5.7 aft.</td>
<td>7 46</td>
<td>3 53</td>
<td>1 a 49</td>
<td>0 m 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 S</td>
<td></td>
<td>7 47</td>
<td>3 52</td>
<td>2</td>
<td>7</td>
<td>1 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 SUN</td>
<td>2 Sunday in Advent</td>
<td>7 49</td>
<td>3 51</td>
<td>2 25</td>
<td>2 27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 M</td>
<td></td>
<td>7 50</td>
<td>3 51</td>
<td>2 42</td>
<td>3 33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 TU</td>
<td>Nicholas</td>
<td>7 51</td>
<td>3 50</td>
<td>3 1</td>
<td>4 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 W</td>
<td></td>
<td>7 52</td>
<td>3 50</td>
<td>3 23</td>
<td>5 45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 TH</td>
<td>Conception Virgin Mary</td>
<td>7 53</td>
<td>3 50</td>
<td>3 50</td>
<td>6 51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 F</td>
<td>Jupiter rises 3.59 aft.</td>
<td>7 54</td>
<td>3 49</td>
<td>4 23</td>
<td>7 55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 S</td>
<td></td>
<td>7 55</td>
<td>3 49</td>
<td>5</td>
<td>8</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 SUN</td>
<td>3 Sunday in Advent</td>
<td>7 56</td>
<td>3 49</td>
<td>5 54</td>
<td>9 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 M</td>
<td></td>
<td>7 57</td>
<td>3 49</td>
<td>6</td>
<td>11</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 TU</td>
<td>Lucy</td>
<td>8 0</td>
<td>3 49</td>
<td>9</td>
<td>11</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 W</td>
<td>EMBER WEEK</td>
<td>8 1</td>
<td>3 49</td>
<td>9</td>
<td>0 a 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 TH</td>
<td>Mars rises 11.38 aft.</td>
<td>8 2</td>
<td>3 49</td>
<td>11</td>
<td>42</td>
<td>0 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 F</td>
<td>Camb. Term ends. O! Sap.</td>
<td>8 3</td>
<td>3 49</td>
<td>9</td>
<td>0 m 54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 S</td>
<td>Oxford Term ends</td>
<td>8 4</td>
<td>3 49</td>
<td>1</td>
<td>1</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 SUN</td>
<td>4 Sunday in Advent</td>
<td>8 4</td>
<td>3 49</td>
<td>2</td>
<td>0 a 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 M</td>
<td></td>
<td>8 5</td>
<td>3 50</td>
<td>3</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 TU</td>
<td>Venus sets 4.0 aft.</td>
<td>8 6</td>
<td>3 50</td>
<td>5</td>
<td>2 31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 W</td>
<td>ST. THOMAS. Shortest day</td>
<td>8 6</td>
<td>3 50</td>
<td>6</td>
<td>3 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 TH</td>
<td></td>
<td>8 7</td>
<td>3 51</td>
<td>7</td>
<td>3 58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 F</td>
<td></td>
<td>8 7</td>
<td>3 52</td>
<td>9</td>
<td>4 58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 S</td>
<td>Mercury sets 5.3 aft.</td>
<td>8 7</td>
<td>3 52</td>
<td>9</td>
<td>59</td>
<td>6 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 SUN</td>
<td>Christmas Day</td>
<td>8 8</td>
<td>3 53</td>
<td>10</td>
<td>39</td>
<td>7 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 M</td>
<td>ST. STEPHEN</td>
<td>8 8</td>
<td>3 53</td>
<td>11</td>
<td>11</td>
<td>8 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 TU</td>
<td>ST. JOHN EVANGELIST</td>
<td>8 8</td>
<td>3 54</td>
<td>11</td>
<td>35</td>
<td>9 53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 W</td>
<td>INNOCENTS</td>
<td>8 9</td>
<td>3 55</td>
<td>11</td>
<td>55</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 TH</td>
<td></td>
<td>8 9</td>
<td>3 56</td>
<td>0</td>
<td>15</td>
<td>0 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 F</td>
<td></td>
<td>8 9</td>
<td>3 57</td>
<td>0</td>
<td>15</td>
<td>0 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 S</td>
<td>Silvester</td>
<td>8 9</td>
<td>3 58</td>
<td>0</td>
<td>48</td>
<td>1 21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Day</th>
<th>Day dechr.</th>
<th>Day br.</th>
<th>Twilight ends</th>
<th>Sun East</th>
<th>Time on clock at O's noon</th>
<th>Moon's Southing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 7</td>
<td>8 27</td>
<td>5 a 42</td>
<td>5 a 57</td>
<td>4 m 35</td>
<td>11 49 14 7 a 29</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7 58</td>
<td>36</td>
<td>47</td>
<td>55</td>
<td>34</td>
<td>51 14 11 1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>51</td>
<td>43</td>
<td>52</td>
<td>55</td>
<td>35</td>
<td>53 28 2 m 17</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>46</td>
<td>48</td>
<td>56</td>
<td>56</td>
<td>36</td>
<td>55 51 6 26</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>44</td>
<td>50</td>
<td>59</td>
<td>57</td>
<td>38</td>
<td>58 19 10 55</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>46 Oiner.2</td>
<td>6 1</td>
<td>6 0</td>
<td>40</td>
<td>12 0 50 3 a 51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# DECEMBER, 1870.

<table>
<thead>
<tr>
<th>D</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rises</td>
<td>sets</td>
<td>rises</td>
<td>sets</td>
</tr>
<tr>
<td></td>
<td>h m</td>
<td></td>
<td>h m</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>7 m35</td>
<td>3 a 49</td>
<td>11 a 57</td>
<td>1 a 15</td>
</tr>
<tr>
<td>13</td>
<td>8</td>
<td>8</td>
<td>52</td>
<td>21</td>
</tr>
<tr>
<td>25</td>
<td>8</td>
<td>29</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

### Notices and Historical Memoranda

#### Notices

- **16.** Cambridge Michaelmas Term ends.
- **17.** Oxford Michaelmas Term ends.
- **22.** Winter Quarter begins.
- **25.** Christmas Day.
- **26.** Stock Exchange closed on this day, unless otherwise specially ordered by the Committee of General Purposes.

#### Historical Memoranda

- **2.** Napoleon I crowned, 1804.
- **3.** Flaxman died, 1827.
- **6.** Rhode Island taken, 1776.
- **4.** Discovery of Hayti by Columbus, 1492.
- **9.** Milton born, 1608.
- **21.** Mr. Gladstone Prime Minister, 1868.
- **11.** John Gay died, 1732.
- **12.** Discovery of New Zealand by Tasman, 1642.
- **13.** Dr. Johnson died, 1784.
- **14.** General Washington died, 1799.
- **10.** Prince Consort died, 1861.
- **16.** Cromwell made Protector, 1653.
- **20.** Dulwich Gallery founded, 1810.
- **22.** Thos. Banks born, 1738.
- **24.** Robin Hood died, 1247.
- **23.** Vasco de Gama expired, 1525.
- **4.** Peace between England and America, 1814.
- **25.** Sir Matthew Hale died, 1676.
- **5.** Colony of South Australia founded, 1836.
- **27.** Jno. Wilkes died, 1797.
- **7.** Lord Macaulay died, 1859.
- **29.** Earl of Stafford beheaded, 1680.
- **30.** Royal Society instituted, 1660.

From the 1st to the 21st the days shorten 21m. in the morning, and 2m. in the afternoon.

Moon in apogee on the 5th; perigee on the 21st.

*Venus* will be a *Morning Star* till the 8th.

*Jupiter* will be a *magnificent object* during the month.

**Eclipse.**—Dec. 23. A total eclipse of the Sun, visible in Great Britain as a partial eclipse of between 9 and 10 digits. It begins in the forenoon at 11h. 8m.; greatest phase at 12h. 25m.; eclipse ends at 1h. 42m.
JEWISH CALENDAR.

The 5630th Jewish Year, ends September 26, 1870.

1870
Jan. 3, 1st of SEBAT.
Feb. 2, 1st of ADRAR.
Mar. 4, 1st of VEADAN.
10, 16th of ditto.—Fast of Esther.
17, 14th of ditto.—Purim.
18, 15th of ditto.—Second Day.
Apr. 2, 1st of NISAN.
18, 15th of ditto.—PASSOVER.
May 2, 1st of YIAR.
31, 1st of Sivan.
June 5, 6th of ditto.—Pentecost.
6, 7th of ditto.—Second Day.
30, 1st of TAMUZ.
July 17, 18th of ditto.—Fast; Taking of Jerusalem.
29, 1st of Ab.
Aug. 7, 10th of ditto.—Fast; Destruction of the Temple.
28, 1st of ELUL.

1870
Sept. 26, 1st of TISRI. (Year 5631 begins.)
27, 2nd of ditto.—Second Day.
28, 3rd of ditto.—Fast of Guelah.
Oct. 5, 10th of ditto.—Fast of Expiation.
10, 15th of ditto.—Feast of Tabernacles.
11, 16th of ditto.—Second Day.
16, 21st of ditto.—Last Day of the Festival.
17, 22nd of ditto.—Fast of the 8th Day.
18, 23rd of ditto.—Rejoicing of the Law.
25, 1st of HESHAN.
Nov. 25, 1st of Kislev.
Dec. 19, 25th of ditto.—Dedication of the Temple.
25, 1st of TEBET.
1871
Jan. 3, 10th of ditto.—Fast; Siege of Jerusalem.
23, 1st of SEBAT.

MAHOMETAN CALENDAR.

Employed in Turkey, Persia, Arabia, &c., and by Mahometans at Gibraltar.

Year 1236 of the Hegira began April 13, 1869; ends April 3, 1870.

1869. Dec. 5, 1st day of Ramadhan.
Feb. 2, " " Dulkadah.
Mar. 4, " " Duthqanah.
Apr. 3, (Yr. 1877) 1st of Muharam.
May 3, 1st day of Safar.
June 1, " " Rabia I.
July 1, " " Rabia II.

1870. July 30, 1st day of Jomada I.
Aug. 29, " " Jomada II.
Sept. 27, " " Rajab.
Oct. 27, " " Sha'ban.
Nov. 25, " " Ramadhan.
Dec. 25, " " Shawwal.

CHRONOLOGICAL CYCLES, ETC.

| Dominical Letter | B | Solar Cycle | 3 |
| Golden Number | 9 | Number of Direction | 27 |
| Epact | 28 | Julian Period | 6538 |
| Sundays after Trinity | 23 | Roman Indiction | 13 |

ECCLESIASTICAL FEASTS.

| Shrove Sunday | Feb. 27 | Holy Thursday | May 26 |
| Mid-Lent Sunday | March 27 | Whit Sunday | June 5 |
| Easter Day | April 17 | Trinity Sunday | June 12 |
| Rogation Sunday | May 33 | Advent Sunday | Nov. 27 |

THE TIDES.

In the Calendar placed upon the foregoing pages, we have given only the time of the primary high water, or that which depends upon the moon's coming to the south; having omitted the column for the secondary high water (depending upon the moon's being on the opposite part of the meridian). The time of the secondary high water, however, may always be found with sufficient accuracy by taking the midway between any day's high water and that of the following day. Thus, on the 20th of August, the afternoon high water will be about 8h. 6m., half way between the morning full tides of August 20th and 21st. The column given in this Almanack is computed for just above London Bridge.
POETICAL ANSWERS TO THE PRIZE ENIGMA.

Answer—Rent.

1. By Miss MARY SMITH, Ampleforth, York.

Our hearth has now a vacant chair,
   A form beloved the less;
And when our household gathers there,
   'Tis view'd with deep distress.
When Dia's page we pondered o'er,
   Each mystery to clear,
To seek with pleasure or with hope
   The answers for the year,
Oh! could his loving spirit come
   To visit earth again,
How would it grieve to see our home
   And hearts now rent with pain;
But here a visitant no more,
   All doubts are laid to rest;
Hope beckons from a distant shore
   To meet among the blest.

2. By Dr. Rutherford.

Poets are poor, so thoughtful Hewitt sent
To each and all a splendid Christmas rent;
Thanks to the noble donor, let us send,
And trust that times with all of us will mend.


"'Tis finished!" said the bleeding Lord,
   Sin claims no more from Me;
To all who now obey the word,
   Salvation full and free.
The veil that shrouds the mercy-seat
   Must now be rent away;
The rough made plain, the crooked straight,
   And darkness turned to day.
The "middle wall" is broken down,
   That barred the Gentile race;
No terrors of the law shall frown
   O'er realms of Gospel grace.
Sinner, believe my power to save,
   To earth's remotest bound;
Repent, accept the gift, and have
   Thy wants with blessings crowned.
4. By Mr. Joseph Hutchinson, Halifax.
Your laureate bard has labour'd hard
His subject to present,
In dress complete, all trim and neat,
But fail'd to hide the rent.

5. By "Œdipus."
O'er Hewitt's prize long time I bent,
But now at last the veil is rent.

Friend Hewitt last year generously imprest,
Honour'd our fair Dia with arms and a crest;
And this year again he does kindly present
A gift of great value, although it is rent.

On Hewitt's well-constructed prize
My thoughts were fixed intent;
At length I pierc'd the dark disguise,
The mystic veil was rent.

8. By Mr. John Crawford, Edinburgh.
Reposing in many a cryptical line,
Enigmas in Di for the year '69
Necessitate thought, and while fitted to teaze,
Their current of wit is intended to please.

9. By Mr. John Jerrard, Charmouth.
God's only Son resign'd a heavenly throne
For disobedient mortals to atone;
He on the cross grief, pain, and death endured,
And thus salvation for the world procur'd.
Graves, rocks, and temple, all in twain were rent,
In confirmation of the great event.

10. By G. R.
Though Hewitt veils his theme in well-wrought guise,
A rent is visible to curious eyes.

11. By "Zig-Zag."
I would not, sir, too far presume,
But wish, with your consent,
To take in Di a little room,
And send herewith the rent.
1. Landmarks. By Miss Helen Ogden, Shaw.

The landmarks of our Fathers how beautiful they stand,
Defining by their presence each owner's neck of land.
No matter what their nature, the little purling rill
Meandering on its way the purpose may fulfill.
The landmarks of our Fathers how stately in their pride,
The forest monarch high with its spreading branches wide.
The ancient yew matured in hygone days to tell,
Some little favorite spot adown the leafy dell.
The landmarks of our Fathers how beautiful to view,
With simple flow'rets deck'd of many a varied hue;
The hawthorn in its bloom perfuming flowery May,
The wild rose in its beauty bright summer's ardent ray.
The landmarks of our Fathers some lowly wall may be,
Where stonecrop and the ivy o'ercovering it we see.
Or unfolding to the eye the skill and genius rare,
Of some departed worthy content his own to share.
The landmarks of our Fathers perchance some humble pale,
Near which the honest rustic may tell his artless tale;
Or tune his merry pipe, when from toil and labour free,
Or echo to the eloian harp his song in jocund glee.
The landmarks of our Fathers inviting still remain,
Discharging their protection around each lov'd domain.
The cotter's little portion encircled by its aid,
Affords him a security on which his hopes are staid.
The landmarks of our Fathers, oh! view them with delight;
Mementoes of their strict regard to equity and right.
Let man to man in closest ties of amity combine,
And guard with nicest care each other's boundary line.

2. Thoughts suggested by the perusal of a volume of old Diaries.*

By Mr. James Hewitt, Hexham.

Saddening memorial of bygone days,
When other fingers swept the mystic lyre;
Other aspirants sought diarian bays,
Or sang as love, or fancy might inspire.
Baker and Sheridan trod Parmassian dales
With rival bards to present times unknown;
While Sappho's mantle graced young Betty Smales,
And won the heart of youthful Richardson.
They lived their happy childhood, loved and sung,
And whispered flattering tales to raptured ears;
In friendly rivalry their notes prolong,
Till each in swan-like cadence disappears.

* 'Gentlemen s,' 1785-7; 'Ladies,' 1789-90.
**GENERAL ANSWERS TO THE ENIGMAS.**

*Sic vita est, and such are human ways,*
Man rises, sings his song, decays, and dies.
Or, all unskilled, earth's buffetings to face,
Others supplant him in life's high emprise.
A boot, or peg top, haply forms his theme,
Cover, or tumbler, teems with mental food.
His duty to discharge, O, idle dream!
Fritters away blest gifts for "public good."
Heaven gave a harp, and he perform must play,
As subjects prompt, solemn or merry tune;
Brisk youth, or withered age, inspires his lay,
Or jaunty jigs for manhood's dancing June.
On sober, sad, or transient trifles bent,
Each—self-applauded—harped his little day,
Till fate's stern hand the veil asunder rent,
And dread eternity before them lay.
Thus lived our predecessors; thus live we,
Pluming ourselves more wise, as they "too fast."
Vain, thriftless mortals! soon the time shall be
That we, like them, are shadows of the past.
And shall some future poet sadly tell
That once my humble name was known to Di?
While sympathetic throbs his bosom swell,
And tears spontaneously suffuse his eye.
Yet why repine, or cherish vain regret?
Shall puerile weakness challenge Heaven's plan?
On all is written—"change!" worlds rise and set,
And why should permanence obtain for man?
The smallest, vilest thing lives, breathes, or moves,
Atom of dust, or diamond of the mine,—
Its usefulness, by mere existence proves,
A link connective in the great design.
Our purpose well performed, why tarry here?
Earth is no home for an immortal mind,
Which longs for converse in supernal sphere,
And joyful leaves its borrowed crust behind.

**3. By DR. RUTHERFORD, Charlton.**

Unwonted fervour animates my breast;
In silence let the chords no longer rest;
High swelling thoughts to utterance aspire;
My fingers seek to strike the trembling wire.
What pity that the muse should be restrained,
And Dia's former status not regained!
Is it because poetic talent fails?
Or taste for science now less wide prevails?
Whate'er the cause let's sign a sharp protest,
And beg our wants be speedily redressed.
Let all dear Dia's friends their voices raise,
And rend the veil that darkens future days.
Why limit Dia's space in such a way?
What cares the poet for the courtiers gay?
Although Lycurgus fashioned Sparta’s fame,
And the great Pompey gave the Roman name
Such universal sway; yet where are they?
While Homer’s page all tongues and climes obey.
Indulge the poet, then! curtail no more
The wonted space he occupied before!
Give ample room that he may well relate
Achievements of great men—their merits state.
How Paganini well could span the neck,
And make his old Cremona well nigh speak.
Enough for him had he one only string;
From it he could the sweetest music bring.
So, too, good old John Pounds, a cobbler rare,
Could boots and shoes with pegs so well repair;
Could charm the children to his little shop;
And on their ears “good words” would kindly drop.
Friend Escott does his cover so conceal;
You cannot tell what is to make your meal;
Rich turtle-soup, or some such savoury dish;
Perhaps stewed eels or other kind of fish;
Or ham and chicken would be pleasant cheer,
Washed down by tumblers of good table beer.
But on such dainties I will not enlarge,
For other duties here I must discharge,
The gifted Helen Ogden strikes the strings,
And from her harp the sweetest notes she brings;
Long has her pen adorned Diaria’s page;
The best—the loftiest themes her thoughts engage.
Long may she company with the Hexham bard,
And Dia’s reputation still regard.
And when our chief announces his rent day,
Let you and I, Miss Ogden, homage pay;
Take a joint trip—and with friend Hewitt dine;—
Then view the beauties of the lovely Tyne.

4. The Village Schoolboy. By Mr. THOS. EDWARDS, Lois Weedon.

See the village schoolboy how he hastens on his way,
With satchel hung about his neck he does not stop to play.
With nice clean shoes or peytop boots he looks so clean and neat,
A pattern to those truant boys who loiter in the street.
And if you saw him when at school you might discover then
His duty he will there discharge with pencil, slate, or pen,
Though diligent soe’er he be he sometimes meets with frowns,
Or like a tumbler on the stage he has his ups and downs.
Though not endow’d with gifts like some, yet still in him we find
An intellect both sharp and keen, likewise a studious mind.
His parents fondly dote on him; he is their only boy;
We hope and trust in future years their peace he’ll not destroy;
But honour those who guided him through childhood’s giddy maze,
And be their comfort and support in life’s declining days.
5. By Mr. Joseph Hutchinson, Halifax.

While Mr. Campbell leads the way,
Within a neck comes Mr. Wray.
Amanda follows with a boot,
And Edwards with a peg to suit.
A cover next—and for a stare,
A tumbler at a country fair;
A free discharge, a gift or boon,
With Ogden's harp so full of tune;
And Hewitt's rent, as I opine,
Will close the list for sixty-nine.


A Campbell starts, to show the way;
We gain the neck of Mr. Wray.
As onward we our course pursue,
Amanda kindly grants a shoe.
And Edwards, most considerate, begs
The shoe to furnish with his pegs.
Next, Ecott's mysteries are over,
He fails to keep them in a cover.
A reverend gentleman portrays
Tumblers in all their varied ways.
And Oedipus attempts, you see,
Discharge of poor artillery.
The mystic envelope we lift,
Of Rutherford's most worthy gift.
To Ogden's harp our ear is lent,
And last we've Hewitt's prize of rent.

7. The Old Harper. By Mr. James Bartram, Sherburn.

A harper old on miry way,
Hobbled and went, his locks were grey;
Braving the storm his neck down bent,
His clothing, threadbare, tatter'd, rent.
His shoes were bad, his covering light,
For hoary age a wretched plight.
Still, thought recall'd the times when young,
When to the harp he cheerily sung,
When Peggy joined in concert sweet,
And gifts in showers fell at their feet;
These bypass scenes still own'd a charm,
And made again his heart beat warm.
Then scann'd himself a tumbler now,
Among the splash, the mire and snow;
His youthful joys and bright days flown,
His harp at rest, his partner gone,
His future prospect—toil and want,
Till death him a discharge shall grant.

8. By Zig-Zag.

Dear sir, in my brief way I beg
To answer thus the riddles sent:
Neck, gift and cover—boot and peg,
Discharge and tumbler—harp and rent.
GENERAL ANSWERS TO THE REBUSES AND CHARADES.

1. Ermine, miner, mine.
2. Steel-yard.
3. Jargon, organ, groan.
4. Bumpkin.
5. Imagine, enigma.
6. Aspire.
7. Myriad, diary.
8. Clp-her.
9. Tap, pat, apt.
10. Vic-trin.
11. Pig-eon.
12. Ma-ma (or Pa-pa).

1. A Poet in a Predicament. By Mr. James Hewitt, Hexham.
Di asks me for a song, who could refuse,
When ladies call, while having power to please?
My muse has got a cold; “a trite excuse,
   Good singers always have,—’tis no disease.”
My harp is cracked, and sadly out of tune;
Kinked, knotted, broken, almost every string;
Besides, I fear I’ve had a coup du lune,
My Pegasus has broke his dexter wing!
And then, for subjects—everything’s threadbare;
Ermine is fair, yet rather grave ’tis true;
Miner, and mine, are but a dingy pair;
And steelyards are unjust, illegal too.
Of jargon sing?—’twould make an organ groan!
A bumpkin, bah! imagine such an elf!
A taciturn—an enigmatic drone!
Sub rosa, madam, I was one myself!
Yes, bumpkin bred, yet e’en did I aspire,
Like myriads more, who haply “dairy fed.”
Scorned to be ciphers—nurst poetic fire,
While toiling meanwhile for the daily bread.
A tap’s ambiguous, and so is a pat,
Both apt to make a victim in their way;
A pig suits one, or it may please a cat—
And pigeon shooting’s sport—alackaday!
What, ask papa?—no use, I cannot sing;
The subjects you propound confound me quite;
So pray excuse me till another spring;
To you, and your fair readers all, Good night!

2. By Dr. Rutherford, Charlton.
With some misgivings of my prentice hand,
I fain would join Di’s skilled poetic band;
But taste and talents such as they possess
Combine to make me humble, I confess.
Well, be it so! humility’s a grace
That tends to keep man in his proper place.
With these few words of introduction here,
I now attempt to make the riddles clear.
Soft ermine neither suits the mine nor pit,
But oft adorns those who in judgment sit.
The steel-yard, nicely poised, the weight makes known
The bumpkin has a jargon of his own;
Nor can imagine what enigma means,
Though well informed regarding farming scenes.
To learning’s path he does not much incline,
Nor yet aspires to court the muses nine.
So myriads of the human race sink down,
As ciphers quite regardless of renown.
LIST OF POETICAL ANSWERS.

The tap has victimised them, sure enough;
Adulterated gin is horrid stuff;
Far better dine upon a pigeon pie:
Mama, papa, which is it? you or I.


He nothing knows of ermine or of courts,
The steel-yard's uses he can better see;
Where legal jargon flows he ne'er resorts;
A rustic wight, a country bumpkin he.
What he imagines seldom comes to aught;
He may aspire, but 'tis to nothing great;
The dairymaid employs his highest thought,
A very cipher in affairs of state.
Yet apt at work, no victim to the tap,
To pigs and pets and pigeons ever kind;
And for mamma, or miss, will touch his cap,
As one would do more polish'd and refined.

4. By Edipus.

Ermine adorns judicial seat,
Steel-yard is used to weigh our meat.
Jargon no sympathy engages,
Useless to bumpkin as to sage.
Study we duty to fulfil;
Aspire not lofty spheres to fill,
Nor long our myriads to possess,
Contented with a cipher less.
A tap or pat seems much the same,
So apt enough is either name.
Victim to pies the pigeon falls;
Papa, "jam satis est," now calls.

LIST OF POETICAL ANSWERS.

Allanson, Thomas, Billington, Malton, Yorkshire, ans. all.
Amanda, Gosport, ans. Prize Enigma.
Bainbridge, Thomas, Fore Street, Stanhope, ans. all.
Barthram, James, Sherburn, near Scarborough, ans. all.
Bell, Geo. J., jun., 11, Elswick Lane, Newcastle-upon-Tyne, ans. all.
Clio, of Hexham, ans. Prize Enigma.
Crawford, John, 129, Nicholson Street, Edinburgh, ans. all.
Donald, J. S., 3, Lander Road, Grange, Edinburgh, ans. Enigmas.
Edwards, Thomas, Lois Weeton, ans. all.
Elliott, John, Park Head, near Stanhope, ans. all.
Elliott, Robert, jun., Choppington, ans. all.
Function, ans. all.
G. R., ans. Prize Enigma.
Hattam, Thomas, Falmouth Harbour Lighthouse, ans. all.
Hewitt, Miss Isabella, Hexham, ans. Prize Enigma.
Hewitt, James, of Hexham, ans. all.
Hutchinson, Joseph, Halifax, ans. all.
J. D., West Woodburn, ans. all.
Jackson, Thomas, Alnwick, ans. all.
Jerrard, John, Charmouth, Dorsetshire, ans. all.
Novitius, ans. all.
Edipus, ans. all.
Ogden, Miss Helen, Shaw, near Oldham, ans. all.
Pretetjohn, 11, Woodwell Crescent, St. George's Road, Bristol, ans. all.
Rutherford, Dr., Clarion, ans. all.
Scofer, Alexander, Grainger Villa, Elswick, Newcastle-upon-Tyne, ans. all.
Selim, of Pakenham, Norfolk, ans. all.
Smith, Miss Mary, Ampleforth, near York, ans. all.
Wray, Rev. J. Jackson, Exeter, ans. Prize Enigma.
Wray, Thomas, Market Weighton, ans. all.
Zig Zag, ans. all.
NEW ENIGMAS.

I.  **Enigma (1521); by Mr. George J. Bell, Jun., Newcastle-upon-Tyne.**

When murmuring zephyrs steal amongst the trees,
   The passing traveller sees me as he goes;
When tempests raise the heaving of the seas,
   The sailor views me as the ocean flows.
I am the cause of many a change of place,
   I bring the monarch his accustomed round,
Am used by followers of the noisy chase,
   And in the depths of ocean I abound.
In Parliament I may be made, withdrawn,
   Rejected, or amended in due form;
I bring the cattle from the dewy lawn,
   And cause the raging of the angry storm.

II. **Enigma (1522); by Amanda.**

Diarians learned, who in search of lore
Star-studded space and hopeless depths explore,
Rest from such labours for a moment’s span,
To learn my use and all my wonders scan.
When heaven’s bright orbs bade by might supreme,
In countless numbers made the azure gleam,
I lent my aid to cheer the darkening world,
As through successive light and shade ’twas whirled,
Nor ceased my labours here. Lo! ocean teems,
And I in myriad numbers haunt the streams;
My colour varied as the phantom bow,
When light’s mild beams through gentle raindrops flow.
Parting from Nature, Art demands my skill,
With lines untold I wait her lordly will,
Assisting man to raise the dome divine,
Or reach some wished-for port beyond the line.
Beauty my aim, yet man’s oft failing eye
Mars my attempts to shame antiquity;
Vain are the chords with which I enter life,
If passion’s sway set men in deadly strife.
Misusing me, gaunt ugliness appears,
Filling aesthetic eyes with bitter tears.
To puzzle schoolboys often is my fate,
’Tis mine to bid, then transform, not translate.
Classics are not my forte, ’tis very true,
But music sprang from me, give me my due.
At ducal Goodwood, Ascot’s royal race,
With keenness watched, I have a resting-place,
Detecting fraud, most pure where most are vile,
Though it may be I’m cheating all the while;
Running my neck into the fatal noose
Of the inspector very hard to loose.
NEW ENIGMAS.

Thus many ups and downs through life I see,
Yet night’s grey curtains bring repose to me.
One final hint, to help you to pass muster,
Gunter’s great name to my fair fame adds lustre.

III. ENIGMA (1523); by Mr. JOHN CRAWFORD, Edinburgh.

Diarian friends, as your critical eyes
Can penetrate secrecy’s deepest disguise,
I need not endeavour, by tortuous mode,
To shun the clear day in a fox’s abode.
Now listen a moment, and please to compare
A few slight remarks on my “how,” “when,” and “where.”
So various in size, I’m gigantic or small;
Though form’d for endurance, I doubtless can fall.
Here wood, stone, or marble—there turf, ice, or shell;
At times I am iron—what more can I tell?
Remotest antiquity truly I claim,
My pedigree, know it, is ancient as fame.
Existing ere Cain built his city in Nod,
I feel independent of measuring rod.
The first race of beavers, of storks, I may say,
Undoubtedly prized me as men do to day.
Enlightened astrologers, seemingly sage,
Hold planets and me to be equal in age.
In town I am always, ’mid tombs I am found;
You carry me crab-like till laid in the ground.
If tired of your burden, be cheered, look on high;
I stand in great splendour where none ever sigh.
My how, when, and where, thus presented to view,
Suggest a loved name; it is music—adieu.

IV. ENIGMA (1524); by Mr. THOMAS EDWARDS, Lois Weedon.

When first my use to man or beast was known,
Both history and tradition have not shown.
Though ages long and drear have passed away
Since first my fragile form rose from the clay;
For be it known I sprang from mother Earth,
And sometimes I am deemed of little worth;
Aye, worthless as a pin, yet you may see
Both gold and silver often paid for me.
What I endure the muse can scarce unfold;
How like a slave I’m beaten, bruised’d, and sold,
And sometimes also cast into the street,
Despised and trampled down beneath your feet.
Yet spurn me not, ye fair; you must confess
I help to form an article of dress.
The crown ’tis oft my privilege to protect;
With lace or flowers or feathers I am deck’d,
Or like some cloister’d nun the veil I take;
But that, perhaps, may be for fashion’s sake.
Though I’m so common, still what I produce
To man is of a great essential use;
NEW ENIGMAS.

But if I was destroyed through blight or drought,
Throughout the land—oh! dire and awful thought!
For want of me what thousands soon would rue,
A fearful famine doubtless would ensue.
If I was analysed—just mark the hint—
A substance I should form as hard as flint.

V. ENIGMA (1525); by the Rev. J. J. Wray, Exeter.

I dwell 'neath the glow of a tropical sky,
Where the splendours of nature so lavishly lie;
Or away in the desert, hot, dreary, and wild,
Where the Ishmaelite mother still fondles her child.
There I have my home, and exhibit my form,
And stand in the sunshine or bow in the storm.
Yet why should you wander so far and so wide?
You may find me at home—I am near to your side.
I am near, though full often I'm hidden from view.
I'm hard and I'm soft, large, small, various in hue;
Here, "as brown as a berry"—there, "white as the snow;"
Yonder, "yellow as gold," or "black as a sloe."
Like the augurs, astrologers, sybils of old,
Some say I the mysteries of time can unfold.
Go back to past ages, ancient Greece and old Rome,
When a conquest was won, when the victor came home.
Amid music and banners, and shouts long and loud,
The warrior was borne by the worshipping crowd,
To forum, or tribune, or temple, or throne,
(Where his name was inscribed upon pillar of stone),
I join'd in the pageant, I graced the display,
In honour of him who was hero that day.
In the sacred land, so the Scriptures declare,
I aided a welcome once organized there.
But alas! I have now sad confession to make;
I serve the imposter. Advantage to take
On the honest, his skill and his cunning he tries
To impose by a fraud—to deceive them with lies.
If as yet you have failed to read me aright,
Transpose me; my secret now dies in the light.

VI. ENIGMA (1526); by "Oeipus."

When the great Grecian bard essays to sing
The woes which from Achilles' anger spring;
Apollo's priest he ushers on the stage,
Retreating from that lofty chieftain's rage.
He leaves the tent, his earnest suit refused,
And he himself with threatening words abus'd.
Slowly the old man paces near the sea,
Too much engrossed, perchance, to think of me.
Old Walton, in his piscatory lore,
Breaks out in verse, proceeding to implore
He "may live harmlessly, or near the Trent
Or Avon," that as o'er me oft he's bent,
So near me henceforth may his life be spent.
The bard who satire's weapon fain would wield
Must fail, unless his verse with me be steeled;
With me, the critics hapless authors gall;
Without me, all their shafts innocuous fall.
I might proceed my barbarous acts to tell,
But on such deeds I must decline to dwell,
For am not I your friend? I'm bold to say
I render you assistance day by day.
Without my aid your cook would vainly try
Your board with food or dainties to supply;
Seated at table, you without offence
Could scarcely with my useful aid dispense.
But ah! beware some articles you see,
Lest they should haply set your teeth on me.
Am I, then, eatable? Nay, I confess
I rather form a portion of your dress.
Ladies will wear me, as the fashions go,
But less for use, I fancy, than for show.
Yet I must cease, or you my form will see,
Tho' duller than myself will sometimes be.

VII. ENIGMA (1527); by Mr. JOSEPH HUTCHINSON, Halifax.

Ladies and gents, I hope I don't intrude,
It is not in my nature to be rude,
Refinement rather is my character,
As all who know me doubtless will aver;
And in that sphere I've held a potent sway,
In former times—and at the present day
'Tis mine to mingle with the grand and great,
And minister to scenes of pomp and state.

In early ages and before the flood,
My service may not have been understood,
But certainly in ancient Greece and Rome
I was as highly prized as here at home;
With orators and artists I am found,
In banquets, balls, and etiquette abound.
Where fashion reigns I various forms assume,
And grace the levee and the drawing room.
But not confin'd to grandeur or the great,
Nor to the lackeys who upon them wait;
Who, by-the-bye, in passing I may say,
My varied qualities will oft display;
The labouring poor, the artisan as well,
Can of my service and importance tell;
Tho' some will slight me, and with this excuse,
That I am more for ornament than use.
Well, be it so—yet many more commend,
Who for their daily bread on me depend;
While from the village cottage to the throne
In almost every grade of life I'm known.
The rooms wherein you breakfast, sit, and dine,
Have each, no doubt, some properties of mine;
I'm in the kitchen—serv'd with many a dish,
Tho' neither beef nor mutton, fowl nor fish;
Yet on your plate I constantly attend,
And when you dine am at your fingers' end;
Indeed, were I not there, and plainly seen,
Censure would fall on some one's head, I ween;
And butler, housemaid, cook, and scullery scrub,
Are each and all involv'd,—"Aye, there's the rub."
But out of doors you'll also with me meet,
I daily pass along the busy street;
Tho' low my station, and requiring care,
To keep my character unspotted there;
Where a false step or slip, tho' void of blame,
May bring disgrace, or tarnish my fair name.
I often aid the poet—but I fear
That Lady Di will fail to find me here;
However, one more hint I freely give her,
One third of me will name a foreign river.

VIII. Enigma (1528); by Miss Helen Ogden, Shaw.
Shall I, or shall I not, on Dia's page,
Your kind attention for awhile engage.
Of ancient fame, when the Almighty's plan
First form'd our globe, and his new creature man;
The glorious sun, to rule the world by day,
The milder moon by night her influence sway;
The starry host, that gem the concave high,
And shed their lustre on the midnight sky.
True to their destin'd course, they still maintain
Their matchless order through the wide domain;
I too, like them, in beauty oft appear,
Traverse, like them, a much exalted sphere.
And should you turn to Holy Writ, you'll see
A part important oft perform'd by me.
Oh! dreadful sight, to see the living world
Upon the awful waste of waters hurl'd,
Till love and pity mov'd the all-seeing eye,
To view His matchless works disorder'd lie.
His wrath appeased, the sacred promise gave,
That it no more should find a watery grave;
The beaut'ous bow, a solemn pledge to be
Of His unchanging love, we still may see
That faithful promise to His children true,
Whenever they its pleasing form review.
When Israel's sons set out from bondage free,
Their fathers' land their heritage to be;
If not a partner in their hasty flight,
I with them journey'd through the gloomy night.
And when the prophet from Mount Carmel view'd
The plains around, by parching drought subdu'd,
Offered to Heaven the fervent prayer that he
A blessed change upon the earth might see,
One persevering eye, at his command,
At length beheld me wondrously expand;
And greater still, to gazing eyes reveal'd
The glorious work of our redemption seal'd.
And still to man I frequently appear,
A constant visitor throughout the year;
Flimsy and light you may my form behold,
Fair as the snow that waits on winter cold;
Fair, do I say, no blushing rose can vie
With me in bright and rich vermilion dye,
Yet dark as ebon to the eye appear,
And sometimes fill the timid mind with fear;
Who in my threatening aspect can descry
Some warring conflict is approaching nigh.
Yet harmless I upon the solid ground,
With many a simple pebble may be found;
While in the mystic page methinks you'll say,
Regard to distance I might surely pay.

IX. Enigma (1529); by Mr. James Hewitt, Hexham.

When first vicarious functions were assumed,
Whether before, since, or whilst Eden bloomed;
We stay not to discuss the question here,
But that such things both were, and are, 'tis clear.
And let this hint diarian wits inspire,
Who thread the windings of the mystic lyre.
Go search great Milton, and perchance you'll find
My office to angelic forms assigned:—
Where fiercely floundering in the Stygian lake
Rebellious demons howl, and rage, and quake,
To be accredited, though anxious all,
And work perdition on this mundane ball.
Rank envy's throes rack each infernal brain,—
To each the preference is assigned in vain.
Till Satan wreathed in hate's relentless fume,
Himself perforce the mission must assume.
But mark the concord in the courts above,
The source and centre of Almighty love;
Exulting Raphael his selection hailed,
Though haply you'll aver his errand failed.
When o'er the earth stern retribution's waves
Rolled fell destruction, swept unnumbered graves;
The patriarch a heaven appeased to prove,
Exemplified me in the faithful dove.
So pious Abraham, doubtless heaven inspired,
A proper consort for his son desired;
Despatched his servant for some kindred fair—
Did he not then my spirit too declare?
Moses and Aaron, too, confessed my power,
As did the avenger in that solemn hour,
NEW ENIGMAS.

When shook o'er Nilus' shore his fatal brand,
And scattered death through that devoted land.
The aged prophet, when unhappy Saul
Strove blindly to precipitate his fall,
To execute my high behest intent,
And choose the future king, to Ramah went,
He on the handsome shepherd's youthful head
The sacred oil of heavenly unction shed.
The ascetic Baptist, and his mighty Lord
Whom he preceded, published, and adored,
From vice, from pride, from ostentation free,
Both owned their presence and their power from me.
The Great Physician, who our woes endured,
Our miseries solaced, and diseases cured;
First, having shown, our minds to disabuse—
With faith in God, still we the means must use,
Directs his patient to repair to me,
If he creation's glorious forms would see;
He comes, my sovereign remedy applies,
And heaven's blest light o'erflows his raptured eyes.

X. PRIZE ENIGMA (1550); by Dr. Rutherford, Caliton.

Dark rolled the waters o'er the pristine earth;
And days elapsed before they gave me birth.
Meanwhile the great Creator spoke and said,
"Let there be light;" and light forthwith obeyed.
As yet no eye was formed to catch the rays
That from the sun diverged in various ways;
Until, obedient to the high behest,
The waters heard the words to them addressed;
Then moving creatures sprung to life and light;
And the winged fowl was formed for rapid flight.
Close linked with these I to existence came,
And to the present hour retain my fame;
But time and space would fail were I to mention
My powerful aid and feats of intervention.
Without me what a scene this world would show;
Frail man his brother man would cease to know;
The earth might still revolve around the sun;
The moon and stars their daily courses run;
But animated life would fail to move;
My total absence would destructive prove.
Ye architects of ancient Greece and Rome!
Men of renown abroad—admired at home;
Whose matchless skill and cultivated taste
Reared sculptured structures, elegant and chaste;
Ye knew me well. Your sharpest eye I met;
With greatest care I have been firmly set.
But where are now those monuments of art
Which to the groves such beauty did impart?
Where now are Carthage, Nineveh, and Troy?
Their former splendour gone—silent their joy.
Yet in the shades of Nineveh I'm found,
Firm as a rock though buried under ground.
   In youth and age I have been heard to crack;
While here and there I'm hung upon a rack;
Exposed for sale I meet the public gaze;
I'm turned and twisted in a thousand ways.
Men and mechanics of the present day
Proclaim my power—my universal sway.
By companies and banks I'm often sought;
And shares through my prestige are freely bought;
Yet oft the man of wealth has to regret
The unexpected losses he has met.
"All is not gold that glitters" many know;
Yet men are taken captive by false show.
Few words, fair ladies, I will now employ;
I trust sincerely you will long enjoy
The free—the full—the animating swing,
That to your movements I can ever bring.
As to my name if you have any doubt,
I hope and trust you'll never find me out.

NEW CHARADES, REBUSES, &c.

1. **Charade**; by Miss Helen Ogden, *Shaw*.
   Behold my first a leader stand,
   Of more than one familiar band.
   My second moulded to your taste,
   You may despatch with decent haste.
   My third sometimes doth pleasure bring
   To those who join the festive ring.
   My whole to man, if understood,
   Is a precursor of much good.

2. **Charade**; by Mr. James Hewitt, *Hexham*.
   Poor Jack was naughty!—got my first,
   And as he trudged away,
   His simple heart was like to burst;
   His feelings to allay,
   He took my next; poor, heedless soul!
   No sooner did he hear my whole,
   His spirits leapt beyond control,
   He danced his griefs away!

   My whole you doubtless may require,
   Each night when you to rest retire.
      Behead and then transpose,
   I to the farmer's wants attend,
   Or to his steed may prove a friend
      When he to market goes.
Two interjections, if you rightly place,
Will give an object of exceeding grace,
Whose beauty well may cause us to exclaim,
The words that I have said compose its name.

5. Charade; by Edipus.
My first's one of a numerous race: my next
Should honoured be by all our human kind.
My whole has pleased, or oftentimes perplexed,
Those who fair truth's true linaments would find.

6. Charade; by Mr. Joseph Hutchinson, Halifax.
My first's a vessel rather mystical,
 Containing what we cannot well define;
My next is somewhat egotistical;
My third is seen where soldiers mess or dine.
My whole's a palace for a certain chief,
Of what or whom I say not—to be brief.

7. Charade; by Mr. T. T. Wilkinson, Burnley.
My first is near you when you sleep,
And roams at large with flocks of sheep;
My second they and you may shelter,
When keen winds blow, or hailstones pelt;
My whole Mathesis deems supreme,
When highest subjects form the theme.

8. Rebus; by Edipus.
I'm given, taken, sometimes broken, sold;
Behold, I'm a projector, you behold;
Behold once more, your dinner I prepare,
Or view the river or the lake—I'm there.

9. Charade; by Dr. Rutherford, Charlton.
Look for my first, and get my second;
Be careful how the charge is reckoned.
My first will take you where you please;
My whole will shield you on the seas.

10. Charade; by Amanda.
In life's varied journey, ah! ne'er do my first;
Be my second your watchword for ever;
Beware of my whole, for 'tis often accused,
And you from your reason may sever.

11. Charade; by Mr. Thomas Wray, Market Weighton.
My first my second doth not need,
Ladies, howe'er life's currents roll,
Let wisdom always guide and lead,
'Twill soften care, and be my whole.

12. Charade; by "Zig-Zag."
In talking or walking, my first you may do;
My second is known to the printer;
My whole is a compound rejected by few,
At a notable season in winter.
I. Query; by Mr. Thomas Hattam, Falmouth Lighthouse.

When and how did the custom originate of blessing persons when they sneeze?

Answered by Mr. James Hewitt, of Hexham, and Mr. Hattam, the Proposer.

"Some Catholics," says Father Fanjo, have attributed the origin of this custom to the ordinance of the Pope, Saint Gregory, who is said to have instituted a short benediction, to be used on such occasions, at a time when, during a pestilence, the crisis was attended by sneezing, and in most cases followed by death." But the Jewish Rabbins, who seem to have considered themselves bound to furnish a reason for, or to explain everything, say that before Jacob, men never sneezed but once, and then immediately died: they assure us that that patriarch was the first who died by natural disease; before him all men died by sneezing; the memory of which was ordained to be preserved in all nations, by a command of every prince to employ some salutary exclamation after the act of sneezing. Passages in Aristotle and other Greek writers, and allusions to it in Pliny, prove the antiquity of the custom, and that it existed long prior to the time of Pope Gregory; and a memoir of the French Academy shows that the same formalities also obtained in the New World on the first discovery of America, which farther proves the universality of these formal salutations.

Similar answers were given by Mr. Thomas Jackson and Mr. Artemas Martin.

Again, by Mr. T. T. Wilkinson, Burnley.

The Greeks looked upon sneezing as a disease, or, at least, as a symptom of some infirmity, and therefore, as Archbishop Potter observes, "when any man sneezed it was usual to say Za̱di, may you live; or Zev oswar, God, or Jove, bless you." Whence the Greeks derived the custom is not known, but probably from the Phrygians, who had established a religious system ages before the Greeks became known as a nation. Ammian alludes in one of his epigrams to a person with a long nose who could not hear himself sneeze. Athenæus proves that sneezing was accounted sacred; and Aristotle tells us that sneezing was accounted a deity. Xenophon's soldiers worshipped sneezing as a god. A sneeze on the right hand caused Xenophon to be elected a general; and Themistocles had victory promised him by Euphrantes from a similaromen. Cupid is represented as sneezing by Theocritus when Menelaus married Helen; and Homer introduces Penelope rejoicing at the sneezing of her son Telemachus. The Romans derived these superstitions from the Greeks, and we, probably, from those our early conquerors.

II. Query; by Mr. John Grey, Westgate, Weardale.

What is the derivation of the word swankey as applied to small beer?

Answered by Mr. T. T. Wilkinson, Burnley.

Many uncouth words, still in use in what was formerly the Danish kingdom of Northumbria, find their etymons in the Danish or Dutch languages. Swankey is most probably derived from the Danish swang = swang = lean, thin, weak, meagre, &c. The Dutch swack is a word of similar import; and so is the German schwank, which comes nearer to the term applied to small beer than the others. In East Lancashire, where many Danish and Dutch words are constantly in use, the term is applied to any kind of liquid food which is tottering, or shaky, when slightly moved, such as jellies, &c. A "swankey fellow" is one who staggers in his walk from weakness, and the term is figuratively applied to those whose word is not to be depended upon.

Again, by Mr. James Hewitt, Hexham.

In the glossary to Burns' poems we have "Swank, stately, jolly." "Swankie, or swanker, a tight strapping young fellow, or girl." "Swankie" is, in fact, an old English word derived from the Saxon swang, a country swain, which is the nearest approach I find to the word in question. Now whether, reasoning from analogy, that as swankie seems to mean a frisky young fellow, we should be justified in deriving therefrom swankey, frisky (young) beer. We have perhaps a more direct and tangible reason for deriving swankey from the old
Saxon "swang," in the fact that, in many parts of England, countrymen, owing perhaps to the scarcity or bad quality of the water in their fields, generally carry with them to their work a keg of very inferior beer, supplied by their employers as part of their hire; and hence the term may have arisen from this "table beer" being called swanky's beer, and the name having in the course of time been dropped as superfluous, in the same manner as "porter's beer" has for many years been held as sufficiently described and indicated when simply spoken of or written as "porter."

Third Answer, by Mr. Thomas Jackson, Alnwick.

The word swankey derived from the German schwank, thin or weak; in Latin, tenuis, exilis, nuer, small beer is schwank bier.

It may, however, have come through the Danish swang, which has the same meaning.

Swankie is Scotch (from German), and is applied to a brisk, lively young fellow; consequently it may have come through the Scotch, and thus mean brisk beer, only beer may be brisk without being small, while the proper character of small beer is briskness; this quality lost, it becomes stale beer. I think, therefore, swankey means properly thin, for strong beer is never called swankey, however brisk and lively it may be.

The query was similarly answered by Mr. Thomas Hattam.

III. QUERY; by Mr. James Herxson, Edinburgh.

What is the reason that infants scarcely a week old are sometimes observed to smile?

Answered by Mr. T. T. Wilkinson, Burnley, and similarly by Mr. Thomas Hattam, Mr. James Hewitt, and Ædipus.

It is a common opinion in the North of England that when a very young child smiles in its sleep an angel is whispering to it. A more tangible reason may, perhaps, be found in animal physiology. When we are pleased various systems of nerves are excited, and these, acting on the muscles, produce contractions, which we call smiling. Infants are undoubtedly capable of experiencing pleasurable sensations, both physical and mental, even during sleep, and hence the "infant smiles" of the querist.

Second Answer by G. R.

Probably the smile is a slight reaction of nature from the frequent audible expressions of discomfort on the part of infants.

IV. QUERY; by Mr. J. Jackson, of Sheffield.

Was Elijah fed by ravens, as stated in Scripture, or in some other way?

Answered by Mr. James Hewitt, Hexham.

The subject of this query has been much debated, in both ancient and modern times. The following condensed extracts from a Bible published in 1785, seem as much to the point as anything I have met with:—I Kings xvii, 4—"I have commanded the ravens," &c. Though several learned commentators render the word orebim as an appellative by the term ravens, yet there are others who either think that it signifies merchants, as in Ezek. xxvi, 27, or the Arabs, and read the word orebin, as in 2 Chron. xxi, 16, and Nehemiah iv, 7. It is, indeed, objected to these critics, that the word orebim is never used to express merchants without some other words being joined to it, as in the passage quoted from Ezekiel. The most probable opinion is that these Orebbim were the inhabitants of some city; and we find from Beroschith Rabba c. xxi, that there was a city named Orbo, not far from Scythopolis, whose inhabitants were named Orebim. Eusebius confirms this assertion. St. Jerome expressly asserts that "The Orebim, the inhabitants of a town on the borders of Arabia, supplied the prophet with food."

Answers agreeing in substance with the above were likewise given by "Ædipus," and by Messrs. Hattam and Wilkinson.

V. QUERY; by Mr. Artemas Martin, Franklin, United States.

What kind of fish was the "whale" that swallowed Jonah?
ANSWERS TO THE QUERIES.

Answered by Mr. James Hewitt, Hexham; Mr. Martin, the Proposer; and Messrs. Hattam and Wilkinson.

The subject of this query has given rise to much debate among commentators, some holding to the New Testament rendering, and others that the great fish—םָבָטָה—dag-gadol, could not be a whale, but a shark. The Old Testament says—“Now the Lord had prepared a great fish to swallow up Jonah,” &c. Dr. Clarke, in his Commentary, says—“This could not have been a whale, for the throat of that animal could scarcely admit a man’s leg; but it must have been a shark, which abounds in the Mediterranean, and whose mouth and stomach are exceedingly capacious. In several cases they have been known to swallow a man when thrown overboard.” Having regard to the physical conformation of the whale species, the cavity of the mouth might, without any great stretch of the imagination, be assumed as more feasible, if it be a well ascertained fact that an ordinary man may stand upright on the tongue of a whale, while his arm would fill its throat. Now, while it was impossible (except, of course, by miracle) that a man could exist so long in the stomach of any living animal without being suffocated, and, to adopt a Yankeeism, “used up,” I hold that he might for a considerable period “live, move, and have his being” in the mouth of a whale without being responsible to the amenities of deglutition, the whalebone fringe attached to the upper jaw being susceptible of admitting a sufficient quantity of air to sustain respiration. But even according to this, the whale and shark, several eminent naturalists assert that there are other fishes of sufficient capacity of both mouth and oesophagus to swallow a man; and amongst others, they mention the dogfish, by some writers called, technically, lamiæ. My own leaning, I must confess, is towards accepting the rendering of St. Matthew, in its full and entire literality, and believing that the “whale” in question was truly and veritably a whale.

Second answer by "Cedipus."

Admiral Smyth, in his work, “The Mediterranean,” after remarking that instances have occurred of the larger cetaceans having made their appearance in that sea, goes on to say—“Some consider the large basking shark (Squalus marinus) to have been Jonah’s ‘great fish,’ although it is the most harmless of the ichthyological races, feeding mostly on medusæ, crustacea, and sea-plants. The lamiæ (Squalus carcanarius) or white shark, the most voracious of all fishes, has a better claim, since he can readily engulf a man whole, and has, therefore, sometimes been designated Jure piscis."

There is not wanting, however, a rationalistic theory on the subject. The Hebrew word in Jonah is dag, whilst than is the one which signifies a whale. Now, dag signifies a fish, but it also signifies a “fish-boat,” and figuratively a “preserver.” May we not therefore understand it is said that it was a “floating preserver,” in “the belly or hold” of which Jonah was preserved? The Greek translators give kites, and this word not only signifies a whale, but also a great ship as big as a whale.

VI. Query; by Mr. Artemas Martin, Franklin, United States.

When, and by whom, was the magnetic needle invented?

Answered by Mr. Artemas Martin, the Proposer.

The property of the magnet of attracting towards itself anything containing iron or steel in its composition, and its capability of imparting the same power to those metals, were well known to the ancient Greeks; but at what period that more important property, “polarity,” or its disposition to turn to the north and south poles of the earth, was first discovered, is not known.

The earliest notice of the magnet, in the Chinese records, relates to a period 2634 years before the birth of Christ.

In the dictionary of Po-wen-yen-fou it is stated, about the close of the third century of the Christian era, “that ships were then directed to the south by the needles.”

According to a book translated from Arabic manuscript, said to bear all the marks of authenticity, the captain who navigated the Syrian sea used a primitive compass, which they made by driving a needle through a wooden peg or cornstalk so as to form the shape of a cross, and then put it in a basin of water, upon the surface of which it would float.

Many circumstances contribute to the impression that the mariner’s compass was first made known to Europe through the communication of the Moorish invaders of Spain, although the knowledge of it has been brought direct from China.

The magnet is not mentioned in English history earlier than the reign of Edward III.; it was then called a “sail-stone.” The Plenty, which sailed from Hull in 1385, was steered by a “sailing-stone.”

The above information has been derived from a book entitled “A History of Wonderful Inventions.”
NEW QUERIES.

Again, by Mr. T. T. Wilkinson, Burnley.

The magnetic needle appears to have been invented by the Chinese. It does not seem to have been known to the Greeks, the Romans, nor to any European nations till towards the close of the twelfth century. The use of the needle for nautical purposes was also known to the Japanese, Indians, and Arabians from a period of high antiquity. The late Professor Davies, in his Early History of the Mariner's Compass, translates a passage from Klaproth's letter to Humboldt, which relates to the use of the needle 2634 years before the commencement of our era, and this has since been generally received as authentic. Some have contended that the Chinese did not use the needle for purposes of navigation before about A.D. 270. Its use was known on the Syrian coasts in A.D. 1243; and in A.D. 1260 Marco Polo is said to have introduced it into Europe.

Third Answer, by Edipus.

The introduction of the mariner's compass into Europe, in its application to navigation, is generally attributed to Flavio Gioja, of Amalfi, near Naples, about the year 1302; nevertheless, there is distinct reference to it in a French poem written a century earlier.

Fourth Answer, by Mr. Alexander Scorrier, Newcastle-upon-Tyne.

The Mariner's Compass, said to have been known to the Chinese, 1115 B.C., is ascribed to Marco Polo, a Venetian, A.D. 1260; and to Flavio Gioja, of Amalfi, a navigator of Naples. Until this time the needle was laid upon a couple of pieces of straw, or small split sticks, in a vessel of water; Gioja introduced the suspension of the needle, 1306. It is also said to have been known to the Swedes in the time of King Jarl Birger, 1550. Its variation was discovered first by Columbus, 1492; afterwards by Sebastian Cabot 1540. The compass box and hanging compass used by navigators were invented by William Barlowe, an English divine and natural philosopher, in 1608. The measuring compass was invented by Jost Bing, of Hesse, in 1602.—Haydn's 'Dictionary of Dates.'

Answers containing statements similar to those already made were also given by Messrs. Hattam, Hewitt, and "Edipus."

---

Erratum.—Diary for 1869, page 46, line 19, for "brain," read "burin."

I. QUERY; by Mr. Artemas Martin, Franklin, United States.

When and by whom were decimal fractions invented?

II. QUERY; by Mr. James Hewitt, Hexham.

Required, the origin and meaning of the term Watling Street, as applied to the ancient (Roman?) road or highway across the island?

III. QUERY; by Mr. Thomas Hattam, Falmouth Lighthouse.

What process constitutes the act of blushing?

IV. QUERY: by Mr. T. T. Wilkinson, Burnley.

What reason can be assigned for the fact that much of the folk-lore of all nations is identical in its primary conceptions?

V. QUERY; by G. R.

Is the retina affected during the sensation of vision in a dream?

VI. QUERY; by the Editor.

What is known about meteors, commonly called "falling stars?"
# TABLE OF THE KINGS AND QUEENS OF ENGLAND SINCE THE CONQUEST.

<table>
<thead>
<tr>
<th>Kings and Queens</th>
<th>Born A.D.</th>
<th>Crowned</th>
<th>Reigns ended</th>
<th>Age</th>
<th>Where Buried</th>
</tr>
</thead>
<tbody>
<tr>
<td>William Conq'r.</td>
<td>1027</td>
<td>1066 Dec. 25</td>
<td>1067 Sept. 9</td>
<td>60</td>
<td>Caen, Normandy</td>
</tr>
<tr>
<td>William Rufus</td>
<td>1057</td>
<td>1087 Sept. 26</td>
<td>1100 Aug. 2</td>
<td>43</td>
<td>Winchester</td>
</tr>
<tr>
<td>Henry I.</td>
<td>1068</td>
<td>1100 Aug. 5</td>
<td>1135 Dec. 1</td>
<td>67</td>
<td>Reading</td>
</tr>
<tr>
<td>Stephen</td>
<td>1105</td>
<td>1135 Dec. 26</td>
<td>1144 Oct. 23</td>
<td>49</td>
<td>Feversham</td>
</tr>
</tbody>
</table>

**The Saxon Line Restored.**

| Henry II         | 1133     | 1154 Dec. 19 | 1189 July 6 | 56  | Fontevrault   |
| Richard I        | 1156     | 1159 Sept. 3 | 1199 April 6 | 43  | Fontevrault   |
| John             | 1165     | 1199 May 27 | 1216 Oct. 19 | 51  | Worcester     |
| Henry III        | 1207     | 1216 Oct. 28 | 1272 Nov. 18 | 65  | Westminster |
| Edward I         | 1259     | 1274 Aug. 19 | 1307 July 7 | 67  | Westminster |
| Edward II        | 1284     | 1307 July 8 | 1327 Jan. 20 | 43  | Gloucester |
| Edward III       | 1312     | 1327 Feb. 1 | 1377 June 21 | 65  | Westminster |
| Richard II       | 1366     | 1377 July 16 | 1399 Sept. 29 | 33  | Westminster |

**The Line of Lancaster.**

| Henry IV         | 1387     | 1399 Oct. 13 | 1413 Mar. 20 | 46  | Canterbury |
| Henry V          | 1389     | 1413 April 9 | 1422 Aug. 31 | 33  | Westminster |
| Henry VI         | 1421     | 1429 Nov. 6 | 1461 Mar. 4 | 39  | Windsor |

**The Line of York.**

| Edward IV        | 1442     | 1461 June 28 | 1483 April 9 | 41  | Windsor |
| Edward V         | 1471     | 1483 July 7 | 1485 Aug. 23 | 42  | Leicester |
| Richard III      | 1483     | 1485 July 7 | 1485 Aug. 23 | 42  | Leicester |

**The Families United.**

| Henry VII        | 1456     | 1485 Oct. 30 | 1509 April 21 | 52  | Westminster |
| Henry VIII       | 1492     | 1509 June 24 | 1547 Jan. 28 | 55  | Windsor |
| Edward VI        | 1537     | 1547 Feb. 25 | 1583 July 6 | 16  | Westminster |
| Queen Mary       | 1516     | 1553 Nov. 30 | 1558 Nov. 17 | 42  | Westminster |
| Queen Elizabeth  | 1533     | 1559 Jan. 15 | 1603 Mar. 24 | 69  | Westminster |

**The Union of the English and Scotch Crowns.**

| James I          | 1566     | 1603 July 25 | 1625 Mar. 27 | 58  | Westminster |
| Charles I        | 1600     | 1625 Feb. 3 | 1649 Jan. 30 | 48  | Windsor |
| Charles II       | 1630     | 1661 April 23 | 1665 Feb. 6 | 54  | Westminster |
| James II         | 1653     | 1685 April 23 | 1688 Dec. 11 | 67  | Paris |
| William III      | 1650     | 1689 April 11 | 1702 Mar. 8 | 51  | Westminster |
| Mary II          | 1662     | 1694 Dec. 13 | 1694 Dec. 13 | 32  | Westminster |

**The Union of the two Kingdoms.**

| Queen Anne       | 1665     | 1702 April 23 | 1714 Aug. 1 | 49  | Westminster |
| George I         | 1660     | 1714 Oct. 20 | 1727 June 11 | 67  | Hanover |
| George II        | 1683     | 1727 Oct. 11 | 1760 Oct. 25 | 77  | Westminster |
| George III       | 1732     | 1761 Sept. 22 | 1830 Jan. 29 | 83  | Windsor |
| George IV        | 1793     | 1831 July 19 | 1836 June 20 | 72  | Windsor |
| William IV       | 1765     | 1831 Sept. 8 | 1837 June 20 | 72  | Windsor |
| Victoria         | 1819     | 1838 June 28 | Whom God preserve. |

The reign of each succeeding Sovereign of course commenced with the day of his accession to the throne on the death of his immediate predecessor, the date of which is shown in the fourth column of the above Table. It was not until the reign of Elizabeth that the principle, that "the king never dies," was admitted. That of hereditary right, clearly, from the accession of Edward I.

Maud, the sixth child of Henry II, married Henry, surnamed the Lyon, Duke of Brunswick, who was the ancestor of the present Royal Family of England.

The three longest reigns were those of Henry III, Edward III, and George III. The reign of George III, being 59 years, 3 months, and 7 days, was 3 years longer than that of Henry III, and 8 years longer than that of Edward III.
THE QUEEN AND ROYAL FAMILY.

THE QUEEN.—Victoria, of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, born May 24, 1819; succeeded to the throne June 20, 1837, on the death of her uncle, King William IV.; crowned June 28, 1838, and married Feb. 10, 1840, to his Royal Highness Prince Albert of Sax-Coburg, who died Dec. 14, 1861. Her Majesty is the only daughter of his late H.R.H. Edward Duke of Kent, fourth son of King George III.


H.R.H. ALICE MAUD MARY, b. April 25, 1843; m. July 1, 1862, Prince Ludwig of Hesse.


H.R.H. LOUISA CAROLINE ALBERTA, b. March 18, 1848.

H.R.H. ARTHUR WILLIAM PATRICK ALBERT, b. May 1, 1860.

H.R.H. LEOPOLD GEORGE DUNCAN ALBERT, b. April 7, 1853.

H.R.H. BRITRICE MARY VICTORIA FEDORDE, b. April 14, 1857.

PRINCES AND PRINCESSES.

George Frederick Alexander Charles Ernest Augustus, K.G., Duke of Cumberland (Ex-King of Hanover), cousin to her Majesty, b. May 27, 1819; m. Feb. 18, 1843, Princess Mary of Saxe-Altenburg.

Augusta Wilhelmina Louisa, Duchess of Cambridge, niece of former Landgrave of Hesse, b. July 29, 1791; m. in 1818, the late Duke of Cambridge, by whom she has issue.


Augusta Caroline Charlotte Elizabeth Mary Sophia Louisa, cousin to her Majesty, b. July 19, 1822; m. June 28, 1843, Friedrich, Grand Duke of Mecklenburg-Strelitz.

Mary Adelaide Wilhelmina Elizabeth, cousin to her Majesty, b. Nov. 27, 1833; m. June 12, 1866, Prince Franz Von Teyck.

HER MAJESTY'S CHIEF OFFICERS OF STATE.


Lord High Chancellor, Lord Hatherley.


Lord President of the Council, Earl de Grey and Ripon.

Lord Privy Seal, Earl of Kimberley.

Home Secretary, Rt. Hon. H. A. Bruce.

Foreign Secretary, Earl of Clarendon.

Colonial Secretary, Earl Granville.

War Secretary, Rt. Hon. E. Cardwell.

Secretary for India, Duke of Argyll.

First Lord of Admiralty, Right Hon. H. C. E. Childers.


President of the Board of Trade, Rt. Hon. John Bright.

President of the Poor Law Board, Rt. Hon. G. J. Göschen.

Sec. for India, Rt. Hon. Chichester S. Fortescue.

The above form the Cabinet.

Field-Marshal Commanding in Chief, H.R.H. the Duke of Cambridge, K.G.

First Commissioner of Public Works, Acton Smeaton Ayrton.

Chancellor of the Duchy of Lancaster, Right Hon. Lord Dufferin.

Quartermaster-General, Lieut.-Gen. Sir J. R. Hope Grant, G.C.B.

Under Sec. for the Colonies, Right Hon. W. Monsell.


Vice-President of Council of India, H. T. Prinsep.

Attorney-General, Sir R. P. Collier.

Solicitor-General, Sir J. D. Coleridge.

Judge-Advocate-General, Rt. Hon. Sir C. M. O'Loghlen, Bart.

CHIEF OFFICERS OF HER MAJESTY'S HOUSEHOLD.

Lord Great Chamberlain, Lord Willoughby d'Eresby.

Lord Chamberlain, Viscount Sydney.

Lord Treasurer, Earl of Bessborough.

Lord High Almoner, Bishop of Winchester.

Mastr. of the Horse, Marquis of Ailesbury, K.G.

Mastr of the Buckhounds, Earl of Cork.


Private Sec. to Her Majesty, Gen. Hon. Chas Grey.


Master of the Household, Major Sir John C. Cowell, K.C.B.
OFFICERS OF STATE AND ROYAL HOUSEHOLD.

Captain of the Gentlemen-at-Arms, Lord Foley.
Captain of the Yeomen of the Guard, Duke of St. Alban.
Assistant, Col. Charles Bagot.

Chief Equerry and Clerk Marshal, Col. Lord Alfred Paget.
Poet Laureate, Alfred Tennyson, D.C.L.
Physicians in Ordinary, Sir James Clark, Bart., M.D., K.C.B.; Sir H. Holland, Bart., M.D.; Sir William Jenner, Bt., M.D.
Physician to Household, Francis Hawkins, M.D.
Sergeant Surgeons, Cesar H. Hawkins, F.R.S.; Sir W. Fergusson, Bt., F.R.S.

FEMALE APPOINTMENTS IN HER MAJESTY'S HOUSEHOLD.

Mistress of the Robes, Duchess of Argyll.

Bedchamber Women, Lady Caroline Barrington, Viscountess Forbes, Mrs. G. Campbell, Mrs. Mrs. A. Gordon, Viscountess Chewton, Lady Cogdington, Lady S. E. Lindsay, Hon. Mrs. Robert Bruce, Mrs. Pratt.

HOUSSEHOUSE OF H.R.H. THE PRINCE OF WALES.

Groom of the Stole (vacant).
Lords of the Bedchamber, Marq. of Hamilton; Earl of Mount Edgcumbe; Lt. Col. Charles Bulteel;
Comptroller and Treasurer, Lt.-Gen. Sir W. T. Knollys, K.C.B.

PRIVATE SECRETARY, Herbert W. Fisher.
Physicians in Ordinary, Sir W. Jenner, Bt., M.D.; E. Stirling, M.D.
Surgeons in Ordinary, James Paget; George Pollock, and Oscar Claysy.

HOUSSEHOUSE OF H.R.H. THE PRINCESS OF WALES.

Chamberlain, Lord Harris, G.C.S.I.
Ladies of the Bedchamber, Marchioness of Carmarthen, Countess of Morton, Countess of Macclesfield, Viscountess Warden.

Physician Accoucheurs, Arthur Parke, M.D., F.R.S.; George Thompson Green, M.D.

SCOTLAND, CHIEF OFFICERS OF.

Keeper of Great Seal, Earl of Selkirk.
Lord Justice Clerk, Lt. Hon. J. Moncreiff.
Lord High Commissioner, Earl of Haddington.
Hereditary Standard-bearer, Earl of Lauderdale.
Hereditary Master of Household, Duke of Argyll, K.T.
Lord Privy Seal, Earl of Dalhousie, K.T.

Lord Clerk Register, Rt. Hon. Sir W. G. Craig, Bart.
Deputy Clerk Registrar, W. P. Dundas, Lord High Constable, Earl of Erroll.
Com. of Forces, Maj.-Gen. Randall Rumley.
Ass. Adj.-General, Hon. E. Colborne.
Lord Advocate, George Young.
Solicitor-General, A. Rutherford Clark.

IRELAND, CHIEF OFFICERS OF.

Lord Lieutenant, Earl Spencer, K.G.
Lord Almoner, The Prime.
Lord Chancellor, Rt. Hon. T. O'Hagan.
Chief Secretary, Rt. Hon. Chichester S. Forrescue.
Under Secretary, T. H. Burke.
Private Sec., Hon. L. G. Dillon.
State Steward, Viscount St. Lawrence.
Master of the Rolls, Rt. Hon. J. E. Walsh.

Lord Chief Justice of Queen's Bench, Rt. Hon. James Whiteside.
Military Secretary, Lt.-Col. E. Whitmore.
Attorney-General, Rt. Hon. J. Sullivan.
Solicitor General, G. K. Barry.
HOUSE OF LORDS.

LIST OF THE HOUSE OF LORDS, WITH THE SURNAME AND YEAR OF THE BIRTH AND ACCESSION (OR CREATION) OF EACH PEER.

The Scotch Representative Peers, 16 in number, and elected for each new Parliament, are distinguished by a *; the Irish, 28 in number, and elected for life, by a †. The Irish Representative Prelates (who will cease to sit in the House of Lords after Jan. 1, 1871), are marked with a ‡. Other Scotch and Irish Peers, who sit in this House as Peers of England, have their national titles assigned to them, that by which they sit being added. Such Peers as are Knights of the Garter, Thistle, or St. Patrick, are distinguished by G. T. P. Those marked  ′ are Privy Councillors in England;  ″ Privy Councillors in Ireland.

b. born; s. succeeded; c. created.

Speaker, Lord Hatherley, Lord High Chancellor.—Deputy Speaker, Lord Redesdale.

PRINCES.

[| z H.R.H. the Prince of Wales, G. T. P. ]
[| H.R.H. the Duke of Edinburgh, G. T. ]
[| H.R.H. the Duke of Cumberland, G. ]
[| z H.R.H. the Duke of Cambridge, G. P. ]

ARCHBISHOPS.


DUKES.

1. Abercorn (Hamilton) sits as M. of Abercorn, b. 1811, c. 1868. G. P.
2. Argyll (Campbell), sits as L. Sunders, b. 1823, s. 1847. T.
3. Atholl (Murray), sits as E. Strange, b. 1840, s. 1864. T.
4. Beaumont (Somerset), b. 1824, s. 1853. G.
5. Bedford (Russell), b. 1809, s. 1861.
6. Bucklebury (Scott), sits as E. Duncaster, b. 1806, s. 1819. G.
7. Buckingham and Chandos (Greville), b. 1823, s. 1861.
8. Cleveland (Pole), b. 1803, s. 1864. G.
9. Devonshire (Cavendish), b. 1808, s. 1858. G.
10. Grafton (Fitz-Roy), b. 1819, s. 1863.
11. Hamilton (Somerset), sits as D. of Brandon, b. 1845, s. 1863.
12. Leeds (Osborne), b. 1802, s. 1859.
13. Leinster ( Fitzgerald), sits as V. Leinster, b. 1791, s. 1804.
14. Manchester (Montagu), b. 1823, s. 1855.
15. Marlborough (Churchill), b. 1822, s. 1857. G.
16. Montrose (Graham), sits as E. Graham, b. 1799, s. 1836. T.
17. Newcastle (Clinton), b. 1834, s. 1864.
18. Norfolk (Howard), b. 1847, s. 1861.
19. Northumberland ( Percy), b. 1810, s. 1867.
20. Portland (Bentinck), b. 1800, s. 1854.
21. Richmond (Lennox), b. 1815, s. 1860. G.
22. Roxburghe (Innes-Ker), sits as E. of Innes, b. 1816, s. 1823. T.
23. Rutland (Manners), b. 1815, s. 1857. G.
24. St. Alban's (Beauchier), b. 1840, s. 1849.
25. Somerset (St. Maur), b. 1804, s. 1855. G.
26. Sutherland (Levens- Gower), b. 1828, s. 1861. G.
27. Wellington (Wellesley), b. 1807, s. 1852. G.

MARQUESSES.

1. Aylesbury (Bruce), b. 1804, s. 1856. G.
2. Ailsa (Kennedy), b. 1816, s. 1846. T.
3. Alcester (Pogue), b. 1821, s. 1869.
4. Bath (Thynne), b. 1831, s. 1832.
5. Bristol (Hervey), b. 1834, s. 1864.
6. Bute (Stuart), b. 1847, s. 1848.
7. Camden (Pratt), b. 1840, s. 1866.
8. Cholmondley (Cholmondeley), b. 1792, s. 1827.
9. Clanricarde (De Burgh), sits as L. Somerhill, b. 1802, s. 1825. P.
10. Conyngham (Conyngham), sits as L. Minster, b. 1797, s. 1852. P.
11. Donegal (Chichester), sits as L. Fisherwick, b. 1798, s. 1844. P.
12. Downshire (Hill), sits as E. Hillsborough, b. 1844, s. 1868.
13. Drogheda (Moore), sits as L. Moore, b. 1825, s. 1837. P.
14. Ely (Loftus), sits as L. Loftus, b. 1849, s. 1857.
15. Exeter (Cecil), b. 1825, s. 1867.
16. Headfort (Talbot), sits as L. Kenlis, b. 1787, s. 1829. P.
17. Hertford (Conway), b. 1800, s. 1842. G.
18. Huntly (Gordon), sits as L. Meldrum, b. 1847, s. 1863.
19. Lansdowne (Fitz-Maurice), b. 1845, s. 1866.
20. Londonderry (Stewart), sits as L. Stewart, b. 1805, s. 1854. P.
21. Lothian (Kerr), sits as L. Kerr, b. 1832, s. 1841.
22. Normanby (Whitby), b. 1819, s. 1863.
23. Northampton (Compton), b. 1816, s. 1851.
24. Ormonde (Butler), sits as L. Ormonde, b. 1844, s. 1854.
25. Salisburgo (Cecil), b. 1830, s. 1868.
26. Sligo (Browne), sits as Lord Montague, b. 1820, s. 1845.
27. Townshend (Townshend), b. 1831, s. 1863.
28. Tweeddale (Hay), b. 1787, s. 1804. T.
29. Waterford (Beresford), sits as L. Tyrone, b. 1844, s. 1866. P.
30. Westmeath (Nugent), b. 1785, c. 1822.
31. Westminster (Grovener), b. 1796, s. 1846. G.
32. Winchester (Paulet), b. 1801, s. 1843.

EARLS.

Aberdeen (Gordon), sits as V. Gordon, b. 1841, s. 1864.
Abercoveney (Nevill), b. 1826, s. 1868.
Abingdon (Bertie), b. 1808, s. 1854.
Airlie (Ogilvy), b. 1826, s. 1849. T.
Albemarle (Keppel), b. 1799, s. 1861.
Amherst (Amherst), b. 1805, s. 1857.
Anneley (Anneley), b. 1830, s. 1852.
Ashburnham (Ashburnham), b. 1787, s. 1830.
Minto (Kynynmond), b. 1814. s. 1859.
Moray (Stuart), sits as L. Stuart, b. 1810. s. 1867.
Morley (Parker), b. 1843. s. 1864.
Morton (Douglas), b. 1818. s. 1858.
Mountgussell (More), b. 1792. s. 1822.
Mount Edgecumbe (Edgecumbe), b. 1832. s. 1861.
Munster (Fitzclarence), b. 1824. s. 1842.
Nelson (Nelson), b. 1823. s. 1833.
Onslow (Onslow), b. 1777. s. 1827.
Orford (Walpole), b. 1813. s. 1858.
*Drury (Fitzmaurice), b. 1803. s. 1831.
Pembroke (Herbert), b. 1850. s. 1862.
Portarlington (Dawson-Damer), b. 1822. s. 1845.
Portsmouth (Fellowes), b. 1825. s. 1854.
Poulett (Poulett), b. 1827. s. 1864.
Powis (Herbert), b. 1815. s. 1843.
Radnor (Bouvier), b. 1815. s. 1869.
Runfurry (Knox), sits as L. Runfurry, b. 1849. s. 1858.
Roden (Jocelyn), sits as L. Clanbrassil, b. 1788. s. 1820. P.
Romney (Marham), b. 1808. s. 1845.
Roscoby (Primrose), sits as L. Roscoby, b. 1847. s. 1868.
Rosse (Parsons), b. 1840. s. 1867.
Rosslyn (Erskine), b. 1833. s. 1866.
Russell (Russell), b. 1792. c. 1861. G.
St. German (Elliott), b. 1798. s. 1845.
Swindon (Montagu), b. 1811. s. 1818.
Scarborough (Lumley), b. 1813. s. 1856.
Seafield (Ogilvy), sits as L. Strathclyde, b. 1815. s. 1853.
Selton (Molyneux), sits as L. Selton, b. 1835. s. 1855.
Selkirk (Douglas), b. 1809. s. 1820.
Shaftesbury (Ashley-Cooper), b. 1801. s. 1851. G.
Shannon (Boyle), sits as L. Carleton, b. 1833. s. 1868.
Sheffield (Holroyd), sits as L. Sheffield, b. 1802. s. 1821.
Shrewsbury and Talbot (Talbot), b. 1830. s. 1860.
Somers (Cocks), b. 1819. s. 1852.
Spencer (Spencer), b. 1835. s. 1857. G.
Stair (Dalrymple), sits as L. Oxenford, b. 1819. s. 1864. T.
Stamford and Warrington (Grey), b. 1827. s. 1845.
Stanhope (Stanhope), b. 1805. s. 1855.
Stradbroke (Rous), b. 1794. s. 1827.
Stafford (Byng), b. 1806. s. 1860.
Suffolk (Howard), b. 1804. s. 1851.
Tankerville (Bennet), b. 1819. s. 1859.
Vane (Vane-Tempest), b. 1821. s. 1854. G.
Verulam (Grimsby), b. 1809. s. 1815.
Waldegrave (Waldegrave), b. 1851. s. 1859.
Warwick, see Brooke.
Wemyss and March (Douglas), sits as L. Wemyss, b. 1798. s. 1853.
Wem (Fane), b. 1825. s. 1859.
WJohnny (Egypton), b. 1799. s. 1814.
Winchelsea (Finch-Hatton), b. 1815. s. 1858.
Yarborough (Pelham), b. 1835. s. 1862.
Zetland (Dundas), b. 1795. s. 1839. T.

VISCOUNTS.
Bangor (Ward), b. 1827. s. 1837.
Bolingbroke (St. John), b. 1820. s. 1851.
Boyne (Hamilton-Russell), sits as L. Brancaster, b. 1797. s. 1855.
Bridport (Hood), b. 1814. c. 1865.
Canterbury (Sutton), b. 1812. s. 1845.
Clifton (Ager-Ellis), sits as L. Mendip, b. 1863. s. 1866.
Combermere (Cotton), b. 1818. s. 1865.
De Vere (Vesey), b. 1803. s. 1855.
Doneraile (St. Leger), b. 1813. s. 1864.
Eversley (Lefevre), b. 1794. s. 1857.
Exmouth (Plymoll), b. 1811. s. 1833.
Falkland (Cary), sits as L. Hanwood, b. 1802. s. 1809.
Falmouth (Boscawen), b. 1819. s. 1852.
Gage (Gage), sits as L. Gage, b. 1791. s. 1809.
Gough (Gough), b. 1816. s. 1869.
Halifax (Wood), b. 1800. s. 1866.
Hardinge (Hardinge), b. 1822. s. 1856.
Hawarden (Maude), b. 1817. s. 1828.
Hereford (Leveson), b. 1843. s. 1855.
Hill (Hill), b. 1800. s. 1842.
Hood (Hood), b. 1833. s. 1846.
Lifford (Hewitt), b. 1811. s. 1855.
Lismore (O'Callaghan), sits as L. Lismore, b. 1815. s. 1857.
Massereene (Skeffington), sits as L. Oriel, b. 1842. s. 1863.
Melville (Dundas), b. 1801. s. 1851.
Midleton (Brodrick), sits as L. Brodrick, b. 1798. s. 1863.
Monck (Monck), sits as L. Monck, b. 1819. s. 1849.
Powicke (Wingfield), b. 1836. s. 1844.
St. Vincent (Jervis), b. 1825. s. 1859.
Sidmouth (Addington), b. 1824. s. 1863.
Stafford de Redcliffe (Canning), b. 1788. c. 1852.
Strathallan (Drummond), b. 1810. s. 1861.
Sydney (Townshend), b. 1805. s. 1831.
Templeton (Upton), b. 1822. s. 1863.
Torrington (Byng), b. 1812. s. 1831.

BISHOPS.
Bangor, J. C. Campbell, D.D., b. 1813. c. 1859.
Bath & Wells (designate), J. D. A. Hervey, D.D., b. 1808. c. 1869.
Carlisle (designate), H. Goodwin, D.D., b. 1818. c. 1869.
Down, R. Knox, D.D., b. 1808. c. 1849.
Durham, C. Baring, D.D., b. 1807. c. 1861.
Exeter (designate), F. Temple, D.D., b. 1821. c. 1869.
Hereford, James Attlay, D.D., b. 1817. c. 1868.
Lichfield, G. A. Selwyn, D.D., b. 1809. c. 1867.
Limerick, Chas. Graves, D.D., b. 1812. c. 1866.
Manchester, James Prince Lee, D.D., b. 1804 c. 1846.
Ossory, J. T. O'Brien, D.D., b. 1792. c. 1842.
Peterborough, W. C. Magee, D.D., b. 1821. s. 1868.
Ripon, R. Bickersteth, D.D., b. 1816. c. 1856.
Rochester, T. L. Cloughton, D.D., b. 1808. c. 1868.
Salisbury, George Moberly, D.D., b. 1803.
St. Asaph, T. V. Short, D.J., b. 1790. c. 1846.
St. David’s, G. Thirlwall, D.J., b. 1797. c. 1840.
Winchester (designate), S. Wilberforce, D.D., b. 1805. c. 1869.

BARONS.
Abercornby (Abercornby), b. 1833. s. 1852.
Aitkin (Scarlett), b. 1826. s. 1861.
Annaly (White), b. 1795. c. 1863.
Arundell (Arundell), b. 1831. s. 1862.
Ashburnham (Baring), b. 1834. s. 1868.
Athenlay (Somerville), sits as L. Meredith, b. 1806. c. 1863.
Auckland (Eden), b. 1799. s. 1819.
Audley (Poulett), b. 1777. s. 1837.
Averst (Heathcote), b. 1839. s. 1867.
Bagot (Bagot), b. 1811. s. 1856.
Bateman (Hanbury), b. 1826. s. 1845.
Beamont ( Stapleton), b. 1848. s. 1854.
Belcher (Strutt), b. 1801. c. 1856.
Berners (Wilson), b. 1797. s. 1851.
Berwick (Niel-Hill), b. 1802. s. 1861.
Blantyre (Stewart), b. 1818. s. 1830.
Blayney (Blayney), b. 1803. s. 1834.
Bolton (Poulcott), b. 1818. s. 1850.
Boston (Ibby), b. 1802. s. 1856.
Braybrooke (Neville), b. 1822. s. 1861.
Brongham and Vaux (Broughton), b. 1795. s. 1868.
Byron (Byron), b. 1818. s. 1868.
Calms (Cains), b. 1810. c. 1867.
Calhorne (Calhorne), b. 1790. s. 1851.
Camways (Somer), b. 1797. s. 1839.
Carew (Carew), b. 1813. s. 1856.
Carlington (Carlington), b. 1843. s. 1868.
Chelmsford (Theesiger), b. 1794. c. 1868.
Chesham (Cavendish), b. 1825. s. 1863.
Churchill (Spencer), b. 1802. s. 1845.
Churston (Buller), b. 1799. c. 1838.
Churtin (Mass), b. 1799. s. 1837.
Clermont (Fortescue), b. 1815. c. 1852.
Clifford (Clifford), b. 1819. s. 1858.
Clinton (Trefusis), b. 1834. s. 1866.
Clonbrock (Ullon), b. 1807. s. 1826.
Cloncurry (Lawless), b. 1840. c. 1869.
Colchester (Abbot), b. 1542. s. 1867.
Colonese (M’Neill), b. 1794. c. 1867.
(Colville (Coville), b. 1818. s. 1849.
Congleton (Parnell), b. 1805. s. 1842.
Conyers (Fox), b. 1827. s. 1859.
Crews (Crewes), b. 1812. s. 1835.
Crofoot (Crofoot), b. 1806. s. 1817.
Daere (Trevor), b. 1808. s. 1853.
De Freyne (Frenche), b. 1801. s. 1868.
Delamere (Cholmondeley), b. 1812. s. 1855.
De Lisle and Duddy (Foullis), b. 1825. s. 1851.
De Manley (Ponsonby), b. 1815. s. 1855.
Denman (Denman), b. 1805. s. 1854.
De Ros (De Ros), b. 1797. s. 1839.
De Saumares (Saumares), b. 1806. s. 1863.
De Tabery (Warren), b. 1811. s. 1827.
Digby (Digby), b. 1806. s. 1856.
Dorchester (Carleton), b. 1811. s. 1826.
### HOUSE OF COMMONS

#### Eighth Parliament of Queen Victoria, and twentieth Parliament of the United Kingdom.

**County Members**
- England 172
- Wales 15
- Scotland 32
- Ireland 64

**Cities and Boroughs**
- 288
- 15
- 26
- 39
- 366

**Universities**
- 5
- 2
- 2
- 9

**Speaker**
- Rt. Hon. John Evelyn Denison

#### HOUSE OF PEERS

Clerk of the Parliaments, Sir J. G. Shaw Lefever, K.C.B.
Clerk Assistant, Sir Wm. Rose, K.C.B.
Reading Clerk and Clerk of Private Committees, Hon. Slingsby Bethell.
Counsel to Committees, Thos. F. Kent.
Chief Clerk, Henry Stone Smith.
Examiner of Standing Orders, Charles Freere.
Principal Clerk for Bills, W. E. Walmisley.
Librarian, James Heard Pulman.

#### OFFICERS OF THE HOUSE OF COMMONS

<table>
<thead>
<tr>
<th>Name</th>
<th>Constituency</th>
<th>Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ribblesdale (Lister)</td>
<td>b. 1828</td>
<td>z. 1832</td>
</tr>
<tr>
<td>Rivers (Pitt)</td>
<td>b. 1814</td>
<td>z. 1827</td>
</tr>
<tr>
<td>Rodney (Roderick)</td>
<td>b. 1857</td>
<td>z. 1864</td>
</tr>
<tr>
<td>Rolle (Rolle)</td>
<td>b. 1835</td>
<td>z. 1852</td>
</tr>
<tr>
<td>Romilly (Romilly)</td>
<td>b. 1802</td>
<td>c. 1866</td>
</tr>
<tr>
<td>Rossmore (Westenra)</td>
<td>b. 1851</td>
<td>z. 1869</td>
</tr>
<tr>
<td>Saltoun (Fraser)</td>
<td>b. 1829</td>
<td>z. 1853</td>
</tr>
<tr>
<td>Sandys (Sandys)</td>
<td>b. 1840</td>
<td>z. 1863</td>
</tr>
<tr>
<td>St. John (St. John)</td>
<td>b. 1811</td>
<td>z. 1817</td>
</tr>
<tr>
<td>St. Leonards (Sugden)</td>
<td>b. 1781</td>
<td>z. 1852</td>
</tr>
<tr>
<td>Saye and Sele (Wykeham-Fiennes)</td>
<td>b. 1799</td>
<td>z. 1847</td>
</tr>
<tr>
<td>Searlesdale (Curzon)</td>
<td>b. 1831</td>
<td>z. 1856</td>
</tr>
<tr>
<td>Seymour (Colborne)</td>
<td>b. 1815</td>
<td>z. 1863</td>
</tr>
<tr>
<td>Sherborne (Button)</td>
<td>b. 1864</td>
<td>z. 1862</td>
</tr>
<tr>
<td>Sinclair (St. Clair)</td>
<td>b. 1803</td>
<td>z. 1863</td>
</tr>
<tr>
<td>Skerne-staite (Wilbraham)</td>
<td>b. 1837</td>
<td>z. 1853</td>
</tr>
<tr>
<td>Sondes (Milles)</td>
<td>b. 1794</td>
<td>z. 1838</td>
</tr>
<tr>
<td>Southamptone (Fitzroy)</td>
<td>b. 1804</td>
<td>z. 1810</td>
</tr>
<tr>
<td>Stafford (Stafford-Jenyngham)</td>
<td>b. 1802</td>
<td>z. 1851</td>
</tr>
<tr>
<td>Stanley of Alderley (Stanley)</td>
<td>b. 1827</td>
<td>z. 1859</td>
</tr>
<tr>
<td>Stratheden and Campbell (Campbell)</td>
<td>b. 1824</td>
<td>z. 1859</td>
</tr>
</tbody>
</table>

#### HOUSE OF PEERS

Assistant Librarian, W. J. Thomas.
Principal Clerk, Private Bill Office, B. S. Adam.
Principal Clerk, Peers' Printed Paper Office, O. E. Grant.
Chief Under of the Black Rod, Adm. Sir A. W. Clifford, Bt.
Deputy, G. Wallace Goodbody.
56

HOUSE OF COMMONS.

41 Cardiganshire, E. M. Richards.
42 Cardigan, Sir T. D. Lloyd, Bart.
43 Carmarthen, Col. F. Potter, Sir W. Lawson.
44 Carmarthenshire, John Jones, E. J. Svoros.
45 Carmarthen, Lt.-Col. C. Stepney.
46 Carnarvonshire, Capt. Jones Parry.
47 Carnarvon, W. B. Hughes.
49 Chelsea, Sir Chas. W. Lilke, Blt., Sir H. A. Hawe, Bt.
50 Cheltenham, H. B. Samuelson.
51 Cheshire (E.), W. J. Leach, Wm. B. Brooks.
53 Cheshire (W.), Sir P. de M. G. Egerton, Bart., J. Tollemache.
54 Chester, Earl Grosvenor, H. C. Ralke.
55 Chichester, Lord H. G. C. G. Lennox.
56 Chippingham, Gabriel Goldney.
57 Christchurch, E. H. Burke.
58 Crewe, A. A. Buthurst.
59 Cleveland, R. Asheton.
60 Cockermouth, Isaac Fletcher.
61 Colchester, J. Gurdon Rebow, Dr. Brewer.
62 Cornwall (East), Sir J. S. Trelawny, Bt., B. Willyams.
63 Cornwall (West), J. St. Aubyn, A. P. Cowan, H. W. Eaton, A. S. Hill.
65 Cricklade, Hon. F. W. Cadogan, Sir D. Glooch, Bart.
66 Cumberland (East), W. N. Hodgson, Hon. C. W. G. Howard.
68 Darlington, E. Backhouse.
70 Denbigh, W. Atkin Williams.
71 Derbyshire (North), Lord G. H. Cavendish, A. P. Arkwright.
72 Derbyshire (South), Col. Hy. Wilmot, Rowland Smith.
73 Derbyshire (East), Hon. Capt. Egerton, Hon. H. Strutt.
74 Derby, Mich. T. Bass, S. Plimsoll.
75 Devizes, Sir Thomas Bateson, Bt.
76 Devonport, Montagu Chambers, J. D. Lea.
78 Devonshire (East), Sir Lawrence Falk, Bart., Viscount Courtenay.
79 Devonshire (South), Sir Massey Lopes, S. T. Kekewich.
80 Dewsbury, Serjeant Jno. Simon.
81 Dorchester, Lt.-Col. C. N. Sturt.
83 Dover, Major A. G. Jackson, G. Jessel.
84 Droitwich, Rt. Hon. Sir J. S. Pakington.
85 Dudley, H. B. Sheridan. [Bart.]
86 Durham (North), G. Elliott, Sir Hedworth Williamson, Bt. [Bamborough.]
87 Durham (South), J. W. Pease Capt. F. B.
138 Lancashire (N. East), J. M. Holt, C. Strong.
139 Lancashire (South E.), Hon. Algernon F. Egerton, J. S. Henry.
140 Lancashire (South West), R. A. Cross, C. Turner.
141 Launceston, H. C. Lopes.
143 Leicestershire (North), Right Hon. Lord John Manners, S. W. Cowes.
144 Leicestershire (S.), Vis. Curzon, A. Pell.
145 Leicester, J. J. Harris, Peter Alf. Taylor.
147 Lewes, Lord Pelham.
148 Lichfield, Col. Richard Dyott.
149 Lincolnshire (North), Sir M. J. Cholmeley, Bt., R. Wynn. (Amcotts.
150 Lincolnshire Mid.), H. Chaplin, Lt. Col.
151 Lincolnshire (South), W. E. Welby, E. Turner.
152 Lincoln, Charles Seely, J. H. Palmer.
156 London University, Rt. Hon. R. Lowe.
159 Macclesfield, Wm. C. Brocklehurst, D. Chadwick.
160 Maidstone, Wm. Lee, James Whatman.
161 Malden, E. H. Bentall.
162 Malmsbury, Walter Powell.
163 Malton, Hon. C. W. W. Fitzwilliam.
164 Manchester, Sir Thos. Bazley, Bt., Hugh Birley, Jacob Bright.
165 Marborough, Rt. Hon. Lord Ernest Bruce.
166 Marlborough (Great), T. O. Wethered.
168 Merchiston, David Williams.
170 Middleborough, H. P. Bolckow.
172 Mitcham, W. T. Mitford.
174 Monmouth, Sir John W. Ramsden, Bt.
175 Montgomeryshire, C. W. Williams Wynn.
176 Montgomery, &c., Hon. Chas. R. D. Hanbury Tracy.
177 Morpeth, Rt. Hon. Sir G. Grey, Bt., G.C.B.
180 Newport, Isle of Wight, C. W. Martin.
181 Norfolk (N.), Hon. F. Walpole, Sir E. H. K. Bacon.
182 Norfolk (S. E.), E. Howes, C. S. Read.
183 Norfolk (West), Sir W. Bagge, Bt., Hon. T. de Grey.
184 Northallerton, John Hutton.
185 Northamptonshire (N.), Rt. Hon. G. W. Hunt, S. G. Stopford.
186 Northamptonshire (S.), Sir R. Knightley, Bt., Major F. W. Cartwright.
187 Northampton, Chas. Gipps, Lord Henley.
188 Northumberland (N.), M. W. Ridley.
189 Northumberland (S.), W. D. Beaumont, Earl Percy.
190 Northumberland (W.), Hon. H. G. Ridell. (Vacant.
191 Norwich, Sir Wm. Russell, Bt. (Vacant.
193 Nottinghamshire (S.), Wm. Hodgson Barrow, T. B. T. Hildyard.
194 Nottingham, C. Seely, Jun., Col. Ichabod Wright.
195 Oldham, J. T. Hibbert, John Platt.
198 Oxford University, Rt. Hon. Gathorne Hardy, Bt., Rt. Hon. J. R. Mowbray.
199 Pembroke, J. H. Scourfield.
200 Pembroke, &c., Thomas Meyrick.
201 Penryn and Falmouth, R. N. Fowler, E. B. Eastwick.
202 Peterborough, G. H. Whalley, Wm. Wells.
204 Plymouth, Sir R. P. Collier, W. Morrison.
206 Poole, A. E. Guest. (Elphinstone, Bt.
208 Preston, Hon. Arthur Walsh.
210 Reading, Sir F. H. Goldsmid, Bt., Geo. J. Shaw Lefevre. (Poi Jambe.
212 Reigate (E.), Viscount Galway, F. J. S.
213 Richmond, Sir Roundell Palmer.
214 Ripon, Lord John Hay.
215 Rochdale, T. B. Potter.
217 Rutlandshire, Hon. G. J. Noel, G. H.
218 Ryde, J. Stewart Hardy.
219 St. Ives, C. Magniac.
220 Safford, C. E. Cawley, W. T. Charley.
221 Salisbury, Dr. J. A. Lush, Aif. Seymour.
224 Sandwich, E. H. Knatchbull-Hugessen, H. A. Brassey.
225 Scarborough, Sir Harcourt Johnstone, Bt., John Dent Dent.
226 Shaftesbury, G. G. Glyn.
228 Shoreham, Rt. Hon. Stephen Cave, Sir Peter Burrell, Bt.
229 Shrewsbury, W. J. Clement, Jas. Figgins.
230 Somersetshire (E.), Major R. S. Allen, Richard Bright.
231 Somersetshire (Mid.), Major R. H. Puge, R. Nevil Grenville.
233 Southampton, Rt. Hon. Russell Gurney, P. M. Hoare.
234 South Shields, J. C. Stevenson.
235 Southwark, John Locke (Vacant).
236 Staffordshire (N.), Sir E. M. Bulter, Bt., Rt. Hon. C. B. Adderley.
237 Staffordshire (W), H. F. Meynell-Ingram, Sir Thomas, 1st B., Bt.
238 Staffordshire (E), M. A. Bass, J. R. Mclean.
240 Stalybridge, S. Sidebotham.
241 Stamford, Adm. Sir T. J. Hay, Bt.
242 Stockport, W. Tipping, J. B. Smith.
243 Stockton, J. Dodds.
244 Stoke-upon-Trent, G. Melly, W. S. Roden.
245 Stroud, H. S. F. Winterbotham, S. S. Dickenson.
246 Suffolk (E), Hon. J. M. Henniker-Major, F. S. Corrance.
247 Suffolk (W), Major Windsor Parker, Lord Augustus Hervey.
249 Surrey (E), Hon. P. J. L. King, Charles Buxton.
250 Surrey (Middx), H. W. Peck, Hon. W. Brodrick.
251 Surrey (W), Geo. Cubitt, J. S. Briscoe.
252 Sussex (E), J. G. Dodson, G. B. Gregory.
253 Sussex (W), Earl of North, Col. W. Bartleth.
254 Swansea, L. L. Dillwyn.
256 Taunton, A. C. Barclay, Henry James.
257 Tavistock, A. J. F. Russell.
258 Teignestover, W. E. Price.
259 Thirsk, Sir Wm. P. Galloway, Bt.
260 Tiverton, Hon. G. Denman, J. H. Amory.
261 Tower Hamlets, A. S. Ayrton, J. D. Samuda.
262 Trewo, F. M. Williams, Capt. Hon. J. C.
263 Tynemouth, E. T. Smith. [Vivian]
264 Wakefield, Somerset A. Beaumont.
265 Wallington, Stanley Vickers.
266 Walsall, Charles Forster.
267 Wareham, J. S. W. Drax.
268 Warrington, R. Hyland.
269 Warwickshire (N), C. N. Newdegate, W. Bromley-Lawrence.
270 Warwickshire (S), H. C. Wise, John Hardy.
271 Warwick, A. W. Peel, E. Greaves.
272 Wexford, Alexander Brogden.
274 Westminister, Chas. Paul Phipps.
278 Whitby, W. H. Gladstone.
279 Whitehaven, G. A. F. Bentinck.
280 Wigan, H. Woods, J. Lancaster.
281 Wight, Isle of, Sir John Simeon, Bt.
283 Wiltshire (N), Lord C. Bruce, Sir G. Jekinson. [Grove]
284 Wiltshire (S), Lord H. Thynne, T. Fraser.
285 Winchester, J. Bonham-Carter, W. B. Simonds.
286 Windermere, Roger Eykyn.
287 Wolverhampton, Rt. Hon. C. P. Villiers, T. M. Weggelin.
288 Woodstock, Henry Barnett.

Commons:

289 Worcestershire (E), R. P. Amplett, Hon. Chas. G. Lyttleton.
290 Worcestershire (W), F. W. Knight, W. K. Dowdeswell.
292 Wycombe, Hon. W. H. P. Canning.
293 Yorkshire (N), F. A. Milbank, Hon. Octavius Duncombe.
294 Yorkshire (E), C. Sykes, W. H. Broadley.
295 Yorkshire (W., N.D.), Sir Frank Crossley, Bt., Lord F. C. Cavendish.
296 Yorkshire (R., E.D.), C. B. Denison, Joshua Fielden.
298 York, James Lowther, J. B. Westhead.

Scotland:

299 Aberdeen Co (East), W. D. Forde.
300 Aberdeen Co (West), W. McCombie.
301 Aberdeen, Col. W. H. Sykes.
302 Andrews (St.), Cupar, M., E. Ellice.
303 Argyll Co, Marquis of Lorne.
304 Arron Co (North), Wm. Pirrie.
305 Arron Co (South), Sir D. Wedderburn, Bt.
308 Berwick Co, David Robertson.
309 Bute, C. Dalrymple.
310 Caithness, Sir J. G. Tollemache Sinclair.
311 Caithness and Kincard, W. P. Adam.
312 Dunbar, Archibald, E. Orr Ewing.
313 Dumfries Co, Major G. G. Walker.
314 Dumfries, R. Jardine. [stead]
315 Dunedee, Sir John Ogilvy, Bt., Geo. Armistead.
317 Edinburgh, Duncan McLaren, J. Miller.
318 Edinburgh & St. Andrews Universities, Dr. Lyon Playfair.
319 Elgin Co, Lt.-Col. Hon. J. Grant.
320 Elgin, Banff, M., M. Grant Duff.
322 Forfar, Sir Robert Anstruther, Bt.
323 Forfar, Hon. C. Carnegie.
325 Glasgow and Aberdeen Universities (vacant).
326 Greenock, Jas. J. Griev.
327 Haddington Co, Lord Elcho.
328 Haddington, M., Sir H. R. F. Davis, Bt.
329 Hawick, Jas. G. O. Trevelyan.
330 Inverness Co, D. Cameron.
331 Inverness, Nairn, M., G. W. Macintosh.
332 Kilmarnock, Bt. Hon. E. P. Bouverie.
333 Kincardine, J. D. Nicol.
334 Kirkcaldy Burgh, R. S. Aytoun.
335 Kirkcudbright, W. H. Maxwell. [Bt]
336 Lanark Co (North), Sir 2nd. Sir A. J. Colebrooke.
337 Lanark Co (South), J. G. C. Hamilton.
338 Leith, M., Rob. A. Macle.
339 Linlithgow Co, Peter McLellan.
341 Orkney and Shetland, Fred. Dundas.
342 Paisley, H. E. C. Ewing.
343 Perth Co, C. S. Parker.
344 Perth, Hon. A. F. G. Kinnaird.
345 Renfrew Co, Bt. Hon. H. A. Bruce.
346 Ross and Cromarty, Alex. Matheson.
347 Roxburgh Co, Sir Wm. Scott, Bt.
IRELAND.

355 Armagh, Sir J. M. Stronge, Bt., William Verney.
356 Armagh, J. V. Vance.
357 Athlone, J. J. Ennis.
358 Bandon, W. Shaw.
359 Belfast, W. Johnston, T. McClure.
360 Carlow, Henry Bruen, A. Kavanagh.
361 Carlow, Capt. Wm. Fagan.
362 Carrickfergus, M. R. Dalway.
363 Casteltown, (seat vacant).
365 Clare, Col. C. M. Vandeleur, Rt. Hon. Sir Colman O'Loghlin, Bt.
366 Clonmel, John Bagwell.
367 Coleraine, Sir H. H. Bruce, Bt.
368 Cork City, A. Smith Barry, M'C. Downing.
369 Cork City, J. F. M'Guire, N. D. Murphy.
370 Donegal, T. Conolly, Marq. of Hamilton.
371 Downpatrick, W. Keown.
373 Drogheda, Thos. Whitworth.
375 Dublin City, Jonathan Pim, (one seat vacant).
376 Dublin University, A. Lefroy, Rt. Hon. J. T. Ball.
377 Dundalk, P. Callam.
379 Dundunvan, H. Matthews.
380 Ennis, Capt. W. Stackpoole.
381 Enniskillen, Visct. Crichton.
384 Galway, Lord St. Lawrence, Sir R. Blennerhasset, Bt.
388 Kilkenny, Sir John Gray. [Kilis.
389 King's Co., Sir P. O'Brien, Bt., D. Sherlock.
390 Kinsale, Sir George Conway Colthurst, Bt.
392 Lisburn, E. W. Verner.
393 Londonderry, R. P. Dawson, Sir F. W. Heygate, Bt.
395 Louth Co., Rt. Hon. C. S. Fortescue, M. O'Reilly-Dease.
396 Mallow, Rt. Hon. E. Sullivan.
399 Monaghan Co., C. F. Leslie, S. E. Shirley.
400 Newry, W. M. Kirk.
401 Portarlington, Capt. Hon. Dawson Damer.
404 Ross, New, Patrick McMahon.
406 Sligo, (seat vacant).
407 Tipperary, Hon. Capt. C. White (one seat vacant).
408 Tralee, Daniel O'Donoghue.
410 Waterford Co., J. Esmonde, E. De La Poer.
411 Waterford, J. A. Blake, Jas. Delahunty.
413 Wexford, M. P. D'Arcy, J. T. Power.
414 Wexford, E. J. Devineux.
420 Yorksh, Montague J. Guest.

ALPHABETICAL LIST OF THE MEMBERS.

The Numbers refer to the Places in the Preceding List.

Acland, 77
Adair, 127
Adam, 311
Adlerley, 236
Agar-Ellis, 388
Akroyd, 110
Allen, 179, 230
Amcotts, 150
Amory, 360
Ampthill, 289
Anderson, 324
Annally, 366
Anson, 15
Anstruther, 322
Antrim, 382
Arklow, 283
Arkwright, 11, 146
Armistead, 315
Battelot, 253
Bass, 74, 238
Bateson, 75
Bathurst, 58
Baxter, 340
Bazley, 164
Beach, 101, 111
Beaumont, 67
Bolingbroke, 190, 234, 297
Bective, 276
Bentall, 161
Bennett, 279
Benyon, 12
Berkeley, 29
Biddulph, 118
Bingham, 461
Birley, 184
Blake, 415
Blennerhasset, 386
Bolckow, 170
Bonham-Carter, 285
Booth, 409
Bouquet, 133
Bourne, 92
Bouverie, 322
Bowring, 63
Brady, 392
Brand, 36, 120
Brassey, 118, 224
Bremer, 61
Bright, 17, 164, 230
Brinckman, 39
Brisco, 251
Brise, 90
Broadley, 234
Brockenhurst, 159
Brodrick, 250
Broden, 272
Brooks, 51
Brown, 273
Bruce, 185, 283;
Buckley, 179
Bullen, 185, 236
Burke, 255
Burren, 281
Burke, 57, 384
HOUSE OF COMMONS.

Burrell, 223
Bury, 13
Butlton, 249
Cadogan, 65
Callam, 378
Cameron, 330
Carnegie, 323
Cartwright, 187
Castle, 142
Cavendish, 71
Cawley, 220
Cecil, 59
Chamberlain, 159
Chambers, 76, 167
Chaplin, 150
Charley, 220
Child, 237
Childers, 205
Cliffe, 104
Clay, 134
Clement, 229
Clive, 119, 157
Clowes, 143
Cogan, 337
Cole, 283
Colebrooke, 336
Coleridge, 136
Collier, 204
Collins, 21
Colquhoun, 391
Conolly, 371
Corbally, 402
Corbett, 223
Corrane, 246
Corry, 413
Courtney, 78
Cowper, 112, 120
Crawford, 306
Crawford, 155
Crichton, 382
Croft, 118
Cross, 140
Crossley, 295
Cubitt, 251
Curzon, 144
Dalglish, 324
Dalrymple, * 369
Darwin, 363
Damer, 465
D'Arcy, 417
Davenport, 269
Davey, 328
Davies, 3
Davison, 83
Dawson, 396
Dean, 399
De Grey, 184
Delahunty, 415
De la Poer, 414
De Berenger, 122
Denman, 260
Dent, 225
Dreyer, 418
Dick, 418
Dickenson, 245
Dickson, 83
Dible, 466
Dillwyn, 254
Dinmore, 121
Disraeli, 30
Dixon, 17
Dodds, 243
Dodson, 252
Dowdswell, 230
Downing, 369
Dowse, 307
Drax, 267
Drury, 350, 320
Duncombe, 293
Dundas, 211
Dundurn, 369
Dwyer, 130
Dyke, 148
Eastwick, 291
Eaton, 61
Edwards, 277
Edwardses, 116
Egerton, 52, 53, 73, 139
Eldon, 327
Elliot, 302
Elliot, 96
Elephantine, 207
Enfield, 171
Emmis, 358
Erskine, 319
Esmonde, 414
Ewing, 312, 312
Evans, 298
Fagan, 382
Fawcett, 23
Felida, 18
Feloues, 124
Fennel, 269
Figgins, 229
Finch, 217
Finnis, 304
Fitzgerald, 387
Fitzmaurice, 35
Fitzpatrick, 406
Fitzwilliam, 163, 419
Fletcher, 69
Floyer, 82
Foljambe, 212
Forre, 373
Fordyce, 299
Forster, 273
Forster, 22, 266
Forsyte, 2, 299
Fothergill, 169
Fowler, 38, 201
French, 406
Galway, 259
Gallway, 212
Gardles, 353
Gavin, 394
Gilpin, 10, 188
Gladstone, 107
Glyn, 228
Goldney, 56
Goldsmith, 211
Gooch, 65
Gore, 222, 292
Goschen, 155
Gourley, 248
Gower, 19, 351
Grant, 319
Graves, 154
Gray, 20, 389
Greaves, 271
Greene, 34
Gregory, 232, 384
Greville, 291
Greville, 416
Grey, 177
Grieve, 326
Grosvenor, 54, 206
Grorce, 284
Guest, 206, 420
Gurney, 243
Hadfield, 227
Hambo, 277
Hamilton, 171
Hamilton, 371, 375
Hamner, 97
Harcourt, 197
Hardcastle, 34
Hardy, 198, 218, 70
Harris, 145
Hartington, 210
Hays, 241
Headlam, 189
Henderson, 88
Henley, 168, 198
Hemming, 246
Henry, 139
Herbert, 223, 386
Hermon, 208
Hervey, 247
Hesketh, 208
Hesegrave, 396
Hibbert, 195
Hibbs, 20
Hildyard, 193
Hill, 64
Hoare, 49, 233
Hoggkinson, 178
Hodgson, 66
Holford, 101
Holmesdale, 130
Holmes, 109
Holt, 138
Hood, 232
Hope, 37
Hornby, 18
Horsman, 133
Hoskins, 119
Howard, 11, 66
Hove, 182
Hughes, 47, 93
Hunt, 186
Hurst, 122
Hutt, 99
Hutton, 185
Hyde, 24
Ilingworth, 135
Ingram, 257
Jackson, 113
James, 256
Jardine, 314
Jenkinson, 283
Jervis, 114
Jessel, 83
Johnson, 380
Johnston, 39, 91, 225
Jones, 44
Kavanagh, 361
Kekewich, 79
Kew, 372
King, 249
Kinglake, 316
Kingscote, 102
Kinnaird, 344
Kirk, 404
Ansbach-Hussen, 224
Knight, 290
Knightley, 187
Knox, 379
Lacock, 182
Laird, 16
Lamb, 30
Lancaster, 290
Langton, 232
Lassett, 291
Lawrence, 136, 155, 385
Lawson, 43
Lea, 132
Leatham, 123
Lee, 169
Lefevre, 211
Lefroy, 377
Legh, 51, 52
Lennox, 55, 158
Lees, 403
Lewis, 16, 167
Liddell, 190
Lindsay, 1, 8
Lloyd, 12
Loyd, 392
Locke, 235
Lopes, 79, 141
Lorne, 383
Lowe, 158
Lowther, 67, 276, 298
Lush, 221
Lush, 95
Lyttelton, 259
Macintosh, 331
MacArthur, 136
McClure, 369
McCombe, 300
Macle, 338
McEvoy, 402
McGlashan, 339
McLaren, 317
McLean, 233
McMahon, 408
Maghamee, 219
Maguire, 370
Maitland, 316
Malcolm, 21
Manners, 56, 143
March, 253
Marling, 162
Martin, 316
Mathew, 316
Matthews, 380
Maxwell, 335
Mellor, 4
Melly, 244
Meyrick, 209
Miall, 22
Milbanke, 293
Miller, 317
Mills, 129
Mills, 121
Mitton, 297
Mitchell, 27
Mitford, 172
Monk, 103
Monsell, 382
Montagu, 184
Montgomery, 348
Moore, 401
Morgan, 23, 69
Morley, 29
Morris, 204
Mowbray, 188
Mundella, 227
Muntz, 17
Murphy, 370
Newdegate, 295
Newport, 222
Nicholson, 203
Nicoll, 333
Noel, 217
North, 115, 195
Northcote, 77
Norwood, 134
Nugent, 398
O'Brien, 390
O'Donnoghue, 412
O'Goghe, 366
O'Reilly, 398
Ogilvy, 315
Onslow, 108
Owry, 48
Paet, 231
Pakington, 84
Palk, 78
Palmer, 152, 223
Parker, 247, 38
Parry, 46
Patten, 137
Pease, 87
Peek, 250
Peel, 255, 271
Pelham, 147
Pell, 144
Pemberton, 129
Percy, 189
Phillips, 53
Phipps, 374
Pim, 376
Platt, 195
Playfair, 316
Plimsoll, 74

OFFICERS OF THE HOUSE OF COMMONS.

Chief Clerk, Sir Denis Le Marchant, Bt.
Clerk Assistant, Sir T. Erskine May, K.C.B.
Second Clerk Assistant, Reginald Palgrave.
Clerk of Public Bills & Fees, W. Rose.
Accountants, G. Broom, W. O. Mayne.
Clerk of Committees, C. W. Pole.
Clerk of Journals, J. L. Postlethwaite.
Clerk, Private Bill Office, W. Hodgkin.
Speaker's Secretary, Alfred Denison.
Counsel to Speaker, G. K. Rickards.
Examiner of Petitions for Private Bills, Chas. Freer.

Taxing Master, Charles Freere.
Short-hand Writer, Joseph Gurney.
Serjeant-at-Arms, Lord C. J. F. Russell.
Deputy Serjeant, Capt. R. A. Gossett.
Assistant Serjeant, Col. C. W. Forrest.
Deliverer of Votes, J. J. Collins.
Chaplain, Rev. C. Jeramile, B.D.
Printer of Journals, Henry Harsand.
Printers of Votes, J. G. Nichols and R. C. Nichols.
Librarian, G. Howard.
Assistant-Librarian, W. Hearn.

LIST OF THE NOBILITY OF SCOTLAND AND IRELAND,
Who, not being Peers of Parliament, have no seat in the House of Lords.

SCOTLAND.

MARQUIS.
Queensberry (Douglas), b. 1844. s. 1858.

EARLS.
Breadalbane (Campbell), b. 1834. s. 1862.
Buchan (Erskine), b. 1815. s. 1857.
Carnwath (Hawtrey), b. 1858. s. 1868.
Dundonald (Cochrane), b. 1814. s. 1860.
Dyart (Tollemache), b. 1794. s. 1840.
Kellett (Erskine), b. 1810. s. 1866.
Mar (Goodeve-Erskine), b. 1836. s. 1866.
Northesk (Carnegie), b. 1794. s. 1831.
Perth (Urmston), b. 1807. s. 1853.
Southesk (Carnegie), b. 1827. s. 1855.
Strathmore (Bowes), b. 1824. s. 1865.

VISCONTI.
Arbuthnot (Arbuthnot), b. 1806. s. 1860.

BARONS.
Balfour (Burleigh), b. 1849. s. 1869.
Cranston (Cranstone), b. 1809. s. 1818.
Elibank (Murray), b. 1804. s. 1830.
Fairfax (Fairfax), b. 1830. s. 1846.
Forbes (Forbes), b. 1829. s. 1869.
Herries (Constable-Maxwell), b. 1804. s. 1858.
J Napier (Napier), b. 1819. s. 1834.
Polwarth (Scott), b. 1835. s. 1867.
Reay (Mackay), b. 1813. s. 1863.
Ruthven (Hare-Ruthven), b. 1837. s. 1861.
Somerville (Somerville), b. 1839. s. 1864.
Torpischen (Sandlands), b. 1807 s. 1862.
IRELAND.

EARLS.
Aldborough (Stratford), b. 1808. s. 1849.
Antrim (McDonnell), b. 1814. s. 1855.
Arran (Gore), b. 1801. s. 1857. P.
Caledon (Alexander), b. 1846. s. 1855.
Carick (Butler), b. 1835. s. 1856.
Castle-Stuart (Stuart), b. 1810. s. 1857.
Cavan (Lambert), b. 1815. s. 1837.
Charleville (Bury), b. 1852. s. 1859.
Clonmel (Scott), b. 1834. s. 1866.
Desert (Giff), b. 1845. s. 1865.
Howth (St. Lawrance), b. 1863. s. 1822. P.
Kilmorey (Needham), b. 1767. s. 1832.
Lanesborough (Butler-Danvers), b. 1839. s. 1866.
Lissburne (Vaughan), b. 1860. s. 1831.
Listowel (Hare), b. 1833. s. 1856.
Liz Mayo (Bourke), b. 1822. s. 1867. P.
Mecrowborought (Siville), b. 1810. s. 1860.
Milltown (Lees), b. 1829. s. 1866.
Norbury (Toler), b. 1810. s. 1839.
Normanton (Ellis-Agar), b. 1818. s. 1868.
Winterton (Turnour), b. 1812. s. 1833.

VIS COUNTS.
Ashbrook (Flower), b. 1806. s. 1847.
Avonmore (Wilvert), b. 1790. s. 1814.
Barrington (Barington), b. 1824. s. 1867.
Cheatwynd (Chatwynd), b. 1800. s. 1821.
Dill (Dillon-Lee), b. 1811. s. 1865.
Downe (Dawney), b. 1844. s. 1857.
Frankfort (De Montmorency), b. 1806. s. 1822.
Galway (Arundell), b. 1805. s. 1834.
Gort (Verelker), b. 1819. s. 1865.
Guillemore (O’Grady), b. 1835. s. 1860.
Harbenton (Pomery), b. 1836. s. 1862.
Lorton (King), b. 1804. s. 1855.
Molesworth (Molesworth), b. 1788. s. 1815.
Mountgarrett (Butler), b. 1816. s. 1846.
Mountmorres (De Montmorency), b. 1798. s. 1833.
Ranelagh (Jones), b. 1812. s. 1820.

SOUTH WELL (Southwell), b. 1836. s. 1869.
Taaffe (Taaffe), b. 1843. s. 1855.
Valentia (Anneley), b. 1843. s. 1853.

BARONESSES.
Ashtown (Trench), b. 1864. s. 1840.
Aylmer (Aylmer), b. 1814. s. 1853.
Bellieu (Bellieu), b. 1830. s. 1866.
Bloomfield (Bloomfield), b. 1802. s. 1846.
Carbery (Lannere-Freke), b. 1801. s. 1845.
Clannorris (Bingham), b. 1826. s. 1847.
De Biaquiere (De Biaquiere), b. 1812. s. 1853.
Deedes (Beresford), b. 1811. s. 1855.
Dunmore (Prittie), b. 1807. s. 1854.
Farnham (Maxwell), b. 1803. s. 1865.
Fermoy (Roche), b. 1815. s. 1856.
Garvagh (Canning), b. 1826. s. 1840.
Graves (Graves), b. 1804. s. 1830.
Henly (Henley), b. 1825. s. 1841.
Houghton (United), b. 1791. s. 1819.
Huntingfield (Vannock), b. 1818. s. 1844.
Kensington (Edwards), b. 1801. s. 1852.
Kingsale (De Courcy), b. 1828. s. 1865.
Langford (Rowley), b. 1849. s. 1854.
Lisle (Lyasgagh), b. 1811. s. 1868.
Louth (Flaggnet), b. 1832. s. 1849.
Macdonald (Macdonald), b. 1849. s. 1863.
Macnay (Macey), b. 1827. s. 1836.
Mackintosh (Pennington), b. 1834. s. 1862.
Muskerly (Jeanes), b. 1854. s. 1868.
Newborough (Yunn), b. 1803. s. 1832.
Ongley (Ongley), b. 1803. s. 1814.
Ogramore (Guthrie), b. 1819. s. 1860.
Ogilvie (Wodlengrave), b. 1853. s. 1857.
Rendlesham (Thelinson), b. 1840. s. 1852.
Rokeby (Montagu), b. 1792. s. 1847.
Sherard (Sherard), b. 1804. s. 1859.
Teignmouth (Shear), b. 1796. s. 1834.
Teignmouth (Barnes), b. 1796. s. 1839.
Ventry (De Mollyns), b. 1829. s. 1863.
Walcourt (Blake), b. 1841. s. 1849.
Waterpark (Cavendish) b. 1839. s. 1863.

PEER AND THEIR OWN RIGHT.

UNITED KINGDOM.

DUCHESS.
Inverness (Underwood), b. 1789. c. 1840.

COUNTESS.
Cromartie (Gower), b. 1829. c. 1861.

VIS COUNTS.
Beaconsfield (Dysart), b. 1806. c. 1863.

COUNTESSES.
Loudon (Clifton), b. 1832. s. 1868.
Newburgh (Kemp), b. 1796. s. 1858.
Rothes (Leslie), b. 1802. s. 1859.

SCOTLAND.

GRAY (Gray), b. 1799. s. 1867.

Sempill (Sempill), s. 1855.

BARONESSES.
<table>
<thead>
<tr>
<th>PRINCES AND HIGH DIGNITARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prince of Wales</td>
</tr>
<tr>
<td>Duke of Edinburgh</td>
</tr>
<tr>
<td>Duke of Cambridge</td>
</tr>
<tr>
<td>Archbishop of Canterbury</td>
</tr>
<tr>
<td>Lord High Chancellor (L.Ed.) Hatherley</td>
</tr>
<tr>
<td>Archbishop of York</td>
</tr>
<tr>
<td>Earl de Grey and Ripon (President of the Council)</td>
</tr>
<tr>
<td>Earl of Kimberley (Lord Privy Seal)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VIScounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eversley</td>
</tr>
<tr>
<td>Falskland</td>
</tr>
<tr>
<td>Halifax</td>
</tr>
<tr>
<td>Monk</td>
</tr>
<tr>
<td>Stratford</td>
</tr>
<tr>
<td>Sydney</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TITULAR LORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lord Ernest Bruce</td>
</tr>
<tr>
<td>Viscount Bury</td>
</tr>
<tr>
<td>Viscount Castlerose</td>
</tr>
<tr>
<td>Lord Otto Fitzgerald</td>
</tr>
<tr>
<td>Lord Cloud Hamilton</td>
</tr>
<tr>
<td>Marquis of Hartington</td>
</tr>
<tr>
<td>Lord Edward Howard</td>
</tr>
<tr>
<td>Lord Augustus Loftus</td>
</tr>
<tr>
<td>Lord John Manners</td>
</tr>
<tr>
<td>Lord Robert Montagu</td>
</tr>
<tr>
<td>Lord Clarence Paget</td>
</tr>
<tr>
<td>Viscount Royston</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BARONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop of London</td>
</tr>
<tr>
<td>Athlone</td>
</tr>
<tr>
<td>Belper</td>
</tr>
<tr>
<td>Bloomsfield</td>
</tr>
<tr>
<td>*Mansfield</td>
</tr>
<tr>
<td>Colchester</td>
</tr>
<tr>
<td>Colville</td>
</tr>
<tr>
<td>De Ross</td>
</tr>
<tr>
<td>De Tabley</td>
</tr>
<tr>
<td>Ebury</td>
</tr>
<tr>
<td>Foley</td>
</tr>
<tr>
<td>Forester</td>
</tr>
<tr>
<td>Hylton</td>
</tr>
<tr>
<td>Kesteven</td>
</tr>
<tr>
<td>Kincaid</td>
</tr>
<tr>
<td>Lawrance</td>
</tr>
<tr>
<td>Lyons</td>
</tr>
<tr>
<td>Lyttelton</td>
</tr>
<tr>
<td>Lyttom</td>
</tr>
<tr>
<td>Lyveden</td>
</tr>
<tr>
<td>Napier</td>
</tr>
<tr>
<td>Northbrooke</td>
</tr>
<tr>
<td>*Penzance</td>
</tr>
<tr>
<td>*Romilly</td>
</tr>
<tr>
<td>*St. Leonards</td>
</tr>
<tr>
<td>*Wesbury</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMONERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Evelyn Denison (Speaker of the House of Commons)</td>
</tr>
<tr>
<td>C. B. Adderley</td>
</tr>
<tr>
<td>H. U. Addison</td>
</tr>
<tr>
<td>H. J. Baillie</td>
</tr>
<tr>
<td>W. Beresford</td>
</tr>
<tr>
<td>Hon. E. P. Bouverie</td>
</tr>
<tr>
<td>*Sir W. Bovill</td>
</tr>
<tr>
<td>Hon. H. W. E. Brand</td>
</tr>
<tr>
<td>John Bright</td>
</tr>
<tr>
<td>H. A. Bruce</td>
</tr>
<tr>
<td>Sir A. Buchanan</td>
</tr>
<tr>
<td>Sir H. L. E. Bulwer</td>
</tr>
<tr>
<td>Edward Cardwell</td>
</tr>
<tr>
<td>Stephen Cave</td>
</tr>
<tr>
<td>Hugh G. E. Childers</td>
</tr>
<tr>
<td>*Sir A. J. E. Cockburn, Bt.</td>
</tr>
<tr>
<td>*Sir J. T. Coleridge</td>
</tr>
<tr>
<td>*Sir James W. Colvile</td>
</tr>
<tr>
<td>Hon. H. T. L. Corry</td>
</tr>
<tr>
<td>Hon. W. F. Cowper</td>
</tr>
<tr>
<td>Sir W. G. Craig, Bt.</td>
</tr>
<tr>
<td>B. Diaselli</td>
</tr>
<tr>
<td>Sir David Dundas</td>
</tr>
<tr>
<td>Hon. H. G. Elliot</td>
</tr>
<tr>
<td>*Sir William Ede</td>
</tr>
<tr>
<td>T. H. S. Sothern-Escombe</td>
</tr>
<tr>
<td>Sir James Ferguson, Bt.</td>
</tr>
<tr>
<td>Sir W. R. S. V. Fitzgerald</td>
</tr>
<tr>
<td>Hon. G. C. W. Forster</td>
</tr>
<tr>
<td>W. E. Forster</td>
</tr>
<tr>
<td>C. S. Fortescue</td>
</tr>
<tr>
<td>Sir T. F. Fremantle, Bt.</td>
</tr>
<tr>
<td>Thomas Milner Gibson</td>
</tr>
<tr>
<td>*Sir Geo. M. Giffard</td>
</tr>
<tr>
<td>W. Ewart Gladstone</td>
</tr>
<tr>
<td>G. J. Gislen</td>
</tr>
<tr>
<td>Sir G. Grey, Bt.</td>
</tr>
<tr>
<td>Russell Gunney</td>
</tr>
<tr>
<td>G. A. Hamilton</td>
</tr>
<tr>
<td>R. A. C. Nisbet Hamilton</td>
</tr>
<tr>
<td>Edmund Hammond</td>
</tr>
<tr>
<td>Gathorne Hardy</td>
</tr>
<tr>
<td>Sir W. G. Hayter, Bt.</td>
</tr>
<tr>
<td>Sir Frans. Bond Head, Bt.</td>
</tr>
<tr>
<td>T. E. Headlam</td>
</tr>
<tr>
<td>J. W. Henley</td>
</tr>
<tr>
<td>Hon. F. E. Herbert</td>
</tr>
<tr>
<td>Edward Horsman</td>
</tr>
<tr>
<td>Geo. Ward Hunt</td>
</tr>
<tr>
<td>*Sir William Hutt</td>
</tr>
<tr>
<td>*John Inglis</td>
</tr>
<tr>
<td>*Sir Fitzroy Kelly</td>
</tr>
<tr>
<td>*Sir R. F. Kindersley</td>
</tr>
<tr>
<td>A. H. Layard</td>
</tr>
<tr>
<td>Robert Lowe</td>
</tr>
<tr>
<td>Stephen Lushington</td>
</tr>
<tr>
<td>Holt Mackenzie</td>
</tr>
<tr>
<td>W. N. Massey</td>
</tr>
<tr>
<td>Sir John McNeill</td>
</tr>
<tr>
<td>J. Moncrieff</td>
</tr>
<tr>
<td>William Monsell</td>
</tr>
<tr>
<td>J. R. Mowbray</td>
</tr>
<tr>
<td>Sir Joseph Napier, Bt.</td>
</tr>
<tr>
<td>Sir S. H. Northcote, Bt.</td>
</tr>
<tr>
<td>R. More O'Ferrall</td>
</tr>
<tr>
<td>Sir C. M. O'Loghlin, Bt.</td>
</tr>
<tr>
<td>Sir J. S. Pakington, Bt.</td>
</tr>
<tr>
<td>John Parker</td>
</tr>
<tr>
<td>J. Wilson Patten</td>
</tr>
<tr>
<td>Sir Laurence Peel</td>
</tr>
<tr>
<td>Frederick Peel</td>
</tr>
<tr>
<td>Sir Robert Peel, Bt.</td>
</tr>
<tr>
<td>Jonathan Peel</td>
</tr>
<tr>
<td>*Sir R. J. Phillimore</td>
</tr>
<tr>
<td>*Sir Frederick Pollock, Bt.</td>
</tr>
<tr>
<td>*Sir John Rolfe</td>
</tr>
<tr>
<td>Sir E. Ryan</td>
</tr>
<tr>
<td>Sir G. H. Seymour</td>
</tr>
<tr>
<td>James Staniford</td>
</tr>
<tr>
<td>Sir H. K. Storks</td>
</tr>
<tr>
<td>Thomas E. Taylor</td>
</tr>
<tr>
<td>Hon. C. P. Villiers</td>
</tr>
<tr>
<td>S. H. Walpole</td>
</tr>
<tr>
<td>*Sir E. V. Williams</td>
</tr>
<tr>
<td>Hon. J. A. S. Wortley</td>
</tr>
<tr>
<td>*Sir John Young, Bt.</td>
</tr>
</tbody>
</table>
### Archbishops and Bishops, England

#### Archbishops

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Archbishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1865</td>
<td>Canterbury</td>
<td>Rt. Hon. A. C. Tait, D.C.L.</td>
</tr>
<tr>
<td>1862</td>
<td>York</td>
<td>Rt. Hon. W. Thomson, D.D.</td>
</tr>
</tbody>
</table>

#### Bishops

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Bishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1859</td>
<td>Bangor</td>
<td>J. C. Campbell, D.D.</td>
</tr>
<tr>
<td>1860</td>
<td>Bath &amp; Wells (designate)</td>
<td>Lord A. Hervey, D.D.</td>
</tr>
<tr>
<td>1860</td>
<td>Carlisle (designate)</td>
<td>H. Goodwin, D.D.</td>
</tr>
<tr>
<td>1865</td>
<td>Chester</td>
<td>William Jacobson, D.D.</td>
</tr>
<tr>
<td>1842</td>
<td>Chichester</td>
<td>Ashhurst T. Gilbert, D.D.</td>
</tr>
<tr>
<td>1861</td>
<td>Durham</td>
<td>Charles Baring, D.D.</td>
</tr>
<tr>
<td>1864</td>
<td>Ely</td>
<td>Edw. Harold Browne, D.D.</td>
</tr>
<tr>
<td>1869</td>
<td>Exeter (designate)</td>
<td>Fred. Temple, D.D.</td>
</tr>
<tr>
<td>1863</td>
<td>Gloucester &amp; Bristol</td>
<td>C. J. Ellicott, D.D.</td>
</tr>
<tr>
<td>1868</td>
<td>Hereford</td>
<td>James Atlay, D.D.</td>
</tr>
</tbody>
</table>

#### Bishops of Ireland

(By Statute 32 & 33 Vict. cap. 42, which obtained the royal assent July 26, 1869, the Church of Ireland will cease to be established by law on and after Jan. 1, 1871.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Bishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1862</td>
<td>Armagh</td>
<td>Rt. Hon. M. G. Beresford, D.D.</td>
</tr>
<tr>
<td>1864</td>
<td>Dublin</td>
<td>Rt. Hon. R. C. Trench, D.D.</td>
</tr>
</tbody>
</table>

#### Bishops of Colonial Bishops

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Bishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1861</td>
<td>Madras</td>
<td>Frederick Gell, D.D.</td>
</tr>
<tr>
<td>1869</td>
<td>Mauritius</td>
<td>Thos. G. Hatchard, D.D.</td>
</tr>
<tr>
<td>1847</td>
<td>Melbourne</td>
<td>Charles Ferry, D.D.</td>
</tr>
<tr>
<td>1866</td>
<td>Montreal</td>
<td>Ashton Oxden, D.D., Metrop.</td>
</tr>
<tr>
<td>1853</td>
<td>Nassau, Baha,</td>
<td>A. R. P. Venables, D.D.</td>
</tr>
<tr>
<td>1853</td>
<td>Natal</td>
<td>J. W. Colenso, D.D.</td>
</tr>
<tr>
<td>1856</td>
<td>Nelson</td>
<td>A. B. Suter, D.D.</td>
</tr>
<tr>
<td>1847</td>
<td>Newcastle</td>
<td>Wm. Tyrrell, D.D.</td>
</tr>
<tr>
<td>1879</td>
<td>Newfoundland</td>
<td>Edward Field, D.D.</td>
</tr>
<tr>
<td>1857</td>
<td>Newfoundland Assist.,</td>
<td>J. B. Kelly, D.D.</td>
</tr>
<tr>
<td>1851</td>
<td>Nova Scotia</td>
<td>Hibbert Binney, D.D.</td>
</tr>
<tr>
<td>1862</td>
<td>Ontario</td>
<td>T. J. Lewis, D.D., LL.D.</td>
</tr>
<tr>
<td>1857</td>
<td>Perth</td>
<td>M. B. Hale, D.D.</td>
</tr>
<tr>
<td>1865</td>
<td>Rupert's Land</td>
<td>R. Machray, D.D.</td>
</tr>
<tr>
<td>1863</td>
<td>Quebec</td>
<td>J. W. Williams, D.D.</td>
</tr>
<tr>
<td>1860</td>
<td>Sierra Leone</td>
<td>E. H. Beckles, D.D.</td>
</tr>
<tr>
<td>1868</td>
<td>St. Helena</td>
<td>T. E. Welby, D.D.</td>
</tr>
<tr>
<td>1854</td>
<td>Sydney</td>
<td>F. Barker, D.D., Metrop.</td>
</tr>
<tr>
<td>1864</td>
<td>Tasmania</td>
<td>C. H. Bromby, D.D.</td>
</tr>
<tr>
<td>1867</td>
<td>Toronto</td>
<td>A. N. Bethune, D.D., D.C.L.</td>
</tr>
<tr>
<td>1897</td>
<td>Victoria</td>
<td>C. R. Alford, D.D.</td>
</tr>
<tr>
<td>1859</td>
<td>Waiapu</td>
<td>N. Z., W. Williams, D.C.L.</td>
</tr>
<tr>
<td>1853</td>
<td>Wellington</td>
<td>N. Z., C. J. Abraham, D.D.</td>
</tr>
</tbody>
</table>

### Missionary Bishops

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Bishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1863</td>
<td>Central Africa</td>
<td>W. G. Tozer, D.D.</td>
</tr>
<tr>
<td>1861</td>
<td>Honolulu</td>
<td>T. N. Staley, D.D.</td>
</tr>
<tr>
<td>1861</td>
<td>Melanesia</td>
<td>J. C. Patteson, D.D.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Sees</th>
<th>Bishop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1864</td>
<td>Niger Territory</td>
<td>S. E. Crowther, D.D.</td>
</tr>
<tr>
<td>1869</td>
<td>Petermaritsburg</td>
<td>Wm. K. Macarrie, D.D.</td>
</tr>
<tr>
<td></td>
<td>Orange River</td>
<td>(vacant).</td>
</tr>
</tbody>
</table>
UNIVERSITIES OF THE UNITED KINGDOM.

ENGLAND.

OXFORD.

Elected.

Chancellor (vacant).
High Stew., Earl of Carnarvon, D.C.L. 1899
Vice-Chancellor, F. K. Leighton, D.D. 1898
Pro-Vice-Chancellor, Dr. Plumptre, Master of
University: Drs. Lightfoot, Rector of Exeter; Dr. Liddell, Dean of Christ Church;
Dr. Sewell, Warden of New College.
Proctors, C. L. Wingfield, M.A., All Souls;
W. F. Short, M.A., New.
Pro-Proctors, Rev. J. W. Nutt, M.A., All
Sous; Rev. J. P. Garnier, M.A., All Souls;
Rev. L. J. Lee, M.A., New; Rev. H. B.
George, M.A., New.

Colleges.

Founded.

Heads. Elected.

872 Univers., F. C. Plumptre, D.D. 1846
1262 Balliol, Robert Scott, D.D. 1854
1274 Magdalen, R. B. Marsham, D.C.L. 1852
1316 Exeter, J. P. Lightfoot, D.D. 1854
1325 Oriel, E. Hawkins, D.D. 1823
1340 Queen's, W. Jackson, D.D. 1862
1375 New Coll., J. E. Sewell, D.D. 1860
1427 Lincoln, M. Pattison, B.D. 1861
1437 All Souls, F. K. Leigh-ton, D.D. 1858
1449 Magdalen, F. Bulley, D.D. 1865
1511 Brasenose, E. H. Cradock, D.D. 1853
1516 Corp. Christi, J. Norris, D.D. 1843
1532 Chr. Church, H. G. Liddell, D.D. 1855
1555 Trinity, S. W. Wayte, B.D. 1866
1557 St. John's, P. Winter, D.D. 1828
1571 Jesus, Charles Williams, D.D. 1857
1613 Wadham, B. P. Symons, D.D. 1831
1620 Pembroke, E. Evans, M.A. 1864
1547 St. Alban Hall, W. C. Salter, M.A. 1861
1269 St. Edmund Hall, E. Moore, B.D. 1864
1333 St. Mary Hall, D. P. Chase, M.A. 1857
1392 New Inn Hall, H. H. Cornish, D.D. 1865
1602 Magdalen Hall, R. Michell, D.D. 1868

Professors and Public Readers.

Divinity (Reg.), R. Payne Smith, D.D. 1865
Civil Law (Regius), Sir Travers Twiss, D.C.L.

Medicine (Regius), H. W. Acland, M.D.

Hebrew (Regius), E. B. Pusey, D.D.

Greek (Regius), B. Lowett, M.A.

Divinity (Mang.), C. A. Heurtley, D.D.

Eccles. Hist. (Reg.), Wm. Bright, M.A.

Paste. Theol. (Reg.), C. A. Gouinville, D.D.

Nat. Philosophy, B. Price, M.A.

Geometry (Savil.), H. J. S. Smith, M.A.

Astron. (Savil.), W. F. Donkin, M.A.

Moral Phil. (Whites'), J. M. Wilson, B.D.

History (Lamden), G. Rawlinson, M.A.

History, Reader in W. L. Newman, M.A.


Arabic (Laude), R. Gaudell, M.A.

Botany and Riv. Eon., M. A. Lawson, M.A.

Poetry, Sir F. H. Doyle, Bt., B.C.L.

Med. Hist. (Reg.), W. Stubbs, M.A.

Anglo-Saxon, J. Bosworth, D.D.

Law (Viner), J. R. Kenyon, D.C.L.

Venerian Reader, K. E. Digby, M.A.

Clinical Medicine, H. W. Acland, M.D.

Arabic (L. Alm.), T. Chenery, M.A.

Experim. Philos., R. B. Clifton, M.A.

Mineralogy, M. H. S. MASKelyne, M.A.

Geology, J. Phillips, M.A.

Pol. Econ., Bosanquet Price, M.A.

Fine Arts (Slaufe), John Ruskin, M.A.

Sanskrit, M. N. Williams, M.A.

Comparative Philology, Max Muller, M.A.

Logic, Rev. H. Wall, M.A.

Exegesis of Holy Scripture (Dean Ireland's), Robert Scott, D.D.

Latin Literature (vacant).

Moral and Metaphysical Phil. (Waynflete), H. W. Chandler, M.A.

International Law and Diplomacy (Chichele), M. Bernard, B.C.L.

Physiology (Littauer), George Rolleston, M.D.

Zoology (Hope), J. O. Westwood, M.A.

Modern History (Chichele), M. Burrows, M.A.

Chemistry (Waynflete), Sir B. Brodie, Bt., M.A.

Public (orator, Rev. B. Michell, D.D.

Bodleian Librarian, Rev. H. O. Coxe, M.A.

Custos Archiev., Rev. J. Griffiths, M.A.

Keeper of Ash. Mus., J. Phillips, M.A.

Radcliffe Librarian, H. W. Acland, M.D.

Radcliffe Observer, Rev. Robert Main, M.A.

Select Preachers for 1869-70.

Bishop of Winchester, D.D., Oriel; Bishop of Rochester, D.D., Trinity; W. H. How,
M.A., Wadham; Bishop of Chester, D.D., Ch. Ch.; H. L. Mansell, D.D., Ch. Ch.;
J. B. Mowley, B.D., Magdalen; A. Bloxfield, M.A., all Souls; C. Martin, M.A.,
Ch. Ch.

University Officers.

Assessor: M. Bernard, B.C.L. — University
Registrar: E. W. Rowden, D.C.L. — Proctors in the Vice-Chancellor's Court:
F. J. Morrell, J. C. Dudley, T. Mallam, J. M.

Coroners: F. Symonds, R.C.S., F. P. Mor-
reil, M.A. — Council: Sir R. Palmer, D.C.L.

Burs. F. J. Morrel — Clerks of the Market:
E. W. Rowden, D.C.L.; C. Neate, M.A.

Exequy Bedell: Wm. Waters Harrison,
M.A. — Yeomen Bedells: H. Smith Harper;
John Haines — Clerks of the Schools, George
Parker. — Verger: Moses Holloway. — Bailiff:
Alfred Jas. Green.
CAMBRIDGE.

Chancellor, Duke of Devonshire, B.K. (Elected)

High Steward, Earl Poulson, L.L.D. 1861

Vice-Chancellor, Rev. E. Atkinson, D.D. 1861

Commissary, Wm. Forsyth, M.A., Q.C. 1862

Assessor to Chan., J. Tozer, L.L.D. 1852

COLLEGEs AND HALLs.

Founded Heads. Elected

1257 St. Peter's, H. W. Cookson, D.D. 1847

1325 Clare, E. Atkinson, D.D. 1856

1343 Pembroke, G. Ainslie, D.D. 1829

1348 Gonville and Caius, Edwin Guest, L.L.D., F.R.S. 1852

1550 Trin. Hall, T. C. Geldart, L.L.D. 1852

1531 Corpus Christi, J. Pulling, D.D. 1850

1441 King's, Richard Evers, D.D. 1850

1446 Queen's, George Phillips, D.D. 1857

1475 St. Cath., C. K. Robinson, D.D. 1861

1496 Jesus College, G. E. Corrie, D.D. 1849

1505 Christ's, James Cartmell, D.D. 1849

1511 St John's, W. H. Bateson, D.D. 1857

1545 Sidney Sussex, Hon. L. Neville, M.A. 1864

1546 Trinity, W. H. Thompson, D.D. 1846

1584 Emmanuel, G. Archdall Gratwick, D.D. 1835

1598 Sidney, Robert Phelps, D.D. 1843

1800 Downing, T. Worsley, D.D. 1836

Proctors—James Porter, M.A., St. Peter's;

R. B. Somerset, M.A., Trinity;

Preachers—Peter H. Mason, M.A., St. John's;

J. G. Browne, M.A., St. Cath.'

Saw Virdi—Dr. Phelps, Dr. Bateson, Dr. Paget,

Prof. Stokoe, M.A., Prof. Livingstone, M.A.,

J. Power, M.A.

Moderators—Rev. Jos. Wolstenholme, M.A.,

Christ's; Prof. J. C. Maxwell, M.A., Trin.

Founded Professors, etc. Elected

1605 Div. (Marg.), W. Selwyn, D.D. 1855

1653 Lady Magd. Preacher, W. G. Clark, M.A. 1865


1540 Div. (Reg.), J. A. Jeremie, D.D. 1850

PROFESSORS.

Founded Professors, etc. Elected

1602 Div. (Marg.), W. Selwyn, D.D. 1855

1653 Lady Magd. Preacher, W. G. Clark, M.A. 1865


1540 Div. (Reg.), J. A. Jeremie, D.D. 1850

1540 C. Law (Reg.), J. T. Abdy, LL.D. 1864

15410 Physic (Reg.), H. J. H. Bond, M.D. 1851

15410 Hist. (Reg.), T. Jarrett, M.A. 1851

15410 Gr. (Reg.), B. H. Kennedy, D.D. 1867

1632 Arab. H. G. Williams, B.D. 1854

1632 Almo. Read. & Prof. Arab., Theodore Preston, M.A. 1853

1663 Math., G. G. Stokes, M.A., F.R.S. 1849

1683 Mor. Philos., F. D. Maurice, M.A. 1864

1684 Mus., W. S. Bennett, Mus. D. 1858

1702 Chem., G. D. Livingstone, M.A. 1861

1743 Astron. (Plum.), J. Challis, M.A., F.R.S. 1836

1707 Anat., G. H. Humphry, M.D. 1866

1724 Med. Hist., J. R. Sceley, M.A. 1849

1724 Botany, C. C. Babbage, M.A. 1841

1727 Geol., A. Sedgwick, L.L.D., F.R.S. 1819

1749 Lond. Astron., J. C. Adams, M.A., F.R.S. 1853


1764 Hist. Leg., M. J. S. Perowne, B.D. 1853

1764 Nat. & Exp. Ph., R. Willis, M.A. 1854

1768 Phys., F. G. Peacock, F.R.S. 1837

1780 Law (Downs), W. L. Birkbeck, M.A. 1850

1782 Med. (town), W. W. Fisher, M.D. 1841

1784 Min., W. H. Miller, M.A., F.R.S. 1832

1785 Archæ. (Hist.), C. Babington, B.D. 1885

1789 Div. (Hist.), J. B. Lightfoot, D.D. 1861

1789 Math. (Sudbury), A. Cayley, M.A. 1843

1883 Polit. Econ. H. Fawcett, M.A. 1883

1866 Zool. and Comp. Anat., A. Newton, M.A. 1886

1867 Sanscrit, F. B. Cowell, M.A. 1887

1867 International Law, W. G. Vernon Harcourt, M.A. 1889

1869 Latin, Rev. H. A. J. Munro, M.A. 1889

University Officers.

Public Orator, W. G. Clark, M.A. 1860

Librarian, H. Bradshaw, M.A. 1867

Registrar, H. R. Luard, M.A. 1862

Bursar, H. Godfrey, M.A. 1854

Sub hurts (W. H. Besant, M.A. 1866

LONDON.

Visitor, The Queen. Chancellor, Earl Granville. Vice-Chancellor, George Grove, D.C.L.

Registrar, W. B. Carpenter, M.D., V.P.R.S. Clerk to the Senate, Thos. Downe, B.A.

Chairman of Convocation, John Storrer.

EXAMINERS.

Classics—F. A. Paley, M.A.; Rev. H. A.

Hodden, L.L.D.

Mathem. and Nat. Phil.—E. J. Routh, M.A.;

Prof. H. J. Smith, M.A.

Eng. Lang., Lit., & Hist.—Rev. J. D. Angus,

L.D.; J. G. Fitch, M.A.

French—P. H. Ernest Brette, B.D.; Prof. C.

Casual, L.L.D.

German—F. Allnau, Ph.D.; Prof. Buchheim,

Ph.D.

Heb. of the Old Test., Greek of the New, and


Rev. J. J. Seawright, B.D.

Logic and Mor. Philos.—Rev. H. G. Pattison,

B.D.; Prof. G. C. Robertson, M.A.

Pol. Econ.—Prof. W. S. Jenkins, M.A.;

T. F. Leslie, LL.B.

Exp. Phil.—Prof. W. G. Adams, M.A.; Prof.

G. C. Foster, B.A.

Founded Professors, etc. Elected

1869-1870.

Chem.—Wm. Odlind, M.B.; A. W. Willam-

son, Ph.D.

Bot. and Veg. Phys.—M. J. Berkeley, M.A.;

Jos. Dalton Hooker, M.D.

Geology and Palæontol.—A. Geldie, Prof T.

Rupert Jones.

Law and Prin. of Legisl.—Prof. M. Bernard,

B.C.L., M.A.; J. R. Quain, L.L.B.

Med.—Prof. J. B. Reynolds, M.D.; S. Wilks,

M.D.

Surgery—Prof. P. Le Gros Clark; John Bir-

cket, F.R.C.S.

Anatomy—Prof. W. Turner, M.A.; Jno. Wood

Physiology, Com. Anat. and Zoology—Prof.

T. H. Huxley, Ph.D.; H. Power, M.B.

Med.—J. B. Hicks, M.D.; W. O. Priestley, M.B.

Mat. Med. and Pharm. Chem.—Prof. A. B.

Garrod, M.D.; S. O. Habershon, M.D.

Forensic Med.—E. H. Greenhow, M.D.; T.

Stevenson, M.D.
DURHAM.

Visitor, The Bishop of Durham.
Warden, Very Rev. W. Chas. Lake, M.A.
Subwarden, T. Chevallier, B.D.
Prof. of Divinity and Ecc. Hist. Rev. A. S. Farrar, D.D.
Professor of Classical Literature, Rev. T. S. Evans, M.A.

Prof. of Mathematics and Astronomy, Rev. Temple Chevallier, B.D.
Reader in Hebrew, Rev. T. Chevallier, B.D.
Reader in Law, W. Gray, M.A.
Reader in History, T. Greenwood, M.A.
Reader in Medicine, D. Embleton, M.D.
Lecturer in Mining and Civil Engineering, A. Blanlands, M.A.
Lecturer in Chemistry and Mineralogy, A. F. Marreco.
Registrar, Rev. T. Thornton, M.A.
Librarian, Rev. T. P. Dodd, M.A.

SCOTLAND.

St. ANDREWS (Founded 1411).
Chancellor, Duke of Argyll, LL.D., K.T.
Rector, James Anthony Frund.
Dean of Faculty of Arts, Lewis Campbell.

HEADS OF COLLEGES.
S. Salvator and St. Leonard, J. C. Shairp, B.A., LL.D.
S. Mary, John Tulloch, D.D.

GLASGOW (Founded 1450).
Chancellor, Duke of Montrose, K.T.
Rector, Eart of Derby.

Dean of Faculties, Sir T. E. Colebrooke, Bt.
Principal, Thomas Barclay, D.D.

ABERDEEN (Founded 1494).
Chancellor, Duke of Richmond, K.G.
Vice-Chancellor, Principal Campbell.
Rector, M. E. Grant Duff.
Principal, P. C. Campbell, D.D.
Secretary, Prof. David Thomson, M.A.

EDINBURGH (Founded 1582).
Chancellor, Rt. Hon. J. Inglis, LL.D, D.C.L.
Rector, H. Hon. J. Moncreif.
Principal, Sir Alex. Grant.
Clerk and Registrar, Thomas Gilbert.

IRELAND.

QUEEN'S UNIVERSITY.

Chancellor, Earl of Clarendon, K.G.
Vice-Chancellor, Right Hon. M. Brady.
Secretary, G. Johnstone Stoney, M.A.
Clerk of Convocation, James Wilson, M.A.

IRISH COLLEGES.

KING'S COLLEGE, LONDON.
Principal, Rev. A. Barry, D.D.
Secretary, J. W. Cunningham.
Master of the School, Rev. G. F. Macleay, B.D.

UNIVERSITY COLLEGE, LONDON.
President, George Grote, LL.D.
Vice-President, Ht. Hon. Lord Belper.
Secretary, John Robson, B.A.
Master of the School, Thos. Hewett Key, M.A.

WINCHESTER.

Warden, G. B. Lee, M.A.
Head Master, George Ridding, M.A.

ETON.

Provost, Charles Old Goodfard, D.D.
Head Master, J. J. Hornby, D.D.

BEDFORD, Master, F. Fanshawe, M.A.
BIRMINGHAM, — C. Evans, M.A.
BURY ST. EDMUNDS, — A. H. Wratislaw, M.A.
JULIUS COLLEGE, — A. J. Carver, D.D.
GUILDFORD, — J. Oates, M.A.
HARROW, — H. M. Butler, D.D.
HIGHGATE, — J. B. Dyne, D.D.
IPSWICH, — H. A. Holden, M.A.
LEEDS, — W. G. Henderson, D.C.L.
LONDON:— Charter House, — W. Haig Brown, LL.D.
Christ's Hospital, — G. C. Bell, M.A.
Merchant Taylors, — J. A. Hessey, D.C.L.
Southwark, — A. Johnson, M.A.
St. Paul's, — Herbt. Kynaston, D.D.
Stationers' Company, A. K. Isher, M.A.
Westminster, — Charles B. Scott, D.D.
MANCHESTER, — F. W. Walker, M.A.
MARLBORO' COLLEGE, — G. G. Bradley, M.A.
REPTON, — S. A. Pears, D.D.
RUGBY, — (Vacant.)
SHERBROKE, — H. D. Harper, M.A.
SHREWSBURY, — H. W. Moss, M.A.
TONBRIDGE, — J. I. Wolston, D.C.L.
LIST OF THE PRINCIPAL PUBLIC INSTITUTIONS, MUSEUMS, GARDENS, AND EXHIBITIONS, IN LONDON AND ITS NEIGHBOURHOOD,

And the Mode of Admission, whether open to the Public Free or on Payment.

BRITISH MUSEUM (Great Russell Street).—Monday, Wednesday, and Friday, from 10 to 4, in January, February, November, and December; from 10 to 5, in March, April, September, and October; from 10 to 6 (and on Saturdays, from 12 to 5) in May, June, July, and August. The Museum is closed the first week in January, May, and September, on Ash Wednesday, Good Friday, Christmas Day, and Fast or Thanksgiving days. Free.

DULWICH GALLERY.—Monday, Wednesday, and Saturday, Free; Thursday and Friday on payment of 6d.; from 10 to 5 in summer, and from 11 to 3 in winter.

GEOLOGICAL MUSEUM (Jermyn Street, Piccadilly).—Daily, except Friday, from 10 to 4, during November, December, January, and February; and from 10 to 5, during the remainder of the year, with the exception of one month of vacation, from August 10 to September 10. On Mondays and Saturdays it remains open till 10 p.m. Free.

GREENWICH HOSPITAL.—The Painted Hall is open every day from 10 to 6, from March 16 to Sept. 18; and until sunset during the rest of the year. Free.

HAMPTON COURT PALACE.—Every week-day, except Friday, from 10 to 4; on Sundays, after 2. Free.

INDIAN MUSEUM (Whitehall Yard).—Monday, Wednesday, and Friday, 10 to 4. Free.

KEW GARDENS.—The public are admitted to the Royal Botanic Gardens, and the Pleasure Grounds, every week-day (Christmas Day excepted), from 1 till sunset; on Sundays, from 2 till sunset. Free.

NATIONAL GALLERY (Trafalgar Square).—Monday, Tuesday, Wednesday, and Saturday; closed during the month of October, and on Christmas Day and Good Friday (Thursday and Friday students' days). Free.

NATIONAL PORTRAIT GALLERY (Great George Street, Westminster).—Monday, Wednesday, and Saturday, from 10 to 6 in summer; and from 10 to 4 in winter. Free.

ROYAL BOTANIC SOCIETY OF LONDON Gardens, Offices, and Museum (Inner Circle, Regent's Park).—Admission by Fellow's Order.

ROYAL COLLEGE OF SURGEONS' MUSEUM (Lincoln's Inn Fields).—Monday, Tuesday, Wednesday and Thursday, from 12 to 4, October to February inclusive; and from 12 to 5, March to August inclusive, except during the month of September, when the Museum is closed. By order.

ROYAL GEOGRAPHICAL SOCIETY (15, Whitehall Place).—Half-past 10 to half-past 4; Saturdays, half-past 10 to half-past 2. Admission to the Library by Fellow's order; to the Map Room, Charts, Models, &c., by giving name and address.

ROYAL HORTICULTURAL SOCIETY (South Kensington).—Open daily to the Public (Sundays excepted), Mondays, 6d.; Tuesdays and Saturdays, 2s. 6d.; other days, 1s.

ROYAL UNITED SERVICE MUSEUM (Whitehall Yard).—Daily from 11 to 5, in summer, and from 11 to 4, in winter. Admission by Member's Tickets; on Fridays by personal introduction.

SOANE MUSEUM (13, Lincoln's Inn Fields).—Wednesday in February and March; Wednesday, Thursday and Friday during April, May, and June; Wednesday in July and August; from 10 to 4. Admission by tickets, which are sent by post on application.

SOCIETY OF ARTS (John Street, Adelphi).—Daily, except Wednesday, from 10 to 4. Admission by Member's order.

SOUTH KENSINGTON MUSEUM.—Open daily, Free, Monday, Tuesday, and Saturday, from 10 to 10; by payment of 6d., Wednesday, Thursday, and Friday, from 10 to 4, or 6, according to the season.

TOWER OF LONDON.—Daily; the armories and regalia, 10 to 4; 6d. to each place.
WESTMINSTER, PALACE OF.—Admission, when Parliament is not sitting, by free
Tickets, which admit any number of persons, obtainable at the Lord Great Chamberlain's
office, under the Victoria Tower, every Saturday from 10 to 4. Admission to hear the
debates in the House of Lords or Commons can only be obtained by a Peer's or a Mem-
ber's order.

WINDSOR CASTLE.—The State apartments are open to the Public on presentation of cards,
obtainable free of charge, on Monday, Tuesday, Thursday, and Friday, 11 to 4, April to
October; 11 to 5, November to March; and in general during the absence of the Court.

ZOOLOGICAL GARDENS (Regent's Park).—Admission on Mondays, 6d.; on other days, 1s.

PRIME MINISTERS

OF THE VARIOUS ADMINISTRATIONS SINCE THE ACCESSION OF GEORGE III.

<table>
<thead>
<tr>
<th>Prime Minister</th>
<th>Date of Office</th>
<th>Date of Resignation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earl of Bute</td>
<td>May 29, 1762</td>
<td>Jan. 11, 1828</td>
</tr>
<tr>
<td>George Grenville</td>
<td>April 16, 1783</td>
<td>Nov. 12, 1830</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>July 12, 1785</td>
<td>July 14, 1834</td>
</tr>
<tr>
<td>Duke of Grafton</td>
<td>Aug. 2, 1766</td>
<td>Dec. 15, 1834</td>
</tr>
<tr>
<td>Lord North</td>
<td>Jan. 28, 1770</td>
<td>Viscount Melbourne</td>
</tr>
<tr>
<td>Marquis of Rockingham</td>
<td>Mar. 30, 1782</td>
<td>Sir Robert Peel</td>
</tr>
<tr>
<td>Lord Shelburne</td>
<td>July 3, 1782</td>
<td>Aug. 31, 1841</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>April 5, 1783</td>
<td>Lord John Russell</td>
</tr>
<tr>
<td>William Pitt</td>
<td>Dec. 27, 1783</td>
<td>Earl of Derby</td>
</tr>
<tr>
<td>Henry Addington</td>
<td>Mar. 7, 1801</td>
<td>Viscount Palmerston</td>
</tr>
<tr>
<td>William Pitt</td>
<td>May 12, 1804</td>
<td>Earl of Derby</td>
</tr>
<tr>
<td>Lord Grenville</td>
<td>Jan. 8, 1806</td>
<td>Viscount Palmerston</td>
</tr>
<tr>
<td>Duke of Portland</td>
<td>Mar. 13, 1807</td>
<td>Earl Russell</td>
</tr>
<tr>
<td>Spencer Perceval</td>
<td>June 23, 1810</td>
<td>July 6, 1846</td>
</tr>
<tr>
<td>Lord Liverpool</td>
<td>June 8, 1812</td>
<td>Benjamin Disraeli</td>
</tr>
<tr>
<td>George Canning</td>
<td>April 11, 1827</td>
<td>Wm. Ewart Gladstone</td>
</tr>
</tbody>
</table>

THE POPULATION of the different Counties of England and Wales in
1861; with the number of Members of Parliament returned by each to the
Reformed Parliament of 1868.

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
<th>Members of Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedford</td>
<td>135,265</td>
<td>4</td>
</tr>
<tr>
<td>Berks</td>
<td>176,103</td>
<td>8</td>
</tr>
<tr>
<td>Buckingham</td>
<td>166,597</td>
<td>7</td>
</tr>
<tr>
<td>Cambridge</td>
<td>175,950</td>
<td>8</td>
</tr>
<tr>
<td>Chester</td>
<td>655,153</td>
<td>13</td>
</tr>
<tr>
<td>Cornwall</td>
<td>369,323</td>
<td>13</td>
</tr>
<tr>
<td>Cumberland</td>
<td>205,293</td>
<td>8</td>
</tr>
<tr>
<td>Derby</td>
<td>339,377</td>
<td>8</td>
</tr>
<tr>
<td>Devon</td>
<td>564,531</td>
<td>17</td>
</tr>
<tr>
<td>Dorset</td>
<td>188,651</td>
<td>10</td>
</tr>
<tr>
<td>Durham</td>
<td>509,018</td>
<td>13</td>
</tr>
<tr>
<td>Essex</td>
<td>404,644</td>
<td>10</td>
</tr>
<tr>
<td>Gloucester</td>
<td>485,502</td>
<td>11</td>
</tr>
<tr>
<td>Hereford</td>
<td>123,659</td>
<td>6</td>
</tr>
<tr>
<td>Hertford</td>
<td>173,294</td>
<td>4</td>
</tr>
<tr>
<td>Huntingdon</td>
<td>64,297</td>
<td>3</td>
</tr>
<tr>
<td>Kent</td>
<td>733,675</td>
<td>21</td>
</tr>
<tr>
<td>Lancaster</td>
<td>2,428,744</td>
<td>33</td>
</tr>
<tr>
<td>Leicester</td>
<td>237,402</td>
<td>6</td>
</tr>
<tr>
<td>Lincoln</td>
<td>411,997</td>
<td>12</td>
</tr>
<tr>
<td>Middlesex</td>
<td>2,205,771</td>
<td>19</td>
</tr>
<tr>
<td>Monmouth</td>
<td>174,670</td>
<td>3</td>
</tr>
<tr>
<td>Norfolk</td>
<td>435,422</td>
<td>10</td>
</tr>
<tr>
<td>Northampton</td>
<td>227,727</td>
<td>8</td>
</tr>
<tr>
<td>Northumberland</td>
<td>343,028</td>
<td>10</td>
</tr>
<tr>
<td>Nottingham</td>
<td>293,794</td>
<td>10</td>
</tr>
<tr>
<td>Oxford</td>
<td>172,266</td>
<td>9</td>
</tr>
<tr>
<td>Rutland</td>
<td>21,859</td>
<td>2</td>
</tr>
<tr>
<td>Salop</td>
<td>240,876</td>
<td>10</td>
</tr>
<tr>
<td>Somerset</td>
<td>444,725</td>
<td>15</td>
</tr>
<tr>
<td>Southamptton</td>
<td>481,495</td>
<td>16</td>
</tr>
<tr>
<td>Stafford</td>
<td>746,584</td>
<td>19</td>
</tr>
<tr>
<td>Suffolk</td>
<td>336,231</td>
<td>9</td>
</tr>
<tr>
<td>Surrey</td>
<td>830,685</td>
<td>11</td>
</tr>
<tr>
<td>Sussex</td>
<td>363,618</td>
<td>15</td>
</tr>
<tr>
<td>Warwick</td>
<td>561,728</td>
<td>11</td>
</tr>
<tr>
<td>Westmorland</td>
<td>60,809</td>
<td>3</td>
</tr>
<tr>
<td>Wiltshire</td>
<td>249,455</td>
<td>15</td>
</tr>
<tr>
<td>Worcester</td>
<td>307,601</td>
<td>11</td>
</tr>
<tr>
<td>York</td>
<td>2,033,051</td>
<td>40</td>
</tr>
</tbody>
</table>

WALES

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
<th>Members of Parliament</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anglesey</td>
<td>54,546</td>
<td>2</td>
</tr>
<tr>
<td>Brecon</td>
<td>61,627</td>
<td>1</td>
</tr>
<tr>
<td>Cardigan</td>
<td>72,235</td>
<td>2</td>
</tr>
<tr>
<td>Carmarthen</td>
<td>111,757</td>
<td>3</td>
</tr>
<tr>
<td>Carnarvon</td>
<td>95,666</td>
<td>2</td>
</tr>
<tr>
<td>Denbigh</td>
<td>100,862</td>
<td>3</td>
</tr>
<tr>
<td>Flint</td>
<td>69,870</td>
<td>2</td>
</tr>
<tr>
<td>Glamorgan</td>
<td>317,731</td>
<td>6</td>
</tr>
<tr>
<td>Merioneth</td>
<td>38,888</td>
<td>1</td>
</tr>
<tr>
<td>Montgomery</td>
<td>67,606</td>
<td>2</td>
</tr>
<tr>
<td>Pembrok</td>
<td>96,096</td>
<td>3</td>
</tr>
<tr>
<td>Radnor</td>
<td>25,403</td>
<td>2</td>
</tr>
</tbody>
</table>
ASSESSABLE TAXES AND LICENSES.

The following Schedule contains an accurate statement of the Assessed Taxes and Licenses as fixed by 16 & 17 Vict. cap. 90, and 32 & 33 Vict. cap. 14.

Armorial bearings.—When painted, £ s. d. marked, or affixed on or to any carriage ... ... ... ... ... 2 2 0
When not so painted, marked, or affixed, but otherwise used ... ... 1 1 0

Carriages.
For every four-wheeled carriage of the weight of 4 cwt.s. and upwards ... ... ... ... ... ... ... ... 2 2 0
For every carriage with less than four wheels, or, if four wheeled, of less than 4 cwt. ... ... ... ... ... ... ... 0 15 0

Exemptions.—Any carriage used solely in the course of trade or husbandry, and whereon the Christian name and surname, and place of abode of the owner shall be visibly and legibly painted, in letters of not less than one inch in length.

Horses.—For every horse and mule kept for riding or drawing ... ... ... ... ... 0 10 6

Exemptions.—Horses kept solely for purposes of husbandry or market gardening, and which shall not be used for riding, or for drawing any carriage on which duty has to be paid; breed mares; horses which have not been used during the year, and such as are kept for sale by licensed horse dealers, and which shall not be let on hire.

Servants.
For every male servant ... ... ... ... ... ... ... ... 0 15 0

Exemptions.—A single servant employed in a public-house where only one is kept; drivers, grooms, and ostlers employed by owners of stage or hackney carriages; and servants of officers in the Army and Navy, provided they be actual soldiers and sailors.

Horse-dealers’ yearly Duty ... ... ... ... 12 10 0
It is provided by 32 & 33 Vict. cap. 14 (24th June, 1868), that all the above duties shall be paid annually upon licenses to be taken out by the person who shall use the armorial bearings, or keep the horse, or mule, or employ the servant, or exercise the trade of a horse dealer.

Houses.—In lieu of the duty on windows repealed in 1851, a house duty is substituted of 9d. in the pound on houses worth £20 and upwards per annum in rent. By the Act of 1869, houses occupied for purposes of trade only, or as warehouses for the sole purpose of lodging goods, or merchandise, or used as shops or counting-houses, are exempt from this duty, although a servant or other person may dwell in such tenement for its protection. Dwelling-houses with shop annexed on the basement floor; or houses occupied by any person duly licensed for the sale of ale, wine, and other liquors; or houses which are bond fide farm-houses occupied by a tenant or farm servant, to pay 6d. in the pound. In the valuation of houses belonging to market-gardens and nursery-grounds, the garden and grounds are not estimated.

Game Duties—Licence to Kill Game.
If taken out after April 5, and before £ s. d.
Nov. 1, to expire on April 5, in the following year ... 3 0 0
To expire on Oct. 31, in the same year ... ... ... ... ... ... ... ... ... ... ... 2 0 0
In which taken out ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 2 0 0
If taken out on or after Nov. 1, to expire on April 5 following ... ... ... ... ... ... ... ... ... ... ... ... ... 2 0 0
Gamekeepers in Great Britain ... ... ... ... ... ... ... ... ... ... 2 0 0
To deal in game ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 2 0 0

Dogs.—Licence granted by the Commissioners of Inland Revenue to be had at all Post Money Order Offices for every dog of whatever description ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 0 5 0
It is enacted by 32 & 33 Vict. cap. 14, that in the case of shepherds’ dogs, the payment for the licence shall come from the master or employer of the shepherd, but that the licence nevertheless shall be granted in the shepherd’s own name.
## STAMP DUTIES.

<table>
<thead>
<tr>
<th>STAMPS.</th>
<th>MORTGAGES, BONDS, &amp;C.</th>
<th>SETTLEMENTS.</th>
<th>CONVEYANCES, WHEN THE PURCHASE-MONEY IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>More than</td>
<td>Not more</td>
<td>More than</td>
</tr>
<tr>
<td>0 0 0</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>0 1 0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 2 0</td>
<td>..</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>0 3 9</td>
<td>..</td>
<td>..</td>
<td>100</td>
</tr>
<tr>
<td>0 5 0</td>
<td>..</td>
<td>..</td>
<td>200</td>
</tr>
<tr>
<td>0 6 0</td>
<td>..</td>
<td>..</td>
<td>300</td>
</tr>
<tr>
<td>0 7 0</td>
<td>..</td>
<td>..</td>
<td>400</td>
</tr>
<tr>
<td>0 8 0</td>
<td>..</td>
<td>..</td>
<td>500</td>
</tr>
<tr>
<td>0 9 0</td>
<td>..</td>
<td>..</td>
<td>600</td>
</tr>
<tr>
<td>1 0 0</td>
<td>..</td>
<td>..</td>
<td>700</td>
</tr>
<tr>
<td>1 2 0</td>
<td>..</td>
<td>..</td>
<td>900</td>
</tr>
<tr>
<td>1 4 0</td>
<td>..</td>
<td>..</td>
<td>1100</td>
</tr>
<tr>
<td>1 6 0</td>
<td>..</td>
<td>..</td>
<td>1200</td>
</tr>
</tbody>
</table>

For every additional £100, or for any fractional part of £100, 2s. 6d.

For every additional £100, or for any fractional part of £50, or fractional part of £50, 5s.

### Agreements.
- Under hand only, £ s. d.
  - when the matter is of the value of £2 or upwards: 0 0 6
  - And progressive duty: 0 0 6
  - If not stamped within a period not exceeding 14 days, when the matter is above £20, a penalty on stamping: 0 0 6
  - When chargeable with a duty of 6d. only, and the matter of the agreement is under £20, the penalty for stamping is: 0 0 6
  - If between Masters and Mariners, or for hire of menial servant, or sale of goods or merchandise, exempt.

### Bills of Exchange (Foreign) drawn in, but payable out of the United Kingdom, if drawn in set of three or more, then for each Bill—
- not exceeding £25: 0 0 1
- £25 to £50: 50 0 0 2
- £50 to £75: 75 0 0 3
- £75 to £100: 100 0 0 4
- £100 to £200: 200 0 0 8
- £200 to £300: 300 0 0 1
- £300 to £500: 500 0 0 1
- £500 to £1000: 1000 0 0 5
- £1000 to £2000: 2000 0 0 6
- £2000 to £3000: 3000 0 0 10
- £3000 to £4000: 4000 0 0 13
- £4000 and over: 4000 0 0 14

When exceeding £4000, for every £1000, and fraction thereof, 3s. 4d.

### Bills, Inland, payable at any time otherwise than on demand—
- not exceeding £5: 10 0 0 2
- £5 to £10: 10 0 0 3
- £10 to £20: 20 0 0 6
- £20 to £50: 50 0 0 9
- £50 to £100: 75 0 0 10
- £100 to £200: 100 0 0 10
- £200 to £300: 200 0 0 2
- £300 to £500: 300 0 0 3
- £500 to £750: 500 0 0 6
- £750 to £1000: 750 0 0 7
- £1000 to £1500: 1000 0 0 8
- £1500 to £2000: 1500 0 0 10
- £2000 to £3000: 2000 0 0 13
- £3000 to £4000: 3000 0 0 14
- £4000 and over: 4000 0 0 16

When exceeding £4000, for every £1000, and fraction thereof, 10s.
### Indentures of Apprenticeship

<table>
<thead>
<tr>
<th>Premium Paid</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2</td>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>Under £30</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£30 - £50</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£50</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£100</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£200</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£300</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>£400</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Lease

<table>
<thead>
<tr>
<th>Rent</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>£25</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>£50</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Probate of Wills and Letters of Administration

<table>
<thead>
<tr>
<th>Wills</th>
<th>Administrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>£200</td>
<td>£2</td>
</tr>
<tr>
<td>£300</td>
<td>£5</td>
</tr>
<tr>
<td>£1,000</td>
<td>£15</td>
</tr>
<tr>
<td>£1,500</td>
<td>£30</td>
</tr>
<tr>
<td>£2,000</td>
<td>£40</td>
</tr>
<tr>
<td>£3,000</td>
<td>£60</td>
</tr>
<tr>
<td>£4,000</td>
<td>£80</td>
</tr>
<tr>
<td>£5,000</td>
<td>£100</td>
</tr>
<tr>
<td>£6,000</td>
<td>£120</td>
</tr>
<tr>
<td>£7,000</td>
<td>£140</td>
</tr>
<tr>
<td>£8,000</td>
<td>£160</td>
</tr>
<tr>
<td>£9,000</td>
<td>£180</td>
</tr>
</tbody>
</table>

### Licences

**Hawkers in Ireland**

- Foot: £2 s. 6 d.
- Do. each horse used: £2 s. 6 d.

### Promissory Notes Payable on Demand

- For any sum not exceeding £11: £1 s. 6 d.
- Above £1: £2 s. 6 d.

### Succession Duties

- Where whole succession derived from the same predecessor amounts to £100 or upwards; or
- Where any succession is of the value of £100 or upwards, the whole succession being £100 or upwards, the same as a legacy duty.
I. QUEST. (2094); by the Rev. WM. MASON, Kirkby Malzeard.

Given the straight line PAO drawn through the circumference to the centre of a circle, and also the chord BA produced indefinitely, to find by means of the compasses only, and with two openings, two points in the circumference, to which straight lines drawn from P shall form chords each equal to AB.

Answered by the Rev. WM. Mason, the Proposer; and Messrs. Barlow, Brooks, Dobson, Escott, Frisby, Hall, Tucker, and Turrell.

Construction.—Take OP in the compasses, and from O set off OQ terminating in AB produced. Then take an opening equal to QA, and apply it from P to cut the circumference of the circle in C and D; and draw the straight lines PC and PD, which will cut off chords CC', DD', each equal to AB. The other extremities of the chords might be found by laying off PC' and PD', each equal to QB.

Demonstration.—Let Q, C, and O be joined; then the triangles POC, QOA have their sides respectively equal, and therefore also their angles; and hence the two isosceles triangles OAB, OCC', having the angles at their bases equal, and also their sides, have equal bases AB and CC'; and the other chord DD' is manifestly equal to CC'.

Again, by Dr. Rutherford, Charlton; and Messrs. Cranston, Evans, Martin, Rutter, and Watson.

With centre O and radius OP describe a circle intersecting the given chord AB produced in C and D. With centre P and radius AD or BC describe an arc of a circle intersecting the given circle in Q, Q', and draw the lines PQR and PQ'R'; then the chords AB, QR, Q'R' are all equal.

With the centre P and radius BD or AC describe an arc of a circle intersecting the given circle in R and R'; then draw the lines as before; or otherwise from the same centre P with radius CD describe arcs intersecting the exterior circle in S and S', and these points give the position of the chords PS, PS'. The first two methods of determining the positions of PS and PS' are in accordance with the enunciation of the problem; but the simplest method would be to draw through the centre O the lines DOQ', COR intersecting the given circle in Q' and R, and these points give the positions of the chords PS and PS'. The correctness of these processes will be evident when we consider that the two circles are concentric, and that if the intercepted chords QR, Q'R', and AB are to be equal, the chords PS, PS', and CD
of the exterior circle will be equal; and the portions of the lines intercepted between the circumferences of these circles will be equal. In the last method given above we have two triangles, AOD and POQ', in which the sides DO, OA are equal to PO, OQ', and the opposite angles DOA and POQ' are equal; therefore PQ' is equal to AD, and the chords PS', Q'R' respectively equal to the chords CD and AB. In a similar manner it is proved that PR is equal to AC, and hence the chord QR is also equal to the chord AB.

II. QUEST. (2095); by Mr. T. McNamara, Ballymote, Ireland.

If from any point P in the hypothenuse AB of a right-angled spherical triangle ABC, perpendiculars PE, PD are drawn to CB, CA; and if the segments CE, CD be denoted by $\alpha$, $\beta$ respectively, prove that

$$\frac{\tan \alpha}{\tan \beta} = 1;$$

where $a$, $b$ are the sides.

Answered by Dr. Rutherford; Mr. McNamara, the Proposer; and Messrs. Brooks, Dobson, Escott, Evans, Frisby, and Wilson.

Produce the great circle arcs CA and EP to meet in Q, the pole of the side BC; then the arc CE measures the angle CQE, and therefore the angle Q is equal to $\alpha$. Now, the three right-angled triangles APD, QPD, and ABC give

1. $\sin (b - \beta) = \tan PD \cot A$;
2. $\sin (90^\circ - \beta) = \tan PD \cot \alpha$;
3. $\sin b = \tan \alpha \cot A$.

Take the product of (2) and (3); then

$$\sin \beta \cos \beta = \tan \alpha \cot \alpha \cdot \tan PD \cot A$$

$$= \tan \alpha \cot \alpha \sin (b - \beta),$$

by (1);

therefore

$$\frac{\tan \alpha}{\sin \beta} = 1 - \frac{\tan \beta}{\tan b};$$

and hence

$$\frac{\tan \alpha}{\tan \beta} + \frac{\tan \beta}{\tan \alpha} = 1.$$

If the point P is in AB produced, then $\frac{\tan \alpha}{\tan \beta} = \pm 1,$

according as the point $P'$ is taken in the extension of AB in direction AB or BA.

Con.——The product of the tangents of the perpendiculars from $P$ on the sides is equal to the product of the sines of the portions of the sides intercepted between the perpendiculars and the right angle.

For in the triangle PDQ, $QD = 90^\circ - \beta$, angle $Q = \alpha$; hence $\tan PD = \sin (90^\circ - \beta) \tan \alpha = \tan \alpha \cos \beta$. Similarly, $\tan PE = \cos \alpha \tan \beta$; consequently, $\tan PD \tan PE = \sin \alpha \sin \beta$. 
Again, by Mr. Robert Tucker, M.A., University College School; and Messrs. Dale, McCormick, Martin, Turrell, and Watson.

In the diagram we have the angle $R = \beta$, the angle $Q = a$, and $HE = a - a$. Now,

$$\frac{\sin (a - a)}{\sin BPE} = \frac{\sin \beta}{\sin BPR} \quad \text{............(1).}$$

$$\frac{\sin (b - \beta)}{\sin APD} = \frac{\sin b}{\sin APQ} \quad \text{............(2).}$$

Multiplying (1) and (2), we have

$$\frac{\sin (a - a)}{\sin BPE} \cdot \frac{\sin (b - \beta)}{\sin APD} = \frac{\sin \alpha \sin \beta \cos \alpha \cos b}{\sin BPR \cdot \sin APQ},$$

which gives

$$\frac{\tan a}{\tan a} + \frac{\tan \beta}{\tan b} = 1.$$

Mr. Tucker adds:—"I have known this question as having been set in a Cambridge paper. It is given in 'Todhunter's Spherical Trigonometry,' page 45, ex. 17."

Again, by Mr. Anaph Hall, Naval Observatory, Washington, U.S.; and in like manner by Messrs. Barlow, Rutter, and Wilkinson.

The proposed equation is a known result in spherical rectangular coordinates, and may be proved by the usual formulae of trigonometry. The following consideration, however, seems to be more simple. Imagine a tangent plane to the sphere at $C$; then the centre of projection being at the centre of the sphere, the sides of the spherical triangle will become right lines on the tangent plane, and the equation of the line formed by the hypothenuse referred to the other two lines as axes of coordinates will be

$$\frac{x}{a} + \frac{y}{b} = 1.$$

And if $x$, $y$ and $a$, $b$ represent the parts, or arcs, stated in the question, it is obvious that we must write tangent in place of line, which gives the relation sought.

III. QUEST. (2096); by Mr. Thomas Dobson, B.A., Hexham.

If $r'$ denote the radius of the circle inscribed in the triangle formed by joining the feet of the perpendiculars of any triangle ABC, then

$$4R (2R - r') = r^2 + r_1^2 + r_2^2 + r_3^2.$$

Answered by Mr. Thomas Dobson, the Proposer; and Messrs. Dale, McNamara, Trayanor, Tucker, and Watson.

By Question 1699, 'Diary,' 1843—

$$r^2 + r_1^2 + r_2^2 + r_3^2 = 16R^2 - (a^2 + b^2 + c^2)$$

$$= 16R^2 - 4R^2 \left( \sin^2 A + \sin^2 B + \sin^2 C \right)$$

$$= 16R^2 - 4R^2 \left( 2 + 2 \cos A \cos B \cos C \right)$$

$$= 8R^2 \left( 1 - \cos A \cos B \cos C \right)$$

$$= 4R (2R - r').$$

—By 'Todhunter's Trig.,' p. 195.
Again, by the Rev. W. Mills, M.A., Harpham, near Hull.

\[ r' = D \cos A \cos B \cos C, \]
\[ \therefore 4R (2R - r') = 2D^2 (1 - \cos A \cos B \cos C) \]
\[ = 2D^2 \left\{ 2 - \frac{1}{2} (\sin^2 A + \sin^2 B + \sin^2 C) \right\} \]
\[ = 4D^2 - (a^2 + b^2 + c^2) \]
\[ = r^2 + r_1^2 + r_2^2 + r_3^2. \]

It was also thus answered by Messrs. Barlow, Evans, Friasy, Hall, Rutherford, Rutter, Turrell, and Wilkinson.

IV. QUEST. (2097); by Mr. ALBERT ESCOTT, Greenwich.

If from any point on the circle circumscribing a triangle, perpendiculars be drawn to the sides and to the tangents at the angular points, the product of the perpendiculars on the sides is equal to the product of the perpendiculars on the tangents.

Answered by Mr. Stephen Watson, Haydonbridge; Mr. Escott, the Proposer; “G. R.”; and Messrs. Barlow, Dobson, Martin, Tucker, and Turrell.

Let PD, PE, PF be the perpendiculars on BC, CA, AB; and PG, PH, PI those on the tangents at A, B, C. Join PA, PB, PC. Then it is easily seen that the pairs of triangles PBD, PCI; PCE, PAG; PAF, PBH, are similar.

Hence
\[ \frac{PD}{PB} = \frac{PI}{PC}, \quad \frac{PE}{PA'} = \frac{PG}{FA}, \quad \frac{PF}{PA} = \frac{PH}{PB}; \]
\[ \therefore PD \cdot PE \cdot PF = PG \cdot PH \cdot PI. \]

Again, by Dr. Rutherford; and Mr. T. T. Wilkinson, Burnley.

Let ABC be the plane triangle, P a point in the circumference of the circumscribed circle; PD, PE, PF perpendiculars on the sides; and PG, PH, PI perpendiculars on the tangents to the circle at the points A, B, C. Then, since the angles at D, H, I are right angles, and the angle DBH equal to the angle DCI, each being equal to the angle in the alternate segment, therefore the quadrilaterals PHBD and PDCI are equiangular, and their sides about equal angles proportional; hence

\[ PH : PD = PD : PI, \text{ or } PD^2 = PH \cdot PI. \]

Similarly, \( PE^2 = PI \cdot PG, \) and \( PF^2 = PG \cdot PH. \)

Therefore, \( PD \cdot PE \cdot PF = PG \cdot PH \cdot PI. \)

The question was also thus answered by Messrs. Dale, Evans, Friasy, Hall, McCormick, M'Namara, Mills, Rutter, Traynor, Tucker, and Wilson.

Third Answer, by Mr. C. H. Brooks, C.E., Cuttack, Bengal.

In ‘Salmon’s Conics,’ 2nd edit., p. 85, is proved the proposition that, “if from any point in a circle perpendiculars be let fall on any two tangents, and on their chord of contact, the square of the last is equal to the rectangle of the other two.” Hence the proposition in question is true, not only for a triangle, but for any multilateral figure inscribed in a circle. See a solution to a similar problem in ‘Diary’ for 1846, Quest. xi.
V. QUEST. (2098); by Mr. Asaph Hall, Washington, U.S.

In Hansen's 'Theory of Perturbations' he makes use of what he calls the "arithmetic-geometric mean." Thus, if A and B are two values, we have

\[
\frac{1}{2}(A + B) = \text{arith. mean} = A_1;
\]

\[
\sqrt{AB} = \text{geom. mean} = B_1.
\]

Show that, by repeating this process on \(A_1\) and \(B_1\), and so on, the results \(A_n\) and \(B_n\) approach each other without limit.

Answered by Mr. Asaph Hall, the Proposer.

Let \(A\) be greater than \(B\); then \(A_1 < A\), and \(B_1 > B\), &c.; whence the terms in \(A\) form a decreasing series, and those in \(B\) an increasing series. We have also

\[
A_1 - B_1 = \frac{1}{2}(A + B) - \sqrt{AB} = \frac{1}{2}(\sqrt{A} - \sqrt{B})^2; \quad \text{and likewise}
\]

\[
A_n - B_n = \frac{1}{2}(\sqrt{A_{n-1}} - \sqrt{B_{n-1}})^2; \quad \text{and, therefore,} \quad A_n \text{ and } B_n \text{ approach each other indefinitely as the operations are repeated. If we denote by } \omega \text{ the limit towards which we approximate, Gauss has shown that}
\]

\[
\omega = \frac{2}{\pi} \int_0^{\pi} \frac{d\phi}{\sqrt{A^2 \cos^2 \phi + B^2 \sin^2 \phi}}.
\]

The preceding operation is equivalent to the transformation of moduli in the theory of elliptic integrals; and in 'Crelle's Journal, vol. viii, Mr. Burckhardt has shown, in a very elegant manner, that the determination of \(\omega\) depends on the solution of the differential equation

\[
(x - x^2) \frac{d^2y}{dx^2} + (1 - 3x^2) \frac{dy}{dx} - xy = 0.
\]

Again, by Mr. Albert Escott, Royal Hospital School, Greenwich; and Mr. C. H. Brooks, C.E., Cuttack, Bengal.

Let \(A = 2A_1 \cos^2 \theta_1, \quad A_1 = 2A_2 \cos^2 \theta_2, \ldots, \quad A_n = 2A_{n+1} \cos^2 \theta_{n+1}; \quad B = 2A_1 \sin^2 \theta_1, \quad B_1 = 2A_2 \sin^2 \theta_2, \ldots, \quad B_n = 2A_{n+1} \sin^2 \theta_{n+1}.

We shall have the series of first equations satisfied, while the second will reduce to

\[
B_1 = A_1 \sin 2\theta_1, \quad B_2 = A_2 \sin 2\theta_2, \ldots, \quad B_n = A_n \sin 2\theta_n.
\]

Also,

\[
B_n \cos^2 \theta_{n+1} = A_n \sin^2 \theta_{n+1},
\]

Wherefore \(\tan^2 \theta_{n+1} = \sin 2\theta_n\) or \(\sec \theta_{n+1} = \cos \theta_n + \sin \theta_n\), is the equation connecting two of these subsidiary angles taken in order.

Now, if \(A > B\), then \(\theta_1 < \frac{\pi}{4}\), and it is hence easily seen that \(\theta_2 > \theta_1\), and so on. The limit of \(\theta_n\) will therefore be \(\frac{\pi}{4}\).

Therefore \(B_\infty = A_\infty \sin \frac{\pi}{2} = A_\infty\).
Third Solution, by Mr. Robert Tucker, M.A., University College School.

We can readily show that

\[ A - B = 2\sqrt{A_1^2 - B_1^2}, \]
\[ A_1 - B_1 = 2\sqrt{A_2^2 - B_2^2}, \]
\[ A_2 - B_2 = 2\sqrt{A_3^2 - B_3^2}, \]
\[ \&c. = \&c. \]
\[ A_{n-2} - B_{n-2} = 2\sqrt{A_{n-1}^2 - B_{n-1}^2}, \]
\[ A_{n-1} - B_{n-1} = 2\sqrt{A_n^2 - B_n^2}. \]

\[ \therefore \text{multiplying, we get} \]
\[ \sqrt{A_n^2 - B_n^2} = \sqrt{\frac{A_{n-1} - B_{n-1}}{A_{n-1} + B_{n-1}}} \cdot \frac{A_{n-2} - B_{n-2}}{A_{n-2} + B_{n-2}} \cdots \frac{A_1 - B_1}{A_1 + B_1} \times \frac{A - B}{2n}. \]

Now, each of the quantities under the root sign is a proper fraction, and \(2^n\) is susceptible of indefinite increase; hence, when \(n\) is indefinitely increased the right-hand member may be made as small as we please, or in the limit \(B_n\) approaches indefinitely near to \(A_n\).

Similar answers were given by "G. R."; and Messrs. Barlow, Dale, Evans, McCormick, Martin, Rutherford, Rutter, Smith, and Watson.

Fourth Solution, by Mr. Thomas Dobson, B.A., Hexham.

If \(A > B\), each term of the series,

\[ \frac{B}{A}, \frac{B_1}{A_1}, \frac{B_2}{A_2}, \ldots \frac{B_n}{A_n} \]

is a proper fraction, since \(A + B > 2\sqrt{AB}\).

Also the terms of this series are arranged in ascending order of magnitude, for

\[ \frac{B_1}{A_1} \left( = \frac{2\sqrt{AB}}{A + B} \right) > \frac{2\sqrt{AB}}{A + A}, \text{ or } \frac{B}{A}. \]

Similarly it may be shown that \(\frac{B_2}{A_2} > \frac{B_1}{A_1}\), and so on.

Hence, by continuing the series, a term may be found which shall be as nearly equal to unity as may be required.

[The value \(\sqrt{\frac{A^2 + B^2 + 6AB}{8}}\) is a superior limit that represents \(A_n\) and \(B_n\) approximately.—Ed.]

\[8a\]
VI. QUEST. (2099); by Mr. ROBERT TUCKER, M.A., University College School, London.

A is a fixed point. Q moves along a fixed straight line, and \( AQ + QP \) is constant; find the locus of \( P \) when \( \angle AQP \) is also constant.

Answered by Mr. THOMAS DOBSON, Hexham; and in like manner by Messrs. HALL, Rutherford, and Watson.

Draw \( AB \) perp. to the fixed straight line \( BC \). Put \( AB = a, AQ + QP = c, AP = p, \angle AQP = \alpha, \angle QAB = \phi, \angle PAB = \theta \).

Then \( BQ = a \tan \phi, AQ = a \sec \phi, PQ = c - a \sec \phi \).

Now \( AP^2 = AQ^2 + QP^2 - 2AQ \cdot QP \cos \alpha \), which becomes, by a little reduction,

\[
c^2 - p^2 = 4a \cos^2 \frac{\alpha}{2} \sec \phi (c - a \sec \phi) \quad (1)
\]

Again, dividing the value of \( p \sin \theta \) by that of \( p \cos \theta \),

\[
\tan \theta = \frac{a \tan \phi + (c - a \sec \phi) \sin (\alpha - \phi)}{a - (c - a \sec \phi) \cos (\alpha - \phi)} \quad (2)
\]

The equations (1) and (2) determine the required locus. When \( c - a \sec \phi = 0, \theta = \phi \), and \( p = c \); and the locus is that arc of the circle (radius \( c \)) which subtends an angle \( 2(\pi - \phi) \), where \( a \sec \phi = c \). For all values of \( \phi < \phi \), the locus is of the kind shown in the annexed diagram, which is constructed for the case where \( AQP \) is a right angle.

Again, by Mr. ROBERT TUCKER, the Proposer.

Let \( AP (p) \) and \( PAB (\theta) \) be the polar coordinates of \( P \), and the \( \angle PAQ \), \( AQP \) be \( \phi \) and \( \alpha \) respectively; and let \( AB = c \sin \alpha \), and \( AQ + QP = a \sin \alpha \); then

\[
a = p \left[ \frac{\sin(\phi + \alpha) + \sin \phi}{\sin \alpha} \right], \text{ i.e. } a \sin \frac{\alpha}{2} = p \sin \left( \phi + \frac{\alpha}{2} \right) \quad (1),
\]

\[
c = p \frac{\sin(\phi + \alpha)}{\sin \alpha} \cos(\theta - \phi)
\]

or \( p \sin(\theta - 2\phi + \alpha) = -2c \sin \alpha + p \sin(\theta + \alpha) \quad (2) \).

From (1) we have

\[
p^2 \cos(2\phi + \alpha) = p^2 - a^2(1 - \cos \alpha) \quad (3);
\]

hence (2) becomes

\[
-p^2 \sin(2\phi + \alpha) = 2p^2 \cos(\theta + \frac{\alpha}{2}) \sin(\frac{\alpha}{2} - cp \sin \alpha + a^2 \sin^2 \frac{\alpha}{2} \sin \theta) \quad (4).
\]

Squaring (3) and (4) and adding, we get

\[
a^2 \cos^2 \theta \left( p^2 - a^2 \sin^2 \frac{\alpha}{2} \right) = \left[ p^2 \cos(\theta + \frac{\alpha}{2}) - 2cp \cos \frac{\alpha}{2} + a^2 \sin \frac{\alpha}{2} \sin \theta \right]^2
\]

This may be put under the form, if \( a = \frac{\pi}{2} \),

\[
\rho^4(1 - \sin 2\theta) - 4c p^2(\cos \theta - \sin \theta) + \rho^2(4c^2 - 2a^2 + a^2 \sin 2\theta) - 4a^2 cp \sin \theta + a^4 = 0;
\]
or \( 2p(\rho \cos \theta - 2c) \left\{ (a^2 - \rho^2) \sin \theta - 2\rho \right\} = 4c^2\rho^2 - (a^2 - \rho^2)^2 \).

Expressing this in rectangular coordinates, we find the locus to be (in the particular case) the quartic curve

\[
y^4 - 2(x - 2c)y^2 + 2\{(x - c)^2 + c^2 - a^2\}y^2 + 2(a^2 - x^2)(x - 2c)y - 4cx(x - c) + (a^2 - x^2)^2 = 0.
\]

From this equation the curve may be traced.

Analogous solutions were also given by Messrs. Brooks, Escott, Evans, M'Cormick, and Martin.

**VII. QUEST. (2100); by Mr. Thomas Dobson, B.A., Hexham.**

Prove that the volume of any wedge is equal to the product of the area of a transverse section and the line joining the centres of gravity of the two triangular faces of the wedge.

**Answered by Mr. Thomas Dobson, the Proposer; and Dr. Rutherford, Charlton.**

Let ABC be a triangular face of a wedge formed by an oblique section of a prism, and AB'C' a transverse section of the prism through A. Bisect BC in D, and B'C' in D'. Take AG = \( \frac{2}{3} AD \), and AG' = \( \frac{3}{2} AD' \).

Now, BB' + CC' = 2DD' = 3GG'.

Area of figure BCC'B' = \( \frac{1}{6} (BB' + CC') \).

Area of pyramid ABCC'B' = GG' \( \cdot \) \( \triangle AB'C' \).

In the same way the property may be shown to hold for the similar pyramidal portion of the wedge at the other extremity, and it is obviously true as regards the intermediate portion of the wedge.

**Second Solution, by Mr. Stephen Watson; and Messrs. Brooks, Dale, Evans, Hall, and Rutter.**

Let L, B be the length and breadth of the base, E the length of the edge, and H the height, and suppose E < L.

The line L' joining the centres of gravity of the two triangular faces is at the distance \( \frac{1}{3} \)H from the base, and parallel thereto; hence, if a plane pass through one end of the edge, and parallel to the opposite triangular face, the part of the line L' cut off is \( \frac{2}{3} (L - E) \); therefore \( L' = E + \frac{2}{3} (L - E) = \frac{1}{3} (2L + E) \). Also the area A of a vertical section of the wedge is \( \frac{1}{4} B \cdot H \), \( \cdot \) \( A \cdot L' = \frac{1}{3} (2L + E) B \cdot H \) is the volume of the wedge.

When E > L the proof is similar.

Similar answers were given by Messrs. Escott, Frisby, M'Namara, Traynor, and Wilson.

**Third Solution, by Mr. W.M. Barlow, Richmond Hill; Mr. E. M'Cormick, Shucknall; and Mr. Artemas Martin, United States.**

The line joining the centres of gravity of the triangular faces is evidently parallel to the edge of the wedge, since it trisects the distance between this
edge and the plane of the head of the wedge; in this line lies the centre of gravity of any transverse section. Let two such sections be made at the extremities of the edge of the wedge, when it is evident that the solid content of the prism between these sections = the length \( x \) by any transverse section; and the solid content of each of the remaining pyramids = \( \frac{1}{3} \) perpendicular height \( x \) area of rectangular base; but one of the faces of each is perpendicular to the base, and \( \therefore \) the area of this face \( x \) by \( \frac{3}{3} \) the base of one of the adjoining triangular faces will give the solid content of the pyramid; but \( \frac{3}{3} \) length of the rectangular base of each pyramid = the distance between the centres of gravity of the vertical face and the opposite one to it; \( \therefore \) the area of each pyramid = area of vertical face \( x \) distance between the centres of gravity of that face and that of the opposite face, and, adding the prism lying between the pyramids, the solid content of whole wedge = area transverse section \( x \) line joining centres of gravity of triangular faces.

**VIII. QUEST. (2101); by Mr. Artemas Martin, Franklin, U.S.**

Suppose 13 pennies are thrown up, and those that come up heads are taken away, and the remaining ones thrown up again, and so on, till all the pennies have been thrown up heads. Required the probability that this will be effected in 10 throws.

**Solution, by Mr. Artemas Martin, the Proposer; and Messrs. Evans, Hall, Mc Cormick, McNamara, Rutherford, Traynor, and Wilson.**

Let \( m \) = the number of pennies, and \( n \) = the number of throws. The probability of missing a head \( n \) times in succession with a single penny is

\[
\left(\frac{1}{2}\right)^n = \frac{1}{2^n}, \quad \text{and} \quad 1 - \frac{1}{2^n} = \frac{2^n - 1}{2^n}
\]

is the probability of turning up a head once at least in \( n \) trials with one penny.

Therefore \( \left(\frac{2^n - 1}{2^n}\right)^m \) = the probability of turning all of the \( m \) pennies "heads up" at least once each in \( n \) trials.

When \( m = 13 \), and \( n = 10 \),

\[
P = \left(\frac{1023}{1024}\right)^{13} = \frac{13439503918927975848355419878506640383}{1361294676853753853853498429127072845824}
\]

**Second Solution, by Mr. Stephen Watson; and Messrs. Barlow, Brooks, Dobson, Escott, and "G. R."**

Let \( P_n \) be the chance that all will be thrown up heads before or at the \( n^{th} \) throw, when the number of pennies is \( n \). Then obviously \( P_n = \frac{1}{2^n} \). Also the chances of throwing 12, 11,........0 heads the first throw are respectively

\[
\frac{n}{2^n}, \quad \frac{n(n-1)}{2^2n}, \quad \frac{n(n-1)(n-2)}{2^3n}, \ldots, \quad \frac{1}{2^n}
\]

\( \therefore P_n = \frac{1}{2^n} \left\{ 1 + nP_1^1 + \frac{n(n-1)}{2}P_2^1 + \frac{n(n-1)(n-2)}{2\cdot3}P_3^1 + \ldots + P_n^1 \right\} \)
ANSWERS TO THE QUESTIONS.

\[ n = \frac{1}{2^n} \left( 1 + \frac{1}{2} \right)^n = \left( \frac{2^n - 1}{2^n} \right)^n. \]

Similarly, \( p_n = \frac{1}{2^n} \left\{ 1 + np_1^2 + \frac{n(n - 1)}{2} p_2^2 + \ldots + p_n^2 \right\} \)

\[ = \frac{1}{2^n} \left( 1 + \frac{2^n - 1}{2^n} \right)^n = \left( \frac{2^n - 1}{2^n} \right)^n. \]

So generally \( p_n = \left( \frac{2^n - 1}{2^n} \right)^n. \)

When the stated result does not take place before, but only at, the \( n \)th throw, the chance is

\[ \left( \frac{2^n - 1}{2^n} \right)^n - \left( \frac{2^{n-1} - 1}{2^{n-1}} \right)^n. \]

IX. QUEST. (2102); by Mr. STEPHEN WATSON, Haydonbridge.

Find the average length of the perimeter of the triangle formed by joining three points taken at random, one on each side of a given triangle.

Solution, by Mr. Stephen Watson, the Proposer.

Take any points P, Q, R on BC, AC, and AB; join PQ, QR, PR, QB; and draw QD perpendicular to AB. Put AQ = x, \( \angle RQD = \phi \), \( \angle ABQ = \theta \); then QR = x sin A sec \( \phi \),

\( d(AB) = x \sin A \sec^2 \phi \, d\phi \); the limits of \( \phi \) are \(-\frac{1}{2} \pi - A\) and \(\frac{1}{2} \pi - \theta\); those of \( \theta \) are 0 and \( \pi \), and those of \( x \) are 0 and a. Hence when Q and R take every position on AC and AB, the average length of QR is

\[ \frac{1}{bc} \int_0^b dx \int_{-\frac{1}{2} \pi - A}^{\frac{1}{2} \pi - A} x^2 \sin^2 A \sec^2 \phi \, d\phi \]

\[ = \frac{\sin^2 A}{2bc} \int_0^b x^2 dx \left\{ \frac{\cos A}{\sin^2 A} + \frac{\cos \theta}{\sin^2 \theta} + \log \left( \cot \frac{A}{2} \cot \frac{\theta}{2} \right) \right\} \]

\[ = \frac{1}{6} \left\{ \frac{b^2}{c} \cos A + \frac{a^2}{c} \cos B + \frac{b^2 \sin^2 A}{c} \log \frac{s}{s-c} \} + \frac{\sin^2 A}{3bc} \int x \cos^2 \theta \, dx \right\}. \]

But \( \cot \theta = \frac{c-x \cos A}{x \sin A} \), \( \therefore \cos^2 \theta \, d\theta = \frac{cdx}{x^2 \sin A} \); hence (1) becomes

\[ = \frac{1}{6} \left\{ \frac{b^2}{c} \cos A + \frac{a^2}{c} \cos B + \frac{b^2 \sin^2 A}{c} \log \frac{s}{s-c} \right\} + \frac{1}{3bc} \int b^2 \sqrt{c^2 + x^2 - 2cx \cos A} \, dx \]

\[ = \frac{1}{6} \left\{ \frac{b^2}{c} + \frac{c^2}{b} \right\} \cos A + \frac{a^2}{b} \left( \frac{\cos B}{s-c} + \frac{\cos C}{s-b} \right) + \sin^2 A \left( \frac{b^2}{c} \log \frac{s}{s-c} + \frac{c^2}{b} \log \frac{s}{s-b} \right). \]
Similarly, the average lengths of RP, PQ are

\[
\frac{1}{6} \left\{ \left( \frac{c^2}{a} + \frac{a^2}{c} \right) \cos B + b^2 \left( \frac{\cos C}{a} + \frac{\cos A}{c} \right) + \sin^2 B \left( \frac{a^2}{s-a} + \frac{c^2}{s-c} \right) \right\},
\]

\[
\frac{1}{6} \left\{ \left( \frac{a^2}{b} + \frac{b^2}{a} \right) \cos C + c^2 \left( \frac{\cos A}{b} + \frac{\cos B}{a} \right) + \sin^2 C \left( \frac{b^2}{s-b} + \frac{a^2}{s-a} \right) \right\}
\]

Hence the required average is

\[
\frac{1}{3} \left\{ \left( \frac{b^2}{c} + \frac{c^2}{b} \right) \cos A + \left( \frac{c^2}{a} + \frac{a^2}{c} \right) \cos B + \left( \frac{a^2}{b} + \frac{b^2}{a} \right) \cos C \right. \\
+ \frac{c^2 \sin^2 B}{a} \log \frac{s}{s-a} + \frac{a^2 \sin^2 C}{b} \log \frac{s}{s-b} + \frac{b^2 \sin^2 A}{c} \log \frac{s}{s-c} \left. \right\}
\]

When \( a = b = c \), the average is \( a(1 + \frac{2}{3} \log 3) \).

The question was similarly answered by Messrs. Brooks, Dobson, and Escott.

X. QUEST. (2103); by Mr. Septimus Tebay, B.A., Bivington.

If the centre of gravity of a triangle be on the circumference of the inscribed circle, prove that

\[
\frac{5 \cos A - 3}{\sin A} + \frac{5 \cos B - 3}{\sin B} + \frac{5 \cos C - 3}{\sin C} = 0.
\]

Answered by Mr. Septimus Tebay, the Proposer; and Messrs. Evans, Mills, and Rutter.

Let \( ABC \) be the triangle, \( O \) the centre of the inscribed circle, \( G \) the centre of gravity, \( GM \) on peripherals to \( BC \). Then

\[
BM = \frac{1}{2} (2a - b \cos C), \quad GM = \frac{1}{3} b \sin C, \quad BN = r \cot \frac{1}{2} B, \quad ON = r.
\]

\[
\therefore \quad GO^2 = \left\{ r \cot \frac{1}{2} B - \frac{1}{3} (2a - b \cos C) \right\}^2 + (r - \frac{1}{2} b \sin C)^2;
\]

which reduces to

\[
\frac{5}{36} \left( a^2 + b^2 + c^2 \right) - \frac{1}{3} (bc + ca + ab) + r^2.
\]

But

\[
a^2 + b^2 + c^2 = 2(bc \cos A + ca \cos B + ab \cos C).
\]

\[
\therefore \quad GO^2 = \frac{5}{18} \left( bc \cos A + ca \cos B + ab \cos C \right) - \frac{1}{3} (bc + ca + ab) + r^2
\]

\[
= \frac{abc}{18} \left\{ \frac{5 \cos A - 3}{a} + \frac{5 \cos B - 3}{b} + \frac{5 \cos C - 3}{c} \right\} + r^2.
\]

When \( GO = r \), we have

\[
\frac{5 \cos A - 3}{\sin A} + \frac{5 \cos B - 3}{\sin B} + \frac{5 \cos C - 3}{\sin C} = 0.
\]

Second Solution, by Dr. Rutherford; and Messrs. Brooks, Dale, Dobson, Escott, Hall, Tucker, and Watson.

The trilinear equation to the inscribed circle is

\[
\cos \frac{A}{2} \sqrt{\alpha} + \cos \frac{B}{2} \sqrt{\beta} + \cos \frac{C}{2} \sqrt{\gamma} = 0 \ldots \ldots (1).
\]
The trilinear coordinates of the centre of gravity of the triangle are

\[ a' = \frac{2\Delta}{3a}, \quad \beta' = \frac{2\Delta}{3b}, \quad \gamma' = \frac{2\Delta}{3c}; \]

and \( \cos^2 \frac{A}{2} = \frac{ss_1}{bc}; \quad \cos^2 \frac{B}{2} = \frac{ss_2}{ac}; \quad \cos^2 \frac{C}{2} = \frac{ss_3}{ab} \).

Substituting the values of \( a', \beta', \gamma', \text{ &c.}, \) in equation (1), and dividing through by those quantities common to each of the terms, we get

\[ \sqrt{s_1} + \sqrt{s_2} + \sqrt{s_3} = 0 \ldots \ldots \ldots (2), \]

since equation (1) must be satisfied by the trilinear coordinates of the centre of gravity of the triangle. From (2) we get

\[ 5(a^2 + b^2 + c^2) = 6(ab + bc + ca) \ldots \ldots \ldots (3). \]

\[ \therefore 5(b^2 + c^2 - a^2) + 5(a^2 + c^2 - b^2) + 5(a^2 + b^2 - c^2) = 6(ab + bc + ca); \]

and, dividing by \( 2abc, \)

\[ 5 \left( \frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} \right) = 3 \left( \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right); \]

\[ \Rightarrow \frac{5 \cos A - 3}{\sin A} + \frac{5 \cos B - 3}{\sin B} + \frac{5 \cos C - 3}{\sin C} = 0; \]

which is the required condition.

The equations (2) and (3) are also remarkably neat and simple.

Nearly thus were the answers by Messrs. Barlow, Frisby, McCormick, M'Namara, Martin, Turrell, and Wilson.

**XI. QUEST. (2104); by Mr. Stephen Watson, Haydonbridge.**

Through any two points \( O, O_1, \) within the triangle \( ABC, \) lines from \( A, B, C \) are drawn meeting \( BC, CA, AB \) in \( D, E, F \) and \( D_1, E_1, F_1; \) then a conic will pass through these six points. If tangents to this conic at \( D \) and \( D_1 \) meet in \( P, \) at \( E \) and \( E_1 \) meet in \( Q, \) and at \( F \) and \( F_1 \) meet in \( R; \) then \( AP, BQ, CR \) meet in one point.

**Solution, by Mr. Stephen Watson, the Proposer; and Messrs. Brooks, Dobson, Hall, Rutherford, and Tucker.**

The equations of the lines through the two points \( O, O_1 \) may be written

\[ l \alpha = m \beta = n \gamma \ldots (1), \text{ and } l' \alpha = m' \beta = n' \gamma \ldots (2); \]

then the conic through the points \( D, E, F, D_1, E_1, F_1, \)

\( F_1 \) is

\[ (m \beta - n \gamma)(m' \beta - n' \gamma) + (n \gamma - l \alpha)(n' \gamma - l' \alpha) \]

\[ + (l \alpha - m \beta)(l' \alpha - m' \beta) = ll' \alpha^2 + mm' \beta^2 + nn' \gamma^2 \]

\[ = 0 \ldots \ldots (3). \]

Let the tangents at \( D \) and \( D_1 \) be

\[ m \beta - n \gamma = 0 \ldots \ldots (4), \]

and \( m' \beta - n' \gamma = 0 \ldots \ldots (5); \]

then the equation of \( AP \) will be

\[ (m' r - m r) \beta = (m' r - n' r) \gamma \ldots \ldots (6). \]
Put the value of $a$ derived from (4) in (3); the result divides by $m\beta - n\gamma$, and gives

\[
\frac{\beta}{\gamma} = \frac{n'r^2 + (n'i + n'l)r - ll'n}{m'r^2 - (lm' + l'm)r + ll'm'},
\]

which must equal \( \frac{n}{m} \), since (4) is a tangent at D; whence we obtain

\[
r = \frac{2lm'n + l(mn' + mn')}{mn' - mn'}.
\]

Similarly \( r' = \frac{2lm'n' + l(mn' + mn')}{mn' - mn'} \);

hence by substitution (6) becomes

\[
\{3mm'(n'l' + n'l) + m^2n'l' + m^2nl\} \beta = \{3nn'(lm' + l'm) + n^2l'm' + n^2lm\} \gamma.
\]

In like manner the equations of BQ, CR are

\[
\{3nn'(lm' + l'm) + n^2l'm' + n^2lm\} \gamma = \{3ll'(mn' + mn') + l^2m'n' + l^2mn\} \alpha,
\]

\[
\{3ll'(mn' + mn') + l^2m'n' + l^2mn\} \alpha = \{3mm'(n'l' + n'l) + m^2n'l' + m^2nl\} \beta;
\]

hence AB, BQ, CR meet in one point.

Second Solution, by Mr. Asher B. Evans, A.M., Lockport, United States; and Messrs. Barlow, Dale, and Escott.

AB and BC are the polars of R and P; therefore RP is the polar of B; for it is well known that, with reference to a conic, the line joining two points is the polar of the intersection of the polars of these points. Similarly PQ is the polar of C, and QR is the polar of A; therefore PQR is conjugate to the triangle ABC; but the lines joining corresponding vertices of any triangle, and of its conjugate triangle with respect to a conic, meet in a point (see "Salmon's Conic Sections," art. 292, ex. 2). Hence AP, BQ, CR meet in a point.

Mr. Barlow observes:—"The above proof evidently applies to the general case of any conic intersecting the three sides of the triangle."

XII. QUEST. (2105); by Mr. Septimus Tebay, B.A., Rivington.

A triangle is drawn at random on a plane; determine the probability that the inscribed circle contains the centre of the circumscribed circle.

Answered by Mr. Septimus Tebay, the Proposer.

It is only necessary to consider the triangle in specie; for although there are an infinite number of dissimilar triangles and an infinite number of triangles similar to any one triangle, it is only necessary to consider one of each kind.

The square of the distance between the centres of the inscribed and circumscribed circles is $R^2 - 2Rr$, which must be less than $r^2$. To find the limiting values of the angle B, suppose the centre of the circumscribed circle to be on the circumference of the inscribed circle. Then

\[
R^2 - 2Rr = r^2, \text{ and } \frac{r}{R} = \sqrt{2} - 1.
\]

But

\[
\frac{r}{R} = 4 \sin \frac{1}{2} A \sin \frac{1}{2} B \sin \frac{1}{2} C
\]

\[
= 4 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} (A + 2B) - \sin \frac{1}{2} A
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]

\[
= 2 \sin \frac{1}{2} A \sin \frac{1}{2} B \cos \frac{1}{2} (A + B)
\]
The limiting values of $B$ are therefore

$$B = \sin^{-1}\left(\frac{\sqrt{2} - 1}{2 \sin \frac{1}{4}A} + \sin \frac{1}{2}A\right) - \frac{1}{2}A$$

$$B = \pi - \sin^{-1}\left(\frac{\sqrt{2} - 1}{2 \sin \frac{1}{4}A} + \sin \frac{1}{2}A\right) - \frac{1}{2}A.$$

The greatest value of $\sin \frac{1}{2}(A + 2B)$ is 1;

$$\therefore \frac{\sqrt{2} - 1}{2 \sin \frac{1}{4}A} + \sin \frac{1}{2}A = 1$$

gives the limiting values of $A$, viz. —

$$A = 2 \sin^{-1} \left(1 - \sqrt{\frac{1}{2}}\right) = 59450, \text{ and } A = \frac{1}{2} \pi.$$

Let $P$ be the probability required, and put $A = 2\theta$; then, since the total cases

$$\int \int dA dB = \pi^2,$$

we shall have

$$P = \frac{2}{\pi^2} \int dA dB \int d\theta \left\{ \pi - 2 \sin^{-1} \left(\frac{\sqrt{2} - 1}{2 \sin \theta} + \sin \theta\right) \right\}$$

$$= 1 - \frac{4}{\pi} \sin^{-1} \left(1 - \sqrt{\frac{1}{2}}\right) - \frac{8}{\pi^2} \int d\theta \sin^{-1} \left(\frac{\sqrt{2} - 1}{2 \sin \theta} + \sin \theta\right).$$

Expanding the circular function by Taylor’s Theorem, we find from the first four terms, $P = \frac{1}{6}$, nearly.

*Again, by Mr. Stephen Watson, Haydonbridge.*

Let $ABC$ be a triangle, $O$ the centre of the inscribed circle, and produce $BO$ to meet $AC$ in $D$. Put $\angle ABD = CBD = \phi$, and $\angle ADB = \theta$. Then the question requires that $R^2 - 2Rr < r^2$;

or $R < (\sqrt{2} + 1)r$;

but $R = \frac{a}{2 \sin \frac{1}{2}A}$, and $r(\cot \phi + \cot \frac{1}{2}C) = a$;

$$\therefore \frac{1}{2 \sin \frac{1}{2}A} < \frac{\sin \phi \sin \frac{1}{2}C}{\cos \frac{1}{2}A} (\sqrt{2} + 1),$$

which, since $A = \pi - \theta - \phi$ and $C = \theta - \phi$, gives

$$\sin \theta > \frac{\sqrt{2} - 1}{2 \sin \phi}.$$

Hence, the limits of $\theta$, on each side of $BD$, are $\sin^{-1} \left\{ \frac{\sqrt{2} - 1}{2 \sin \phi} + \sin \phi \right\}$ and $\frac{\pi}{4}$;

and $\frac{\sqrt{2} - 1}{2 \sin \phi} + \sin \phi = 1$ gives the limits of $\phi = \sin^{-1} \left(1 - \frac{1}{2} \sqrt{2}\right)$ and $\frac{\pi}{4}$.

Now, the angle $B$ may take every value from 0 to $\pi$, and the angle $C$ may take any value from 0 to $\pi - B$; hence the total number of triangles is expressed by $\frac{1}{2} \pi^2$, and the required chance is

$$p = \frac{4}{\pi^2} \int_{\sin^{-1} \left(1 - \frac{1}{2} \sqrt{2}\right)}^{\frac{\pi}{2}} \left\{ \frac{\pi}{2} - \sin^{-1} \left(\frac{\sqrt{2} - 1}{2 \sin \phi} + \sin \phi\right) \right\} d(2\phi)$$
\[ \frac{4}{\pi} \sin^{-1} \left(1 - \frac{1}{\sqrt{2}}\right) - \frac{8}{\pi \sqrt{\sin^{-1} \left(1 - \frac{1}{\sqrt{2}}\right)}} \left\{ \sin^{-1} \left(\frac{\sqrt{2} - 1}{2 \sin \phi}\right) + \sin \phi \right\} d\phi, \]

which, being expanded into series and integrated, gives \( p \approx 1.18 \) nearly.

The question was answered in a similar manner by Mr. C. H. Brooks, Cuttack, Bengal, and Mr. Asaph Hall, Washington, U.S.

Third Solution. by Mr. Thomas Dobson, Hexham; and in like manner by Mr. William Barlow, Richmond Hill; Mr. Albert Escott, Greenwich; and Mr. A. B. Evans, Lockport, U.S.

Let \( O \) and \( Q \) be the centres, and \( r \) and \( R \) the radii of the inscribed and circumscribed circle of any plane triangle, then

\[ R^2 - 2Rr = OQ^2 \ldots \ldots \ldots (1). \]

The probability required is that \( O \) is not at a greater distance from \( Q \) than \( r \), or that \( OQ \) is not greater than \( r \).

When \( Q \) is on the circumference of the inscribed circle, let \( OQ = \rho \); then by equation (1),

\[ \rho = (\sqrt{2} - 1) R \ldots \ldots (2). \]

Now, it is obvious that every possible position of \( O \) where \( OQ \) is not greater than \( r \) is contained in the area \( \pi \rho^2 \); and all the possible positions of \( O \) are contained in the area \( \pi R^2 \); hence, dividing the value of \( \rho^2 \) by \( R^2 \), the probability required is

\[ (\sqrt{2} - 1)^2 \text{ or } 3 - 2\sqrt{2}. \]

Fourth Solution, by Mr. James Dale, Aberdeen.

It may be readily shown that the centre of the circumscribing circle falls within, upon, or without the inscribed circle, according as

\[ \cos A + \cos B + \cos C > \sqrt{2}, \]

and the minimum value of \( \cos A + \cos B + \cos C \) is 1, while the maximum value is \( \frac{3}{2} \).

Let \( p = \) probability of falling within,

\[ 1 - p = \text{probability of falling without}; \]

then

\[ \frac{p}{1 - p} = \frac{3 - \sqrt{2}}{\sqrt{2} - 1}; \quad \therefore \quad p = 3 - 2\sqrt{2}. \]

[In the first and second solutions the angles of the triangle are properly made the independent variables, since it is obvious, from the nature of the question, that these are the quantities the probable subsistence of which is the same for all values. According to the other solutions, it is tacitly assumed that the centres of the inscribed circles are equally distributed over the surface of the circumscribing circle, which does not precisely follow when the sides of the triangles are drawn ad libitum. The last are, in strictness, solutions of another case in which the inscribed centre is supposed to be taken at random.—Ed.]
XIII. QUEST. (2106); by Mr. Asher B. Evans, A.M., Lockport, U.S.

Prove that
\[ x(x + 1) (x + 2) (x + 3) (x + 4) (x + 5) = t^4 \]
is impossible in integers.


For if \( x(x + 1) (x + 2)(x + 3)(x + 4)(x + 5) = t^4 \), then its simple factors would be of the form \( a^4, b^4, c^4 \) \ldots \ldots \ldots \ Now \( x(x + 1) \ldots \ldots \) are successive numbers, and it is plain that no six successive numbers can be put under that form; for amongst them we should have a prime \( (P) \), which, in order to become \( P^4 \), would require three factors, each equal to \( P \); or, in other words, there would be one prime and three other equal primes, or factorial primes, comprised in six successive numbers, which is impossible. .

The question was similarly answered by Messrs. Barlow, Brooks, Dale, McCormick, M’Namara, Martin, Traynor, and Wilson.

Second Solution, by Mr. Robert Tucker, M.A., University College School.

The given equation may be put under the form
\[ x(x + 4)(x + 6) = t^4 \], where \( x = x^2 + 5x \).

Assume \( x \) to be even and \( = 2m \), then \( t^4 = 8m(m + 2)(m + 3) \); manifestly \( m \) cannot be even, also it cannot be odd, for then the expression is of the form \( 16(2n + 1)(2n + 3)(n + 2) \), and two consecutive odd numbers are prime to one another.

Again, let \( x = 2p + 1 \), then \( t^4 = (2p + 1)(2p + 5)(2p + 7) \), and two of the factors are again clearly prime to one another; hence the truth of the question is established.

Third Solution, by Mr. Asher B. Evans, the Proposer.

Let \( P_x = x(x + 1)(x + 2)(x + 3)(x + 4)(x + 5) \); and it may be shown that \( P_x \) cannot be a square while \( x \) is an integer. It is evident that while \( (x + 1)<25 \), \( P_x \) will contain the prime factor \( 5 \) an odd number of times unless \( x = 5m_1 \). Also it is evident that while \( (x + 5)<49 \), \( P_x \) will contain the prime factor \( 7 \) an odd number of times unless \( x = 7m_2 + 1 \). Let \( x = 5m_1 = 7m_2 + 1 \); then, since \( x, m_1 \), and \( m_2 \) are integers, we must have \( x = 35m + 15 \).

When \( m = 0 \), \( x = 15 \), in which case \( P_x \) is not a square, since it contains the prime factors 19, 17 once each. When \( m = 1 \), \( x = 50 \); hence \( P_x \) cannot be a square while \( x < 24 \).

Let \( y = x + \frac{5}{2} \); then \( P_x = (y^2 - \frac{1}{4})(y^2 - \frac{9}{4})(y^2 - \frac{25}{4}) \)

\[ = y^6 - \frac{35}{4}y^4 + \frac{259}{16}y^2 - \frac{225}{64} = (y^3 - \frac{35}{8}y)^2 - \frac{189y^2 + 225}{64} \].

Since \( P_x \) cannot be a square while \( x < 24 \), it cannot be a square while \( y < 20\frac{1}{4} \) or while \( y < 28 \).
Put \( y^2 - \frac{35}{8} y = a \), and \( \frac{189y^2 + 225}{64} = b \); then \( P_x = a^2 - b = a^2 \left(1 - \frac{b}{a^2}\right) \);

and by extracting the square root,

\[
\sqrt{P_x} = a \left\{1 - \frac{1}{2} \cdot \frac{b}{a^2} - \frac{1}{2} \cdot \frac{b^2}{4a^4} - \frac{1}{2} \cdot \frac{b^2}{2a^4} - \frac{3}{4} \cdot \frac{b^2}{6a^6} - &c.\right\}
\]

or

\[
\sqrt{P_x} = a - \frac{b}{a} \left(1 + \frac{1}{4} \cdot \frac{b}{a^2} + \frac{3}{4a^4} \cdot \frac{b^2}{6a^6} + &c.\right).
\]

While \( y > 26 \), \( a > 17402\frac{1}{4} \), and \( b > 1999 \), \( \frac{53}{64} \), and \( \frac{1}{a} < \frac{1}{17} \).

But \( \left(1 + \frac{1}{4} \cdot \frac{b}{a^2} + \frac{3}{4a^4} \cdot \frac{b^2}{6a^6} + &c.\right) \) is evidently greater than 1 and less than \( \frac{17}{16} \)

while \( y > 26 \), \( \therefore \sqrt{P_x} = a - \frac{b}{a} \beta \), where \( \beta \) stands for \( \left(1 + \frac{1}{4} \cdot \frac{b}{a^2} + \frac{3}{4a^4} \cdot \frac{b^2}{6a^6} + &c.\right) \). But \( \frac{b}{a} < \frac{1}{17} \) and \( \beta < \frac{17}{16} \), \( \frac{b}{a} < \frac{1}{17} \). Also \( a = \frac{8y^2 - 35y}{8} \);

hence, since the fractional part of \( a \) is an integral number of eighths, if it has any fractional part, the remainder found by subtracting a fraction less than \( \frac{1}{17} \) from \( a \) cannot be an integer.

\( \therefore \sqrt{P_x} \) cannot be an integer, or \( x(x + 1)(x + 2)(x + 3)(x + 4)(x + 5) \) cannot be an integral square, and consequently cannot be an integral fourth power.

**XIV. QUEST. (2107); by Mr. Artemas Martin, Franklin, U.S.**

In a given triangle inscribe three circles tangential to each other, and each of them touching two sides of the triangle. A geometrical solution is required.

**Answered by Mr. Thomas Dobson, Hexham; and in like manner by Mr. Artemas Martin, the Proposer; and Messrs. Escott, Evans, Tucker, Turrell, and Watson.**

This is known as Malfatti's problem, of which a geometrical construction, without demonstration, has been given by Steiner. The following analysis of Steiner's construction, by Dr. Hart, is taken from the 'Quarterly Journal of Mathematics,' vol. i (1857). I have supplied a geometrical demonstration of Lemma 2.

**Lemma 1.**—If the sum or difference of the tangents \( AB, AC \), drawn from a point \( A \) to two circles, be equal to a common tangent \( DE \) of the circles, the point \( A \) is on a common tangent.

For if not, let \( AC = AB + DE = AF + FE \), then \( GC = AG + AF + FE \),

\( \therefore FG = AG + AF \), which is absurd.

Cor.—Hence it is evident that if the common tangent to each pair of three circles pass through the same point, one of these common tangents must be equal to the sum of the other two; and that, therefore, the other common tangents (which are equal to these) will also pass.
through one point. The common tangents being either all transverse or one transverse and two direct.

**Lemma 2.**—If two circles cut off equal parts, $AB$ and $CD$, from a given right line, and if tangents at the extreme points $A$ and $D$ intersect at $P$, the circles will subtend equal angles at $P$.

From the centres $E$, $F$ draw perpendiculars $EG$, $FH$ to the equal chords, and from $P$ draw $PK$ perpendicular to $AD$. By similar triangles

$$AE : AP = AG : PK = DH : PK = DF : DP;$$

$$\therefore \angle APE = \angle DPF.$$

**Cor.**—If tangents be drawn from each point $A$ and $D$ to the other circle they will be equal by Euclid.

Now, let $LMN$ be the points of contact of three circles which touch one another, and each touches two sides of the triangle $ABC$; draw $DE$, $FG$, $HI$ touching these circles at $LMN$, and meeting one another at $K$. Then, since $FH - HD = FO - DP = FM - DL = FK - DK$, $H$ is the point of contact of the circle inscribed in the triangle $DKF$. So $E$ and $G$ are the points of contact of circles which touch $IK$, $KF$, and $AC$; $IK$, $KD$, and $AB$, respectively. But $HN = HP = QL$, and $NS = ER = EL$; $\therefore HS = EQ$, and $\therefore$ the circles $HQ$ and $ES$ subtend equal angles at $C$ (Lemma 2). Also three common tangents $QL$, $SN$, and $KF$ of the circles $HQ$, $ES$, $PNR$ pass through $K$; $\therefore$ $C$ must be a point on the other common tangent to $HQ$ and $ES$ (Cor. Lemma 1), and $\therefore$ this common tangent bisects the $\angle C$. Similarly the bisectors of $A$ and $B$ are common tangents to $ES$ and $GT$, $HQ$ and $GT$, respectively.

**Construction.**—To the centre $O'$ of the inscribed triangle draw $AO'$, $BO'$, $CO'$, and in the triangles $AO'B$, $BO'C$, $CO'A$ inscribe circles touching $AB$, $BC$, $CA$ in $GHE$ respectively. Through $H$, $E$, $G$ draw common tangents $HI$, $ED$, $GF$ to each pair of opposite circles meeting in $K$. Then circles may be inscribed in the quadrilaterals $AGKE$, $BHK$, $CHKE$ (1), which shall touch each other (2).

(1) For $HS = EQ$, or $HK + KS = EK + KQ$;

$$\therefore HK - EK = KQ = \text{length of common tangent} = CH - CE.$$

(2) $FH - DH = FK - DK = FM - DL = FO - DP = FH + HO - (DH + HP)$, $\therefore HO = HP$.

Good analytical solutions were also given by Messrs. Barlow, Hall, M’Namara, Martin, Traynor, and Wilson.
XV. PRIZE QUEST. (2108); by the late Professor Hearn.

To find the axis of a paraboloid of revolution, the latus rectum being given, so that the attraction of the solid on a point in the focus may be zero. Also determine the same for a paraboloidal surface.

Answered by Dr. Rutherford, Charlton; and Messrs. Barlow, Brooks, Dale, Dobson, Escott, Evans, Frisby, Hall, Martin, and Tebay.

1. For the solid.—Let AVB be the generating parabola whose vertex is V, focus F, and CFD a focal chord at right angles to the axis VH. Let P be any point in the paraboloid, and draw FR at right angles to VH. Then, if VR = x, RP = y, we get an elemental ring of the volume at P = 2πy dy dx.

Let FV be denoted by unity; then the limits of y are 0, 2π1/2, and those of x are 0, 1; consequently the attraction of the elemental ring at P, in direction VF, is

\[ \frac{2\pi y \, dy \, dx}{FP^2} = 2\pi y \, dy \, dx \left\{ \frac{1}{(1-x)^2 + y^2} \right\}^{1/2} \]

\[ = 2\pi \int_0^1 dx \left( 1-x \right) \left( \frac{1}{1-x} - \frac{1}{1+x} \right) \]

\[ = 4\pi \int_0^1 \frac{xdx}{1+x} = 4\pi \left( 1 - \log 2 \right) \]

\[ = 4\pi \log \frac{e}{2} \ldots \ldots \ldots \ldots (1). \]

When the point P is taken on the other side of CD we must write x" for 1 - x, then integrate between the limits of y as above, and for x between the limits 1 and x; thus, we find

\[ 2\pi \int_1^\infty dx \left( x-1 \right) \int_0^{2\pi 1/2} y \, dy \left\{ \frac{1}{(x-1)^2 + y^2} \right\}^{1/2} = 2\pi \int_1^\infty dx \left( x-1 \right) \left( \frac{1}{x-1} - \frac{1}{x+1} \right) \]

\[ = 4\pi \int_1^\infty \frac{dx}{x+1} = 4\pi \log \frac{x+1}{2} \ldots \ldots \ldots \ldots (2). \]

From (1) and (2) we get, when these attractions are equal, and become neutralized,

\[ x + 1 = \epsilon, \text{ or } x = \epsilon - 1 = 1.7182818. \]

2. For the surface.—Let Q be any point on the surface; then the attraction of an elemental ring of the surface at Q, in the direction VF, is

\[ 2\pi y \, ds \cdot \frac{x-1}{(x+1)^2} = 4\pi \frac{(x-1) \, dx}{(x+1)^{3/2}} = 4\pi \frac{(x+1-2) \, dx}{(x+1)^{3/2}} \]

\[ = 4\pi (x+1)^{-3/2} \, dx - 8\pi (x+1)^{-1} \, dx. \]
Integrating between the limits \( x = 1 \) and \( x = x \), we get, for the attraction of the zone ABDC, the expression

\[
\frac{8\pi}{3} \left\{ \sqrt{2} - \frac{2}{(x + 1)^{\frac{3}{2}}} - \frac{3}{(x + 1)^{\frac{1}{2}}} \right\} = \frac{8\pi}{3} \left( \sqrt{2} - \frac{3x + 1}{(x + 1)^{\frac{3}{2}}} \right) \ldots \ldots \ldots (3).
\]

When \( x \) is less than unity, the attraction of the segment CVD is

\[
4\pi \int_0^1 \frac{(1 - x)dx}{(x + 1)^{\frac{3}{2}}} = 4\pi \int_0^1 \frac{2 - (1 + x)}{(1 + x)^{\frac{3}{2}}} dx
\]

\[
= 8\pi \int_0^1 (1 + x)^{-\frac{3}{2}} dx - 4\pi \int_0^1 (1 + x)^{-\frac{1}{2}} dx
\]

\[
= \frac{8\pi}{3} \left( \sqrt{2} - 1 \right) \ldots \ldots \ldots \ldots \ldots (4).
\]

When the combined attraction on \( F \) is zero, the expressions (3) and (4) are equal; hence we obtain

\[(x + 1)^{\frac{3}{2}} = 3x + 1, \text{ or } x(x^2 - 6x - 3) = 0; \]

\[\therefore x = 0, x = 3 \pm 2\sqrt{3}.
\]

As \( x \) does not practically admit of a negative value, the upper sign must here be taken, and thus

\[x = 3 + 2\sqrt{3} = 6.4641016.
\]

**Second Solution, by Mr. Stephen Watson, Haydonbridge.**

Let the generating parabola be \( \beta^2 = 4m(m + x) \), the origin being the focus; then the attraction of a particle at \( (xy) \) on the focus may be expressed by \( \frac{\rho}{x^2 + y^2} \), and hence the attraction in the direction of the axis is \( \frac{\rho x}{(x^2 + y^2)^{\frac{3}{2}}} \).

An elemental ring of the paraboloid is \( 2\pi y dy \); hence the attraction in the direction of the vertex is

\[2\rho \pi \int_0^m x dx \int_0^{\sqrt{4m(m-x)}} \frac{y dy}{(x^2 + y^2)^{\frac{3}{2}}} = 2\rho \pi \int_0^m x dx \left( \frac{1}{2m - x} - \frac{1}{x} \right)
\]

\[= -4\rho \pi m (1 + \log \frac{1}{2}) = -4\rho \pi m \log \frac{\varepsilon}{2} \ldots \ldots \ldots \ldots \ldots (1),
\]

which, though negative, must be taken as positive.

In the opposite direction the attraction on the focus is

\[2\rho \pi \int_0^m x dx \int_0^{\sqrt{4m(m+x)}} \frac{y dy}{(x^2 + y^2)^{\frac{3}{2}}} = -4\rho \pi m \log \frac{2m + x}{2m} \ldots \ldots \ldots \ldots (2),
\]

which must also be taken as positive. Comparing (1) and (2),

\[\frac{\varepsilon}{2} = \frac{2m + x}{2m} \therefore x + m = m(\varepsilon - 1), \text{ the axis in the first case.}\]
Again, an elemental ring of the paraboloidal surface is

\[ 2\pi yds = 2\pi \sqrt{4m^2 + y^2} \, dx; \]

hence the attraction in the direction of the vertex, in which case \( y^2 = 4m(m-x) \), is

\[ 2\rho \pi \int_0^m \frac{(4m^2 + y^2)^{\frac{1}{2}}}{(2m-x)^{\frac{3}{2}}} \, dx = 4\rho \pi m \int_0^m \frac{xdx}{(2m-x)^{\frac{3}{2}}} = \frac{8}{3} \rho \pi (\sqrt{2} - 1) \ldots \] (3).

In the contrary direction \( y^2 = 4m(m+x) \), and the attraction is

\[ 4\rho \pi m \int_0^x \frac{xdx}{(2m+x)^{\frac{5}{2}}} = \frac{8}{3} \rho \pi \left\{ \sqrt{2} - \frac{3m^2 + 3m^2 x}{(2m+x)^{\frac{3}{2}}} \right\} \ldots \] (4).

Comparing (3) and (4), and clearing the result of radicals, we have

\[ x^3 - 3mx^2 - 12m^2x - 8m^3 = 0, \]

the three roots of which are \(-m, 2m(1 - \sqrt{3}), 2m(1 + \sqrt{3})\), the first two of which are inadmissible; the last gives

\[ x + m = m(3 + 2\sqrt{3}), \] the axis in the second case.

---

LIST OF MATHEMATICAL ANSWERS.

Barlow, William, Grafton Lodge, Richmond Hill, ans. all the Questions.
Brooks, C. H., C.E., F.R.A.S., Cuttack, Bengal, ans. all the Questions.
Cranston, David, Greenock, N.B., ans. 1.
Dale, James, 14, Kingsland Place, Aberdeen, ans. 2, 3, 4, 5, 7, 10, 11, 12, 13, Prize.
Dobson, Thomas, B.A., Hexham, ans. all the Questions.
Escott, Albert, F.R.A.S., Royal Hospital School, Greenwich, ans. all the Questions.
Evans, Asher B., A.M., Lockport, N.Y., United States, ans. all the Questions.
Frisby, Edgar, A.M., Naval Observatory, Washington, U.S., ans. 1, 2, 3, 4, 7, 10, 11, Prize.
G. R. (St. John's College, Cambridge), ans. 4, 5, 8.
Hall, Asaph, Naval Observatory, Washington, United States, ans. all the Questions.
M'Cormick, Edward, C.E., Shucknall, Ledbury, Herefordshire, ans. 2 to 8, 10, 18, Prize.
M'Namara, T., Ballyhannis, Mayo, Ireland, ans. 2 to 11, 13, 14, Prize.
Martin, Artemas, Box 70, M'Kean, Erie Co., Pa., United States, ans. 1 to 10, 12, 13, 14, Prize.
Mason, the Rev. Wm., Kirkby Malzeard, ans. 1.
Rutherford, Dr., Tweed Cottage, Maryon Road, Charlton, ans. 1 to 10, 11, 13, Prize.
Rutter, Edward, Darcy Terrace, Sunderland, ans. 1 to 5, 7, 10.
Smith, James, Surveyor, 61, King Street, Manchester, ans. 5, 6.
Tebay, Septimus, B.A., Grammar School, Rivington, ans. 10, 12, Prize.
Traynor, James, C.E., Shercock, near Carrickmacross, Ireland, ans. 2 to 11, 13, 14, Prize.
Tucker, Robert, M.A., University College School, London, Ireland, ans. 1 to 6, 10, 11, 13, 14.
Turrell, Isaac H., Harrison, Ohio, United States, ans. 1, 2, 3, 4, 10, 12, 14.
Watson, Stephen, Grammar School, Haydonbridge, ans. all the Questions.
Wilson, James, 23, South Mall, Cork, ans. 1 to 11, 13, 14, Prize.
The arranging of the matter for the printer is greatly facilitated when contributions, intended for insertion, are written on one side of the paper only.

An esteemed correspondent has informed us of the decease of Mr. Henry Milburn, who many years ago was a promising mathematical correspondent. Mr. Henry Milburn died on the 29th of June, 1866, aged 82 years, at Knoppingsholme, near Bellingham, Northumberland; and he and his brother, Mr. Edward Milburn, of Knoppingsholme, were the representatives of one of the most powerful clans of Tyne and Reed, the Charltons, the Robsons, the Dodds, and the Milburns.

We have to acknowledge the receipt of the following Publications:

1. 'Elementary Mensuration, for the Use of Schools.' By Septimus Tebay, B.A. (Macmillan and Co.) Mr. Tebay has succeeded well in simplifying his work, and, by suitable examples, adapting it to scholastic requirements. He has annexed two rather curious arithmetical tables of right-angled and scalene triangles, the sides and areas of which admit of being exhibited in whole numbers.

2. 'Mensuration for Beginners.' By J. Todhunter, M.A. Another excellent academical work on the same subject.

3. 'Mechanical Geometry.' By A. H. L. S. Béchaux, B.A. (R. Hardwicke, Piccadilly.) This interesting volume contains much that is original in the author's methods of applying the elementary principles of Statics to the development of Geometrical Theorems. The methods are very comprehensive and efficient in their general application, and all kinds of theorems are derived with unusual simplicity and brevity.

4. 'Contributions to Local History.' By Thomas Dobson, B.A. (Herald Office, Hexham.) This small volume is very interesting as regards the locality of Hexham.

The several Prizes are allotted as follows:

For Answers to the PrizE Question, to Mr. Septimus Tebay, Rivington, and Mr. James Dale, of Aberdeen, each twelve Diaries.

For General Mathematical Answers, to Mr. Thomas Dobson, Hexham, and Mr. William Barlow, Richmond Hill, each ten Diaries.

For Poetical Answers to the PrizE Enigma, to Mr. John Crawford, Edinburgh, and Clio, of Hexham, each ten Diaries.

For General Answers to the Enigmas, to Mr. Thomas Wray, Market Weighton, and Mr. Thomas Edwards, Lois Weeden, each ten Diaries.

And for Answers to the Riddles and Charades, to Mr. Thomas Hattam, Falmouth Harbour Lighthouse, and Mr. Alexander Scoror, Elswick, Newcastle-upon-Tyne, each eight Diaries.

They will please to send (or write, post paid) for their respective Prizes to Mr. Joseph Greenhill, Stationers' Hall, London.

All letters must, as usual, be directed "To the Editor of the 'Lady's and Gentleman's Diary,' Stationers' Hall, London." They must likewise be post-paid, and arrive before May 1st, 1870, excepting letters from the United States, which will be in time if received before July 1st.
NEW MATHEMATICAL QUESTIONS.

I. QUEST. (2109); by the Rev. W. Mills, M.A., Harpham, near Hull.

If \( m, m_1, m_2, m_3 \) represent the lines joining the centre of gravity of a triangle with the centres of its inscribed and escribed circles, then:

\[
m^2 + m_1^2 + m_2^2 + m_3^2 = \frac{1}{y}(20D^2 + d_1^2 + d_2^2 + d_3^2).
\]

II. QUEST. (2110); by Mr. T. McNamara, Ballyhannis.

If, from the extremity D of the minor axis CD of an ellipse, two chords DP, DQ are drawn intersecting the major axis in \( p \) and \( q \) respectively; prove that the straight line drawn from D bisecting \( pq \) will pass through the pole of PQ.

III. QUEST. (2111); by Mr. Thomas Dobson, B.A., Hexham.

Two circles \( (p_1, p_1') \) &c. within each angle of a triangle touch the containing sides. Of these \( p', p'', p''' \) have internal contact, and \( p_1, p_2, p_3 \) external contact with the circumscribing circle; prove that

\[
\frac{p'}{p_1} + \frac{p''}{p_2} + \frac{p'''}{p_3} = 1.
\]

IV. QUEST. (2112); by Mr. W. R. Nicoll, King's College, Aberdeen.

If a quadrilateral be inscribable in and circumscribable by a circle, show that its area is equal to the square root of the continued product of its four sides.

V. QUEST. (2113); by Mr. Thomas Dobson, B.A., Hexham.

Each of three circles (radii \( r_1, r_2, r_3 \)) touches two sides of the triangle \( abc \) and the nine-point circle; prove that

\[
\frac{r_1}{r_1} + \frac{r_2}{r_2} + \frac{r_3}{r_3} = \frac{a^2 + b^2 + c^2}{(a + b + c)^2}.
\]

VI. QUEST. (2114); by Mr. T. T. Wilkinson, F.R.A.S., Burnley.

In any triangle ABC, let D, E, F be the points where the internal bisectors of the angles cut the sides BC, CA, AB, respectively: then will \( \Delta F.BF = ab \left( \frac{c}{a + b} \right)^2; \ AE.CE = ac \left( \frac{b}{a + c} \right)^2 \); and \( BD.CD = bc \left( \frac{a}{b + c} \right)^2 \). Required proof.

VII. QUEST. (2115); by Mr. T. T. Wilkinson, F.R.A.S., Burnley.

Let ABC be any triangle; LMN that formed by joining the feet of the perpendiculars; then if \( \sigma, \sigma_1, \sigma_2, \sigma_3 \) denote the inscribed and escribed radii of the triangle LMN, and \( q = \frac{1}{2}(a^2 + b^2 + c^2) \), we shall have \( \sigma = \frac{q - 4R^2}{4R}; \ \sigma_1 = \frac{q - a^2}{2R}; \ \sigma_2 = \frac{q - b^2}{2R}; \ \sigma_3 = \frac{q - c^2}{2R} \). Required proof.

VIII. QUEST. (2116); by Mr. Thomas Dobson, B.A., Hexham.

Where must a man stand so as to hear together the report of a rifle and the impact of the bullet on the target?
IX. QUEST. (2117); by Mr. W. S. B. Woolhouse, London.

The four sides of a quadrilateral are given; determine its form when the rectangle under the two diagonals is a maximum.

X. QUEST. (2118); by Mr. Septimus Tebay, B.A., Rivington.

n cards are marked with the numbers 1, 2, 3, ..., n; if they be shuffled, and any card observed, and placed on the table with the numbers downwards, and upon it a number of cards equal to the complement between n and the card observed, and a like operation be performed on the remainder, and so on till r cards remain which will not answer the condition. If m be the number of groups, show that the sum of the numbers observed is (n + 1)(m−1) + r + 1. Show also how to find the whole number of ways in which this can be done when r is zero; and find the greatest number of groups that can be formed in any case.

XI. QUEST. (2119); by Mr. Matthew Collins, 21, Eden Quay, Dublin.

If every two of five circles ABCDE touch each other except D and E, prove geometrically that the common tangent to this excepted pair (D and E) is just twice as long as it would be if D touched E; and thence infer that the problem is either indeterminate or impossible which requires:
To describe three circles touching each other, each of which shall also touch two given circles.

XII. QUEST. (2120); by Mr. Septimus Tebay, B.A., Rivington.

AB is a straight line, trisected in C, D; if two points be taken at random in CD; or one in CD and one in DB; or one in AC and one in DB; and the extreme portions turned up so as to form a triangle; find the average area in each case.

XIII. QUEST. (2121); by Mr. Stephen Watson, Haydonbridge.

OB, OC are any semidiameters of an ellipse perpendicular to each other. Find the locus and area of the curve which is the intersection of normals at B and C.

XIV. QUEST. (2122); by Mr. Stephen Watson, Haydonbridge.

Four points are taken at random on the circumference of a given circle, and each contiguous pair joined, thus forming an inscribed quadrilateral. Again on the surface of each segment of the circle outside this quadrilateral, a point is taken at random, and each pair in contiguous segments joined, thus forming a second quadrilateral, the average area of which it is required to find.

XV. PRIZE QUEST. (2123); by Mr. W. S. B. Woolhouse, London.

Determine a general expression for the average of the positive values of the linear function k + Ax + By + Cz when the variables x, y, z take all values between given limits, for example, say between −1 and +1.