Gentleman's Diary, or, the Mathematical Repository; An Almanack For the Year of Our Lord 1816: Being Bisextile or Leap-Year.

Containing many useful and entertaining particulars, peculiarly adapted to the ingenious gentlemen engaged in the delightful study and practice of the mathematicks.

The Seventy-sixth Almanack published of this kind; and the Sixty-sixth of the New Style in England.

With wise intent The hand of Nature on peculiar minds Imprints a different bias; and to each Decrees its province in the common To some she taught the fabric of the changeful Moon, the Circuit of the golden Zones of Heaven: to some she gave To weigh the moment of eternal things Of time, and space, and fate's unbroken guide, And Will's quick impulse.

London: Printed for the Company of Stationers, By Nichols, Son, and Bentley, Red Lion Passage, Fleet Street; And sold by George Greenhill, Treasurer to the Company, at their Hall, Ludgate Street, 1816.

[Price Two Shillings and Three Pence stitched.]
ECLIPSES, 1816.

Four; viz. Two of the Sun, and two of the Moon.

1st. May 27th. An eclipse of the Sun invisible at Greenwich. The Sun will be centrally eclipsed on the meridian at 2h. 48m. in the morning, in lat. 58° 52' S. lon. 138° 26' E.

2d. June 9th and 10th. An eclipse of the Moon. Beginning of eclipse 11h. 30m. P. M. Beginning of total darkness 6h. 39m. A. M. Middle of the Eclipse 1h. 15m. Ecliptic opposition 1h. 19m. End of total darkness 1h. 51m. End of the Eclipse, 3h. Digits eclipsed 14d 56' from South side of the Sun's shadow.

3d. November 19th. A visible eclipse of the Sun. Beginning of the eclipse 8h. 18m. morning. Greatest obscuration 9h. 24m. Visible conjunction 10h. 23m. End 10h. 34m. Digits eclipsed 94 23' on the North limb. D makes first impression on Sun's disk at 59° from his vertex on the right hand.

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Venus will be a Morning star till the 31st of July; then an Evening star to the Year's end.

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* * * The last column in each page of the Calendar shews the mean height of the Barometer and of Fahrenheit's Thermometer, near London, on each day in the year 1814.

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Mr. Professor Leybourn's republication of the Mathematical parts of the Ladies' Diary, up to the present time, in four 8vo volumes, will be published about the end of the year. No. 14 of his Mathematical Repository is just published.

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Letters must, as usual, be franked or post-paid, directed To the Author of the Gentleman's Diary, Stationers' Hall, London, and arrive before the 1st of May 1816.
<table>
<thead>
<tr>
<th>JANUARY hath XXXI Days.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Quarter 7</td>
</tr>
<tr>
<td>Full Moon 15</td>
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<tr>
<td>Last Quarter 21</td>
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<tr>
<td>New Moon 29</td>
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<tr>
<td>2 T Rain in Jan.1814, 4°1 inc.</td>
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<tr>
<td>3 W Day 7 h. 58'm. long.</td>
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<tr>
<td>4 F R. B. P. D.</td>
</tr>
<tr>
<td>5 S J. Ch. 4 Ch. of A. 3 morn.</td>
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<tr>
<td>6 M Lucian. Plough Monday.</td>
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<tr>
<td>7 T</td>
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<tr>
<td>8 W Abp. Laud beheaded, 1645.</td>
</tr>
<tr>
<td>9 T</td>
</tr>
<tr>
<td>10 S Hilary, Cam. Term begins.</td>
</tr>
<tr>
<td>11 F</td>
</tr>
<tr>
<td>12 S</td>
</tr>
<tr>
<td>13 M Pondicherry surrendered.</td>
</tr>
<tr>
<td>14 T</td>
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<tr>
<td>15 W Battle of Falkirk, 1746.</td>
</tr>
<tr>
<td>16 T</td>
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<tr>
<td>17 S</td>
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<tr>
<td>18 F</td>
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<tr>
<td>19 S Fabian. In8th of St.Hill.1r.</td>
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<tr>
<td>20 C Ed S. of E. R. Agnes. morn.</td>
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<tr>
<td>21 M Vincent.</td>
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<tr>
<td>22 T Hilary Term begins.</td>
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<tr>
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<td>25 F [in 15d. 2 ret.</td>
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<tr>
<td>26 S D. of Sussex b. Fr. St.Hill.</td>
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<td>27 S</td>
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<td>28 M</td>
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<td>29 T</td>
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<td>47</td>
<td>1</td>
<td>5</td>
<td>57 54</td>
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</tbody>
</table>

**Note:** The table includes various astronomical and historical events of the month of January, such as the phases of the moon, the rising and setting times of celestial objects, and significant historical events. The data is presented in a clear, organized manner, allowing for easy reference and understanding of the events occurring in January.
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<th>Q Decl.</th>
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</thead>
<tbody>
<tr>
<td>First Quarter 7</td>
<td>6 a.m. Afternoon.</td>
<td></td>
<td>---------</td>
</tr>
<tr>
<td>Full Moon 15</td>
<td>1 a.m. Morning.</td>
<td></td>
<td>---------</td>
</tr>
<tr>
<td>Last Quarter 21</td>
<td>Day at 4 a.m. Afternoon.</td>
<td></td>
<td>---------</td>
</tr>
<tr>
<td>New Moon 29</td>
<td>8 a.m. Morning.</td>
<td></td>
<td>---------</td>
</tr>
</tbody>
</table>

### Events

- **1 Jan**: Rain in Jan. 1814, 4:01 inc. 5 a 37; 1 a 37; 2 30°0'-25°5'
- **5 Jan**: Day 7 h. 58 in. long. 6 43; 2 95; 8 29°8'-30°0'
- **6 Jan**: F. R. B. P. D. 7 50; 3 10; 10 429°6'-31°0'
- **7 Jan**: Lucian Plough Monday. 8 53; 3 53; 5 29°4'-29°0'
- **8 Jan**: M. Full Moon 15. 11 13; 5 15; 11 29°3'-24°5'
- **9 Jan**: T. Abp. Laud beheaded, 1645. 0 21; 6 37; 9 29°7'-21°5'
- **10 Jan**: W. Sir Hans Sloane died, 1752. 1 30; 7 21; 10 29°7'-18°5'
- **11 Jan**: T. Sir John Moore slain. 2 42; 8 11; 2 29°7'-21°0'
- **12 Jan**: M. Pondicherry surrendered. 3 57; 9 0; 12 29°3'-22°5'
- **13 Jan**: T. Battle of Falkirk, 1746. 4 27; 2 0; 7 29°4'-25°5'
- **16 Jan**: T. Battle of Falkirk, 1746. 6 1; 1 0; 9 29°4'-22°5'
- **17 Jan**: W. Battle of Falkirk, 1746. 7 27; 2 0; 10 29°3'-25°0'
- **18 Jan**: T. G. S. A. B. Prisc. 8 52; 2 56; 11 29°1'-33°0'
- **19 Jan**: F. S. H. Cam. Term begins. 9 16; 3 49; 12 29°9'-30°0'
- **20 Jan**: S. Fabian. In 8d. of St. Hill. 10 39; 4 39; 13 29°6'-28°5'
- **21 Jan**: C. S. A. G. Agnes. 11 38; 4 39; 14 29°7'-19°5'
- **22 Jan**: M. Vincent. 12 57; 6 16; 15 29°8'-20°0'
- **23 Jan**: T. Hilary Term begins. 13 45; 7 54; 16 29°7'-25°0'
- **24 Jan**: W. Fire at Custom House, 1715. 14 31; 7 55; 17 29°8'-29°5'
- **25 Jan**: T. Conversion of St. Paul. 15 43; 8 46; 18 29°7'-28°0'
- **26 Jan**: F. [in 15 d. 2ret.] 16 48; 9 38; 19 29°4'-34°5'
- **27 Jan**: S. D. of Sussex E. Fr. St. Hill. 17 44; 10 36; 20 29°1'-36°0'
- **28 Jan**: C. A. S. B. p. Epiphany. 18 29; 11 21; 21 29°8'-34°0'
- **29 Jan**: M. D. Conversi of St. Paul. 19 5; 6 16; 22 29°7'-27°0'
- **30 Jan**: T. Hilary Term begins. 20 57; 12 57; 23 29°1'-32°5'
- **31 Jan**: W. Charles I. nat. 1610. 1 39; 1 41; 2 29°6'-30°0'

### Meteorological Data

- **Sun E.**
  - 1 Jan: 2 a 10; 7 m32; 6 a 38
  - 6 Jan: 2 a 10; 7 m32; 6 a 38
  - 11 Jan: 2 a 10; 7 m32; 6 a 38
  - 16 Jan: 2 a 10; 7 m32; 6 a 38
  - 21 Jan: 2 a 10; 7 m32; 6 a 38
  - 26 Jan: 2 a 10; 7 m32; 6 a 38
- **Saturn.**
  - 1 Jan: 2 a 10; 7 m32; 6 a 38
  - 6 Jan: 2 a 10; 7 m32; 6 a 38
  - 11 Jan: 2 a 10; 7 m32; 6 a 38
  - 16 Jan: 2 a 10; 7 m32; 6 a 38
  - 21 Jan: 2 a 10; 7 m32; 6 a 38
  - 26 Jan: 2 a 10; 7 m32; 6 a 38
- **Jupiters.**
  - 1 Jan: 2 a 10; 7 m32; 6 a 38
  - 6 Jan: 2 a 10; 7 m32; 6 a 38
  - 11 Jan: 2 a 10; 7 m32; 6 a 38
  - 16 Jan: 2 a 10; 7 m32; 6 a 38
  - 21 Jan: 2 a 10; 7 m32; 6 a 38
  - 26 Jan: 2 a 10; 7 m32; 6 a 38
- **Mars.**
  - 1 Jan: 2 a 10; 7 m32; 6 a 38
  - 6 Jan: 2 a 10; 7 m32; 6 a 38
  - 11 Jan: 2 a 10; 7 m32; 6 a 38
  - 16 Jan: 2 a 10; 7 m32; 6 a 38
  - 21 Jan: 2 a 10; 7 m32; 6 a 38
  - 26 Jan: 2 a 10; 7 m32; 6 a 38
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<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 M</td>
<td>Rain in April 1814, 1:35 inc.</td>
<td>10 a 31</td>
<td>2 42</td>
</tr>
<tr>
<td>2 T</td>
<td>8 a 53</td>
<td>0</td>
<td>45</td>
</tr>
<tr>
<td>10 W</td>
<td>Day 13th. 34 m. long.</td>
<td>5 0</td>
<td>10</td>
</tr>
<tr>
<td>11 T</td>
<td>Maundy Thursday.</td>
<td>5 20 5</td>
<td>11</td>
</tr>
<tr>
<td>14 F</td>
<td>Good Friday.</td>
<td>8 a 53</td>
<td>0</td>
</tr>
<tr>
<td>15 T</td>
<td>Easter Monday.</td>
<td>11 28 2</td>
<td>3</td>
</tr>
<tr>
<td>16 T</td>
<td>Easter Tuesday.</td>
<td>11 28 2</td>
<td>3</td>
</tr>
<tr>
<td>17 W</td>
<td>Easter Day.</td>
<td>0 40 4</td>
<td>25</td>
</tr>
<tr>
<td>21 F</td>
<td>Alphege.</td>
<td>2 25 6</td>
<td>13 22 29 6-53 0</td>
</tr>
<tr>
<td>31 M</td>
<td>Henry VII. died, 1509.</td>
<td>3 27 7</td>
<td>5</td>
</tr>
<tr>
<td>23 T</td>
<td>St. George.</td>
<td>3 43 8</td>
<td>34 25</td>
</tr>
<tr>
<td>24 W</td>
<td>Oxf. and Camb. Terms b.</td>
<td>4 21 9</td>
<td>57 27</td>
</tr>
<tr>
<td>25 T</td>
<td>St. Mark: Pres. Mary Born.</td>
<td>4 35 10</td>
<td>38 29</td>
</tr>
<tr>
<td>26 F</td>
<td>8 a 28</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>29 M</td>
<td>From East in 15 days 1 r.</td>
<td>9 41 1</td>
<td>35</td>
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<tr>
<td>30 T</td>
<td>Battle of Fontenoy, 1745.</td>
<td>10 54 2</td>
<td>26</td>
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<tr>
<td>MARCH</td>
<td>4th day YRAUH</td>
<td>Mar.</td>
<td>Decl. South</td>
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<tr>
<td>1st Quarter</td>
<td>9h: 55m.</td>
<td>Morn.</td>
<td>19° 7' 50&quot;</td>
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<tr>
<td>Full Moon</td>
<td>at 9h 47m.</td>
<td>Afternoon</td>
<td>10° 15' 15&quot;</td>
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<tr>
<td>Last Quarter</td>
<td>9h 44m.</td>
<td>Morn.</td>
<td>19° 16' 38&quot;</td>
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<td>at 9h 27m.</td>
<td>Afternoon</td>
<td>18° 30' 40&quot;</td>
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<tr>
<td>1st quarter</td>
<td>at 20th day, at 5th, 9 M.</td>
<td>Afternoon</td>
<td>18° 13' 17&quot;</td>
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</table>

| 11 | P. David. | 7 a 52 | 145 | 20° 0' 38" |
| 03 | S. Chad. | 9 | 26 | 3° 2° 38' |
| 14 | 1st Sunday in Lent. | 10 | 9 | 6° 36' |
| 4th | Henry VI. deposed, 1461. | 11 | 20 | 3° 51' |
| 5th | Day 11 hours long. | 11 | 20 | 3° 51' |
| 6th | Ember Week. | 0 | 32 | 5° 27' |
| 1st | T. Perpetua. | 4 | 56 | 7° 18' |
| 9th | F. | 3 | 59 | 8° 19' |
| 10th | 3rd Sunday in Lent. | 4 | 51 | 9° 20' |
| 11th | M. Rizzio murdered, 1566. | 5 | 32 | 10° 19' |
| 12th | T. Gregory Martyr. | 6 | 31 | 1° 17' |
| 13th | W. | 0 | 26 | 4° 40' |
| 14th | T. Admiral Byng shot, 1757. | 6 | 48 | 0° 13' |
| 15th | F. | 8 | 14 | 7° 16' |
| 16th | S. | 9 | 41 | 0° 17' |
| 17th | 3rd Sun. in Lent. St. Patrick. | 11 | 6 | 53° 18° 30° 1° 33" |
| 18th | M. Edward K. of West Sax. | 11 | 6 | 53° 18° 30° 1° 33" |
| 19th | P. | 0 | 26 | 4° 40’ |
| 20th | W. | 1 | 40 | 5° 34° 21° 29° 6° 45° |
| 21st | T. Benedict. | 2 | 43 | 6° 27° 29° 7° 45° |
| 22nd | F. | 3 | 36 | 7° 20° 23° 29° 7° 45° |
| 23rd | S. | 4 | 18 | 11° 24° 39° 6° 44° |
| 24th | 4th Sun. in Lent. Mid-L. S. | 4 | 48 | 6° 59° 25° 9° 48° |
| 25th | M. Ascension or Lady-day. | 5 | 14 | 9° 45° 26° 29° 8° 47° |
| 26th | T. | 5 | 34 | 10° 29° 27° 20° 7° 49° |
| 27th | W. | 5 | 50 | 11° 28° 29° 6° 48° |
| 28th | T. Tobacco bro. to Eng. 1585. | 2 sets, 11 | 52° N | 29° 8° 46° |
| 29th | F. | 6 | 59 | aft. 32° | 1° 39° 21° 43° 2° |
| 60th | S. Rain in Mar. 1814, 2° 06 inc. | 8 | 7 | 1° 14° | 2° 29° 6° 45° |
| 31st | F. 5th Sunday in Lent. | 9 | 19 | 5° 56° | 3° 39° 7° 49° |

<p>| 7th | Rises. | 33° | 27° | 12° | 38° |
| 8th | Etes. | 5° | 37° | 11° | 32° |
| 9th | Cl. ref. | 5° | 37° | 11° | 32° |
| 10th | D. Br. | 4 | 41 | 7° | 41° |
| 11th | Sun. E. | 36° | 10° 3° | 8° 45° |
| 12th | at turn | 25° | 4° 31° | 5° |
| 13th | Jupiter | 4 a 54° |
| 14th | Mars | 5° |
| 15th | | 5° |
| 16th | | 6° |
| 17th | | 6° |
| 18th | | 6° |
| 19th | | 6° |
| 20th | | 6° |
| 21st | | 6° |
| 22nd | | 6° |
| 23rd | | 6° |
| 24th | | 6° |
| 25th | | 6° |
| 26th | | 6° |
| 27th | | 6° |
| 28th | | 6° |
| 29th | | 6° |
| 30th | | 6° |
| 31st | | 6° |</p>
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<td>6:00</td>
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**Notes:**
- D: Rises, D: Sets, C: alt, D: Br., Sun: E., Saturn: S., Jupiter: S., Mars: S.
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<td>Transl. Ter. e. Dog Days b. 0 11. 7 8 29.9 64.5</td>
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<td>10 2 a 18</td>
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<td>6 S</td>
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<td>48</td>
<td>6</td>
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<td>19 5 36</td>
<td>10 2 a 18</td>
<td>2 a 18</td>
<td>10 21</td>
<td>21 20 29</td>
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<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Peace of Utrecht</td>
<td>1713.</td>
<td>0 10. 31 2 55 18 29.9 59.0</td>
</tr>
<tr>
<td>5th Sunday after Trinity</td>
<td>1745.</td>
<td>11 29. 5 39 22 29.8 60.5</td>
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<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czar Peter murdered</td>
<td>1762</td>
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<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Rain in July</td>
<td>1814, 0'91 in.</td>
</tr>
<tr>
<td>Peace of Utrecht</td>
<td>1713.</td>
</tr>
<tr>
<td>Gibraltar taken</td>
<td>1704.</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1930</td>
<td>Lammas, Queen Anne died.</td>
</tr>
<tr>
<td>1930</td>
<td>St. Lawrence Day</td>
</tr>
<tr>
<td>1930</td>
<td>Fifth Sunday after Trinity</td>
</tr>
<tr>
<td>1930</td>
<td>Dog of Wales b. 1762</td>
</tr>
<tr>
<td>1930</td>
<td>Assumption B. V. Mary</td>
</tr>
<tr>
<td>1930</td>
<td>Duke of York born, 1763</td>
</tr>
<tr>
<td>1930</td>
<td>Sixth Sunday after Trinity</td>
</tr>
<tr>
<td>1930</td>
<td>Day 14 h. 20 m. long</td>
</tr>
<tr>
<td>1930</td>
<td>Duke of Clarence b. 1765</td>
</tr>
<tr>
<td>1930</td>
<td>St. Bartholomew</td>
</tr>
<tr>
<td>1930</td>
<td>Fourth Sunday after Trinity</td>
</tr>
<tr>
<td>1930</td>
<td>St. Augustine</td>
</tr>
<tr>
<td>1930</td>
<td>St. John Baptist beheaded</td>
</tr>
<tr>
<td>1930</td>
<td>Rain in Aug. 1914, 2:37 in</td>
</tr>
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</table>

**Decl. North:**

<table>
<thead>
<tr>
<th>M</th>
<th>D</th>
<th>Decl.</th>
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<tr>
<td>1330</td>
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<td>1361</td>
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<td>1392</td>
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<td>17</td>
<td>4</td>
</tr>
<tr>
<td>1454</td>
<td>20</td>
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**Other Events:**

- Full Moon: Day at 1 h. 18 m. Morning.
- New Moon: Day at 7 h. 6 m. Morning.
- First Quarter: Day at 9 h. 45 m. Afternoon.
- Last Quarter: Day at 4 h. 58 m. Morning.
<table>
<thead>
<tr>
<th>No.</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Afternoon of St. Martin's Day</td>
<td>4 September</td>
</tr>
<tr>
<td>2</td>
<td>Day after Trinity</td>
<td>10 September</td>
</tr>
<tr>
<td>3</td>
<td>Transfiguration of Our Lord</td>
<td>16 September</td>
</tr>
<tr>
<td>4</td>
<td>Day after Trinity</td>
<td>23 September</td>
</tr>
<tr>
<td>5</td>
<td>St. Mary Magdalen</td>
<td>30 September</td>
</tr>
<tr>
<td>6</td>
<td>Gibraltar taken</td>
<td>2 October</td>
</tr>
<tr>
<td>7</td>
<td>Cape Breton taken</td>
<td>9 October</td>
</tr>
<tr>
<td>8</td>
<td>St. James</td>
<td>16 October</td>
</tr>
<tr>
<td>9</td>
<td>St. Anne</td>
<td>23 October</td>
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*Note: The table contains historical events from a specific date range.*
<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
<th>Time</th>
<th>Coordinates</th>
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<tbody>
<tr>
<td>1</td>
<td>Lammas D. Q. Anne d. 1714</td>
<td>11 a 13</td>
<td>8 30° 0 69' 5</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>11 41</td>
<td>7 36° 0 70' 0</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>morn.</td>
<td>8 36° 10° 0 67' 0</td>
</tr>
<tr>
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<td>4th Sunday after Trinity</td>
<td>0 17</td>
<td>9 25° 0 67' 0</td>
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<td>Crown Point taken, 1759</td>
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<td>20 12° 0 69' 5</td>
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<tr>
<td>6</td>
<td>Transfiguration</td>
<td>2 3 11</td>
<td>13 13° 29° 46' 3</td>
</tr>
<tr>
<td>7</td>
<td>Name of Jesus</td>
<td>3 9</td>
<td>14 39° 9 45' 0</td>
</tr>
<tr>
<td>8</td>
<td>Cherbourg taken, 1758</td>
<td>0 3 F</td>
<td>29° 6 61' 5</td>
</tr>
<tr>
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<td></td>
<td>8 a 38</td>
<td>5 16° 29° 7 60' 0</td>
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<tr>
<td>10</td>
<td>St. Lawrence</td>
<td>8 54</td>
<td>13 17° 29° 9 60' 0</td>
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<tr>
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<td>9 8</td>
<td>16 18° 30° 0 64' 0</td>
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<td>Mon. of Wales b. 1709. Dog</td>
<td>9 22</td>
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<tr>
<td>13</td>
<td>Days end</td>
<td>9 37</td>
<td>3 37° 20° 29° 8 62' 5</td>
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<tr>
<td>14</td>
<td></td>
<td>9 52</td>
<td>4 13° 29° 7 59' 5</td>
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<tr>
<td>15</td>
<td>Assumption B. V. Mary</td>
<td>10 10</td>
<td>6 22° 29° 8 61' 0</td>
</tr>
<tr>
<td>16</td>
<td>Duke of York born, 1763</td>
<td>10 32</td>
<td>5 45° 23° 29° 7 56' 5</td>
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<td>17</td>
<td></td>
<td>11 1</td>
<td>33° 24° 29° 8 64' 0</td>
</tr>
<tr>
<td>18</td>
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<td>11 40</td>
<td>7 25° 25° 29° 9 64' 5</td>
</tr>
<tr>
<td>19</td>
<td>Day 14 h. 20 m. long</td>
<td>8</td>
<td>21 26° 29° 9 56' 5</td>
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<td>20</td>
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<td>0 35</td>
<td>9 20° 27° 29° 9 59' 5</td>
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<tr>
<td>21</td>
<td>Duke of Clarence b. 1765</td>
<td>1 46 10</td>
<td>21 28° 29° 8 61' 5</td>
</tr>
<tr>
<td>22</td>
<td>T. K. Richard III, slain, 1485</td>
<td>3 6 11</td>
<td>21 29° 29° 8 65' 5</td>
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<tr>
<td>23</td>
<td></td>
<td>D sets.</td>
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<tr>
<td>24</td>
<td>St. Bartholomew</td>
<td>8 a 4</td>
<td>1 14° 1 29° 14° 59' 0</td>
</tr>
<tr>
<td>25</td>
<td>11th Sunday after Trinity</td>
<td>8 22</td>
<td>7 29° 4 60' 0</td>
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<tr>
<td>26</td>
<td></td>
<td>8 40</td>
<td>2 59° 3 29° 15° 61' 0</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>8 59</td>
<td>3 51° 4 29° 7 55' 5</td>
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<td>St. Augustine</td>
<td>9 21</td>
<td>4 43° 5 29° 8 54' 5</td>
</tr>
<tr>
<td>29</td>
<td>St. John Baptist beheaded</td>
<td>9 49</td>
<td>5 37° 6 29° 9 56' 0</td>
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<tr>
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<td></td>
<td>10 23</td>
<td>6 39° 7 30° 0 57' 0</td>
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<td>31</td>
<td>Rain in Aug. 1814, 2.37 in</td>
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<td>7 27° 8 29° 8 56' 0</td>
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**Decl. North:***

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<tr>
<td>11</td>
<td>All Saints' Day</td>
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</tr>
<tr>
<td>29</td>
<td>St. Joseph's Day</td>
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<tr>
<td>30</td>
<td>St. Andrew's Day</td>
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**November: 30 Days**

<table>
<thead>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>29</td>
<td>St. Joseph's Day</td>
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<td>30</td>
<td>St. Andrew's Day</td>
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**December: 31 Days**

<table>
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<tr>
<th>Date</th>
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<tbody>
<tr>
<td>1</td>
<td>Christmas Day</td>
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</tbody>
</table>

**Notes:**

- The table includes the days of the month with important events.
- There are 30 days in November and 31 days in December.
- The events listed include All Saints' Day and St. Andrew's Day.
### October

| Full Moon | 6 | Day at 9 h, 19 m. Morning. | 60° 36' N. 14° 46' E. |
| Last Quarter | 13 | Day at 8 h, 30 m. Morning. | 22° 54' N. 36° 31' E. |
| New Moon | 20 | Day at 11 h, 56 m. Afternoon. | 60° 36' N. 14° 46' E. |
| First Quarter | 27 | Day at 10 h, 58 m. Afternoon. | 60° 36' N. 14° 46' E. |

- **Day at 8 h, 30 m.** at the Full Moon.
- **Day at 10 h, 58 m.** at the First Quarter.
- **Day at 11 h, 56 m.** at the New Moon.
- **Day at 9 h, 19 m.** at the Last Quarter.

#### Important Dates
- **St. Remigius.**
- **Old Parr died, at 152.1635.**
- **Admiral Benbow died, 1702.**
- **St. Denys.**
- **Oxford and Camb. Terms beg.**
- **K. Edw. Conf. Day 10 h, 35 m. long.**
- **Bps. Latimer and Ridley burnt, 1535.**
- **St. Luke.**
- **King John died, 1216.**
- **19th Sunday after Trinity.**
- **Battle of Trafalgar, 1805.**
- **Sir Clo. Shovel lost, 1707.**
- **Battle of Agincourt, 1415.**
- **St. Simon and St. Jude.**
- **Rain in Oct., 1814, 0 80 in.**

#### Additional Observations
- **Rises and Sets.**
- **Cliffs.**
- **Barometer.**
- **Sun E. and Satur.**
- **Jupiters.**
- **Mercury.**
THE GENTLEMAN'S DIARY, No 76.

ANSWER to the QUESTIONS Critical and Philosophical.

CCCXXV. By Hinckleiensis, the Proposer.

"The requisites to constitute the character of a Gentleman completely are many:—They are, perfect ease of deportment, even under the most embarrassing circumstances; manners that conciliate and gain universal esteem; good breeding, so disciplined as never to be thrown from its guard, or, except on the most extraordinary occasions, betrayed to the discovery of passion: a smooth and flowing enunciation: a bland gaiety of heart that no trifles can disturb: a flattering, yet not officious, attention to every person present: and all those charms of address and demeanour which cannot fail to win our esteem.

I should define a gentleman, then, a person well born and educated: manifesting elegance of behaviour, gracefulness of mien, nicety of taste; and of pleasant manners with virtuous habits. Above the vulgar by his character, situation, and fortune: uniting politeness of address with meekness and gentleness of behaviour.

Mr. W. Stringer says: According to the usual acceptance, a gentleman is a man possessed of wealth. But a true gentleman is he who acts as a person of affluence ought to act, that is, charitably, intellectually, liberally, and honourably. He is no gentleman, properly speaking, (however great his wealth) who is guilty of a mean action. Nor is he much short of one, whose mind is of an exalted nature, who possesses liberality of sentiment, a generous disposition, and an upright soul, even though he be destitute of wealth. As for those, who, although they possess what the world calls independence, yet daily prove that they have nothing good, gentle, or honourable, in their composition; nothing can be a greater mistake than to call such creatures gentlemen.

CCCXXVI. By Mr. W. Spencer, of Sapcote, near Hinckley.

"It is highly probable that the relapsing sheep is caused by a flat insect called a lake (fasciola hepatica) which is found adhering to stones and plants in wet situations; and also in the livers and biliary ducts.
of the flock, affected with the rot. It is a good preventive not to feed
in sheep to quit the fold at a morning on the view is taken of their
halation. The following has been found effective: Take powder
of Roman wormwood, and powder of Spanish radish, or each five
ounce, juniper berries four ounces, one gallon, and the
half the weight of the whole of common wormwood in powder.
Put this quantity in the troughs where sheep feed, once a week
least, in March, and occasionally, till the last week in June. The
flock is supposed to consist of about 100 sheep.

Some of our correspondents refer to Mr. B. Holdich's treatise
on the Resp or Rot, as containing many valuable hints.

CCCXXVIII.
The opinions of our correspondents seem nearly balanced in re-
ference to this question. But Mr. Spencer and a few others decide
against both characters, thus:—The Prodigal and the Miser may be
considered as analogous to positive and negative quantities in Algebra,
which destroy each other's effects. It is not easy to conceive how
either of them can promote the wealth of the country. It is evident
that the miser increases nobody's wealth but his own; and though the
prodigal may scatter his property, yet it is doubtful whether that
property increases by flowing in other channels, in a greater ratio
than the value received for it diminishes.

CCCXXIX.
The majority of our correspondents agree as to the fact specified in
this question. But they vary greatly in their mode of accounting for
it; some ascribing it to the pre-ordained difference in the constitution
of the sexes; others to habit. The former opinion, however, prevails
amongst them.

CCCXXX. By Mr. B. Mandall, Woolwich Common.
In this passage, so often brought upon the controversial arena, it is
evident, independent of all critical disquisition, that the interpretation
advanced by those who deny the divinity of our Lord, runs counter
to the whole scope of the Apostle's reasoning in the context. Lost
king, however, to the correct meaning of the passage, the rendering
may be, "Who existing in the form of God, did not think it robbery
to be like God: yet he divested or emptied himself [i.e. of his fore-
mer glory] when he took or received the form of a handman. The
word form is a confessedly inadequate rendering of, μορφή; but that
need not be dwelt upon. That to ὅμοιος ὁ θεός literally signifies to be
like God, has been clearly proved by Whewell, Doddridge, and others.
The fact, and I apprehend, the true, interpretation of the Apostle's
meaning is, that the Saviour being in the form of God, when he made
the world, and appeared to the patriarchs and prophets, he thought it no
degradation from the honour due to God, that he received from angels
and men like worship with God. As to the inference deducible from
the opposition of the two terms ὁμοίωσις and μορφή, in the respective
phrases "ὁμοίωσις ὁ θεός ὁμοίωσις, and ὁμοίωσις ὁ κόσμος ὁ ἀθορυβό
tos; it is, I conceive, manifestly this, that when the Apostle speaks of the form of
God, he employs the first of these terms, showing that Jesus Christ
existed in the form of God; while when he speaks of the form of a
man, he simply uses the latter term, which implies that he received it:
the first form then was not an accidental and transient form, but fast and durable; the second, on the contrary, was not essential, but accidental; for no correct thinker ever judges that to receive a form which it had always. Our Lord, then, was in the form of God essentially, but assumed that of a servant for an especial purpose.

Ingenious answers to one or other of the above Questions were sent by Messrs. John Baines, jun. Thomas Baker, J. Gronow, W. Hill, Hishclieover, James Hood, R. Muffett, Mr. Postlethwaite, John Savage, D. T. Sheridan, W. D. Slooke, W. Spencer, W. Stringer, Jos. Suffield, &c.

ÆNIGMATOLOGY.

Answers to the last Year's Ænigmas.

1. A Pupil. 7. A Root. 10. A Newspaper.
2. A Door. 8. Smoke. 11. A Dilemma.

5. Smart-mart-art.

General Answers.

On first beholding the Tree-primrose. By Mr. J. Baines, jun.

Soon as Aurora's lucid beams, But ere Soil's ever-rolling car
Had ting'd the orient skies, Approach'd the middle sky,
I wander'd by the purling streams, Its modest head, so sweetly fair,
Where countless flow'rets rise Began to droop and die.
And as my raptur'd eyes survey'd What pity that the choicest flow'r
Their silken foliage, Their breath exhale'd;
A lovely stranger in the shade Did all my thoughts engage. But reason cries, one transient hour
Did my thoughts engage. Will tarnish beauty's bloom.
Transported, I beheld, a flow'r Go round the world, convey'd
Which Nature form'd so fine; Which Nature form'd so fine;
Of all that deck'd fair Flora's Where'er,
world; You'll find this maxim true,
But all that deck'd fair Flora's Right beauties, fairest of the fair,
Go round the world, convey'd Are the most transient too.
will trim the Most subtle causes often will But reason cries, one transient hour
The slightest causes often will Their tender forms destroy;
Nay even a single breath may kill What heightens human joy.

The Leisure Hour. By Mr. Richard Claye, Manchester.

When time again gives life to spring, When groves with notes delighted sing,
When groves with notes delighted sing,
When groves with notes delighted sing, This is the most divine.

The leisure hour, This is the most divine.

Sweet is Aralia's spicy gales, Sweet is Aralia's spicy gales,
Of Flora's thy my grove. Of Flora's thy my grove.

This is the most divine.

The leisure hour, This is the most divine.

Of Flora's thy my grove.
Soon summer comes—nor clouds appear.

The sky is bright, no rain is near.

But scented in the bower:

The sea's salt waters greenly shine,

Tars at the cabin door recline,

To pass a leisure hour.

Then lovely Ceres—Autumn's joy,

Hustes, anxious every want to cloy,

And plenty forth to shower;

While, as she treats the welcome way conveyance, Pr.

The nymphs in wanton revels play

To pass a leisure hour.

But, solemn winter, at thy blast

Hopes whispers, long thou wilt not last, resignation 3.

These pleasures to devour;

So at the news with paper nigh

I'll take my pen, and write to Di. 10

To pass a leisure hour.


Behold a weary, toilful, swain

Who sweats to gather in the grain

And plans adopts to save on;

His mind on smoking's never bent;

But with the paper is content,

Upon the banks of Avon.

He toils, and sweats, and takes

great pain,

Mid summer's heat and winter's rain,

And plans adopts to save on;

All cares like vapours from him fly,

His flock he guards with cautious eye

Upon the banks of Avon.

The course he takes is always sure,

No pastimes revel near his door,

But plans adopts to save on;

No bloody scars bedeck his face,

To death at last resigns his place

Upon the banks of Avon.


The farmer with judicious eye,

Beholds the mist in yonder sky;

Which oft foretells a shower of rain,

Then near the door he ricks his grain;

And when his harvest-home's convey'd,

Th' accustomed feast is quickly made;

He reads the news and cracks a joke;

He cannot let the markets drop;

Or if he does he cannot live.

But what comes after saddens me,

For thus there be a plenteous crop,

Nor will he yield to this with resignation.

Let peace and plenty crown our isle,

And poverty again will smile.

No farther laws need then be made

To raise the price of daily bread;

Nor need we dread the consequence.

At present or a few years hence;

For let the poor have what they prize,

A wholesome loaf of decent size;

No sad dilemma need we fear;

Nor want of salt their roots to cheer.
5. To the Editor. By Mr. James Hoop, jun.

Kind Sir, accept a pupil's strain,
The muse invoked he can't refrain;
He'll try your wild notes to explore,
On salt, on root, on snow, or door;
But not like contemplative Young,
When resignation's bow he strung.
Such news cannot expected be
From such a simple one as me.
Tis smoke that finishes the whole,
Which frequent crowns the midnight bowl.
Kind Editor, the muse is coy,
No more I'll add, so now good bye.


Dark was the night, damp mists around her flew,
And stormy winds their loudest war-notes blew;
Soon flashing lightnings glanced across the plain,
And thunders joined with copious showers of rain.
Thus travelled Emma through the trackless waste;
In dread the horrors of the storm she faced:
No tender eye to pity her distress,
No door to open, no place to seek redress;
No bread to eat, no smoking hearth is near,
O sad dilemma! hope itself can't cheer,
"No paper can salute my friends," she cried,
"To tell my doom, or where, or how, I died!"

7. Somnet to Religion. By Mr. John Smith, Alton Park.

Hail, blest Religion! bright celestial maid,
In snow-white vesture clad; thy cheering power
Dispels the vapours that our minds overspread,
Smoke
Renews our joy, and gilds each gloomy hour.
The sinner thou constrainest to depart
From vice, the root of all his killing fears,
Salt
Conveyest balsam to his wounded heart,
And wipest from his eyes the briny tears.
Salt
Thou pointest to that blissful mansion's door
Where notes from golden lyres harmonious sound,
Where cares perplex not; grief as all no more,
And unsophisticated joy's abound.
Dilemma
Scrath rever'd! so teach me to employ
Life's remnant that I may with resignation die.


I was tempted one eve, when the weather was fine,
Through the shadowy lanes, and the woodlands to stray;
Where the lambskins in innocent sports did combine,
And the birds most enchantingly sung on the spray.
Thus allured by the scene, I with pleasure did roam,
So delighted my eye, and enliven'd my mind;
When I found, when I demand'd a sight from my home, That the sun's light without newly declined, 
Whose sable complexion, portending some rain, Plac'd me in a dilemma, which course to pursue,
To seek shelter abroad, or my home to regain.

I resolved to return, when the cloud's smoky hue, 
Had completely obscur'd the horizon around;
When a meteor burst forth, fiercely vivid and blue, 
And some loud distant thunder did mournfully sound.

My speed was increased, and evaded the wet, 
Till, at length, quite fatigued, I arriv'd at my door;
At that instant the hurricane furiously beat, 
And the water in torrents did rapidly pour.

Thus so safely arriv'd, I sat down to reflect; 
On the accidents dire, to which tempests may lead; 
Think I, in the news I may read the effect.

Oh Nature! charming, ever new, 
So pleasing to my ravish'd sight, 
Thy beauties I calmly view,
Till day no more succeeds to night.

Hail, delightful, cheering hope, 
Thou light our steady firmest prop, 
Thou open the door to sacred joys, 
Delightest the soul and fills the eyes, 
Thou still'st the boist'rous winds of life, 
And subdue the sparks of strife. 
The ever-during salt so fair, 
That maketh us quietly evils bear.
No gamut marks more pleasing notes, 
When those thy virtue e'er protect.


The star-light's field beyond our bound, 
And bright appears just opening day; 
The sparkling dew bedeck's the ground, 
And lambs o'er the meadows play.
In green array'd behold the trees, 
The grass now shoots towards the sky; 
And welcome is the morning breeze, 
That makes the smoke and vapour fly.

The feather'd songsters raise their notes, 
And make the neighbouring valleys ring. 
With hope and joy my eye beholds 
His course the rising sun begin.
Oh Nature! charming, ever new, 
So pleasing to my ravish'd sight, 
Thy beauties I calmly view,
Till day no more succeeds to night.


Hail, delightful, cheering hope, 
Should lightning a dark, or waters swell, 
Thou open the door to sacred joys, 
Delightest the soul and fills the eyes, 
And subdue the sparks of strife.

No gamut marks more pleasing notes, 
When those thy virtue e'er protect.

Can moderation wish for more?
The Gentleman's Diary. No. 76. 21.

Other general Answers to the Enigmas were received from Messrs.
Elia T. Drake, P. Gove, Hinckleiensis, Jas. Hood, sen. W. Jorden/Lyde,
R. Maffet, W. Oates, Jas. Postlethwaite, John Savage, Dr. N. Sheridan,
Joseph Smith, W. Spencer, Jon Suffern, John Tysoe, &c.

Answers to the Prize Enigma, Charades, &c.

1. By Mrs. Ansdon.

To her niece who wished to become the favourite of an uncle.
Would you the safe conveyance | Read much, think more, industrious be,
That reaches to your uncle's mind; | [Lee.]
You'll surely please your uncle.

2. By Mrs. Thomas Baker, Nuneaton.

A path, conveyance, track, or way,
The prize Enigma will display;
But of all paths may we be given,
To that which terminates in Heav'n!

3. By a Female Incognito.

Of all the tracks that we can tread,
There's none so smooth and even,
As that which doth through virtue lead,
Straight onward up to heaven!

4. To Mr. Pytches. By Miss Gurney, of Richmond.

O! son of Bentley, of thy mental power,
I'll the conveyance take instead of dower.

5. By Mr. W. Hill, Oldham.

The riddle sent from Groton I seize or solve it; but I fear,
House,
The prize will not arrive this year;
I've view'd as does a cat a mouse,
Behind, before, on every side.
And let no likely mean try'd

6. By Mr. James Hood, sen.

These lines on conveyance, kind sir, I now send.
Not by the Leeds mail, but by an old friend,
They were penned in a cot, near the rise of a hill,
On the border of Warwickshire, near to a mill,
Here Contentment presides, and Friendship, and Love,
A foretaste of that we shall find when above.

7. By Hinckleiensis.

A safe conveyance, I suppose,
The prize Enigma will disclose.

8. By Mr. Thomas Little, of Thorne.

An odd conveyance, he makes,
And sometimes to his study the Diary he takes.

"From my not disdained seat,
I sow the seed, and reap the fruit."
And he seriously asserts, since he's found out Pytches's rhyme;

Such a puzzling conveyance he never saw in all his time.

And next Michaelmas term, he's in hopes you'll glad his eyes,

By entering on your rolls, 'Lawyer Latitata a prize.'

9. By Mr. George Simpkin, of Thetford.
Friend Pytches's prize in dark disguise,
Did puzzle my old brain;
Until at length, I tried my strength,
Conveyance to obtain.

10. By Mr. W. Spencer, of Sapcote.
Hail the mystic bard of Groton,
Tis conveyance thou hast wrote on.

11. By Mr. Joseph Smith, Ruddington, near Nottingham.
As soon as the Diaries are published in town,
By Pytches's conveyance pray send me one down.

Other ingenious Answers to the Prize Enigma were transmitted by Messrs. Baines, jun. Boulby, Bradley, Claye, Cook, Crabtree, Froude, Handford, Herdon, James Hood, jun. T. Hood, Maffett, Nield, Papple, Parsons, Smith, Snooke, Suffolk, Sumner, Treeby, Tyson, Whicker, Whitaker, &c.

1. Answer to Charades and Rebusse. The Wish.
By Mr. R. Claye.
Could I wish, and obtain, I would ask to reside
Secluded from envy with truth as my guide.
In your humble ivy-crown'd cot,
For malice and scarcity shrink back with fear.
The world may have sorrow—it reaches not there,
Contentment is king of the spot.
The portico's splendour, the mansion's gay shew,
With all the smart things which from luxury flow,
No pow'r have such bliss to impart,
Here him I'd resist who would wantonly try
In earnest to wake in my bosom a sigh,
And sting, unoccasion'd, my heart.
How frail is our Nature! how soon one want
Is gone, but another for life seems to pant;
For ah! I a mate should require
To make me a poultice, or read Dia's page
When the eye of discernment is dim'd by old age,
Then grant dearest fate my desire.

2. Address to Mr. W. Hill. By Mr. Wilson Johnson, of Grassy Nook.
Your mansion, Sir, is built with art,
And all about it very smart;
In truth the portico's so fine,
That earnestly I've wish'd it mine.
To wish for things that we do want
Who can resist? I'm sure I can't,
But still my heart is free from malice.

Not envy I your splendid palace,
Contented with my humble lot,
The master of a lonely cot,
In which no scarcity is found.
Not poverty, but I have no wound.
And long may you in health and spirit,
Enjoy the mansion that you merit.
3. Advice. By Mr. James Postlethwaite, Seji Royal Marines.

In earnest seek the mansions of the blest,
That you in bliss eternally may rest:
No scarcity in those abodes are reign,
Nor poultries needed, for there is no pain:
There sisters live in unity and love,
For malice dwells not in the realms above:
But white-rob'd truth the portico pervades,
And sin and smart are thrust to infernal shades.
There pleasure reigns without the least alloy,
And joy transcendant but succeeding joy.

4. By Mr. John Savage, Green's Norton.

No mansion with a portico,
Smarter adorn'd, is mine, no, no;
Nor do I this desire;
Contented with a humble cot,
I'll patient bear what is my lot,
From malice free, with only what
Our nature does require.

New ΑΕΝΙΓΜΑS to be answered next Year.

1. ΑΕΝΙΓΜΑ 955. By Mr. Thomas Baker, Nuneaton.

I am in every city found,
With ivory palisaded round;
And tho' I never leave my place,
I'm lost and found by nymphs of grace.

Like Phoebus in his central car
Enlightening each revolving star,
Creating warmth I move below
The organs that divinely flow,
With songs of joy and hymns of praise,
Delighted with my hallow'd lays,
Yet every poet I inspire,
And warmly strike Erato's lyre:
For I'm an active entity,
Of life and sensibility;
A real automaton of love,
And all the gifts of matchless love.
Yet some assert, and from their creed
That evil does from me proceed;
But I with verity can say,
That I'm as free from guilt as they:
I am as innocently fair
As the most holy vestals are.
Was I engender'd of the earth,
Or did the clouds give me my birth?
Mysteriously in form I'm wrought
With due efficiency of thought:
And I there's the arch and subtle foe
That makes me dread the wreck of yet,
If with earnest zeal I strive,
And keep the hornet from the hive,
Doubtless I shall the victory gain,
And lasting happiness obtain:
Hence tell my name, ye soilsof art,
And keep me clean in every part.
3. **ÆNIGMA 957. By a Female Incognito.**

A female hopes to be allow'd

Again to touch the lyre;  
O! say not she is weak or proud,  
In daring to aspire.  
She's by ambition mov'd, 'tis true.  
To mingle with the wise;  
Yet would not wander from the clue;  
The path where wisdom lies.  
And now, thus prefac'd let her bring  
The thing she has in view;  
Tho' on a seabe muse's wing.  
She trusts the traits are true.  
In early life I sometimes soar,  
Rebellious, headstrong, high:  
Am what reflection must deplore  
And heave the heart-felt sigh.  
Control's the subject of my hate,  
Undisciplin'd by war.  
Aha! in this untutor'd state,  
I needs of angai'st saw.  

On some occasions I disgust,  
To some I yield delight;  
By some I'm censur'd as unjust,  
Seldom exactly right.  
Ingratitude or discontent.  
Oft murmurs at my laws,  
And some with base malign intent,  
Would prove that I have flaws.  
Religion says I must be check'd,  
Subdued, or held in chains,  
Ere on the altar, true respect  
The offer'd incense gains.  
Kind Gents, your Editor has shown  
A condescending mind,  
In oft admitting (though not known)  
A muse of female kind.  
These six and thirty lines review;  
In forty this shall end,  
To prove the writer has me too  
To please a generous friend.
6. **Enigma 958.** By Mr. Philip Gove, Exeter.

When vivid lightnings thro' th' ethereal space,
Display their flashes with terrific glare,
And awful thunders thro' the vast expanse,
Tremendous roll, and fill mankind with fear;
When whistling whirlwinds do tumultuous rise,
And shipwrecks, dreadful shipwrecks, do abound;
When ocean foaming laves the nether skies,
'Tis then I reign and terrors spread around:
When hostile navies on the boisterous main,
Engage with fury, and determin'd ire,
Or armies on the wide ensanguin'd plain,
Destruction spread with cannon, sword, and fire.
When plague and famine lift their direful head,
When earthquakes make convulsive nature groan,
When conflagrations awful terrors spread,
I reign profound, and triumph on my throne.
I, mighty Victor, hold extended sway,
O'er the vast empires of this spacious ball;
My dreadful mandate all mankind obey.
For I encounter, and I conquer all.

5. **Enigma 959.** By Mr. W. Oats, St. Justin Penwith, Cornwall.

Shall silence ever keep her peacefull reign? Or shall the trembling muse pre-
To veil in humble shades the rustic theme,
Or scatter graces like a pleasing dream.
I am a part of this stupendous earth [somes in vain]
Whose copious breast contains ma-
From thence my parent by itself is drawn, [dream.
This seems incredible till fairly
Now quite display'd before the light of day, [aterial worth;
Its various process you may now
Then to the furnace doom'd, where [known.
With honour spread irrevocable

6. **Enigma 960.** By Mr. William Pittam, Barby, Northamptonshire.

I once was held in great repute,
But now, alas! poor me;
I'm almost banish'd from the world,
By incredulity.
Altho' I'm wise, to say a man
Deserves my appellation,
Would doubtless give him great offence,
And hurt his reputation.
Yet, strange to say, it is not me,
Would aggravate him more,
That what I am he would not be,
Nor is it in his power.
If by what I've already said,
You do not guess my name,
A wager may be safely laid,
You are not what I am.

7. **Ænigma 961.** By Mr. Samuel Ringrose, Cottingham.

In rural life, free from corroding care,
My parents liv'd secure from every care,
Peace and serenity they then enjoy'd;
But soon unfeeling man their peace destroy'd,
For no alleg'd crime, or moral guilt,
By murd'rous man my parents' sons,
And, since that day, my different parts do bear.
A discipline degrading and severe,
And free from guilt are stain'd with deepest dye,
Into another's service now they're called,
My scatter'd parts are now in contact brought,
I then receive my proper form;
And what appears to add to man's disgrace,
He oft with dirt, besmears my po,
And when at night I'm put away to rest,
An empty belly is my constant.
Yet, in the morning, 'tis but fair to say,
I'm so well fill'd I want nought.

8. **Ænigma 962.** By Mr. W. Spencer, Sapcote, near Hinckley.

Ere from chaotic atoms first did spring
Those mighty orbs, whose glories far surpass
The state and grandeur of an earthly king,
With all the pomp of royalty—I was.
Anterior to things created, I
Was witness to this world's great natal day:
And, highly favour'd of the Deity,
Have been in Heaven, as sacred records say.
When mortals fail to court my friendly aid,
'Tis doubtful if they're number'd with the wise;
For, know, a most impenetrable shade,
I cast o'er folly in its deep disguise,
By me the bonds of sacred friendship are
More closely drawn, and they that will confide,
Their secret thoughts to my indulgent care,
Shall have no cause to be dissatisfied.

Cleora
Cleora once, the beauty of the plain,
Whose fascinating charms knew no decay.
Commanding homage from each rural swain,
Was by the arts of Strephon led astray.
At length deserted by the faithless youth,
Become a prey to the most poignant grief;
In me she learns the melancholy truth,
A case like hers admits of no relief.

A Gossip's tale.—The village ball is held,
The busy clack of scandal issues thence;
And shafts of malice, hard to be repel'd,
In all directions fly at her expense.

But should the swain to Hymen's court repair,
My magic wand the healing balm shall find;
And each vile tale, and each malicious sneer,
Be to a state oblivious consign'd.

The ancient Romans, and Egyptians, knew
My consequence, rever'd, and worship'd me,
And taught my use.—I am an object too
Of sense, but in a negative degree.
As first of sciences behold me then;
Companion of the wise—to them make known
The knowledge of the thoughts of other men,
And leave them in possession of their own.
Against the gusts of passion I'm a charm:
Far from the field of battle I abide;
Tho' never seen, I sometimes cause alarm,
Tho' never felt, I often am destroy'd.

9. AENIGMA 963. BY MR. D. T. SHERIDAN.

In Marathon's fam'd plains, and the known straits
Of Salamis, where Freedom's sacred flame
Inspir'd the bosom of each martial swain
And made each Greek a hero, I alone
Was thought the only adequate reward
For such transcendant virtue. Blest with me,
The darling meed of many a well-fought day,
The happy victor seeks his peaceful home,
Where aged parents hail his safe return,
And love and beauty bless his future days.

Not always to the valiant sons of Mars
Am I confin'd, the bards whose lofty muse
Recorded heroes and their matchless deeds
Rewarded virtue and degraded vice,
And sung in dulcet softly flowing lays,
The various blessings of the rural life,
Have shed my sweetest smile. O Sophocles!
When all consenting Greece on thee bestow'd
My blooming charms, thy fond and feeling heart,
Oppress'd with transports of exultic joy,
Burst with the mighty impulse fondly view'd
THE

My lovely form, and with a smile expir'd,
While Rome in virtue, as in arms excelled,
And her victorious chiefs alike subdued
The fields of Ceres and of frowning Mars
'Twas I with godlike ardour first'd their soul;
And gave them conquest. Let the shield of Rome
Let brave Dentatus and Camillus speak,
Who in so many sanguinary fields
Have often wooed me, and as often won!
In Britain too I fan the heavenly flame
Of learning and of freedom. Sweet the bliss
When I reward the long laborious toil
Of patriots, bards, and heroes. I with ease,
As with a magic wand, from vulgar minds
Elicit sparks of genius, and exalt,
Imbu'd with science and the liberal arts,
Not the mere pageant of a public show,
To day adorn'd, to-morrow thrown aside,
But the companion of exalted man
That soothes his sorrows and augments his fame.
Where I'm neglected, all th' ignoble weeds
That choke and canker virtue, rankly grow
To foul luxuriance. Ah! ye great, beware
How ye despise for baubles of mere pride
My sterling worth and influence divine.

10. ÆNIGMA 964. By Mr. W. D. SNoOKE, Woolbridge.

Your servant, Gents.—Permit me as a friend
My best respects to offer; and attend
Whilst briefly I my properties portray,
That should we chance to meet another day,
In spite of this disguise in which I'm dress'd,
I may be clearly on your mind impress'd.
——Know then, I've almost constantly a seat
Within the stately mansions of the great,
There I reside, there I delight, and not
Within the precincts of the lowly cot.
Think not from this, dear Gents, that I'm inclin'd
To pride and luxury; or an opprest
To spacious courts.—With innocence I prove
Companion oft, amid the shady grove.
——Here, when the love-sick maid, oppress'd with pain,
With rural pipe deplores her absent swain,
I add a sweetness to the plaintive strain.
In gothic ruins, moss-clad towers, I dwell;
Or where the stream meanders through the vale.
In gloomy caverns I am often found;
On craggy cliffs, or by the lofty mound.
Though seldom am I on the barren plain;
If there you seek me, you may seek in vain.
When lightnings flash, and deaf'ning thunder peals,
Perchance I then surround the neigh'ring hills.
When hounds and huntsmen in the chase combine,
Their general noisy chorus oft I join;
And then old Reynard yields his breath, and all
The crew assemble in the spacious hall,
Amongst the jovial bloods I there attend,
And to their clam'rous mirth assistance lend.
So when the war-whoop angry heroes swell,
My voice is heard amid th'stounding yell.
Yet say not hence, I nought but vice pursue,
For I'm at church as constantly as you;
When there, petitions jointly you prefer,
Then likewise I address to heav'n a pray'r.
These hints remember, (for I close them here,)
And know me when I next salute your ear.

11. ÆNIGMA 965. By Mr. SAM. TREBBY, Plymouth.

Geometers their senses strain;
My simple being to explain;
Yet they have proved, all you can see,
To be composed alone of me;
By this you'll think I'm great—but no—
The least of any thing you know.
And, yet their fame, however so great,
Without my aid were incomplete.
The architect can't columns rear
Nor plans can draw, without I'm there:
And Newton said by me alone,
His fluxions could be quickly known.
But not alone to man a friend,
Each lady will my use commend,
I make them well employ their day,
Assist in needlework and play.
That without me could 'er be made.

PRIZE ÆNIGMA. By Mr. JOHN SIDSBY, W. Boldon.

Ye British youths, whose generous bosoms glow,
When dire Affliction tells her tale of woe;
For your august tribunal I appear
A suppliant, reedy, and a wretch sincere;
Urg'd by despair, I raise the mournful strain:
Of racks, and blows, and fires, and floods, complain...
Fix'd in the centre of surrounding fires,
Where all the rage of Phlegethon conspires;
Where bubbling waters hiss, and thunders roar,
Black whirlwinds rise, and shake the solid shore;
There while around the pois'nous vapours play,
And clouds on clouds, commingling hide the day;
Unmov'd I stand—so tyrant man ordains,
Mocks my distress, and aggravates my pains.

From grand'ire Jubal, first I bore abe e
Who doom'd my race, subservient to his use,
My lot appointed, and my form design'd
My limbs distorted and my parts disjoin'd,
Dubb'd me, O Heav'n, vile man's eternal slave
To serve him from the cradle to the grave.

If from my cell, I turn on Heav'n my eye;
What pitchy pirals intercept the sky.
Below—what heaps of peaceful dust are laid!
(The prime material of which man is made!)
Around—how blest, magnificent the scene!
The roast goose sparkling and the young pea green
Great sirloin reeking, from the murd'rous knife.
The gitt'ring tea-trays and the frugal wife—

Too oft alas! at Persecution's call
I rust in state, on prison's dreary wall
A constant sentinel—unknown to change;
I mark the bounds for criminals to range:
Arrest in dog days, Sol's meridian glow,
And o'er the clanking rooms a dubious-twilight throw.
To fill my maw, to mend the fatal spoil,
Northumbria sends her sable sons to toil
In darksome caves—in satiate I devour
Mountain of food, and hourly-long for more—

Sometimes immur'd, where nightly plunderers stray,
I rob Grimalkin of her lawful prey;
Attend the sickly artist at the loom:
A sure companion at the drawing-room:
With Cooke I sail'd the vast Pacific o'er,
And cheer'd his toils on Nootka's stormy shore.
A curious Infidel, my Creed is such,
I love the parson, yet renounce the church;
Protect him from December's deadly rage
Assist his studies, and illumine his page.
By curves I'm guarded, and by cooks maids spurn'd,
By children dreaded, and by poets shunn'd.

The 'tuneful fool,' that in descriptive song
Roams woods and wilds, and banks, and streams among,
Culls from dame Nature her serenest flow'res
And into rhyme the frenzied spirit pours.

Say, is it just, with more than poet's rage
My form be exil'd from hi. polish'd page.
Me should the muse in lov'liest garb array.
And sense demand me with imperious sway,
Should grave authority to nerve his rhymes,
Attest my merits in Miltonian times—
Noble wretch! of shape uncouth and mean;
By hands rejected, and in books unseen,
'Go frame in Billing gate the loud rough roar,
And add to blacksmiths bill one item more.'

NEW CHARADES AND REBUSSES.

1. CHARADE. By Mr. J. Hawkes, Finedon.

My first at the door gives old Gripus relief,
And aids to secure him from rogue or thief:
Yet the charms of my next do bewitch the elf,
That he grudges all others and half starves himself;
Nor yields to my whole with a downright good will,
Unless it contributes his coffers to fill.

2. CHARADE. By Mr. John Herdson, London.

My first and my second are each known to be
A load for a horse, and that you will see;
But great is the contrast when joined together,
They almost become as light as a feather.

3. CHARADE. By Hinckleyensis, addressed to Mr. Spencer.

Once more a new charade I send—My tiny second may be found
In hope it will amuse my friend: Where woods and coppices abound.
To read it o'er he'll not refuse, When you and I together meet.
Because it sent instead of news; In kitchen, parlour, house, or street,
A smiling infant is my first A smiling infant is my first
When by its tender mother nurs'd; Will help to pass the time away.

4. CHARADE. By Mr. John Smith, Aron Park.

My first's a material of very great use;
Through my next often flows a delectable juice;
My whole pays our island an annual visit,
And is greatly esteem'd.—Diarians, what is it?

5. CHARADE. By Mr. William Whitaker, Halifax.

My first existed ere mankind had birth,
And reigns alternately o'er half the earth:
My next in Paradise a pasture found,
Stretch'd in the shade, or bounding o'er the ground:
My whole, alas! when e'er its powers confess'd,
Maligant, proves a direful foe to rest.
New Rebuses, 1816.

1. Rebus. By Elder Dranch.

In me is often seen a gentle[man]’s delight;
Behold me, then you have the thing on which I write;
Once more my head take off, & you shall then appear
What soldiers all should be when they go to the war.
But if you then transposed and place the letters right; (A)
— A Christian name for men will soon appear in sight.


I’m known to seaman, it is clear,
For I direct them how to steer.
Cut off my head, and then behold;
An animal just six years old:
Now cut again, and you will find
What Nature ever leaves behind.
If still another hint you wish,
Curtail me, and you’ll find a fish.

3. Rebus. By Mr. George Simkin, Finedon.

Read Holy Writ my first to see,
There pious Job doth mention me,
Then join a letter to the same,
The whole will form a noted name.

QUESTIONS Critical and Philosophical.

I. Quest. 331. By Mr. W. Hill, Oldham.

What was the nature of the Cross generally associated with the name of Constantine? Was it real or imaginary?

II. Quest. 332. By Sarcotiensis.

Hops and Kidney-beans wind in different directions round their supporters: can any natural reason be assigned why they do so?

III. Quest. 333. By Mr. Joseph Suffolk, jun. Barwell.

Generally, about sun-setting, the clouds in the western sky appear parallel to the horizon. Why do we not see them in that position at any other time of the day?

IV. Quest. 334. By Clericus.

In Lord Chancellor King’s Enquiry relative to the Constitution of the Primitive Church, page 15, that learned author infers from the analogy of the Greek μονοπροσωπη and the English word single that in the early ages the bishop’s care was no larger than a modern parish. Was the inference, so far as the meaning of the words is concerned, correct? (A)
Answers to the Questions proposed last Year.

(1) Quest. 1036. Answered by Investigator, the Proposer.

Suppose the quantity \( a = \left[ \sqrt{n}a - (n+1) \right] \sqrt{a} \) \( = n^2a - 2(n+1)a + (n+1)^2 \). Then, this equation will be true if \( n \) be any integral positive number, let \( n = 1 \), then \( a = \left[ \sqrt{n} - \sqrt{a} \right]^2 = a - 4a + 4a \); and therefore \( \sqrt{a} = (a - 4a + 4a) \). Taking the root by the usual method, \( a - 4a + 4a(\sqrt{a} - 2\sqrt{a} = -\sqrt{a} \) the negative root.

we have

\[
2\sqrt{a} - 2\sqrt{a} = 4a - 4a
\]

And an analogous result would flow from assuming \( n = 2, 3, 4, \&c. \)

Similar to this were the Answers transmitted by Messrs. Lamplugh, Edward Page, R. Prance, John Smith, and R. Taylor.

Other solutions were received from Messrs. Ambulator, John Baines, jun., Rev. J. Furnass, Ab. Jaques, G. Jones, and John Williamson.

Mr. John Abram, of Canterbury, gave an ingenious answer, upon the supposition that it was required to find the root \( \frac{1}{\sqrt{a}} \) by a direct method, instead of taking it equal to \( \frac{1}{a} \sqrt{a} \). We regret that his curious investigation is too long for insertion here.

Some of our Correspondents refer to No. 13 of Leyhoun’s Repository for a good solution to this question by Mr. White; but the Proposer of the question in this Diary could not be aware of that solution as is evident from the date of the respective publications.

(2) Quest. 1037, answered by Mr. W. G. Horner, Bath.

Let \( AB, AE \), represent the pole and its shadow in the first position, \( Ab, Ae \), the pole and shadow in the second position, or when \( BAb = 30^\circ \), and drop the perpendicular \( bc \). \( AD \) the mean of \( AE \), \( Ae \) is equal to \( AB \), and \( AC = CD, ED = DC \), by the conditions of the problem. Also, \( AC = 2CE + ED \), \( Ce = CE + 2ED \), \( AB + BC \) (a given ratio) :: \( m : n \), \( \text{rad.} \cdot \text{sm.} \), \( 60^\circ \), "Dividendo et multiplicaudo, \( CE - ED, CE + ED :: 3m - 3n : m + n \). Dividendo \( \text{ED} :: 2CE + 2ED = AD = AB :: 2n - m, 2n + 2m :: \sqrt{3} - 1 : \sqrt{3} + 2 \). \( \text{Dividendo,} \) \( 10 : 5(4\sqrt{3} + 5) = 60 \times 90706 \) feet, the height of the pole.

As an additional solution, by Mr. John Smith, Mr. W. D. Shoobey, Mr. George Young, the Proposer, and T. H.
Questions answered.

Then $AE=10$ feet. Then $AE=x$, and $AE=10$. By Trigonometry, $\tan BEA=\frac{1}{x}$, and $\tan BEA=\frac{a}{b}$. But, by reason of the sun's great distance, $be$ and $BE$ may be regarded as parallels, and consequently these two tangents will be equal; that is, $\frac{a}{b}=\frac{x}{c}$. Hence $x=\frac{bc+c}{a+c-b}=50.98076$ feet, the length of the pole.

Again, by Mr. Matthew Lamplugh, Walkington, and Mr. Edward Page, Westwood Cottage, near Beverley.

$AB$ and $Ab$ being, as before, the two positions of the pole, we have $bAB=30^\circ$, and $bAr=60^\circ$. But $AD=Ab=AB$, therefore the triangle $AdD$ (see the preceding figure) is equilateral. $De=DE$ is given $=10$ feet. Also, by the question, $BE$ and $Be$ are parallel; as are, likewise, $AB$ and $Cb$, and $AC=CD$. By similar triangles, $Ce:Cb::AE:AB$, or $\frac{AD+10}{AD+10}$; $AD$/4; $AD=10$; $AD$. Consequently, $\frac{AD+10}{AD}=\frac{10}{4}$, and $AD=AB=50.9808$ feet, the length of the pole.

It is too remarkable for the Editor to omit noticing the circumstance, that not only the above solution, but every solution in their respective sheets, is precisely the same as communicated by Mr. Lamplugh and Mr. Page: the diagrams are alike, letters of reference the same, language the same, contractions the same. A coincidence of this kind always excites unpleasant suspicions; and the Editor hopes it will not occur in future.


(3) QUEST. 1038, answered by Mr. Jesse Winward, Sejr. Schoolmaster.

Geometrical Analysis. Suppose it done, and the points C and D found as required, erect the [Diagram]

$$\frac{AC}{CD}=\frac{m+n}{n};$$ but by similar $AD:DE::AB:BF$, therefore $m+n:n::AB:BF$ a given ratio, and $AB$ is given. $BF$ is given, and $AF$ given in magnitude and position: join $BE$, then $CD^2+DB^2=DE^2+DB^2=BE^2$ a min., or $BE$ a min. and the point $B$ being given, and $AF$ given by position, this will evidently be the case when $BE$ is perpendicular to $AF$; hence this

Construction. Draw $BF$ perp. $AB$, and take $BF$ a fourth proportional to $m+n$, $n$ and $AB$, join $AF$, and upon $AB$ describe a semi-circle cutting $AF$ in $E$; draw $ED$ perp. $AB$, and take $DE=DE$, and the thing is done; the truth of which is sufficiently obvious from the analysis.
Analysis. Suppose it done, C and D the required points; erect DE perpendicular to AB and = CD, and draw AE; now CD : AC being a given ratio, CD, and consequently DE : AD a given ratio (see Euclid's Data, Prop. 7.) Hence AE is given in position, and CD + DE = DE + BD = DE + BD = BE², is to be a minimum, which it is when perpendicular to AE. Hence the following

Construction. In AB take AF of any length, and perpendicular to AB take EG ; AF : DE : AD; through A and G draw an indefinite straight line, perpendicular thereto draw BR; demit DE perpendicular to AB, divide AD in C so that AC : CD may be the ratio given by the question, and it is done.

Another solution, by Omicron, of Penrith.

Analysis. Let the given line AB be divided in the points C and D in the manner required, so that AC : CD may be a given ratio, and CD + DE² may be a minimum. Draw CE perpendicular to AB and equal to CD, and EF parallel to AB and equal to CD or CE, and draw FD perpendicular to AD; then the figure CEFD is a square. Join AE, AF, BF; then since AC : CD is given ratio, and CD = CE, therefore AC : CE is a given ratio; hence the locus of the point E is a straight line, AEC, given by position, and the triangle AEC is given in species. Therefore the ratio of AE : CE or FE is given, and the angle AEF is given; therefore the locus of the point F is also a straight line AFN given by position; also, CD + DB² + DB² = BF², to make which a minimum, since the point B is given by position, the line BF must evidently assume a position perpendicular to AFN. Hence this

Construction. In AB take any point M, from which draw MR perpendicular to AB, and make AM : MR in the given ratio of AC : CD; join AB, and through the point R draw RS parallel to AB and equal to MR; join AS with the indefinite straight line ASN, from the point B draw BF at right angles to ASN, and through F draw FE parallel to AB, meeting AR or AR produced in E; from the points E and F draw EC, FD, each perpendicular to AB; then is AB divided in the points C and D in the required manner.

Demonstration. For, by parallel lines AE : AR :: EF : RS :: EC :: RM, but RS = RM, therefore EF = EC = ED; and AM : MR :: AC : CD in the given ratio; and CD + DB² = BD², therefore, CD + BD² = BD², which will be a minimum, since BF is the least line which can be drawn from the given point B to the straight line AFN, given by position.

Answers to this problem were likewise sent by Messrs. Abram, Bagshaw, Daniel, jun., T. H. Horner, Jacques, Jones, Lamplugh, Maff.

(4) Quest. 1039, answered by Messrs. Jonathan Crowther, of Woodhouse Grove; Griffith Jones, of Warrington; and D. T. Sheridan, of Stafford.

Let \( \triangle ABC \) be any triangle, right angled or not, having the given base \( AB \) and the given vertical angle \( \angle ACB \); bisect the angles \( \angle CAB \), \( \angle CBA \), by the straight lines \( AD, BD \), intersecting each other in \( D \); that, by a well-known proposition will be the centre of the inscribed circle. Then, since the angle \( \angle ACB \) is given, the sum of the angles \( \angle CAB \) and \( \angle CBA \) is also given, and therefore the half of this sum, or the sum of the angles \( \angle DAB \) and \( \angle DBA \), is given; and consequently the angle \( \angle ADB \) is given. The points \( A \) and \( B \) also are given; therefore the locus of the point \( D \) is the segment of a circle capable of containing an angle equal to the given angle \( D \), that is, containing an angle equal to the supplement of half the given vertical angle.

Answers, for the most part similar to the above, were given by Messrs. Abram, Ambulator, Bagshaw, Baiues, Jun., Butterworth, Cook, Furness, T. H., Horner, Jaques, Lamplugh, Maffett, Nicholson, Omicron, Page, Prance, Stringer, Snooke, Taylor, Treeby, Williamson, Weston, Winward, and Youle.

(5) Quest. 1040, answered by Mr. Joseph Hine, the Proposer, Mr. Thomas Charlton, of Newbrough, and Mr. John Smith, of Alton Park.

Let \( AB \) be the horizontal plane, \( AC \) the vertical wall, and \( BC \) the bar. Through \( G \), its centre of gravity, draw \( DE \) parallel and equal to \( AC \); then, by mechanics, the weight of the bar and its pressure at \( B \) are respectively as \( ED \) and \( EB \). Put \( BC = 6 = a \) and \( AC = DE = x \); then \( BD = \sqrt{a^2 - x^2} \); whence \( EB = \sqrt{x^2 + 4a^2 - 4x^2} = \sqrt{(a^2 + x^2)} \). By the question, \( 2ED = EB \); that is, \( 2x = \sqrt{(a^2 + x^2)} \); hence \( x = \sqrt{\frac{13}{13}} = \frac{\sqrt{13}}{13} \approx 1.6641 \).

Then, by trig. \( BC : AC :: \text{rad.} : \sin \angle CBA, 16^\circ 6' 8'' \), the inclination required.

Another solution, by Mr. John Butterworth, Haggate, near Oldham.

This Gentleman, assuming the same principles, remarks that the forces act in the directions \( CE, ED, \) and \( CA \), and are as the sides of the right-angled triangle \( BDE \). But the pressure at \( B \) is double to the force acting in the direction \( ED \); therefore \( BE = 2ED \), or \( ED \cdot BD :: 1 : \sqrt{3} \). But \( BG \) being equal to \( GC \), \( EG = GD \), therefore, \( GD \cdot BD :: 1 : 2/3 \); whence the angle \( BGD \) is found \( = 73^\circ 55' 59'' \) or \( 16^\circ 6' 8'' \) nearly, the inclination of the bar required.
Any particular case may be deduced from the following construction. Let ABCD represent the beam or bar, and let G be the centre of gravity, A the point which will rest on the horizontal plane, B that which will touch the vertical plane. On AB construct the \( \triangle ABH \), right \( \angle A \) at A, and having \( AB : BH \) in the given ratio of the weight to the pressure. Then GH will be a vertical line, and if \( AB \) and \( BH \) be drawn \( \perp \) to GH they will represent the planes, \( \textit{in situ} \). For draw BK \( \perp \) BE, meeting HG in K, and join AK; also let \( r \) be the intersection of HG, AE. Because of the equal \( \angle rHA, HKB \); the points \( HKAB \) lie in a circle, \( \angle rAKH \) or \( AKF=ABH \); whereas the right \( \angle dA_i AFK, ABH \), are similar; and \( KF : KA \left( \frac{AB}{BH} \right) \) the weight : the pressure against \( AE \). Which is the proportion in case of equilibrium (Emerson's Mech. Prop. 63.).

\[ \text{Calculation. Draw } Gs \perp AB, \text{ and let } r \text{ be the intersection of } AB, HG. \text{ In the } \triangle \text{ as } \triangle ArH, GsA, ABE, \triangle Ar; \triangle Ar. \text{ Multiply } \frac{Gh}{Ah} = \frac{Ab}{Ph}; \triangle Ah = \frac{Ar}{Ah} = \frac{Ar}{Ph}. \text{ Alternately } Ah = Gh; \triangle Ah = \frac{Ar}{Ph}. \}

When the bar is a geometrical line, a spindle, or of any other such form that \( G \) is the middle point of \( AB \), \( Gs, As \) from the nature of the solid \( ABCD \).

\[ \text{When the bar is drawn } B = \Phi Gs, LAB, \text{ and let } r \text{ be the intersection of } \triangle ArH, Gs, As, Frs = As : Af. \text{ Alternately } Ah = \frac{Ar}{Ph} = \frac{Ar}{Gs}. \]

This was probably the case intended, as it is the only one that can be resolved independently of the dimensions of the body. Ingenious answers were likewise sent by Messrs. J. Bains, jun. J. Cook, Jonathan Crowther, Rev. J. Furniss, Ab. Jacques, C. Jones, M. Limpough, E. Page, R. Prince, W. D. Sneake, J. T., John Williamson, Jesse Winward, Thomas Yardley, &c.

\( \text{Q. 1031, answered by Mr. W. Weston, Birmingham.} \)

Let \( ECA \) be the rod, \( CA \) perpendicular to the horizon, and bent at \( C \) in an angle of 90°, \( CE = 50 \) inches, \( DB = 60 \) inches, then by the lever we have

\[ \text{CE.W.} \]

\[ \frac{CD}{BC} = \frac{CE.W.}{BC}. \]

\[ \text{the vertical pressure at } D \text{ and } \frac{BC}{BC} = \text{the horizontal pressure at } B, \text{ but by the question } \text{CE.W.} \]

\[ \frac{CD}{BC} = \frac{2CE.W.}{BC}, \text{ and by reduction, we have } CD = \frac{BC}{2}; \text{ but } BC = 3\text{600}, \text{ or } 5BC = 18000, \text{ or } BC = 3600, \text{ or } BC = 533 \]

\[ \text{See Gregory's Mechanics, vol. I. page 132, ed. 3d. Another} \]
Another answer; by Messrs. J. Banks, jun., of Reading; W. Badshaw, of Litton; Jonathan Crowther, of Woodhouse Grove; R. Prance, of Plymouth; and W. D. Snooke, of Woolbridge.

Let $ACE$ represent the bent rod, $DB$ the spur, and $W$ the weight. Put $CE = a = 50$, $DB = b = 60$, and $CD = r$, then $\sqrt{b^2 - r^2} = Be$, and $CE \times W = aW$. Hence, by Ex. 7, p. 354, vol. III. Hutton's Course, $\frac{aW}{CExW} = $ the vertical pressure of the horizontal arm on the spur, and $\frac{aW}{BC} = \sqrt{b^2 - r^2} = $ the horizontal pressure against the vertical arm; therefore; $x = \frac{2aW}{\sqrt{b^2 - r^2}}$ or $x = \frac{b}{5} \sqrt{5} = 26.8328$ inches $= CD + DE = 23.1672$ inches.

Otherwise, by Mr. Abraham Jacques, of Penrith; and Mr. John Smith, Alton Park.

By the principles of Mechanics, $\sin CDB : \sin CBD :: \text{vertical pressure of } CE \text{ on } DB : \text{horizontal pressure of } PB \text{ against } AC$ (see the preceding diagram). These pressures are, by the question, as $2 : 1$. Therefore, (the sides of triangles being as the sines of the opposite angles) $CB = 2CD$. Assume $CD = 1$, then $CB = 2$, and $DB = \sqrt{5}$. But $DB = 60$; therefore it will be

$$\frac{60}{\sqrt{5}} : \frac{60}{\sqrt{5}} :: \frac{2}{\sqrt{5}} = 12 \sqrt{5} = 26.8328 = CD.$$


(7) Quest. 1042, answered by Mr. P. Nicholson, Architect, 10, Oxford Street, London, and Mr. Richard Taylor, Carlisle.

Demonstration. Bisect $AD$ in $O$; produce $AD$ and $TL$ till they meet in $Q$. Then, by sim. tria. $BQ : DQ :: BT = 2BH : DL :: 2AB : AD$; $BQ : DQ :: 2AB : AD$; and $BQ : DQ :: AB : AO$; also, $(BQ - DQ) = BD : BQ :: (AB - AO) = OB : AB :: AB : BD = OB : BQ$. Now the equality of these rectangles indicates $TL$ to be a tangent at $T$, in both curves. (Simson on the Ellipse, Prop. 17, Cor. 1; and Hyperbola, Prop. 35.)
Let $O$ (figure to the preceding answer) be the centre of the ellipse or hyperbola, $Q$ the intersection of $TL$ with the axis, or of their continuations. By similar triangles, $QD : QB :: DL : (BT = 2) HB$ and $DL : HB :: (AD = 2) OD : AB$.

Ex aequo, $QD : QB :: OD : AB$.

Alterna, $QD : OD :: QB : AB$.

Compo. & Divi. $(OD + QD =) OQ : OD :: (AB + QB =) AQ : AB$.

Alterna, $QO : QA :: GD : AB$.

Divi, $QO : (QA – QO = AO =) OD : OD :: (AB – OD = AB – AO =) BO$.

And this last proportion comprehends a well-known property of the tangent to an elliptic or hyperbolic curve. See Hutton’s Course, vol. ii. Th. 7. Ellipse and Hyperbola.

Cor. (by Mr. Horner.) In the parabola $A$ is at an infinite distance, therefore $HL$ is there parallel to $QB$, and consequently $DL = BT$. Therefore $QD = QB$, the known property of the tangent to this curve.

The Editor regrets much that he was obliged to omit the elegant demonstration of Mr. Moore, the proposer, applicable to both curves: also that he can only specify the names of the following ingenious Gentlemen who favoured him with demonstrations, viz. Messrs. W. Bagshaw, J. Baines, jun. John Butterworth, Ant. Cook, G. Jones, Matt. Lamplugh, Edward Page, D. T. Sheridan, W. D. Snooke, W. Stringer, W. Wright, and Edward Young.


Let $x =$ com. diff. and $mx =$ the middle number, then $nx – 3x$, $nx – 2x$, $nx – x$, $nx + x$, $nx + 2x$, and $nx + 3x$ are the numbers, and $7n^3x^3 + 84nx^3 =$ the sum of their cubes, which is to be a biquadrate number: suppose it $= m^4x^4$, then $x = \frac{7n(n^2 + 12)}{m^4}$

where $n$ may be any number greater than 3, and $m =$ any number taken at pleasure, if $n = 4$, and $m = 2$, then $x = 49$, and the numbers will be 49, 98, 147, 196, 245, 294, and 343, Again, if $n = 6$, and $m = 3$, then $x = 126$, and the numbers will be 378, 504, 630, 756, 882, 1008, and 1134.

Otherwise, by Mr. Jesse Winward, of Mullingar, and Messrs. Robert Maffett and Samuel Treeby, of Plymouth.

Put $x, 2x, 3x, 4x, 5x, 6x,$ and $7x,$ for the numbers required, which are obviously in arithmetical progression; the sum of the cubes of these is $784x^3$, and this per question must be a biquadrate whole number. Equate it to $a^4x^4$, and there results $x = \frac{784}{a^4}$. Whence the required numbers will be expressed by this fraction multiplied into 1, 2, 3, 4, 5, 6, and 7, respectively, where $a$ may be assumed at
pleasure. If $a$ be taken $= 2$, there will result $49, 98, 147, 196, 245,$
$294$, and $343$, for the least integer numbers that can be found.

Solutions to this question were also received from Messrs. Bag-
shaw, Baines, jun. Butterworth, Furnass, Horner, Stevenson, (the
Proposer,) and Wright.

(9) Quest. 1044, answered by Mr. W. Wright, Buxby, near
Barton.

Analysis. Suppose ACB the triangle sought, $HN$ the diameter of its circumscribed circle bi-
secting AB in K, draw CD perpendicular to
AB, which continue to meet the said circle in
G, draw GT and CM both perpendicular to
HN, also HL perpendicular to AC, draw CH
cutting AB in F and bisecting the $\angle$ ACB,
and let E be the place where the inscribed cir-
cle touches AB. By similar triangles $CF,
MK; CH; MH,$ and $FH; KH; CH; MH,$
by compounding $CF; FH; MK; KH; CH; MH.$ But by the cir-

Other solutions to this problem were received from Messrs. Bainer,
Jun. Cook, Croother, Furnass, T. H. Horner, Jones, Sheridan, (the
Proposer,) Taylor, and Winward.
Making \( AB = a \), \( BC = b \), the abscissa \( BM = x \), the ordinate \( MP = y \), the equation to the curve is \( y = \frac{b}{a} \sqrt{a^2 - x^2} \). Therefore area

\[
\text{area} = \pi \int_0^a b \sqrt{a^2 - x^2} \, dx
\]

\[
= \frac{ab}{2} \left[ x \sqrt{a^2 - x^2} + a^2 \sin^{-1} \left( \frac{x}{a} \right) \right]_0^a
\]

\[
= \frac{ab}{2} \left[ a \sqrt{a^2} + a^2 \sin^{-1} \left( \frac{a}{a} \right) - 0 \right]
\]

\[
= \frac{ab}{2} \left[ a + 0 \right]
\]

\[
= \frac{ab}{2} \cdot a = \frac{a^2 b}{2}
\]

When \( x = a \), these expressions all vanish; wherefore they need no correction. When \( x = 0 \), the infinite area becomes \( \frac{1}{2} ab \cdot hL = \frac{ab}{2} + \frac{ab}{4} \). quadrant to radius \( a \), where the first term being an expression of infinity, renders the remaining two of no significance in comparing the areas corresponding to different values of \( AB \); and the area will consequently be a maximum when the coefficient \( ab \) of that term is such. But \( a \) is a given quantity. \( \bowtie \equiv \delta b, \) or \( AC \), must be bisected in \( B \).

Another solution, by Messrs. Griffith Jones and Ant. Cook.

Put \( GB = a \), \( BA = b \), \( CA = \alpha \), the abscissa = \( x \), and the corresponding ordinate = \( y \). Then by Simpson's Fluxions, art.

\[
y = \frac{ab}{2} \sqrt{b^2 - y^2}; \text{whence } y \frac{dy}{dx} = \frac{ab}{2}\frac{y}{\sqrt{b^2 - y^2}}
\]

\[
\text{or}, \text{putting } u = \sqrt{(b^2 - y^2)}, \text{we have } y \frac{dy}{dx} = \frac{ab}{2}\frac{u}{u}
\]

\[
\frac{1}{2}(b^2 - y^2)\text{, or putting } y = \sqrt{(b^2 - y^2)}, \text{we have } y \frac{dy}{dx} = \frac{ab}{2}\frac{y}{\sqrt{b^2 - y^2}}
\]

\[
(b^2 - y^2)\text{;} \text{or, putting } u = \sqrt{(b^2 - y^2)}, \text{we have } y \frac{dy}{dx} = \frac{ab}{2}\frac{u}{u}
\]

\[
\frac{1}{2}(b^2 - y^2)\text{. The Fluent of the first part of our given quantity in an infinite series is } \int_0^a \left(1 + \frac{3}{36} + \frac{5}{56} + \frac{7}{72} \cdots \right) \, dx\text{;} \text{ which, when } y = a, \text{ or the space is infinite, becomes } ab \int (1 + \frac{1}{4} + \frac{1}{4} \cdots)\text{;} \text{ which } = ab \cdot \infty \text{, a constant quantity (s). But the Fluent of } z \sqrt{(6 - x^2)} \text{ is (in the present case) } \text{a quadrant of a circle whose radius is } b \cdot \sqrt{6} \text{; therefore } ab \cdot \sqrt{6} \text{ is to be a maximum. Putting the expression into
}

\[
\text{fluxions, writing } s - 5 \text{ for } a, \text{ and reducing, we have } s = \frac{n}{n}
\]

\[
\text{But } s \text{ in infinitely greater than } n; \text{ therefore } b = \frac{1}{n}\text{; that is, the asymptote bisects the given line in the point } B.
\]

Solutions were likewise sent by Messrs. Jackson, Maffett, Snook, Stringer, Taylor, Treby, Williamson, and Wiseman.
Questions answered. 1816.

(11) Quest. 1046, answered by Messrs. John Smith, Robert Marrett, Samuel Treeby, and John Williamson.

Let ABCD be the vessel, and E the aperture in its side; then, by the laws of spouting fluids,

$$BG = 2\sqrt{(AE \times EB)};$$

whence

$$AE = \frac{BG^2}{4BE}.$$

Put $a = \frac{5}{16}$ ft.; the area of the aperture, $g = 16\frac{1}{2}$ ft. $d = AE = 9\text{ ft.}$ $A =$ the area of the surface of the water, and $t = 6h. = 21600''$, the time of running; then (by Prob. 16, Exercises on Forces, Hutton's Course, vol. II.) $t = \frac{a^2}{g} \cdot \frac{d}{h}$; hence $A = \frac{t a^2}{\sqrt{h}} = 100.26$. Then $100.26 \times (9 - 4) = 1303.38$ ft. the content of the reservoir.


By Prop. 70, vol. II. Hutton's Course, we have $AE : BE :: 4AE^2 : BG^2$, whence

$$AE = \frac{BG^2}{4BE} = 9 \text{ ft.}$$

Put $AE = a$, 32$\frac{1}{2}$ feet $= g$, $\frac{1}{2}$ sq. inch $= H$ sq. foot $= n$, 6 hours $= 21600'' = t$, and the area of the base $BC = A$; then, by art. 443, vol. I. Dr. Gregory's Mechanics,

$$A = \frac{2a}{n} \sqrt{\frac{g}{t}}$$

this by the quest. is $t$; hence $A = tn. \sqrt{\frac{g}{2a}} = 100.260075$ feet, the area of the base, which, multiplied by the whole height $BA = 13$, gives $1303.380975$ feet, the solidity of the reservoir.

Note. The above solution is on the supposition that the velocity of efflux is that due to the whole height of the fluid above the hole; but if the result be diminished in the ratio of $\sqrt{2} : 1$, it will give 931.63836 feet the solidity, on the hypothesis that the velocity is that due to half that height.

Ingenious answers were likewise received from Messrs. Abram, Baines, jun. Butterworth, Charlton, Crowther, Furnass, Horner, O'mallon, Sheridan, Snooke, Taylor, (the Proposer,) T. White, and Wiseman.

(12) Quest. 1047, answered by Mr. Thomas White, the Proposer.

It is known that the locus of $c$ is an ellipse; and which may be thus shewn: Drop $\perp cn$, and produce it to cut $\perp ac$ in $o$; $io || ac$; then $ao$ is a parallelogram. About $i$, with the distance $io$, describe the quadrant $pqo$. The line $no$ is bisected by the joint $c$, and $k$ bisects $ig$. Hence $c$ is an ellipse, of which the semiaxes are $2ki$ and $ki$. 

$(12)$
For the locus of $e$ drop $\perp em$, and $l$ being in the curve, we have $\frac{3}{4}$ or $\frac{4k}{4k^2 - m^2}$. By the ellipse $pck$, $4k^2 - m^2 = np \cdot (4k - np) = cn^2 - em^2$; hence $pn = \frac{3}{4}k^2 \frac{2}{\sqrt{k^2 - em^2}}$; and $dn = dm = \sqrt{k^2 - em^2}$; and $ml = 4k - im$; and the above equation becomes $2ki - 2\sqrt{k^2 - em^2} + 4ki - im$; the upper sign gives $im = 0$; and the under sign gives $im = 4\sqrt{k^2 - em^2}$; hence $em$ is $= \frac{k}{4k^2 - 16k^2 - im^2}$, belonging to an ellipse, semi-axes $4ki$ and $ki$.

Scholium: If $a'bc'$ $c'de'$ be jointed rigid rods playing freely around the pivots or pins $b$, $d$, it is plain that the groove becomes unnecessary; and $a$ and $a'$ being moved respectively on $ki$ and $ik$, in opposite directions, the system will act as before, and the joints will describe ellipses, and the pins will describe a rectilinear line, and the progressive velocities of $c$ and $c'$, or of $n$ and $m$, are as the Nos. 1, 2. Moreover, when $e$ and $e'$ meet at $l$ they will hold an object there with exactly the same force as that which brings $a$ and $a'$ together; but they will dart, as it were, to $l$, notwithstanding $a$ and $a'$ are brought comparatively slowly together.

Otherwise, by Mr. P. Nicholson, Architect, 10, Oxford-street, and Omicron, of Penrith.

Let the figure be drawn as directed in the question, and let $abcd$ be any position of the moveable lines. Draw $ef, cg$, perpendicular to $il$. Then, when the point $a$ arrives at $i$, the point $e$ will coincide with $l$, and $il = 4ab$; and since $ab = bc = cd = de$, therefore $ai = cg = ef$, and $ib = bg = gd = df$. Hence, putting $lf = x$, and $ef = y$, and $ab = hixz$, we shall have $if = 4a - x$, $ah = \frac{1}{4}x$, and $y = a^2 = (\frac{1}{4} ax + \frac{1}{2} x^2) = 8a - x^2$. Therefore $y = 4(8a - x^2)$, an equation to the ellipse, the major axis of which $= 8a$, and minor axis $= 2a$; that curve is, therefore, the locus of the point $e$.

Questions answered. 1816.

The Quest. 1048, answered by Omicron, of Penrith,

Analysis. Let \( AB \) be the surface of the water. \( C \) the required position of the eye, \( CAP \) the rod immersed in the pool, the longer part of which \( AP \) is in the water, \( P \) the apparent place of the lower extremity of the rod. Through \( C \), the upper extremity of the rod, draw \( CON \) parallel to \( AB \), and join \( AO, OP \); then since \( AC \) and \( AP \) appear equal to the eye at \( O \), the angle \( COA = AOP \), and since from the principles of optics \( AP : AP \) in a constant ratio, in the present instance as \( 1 : 3 \), and \( AP \) is given, \( AP \) is also given, and consequently the point \( P \), and since the angle \( COP \) is bisected by \( AO \). \( CO : OP : CA \). \( AP \) a given ratio, and the points \( C \) and \( P \) are given, and the straight line \( CN \) is given by position, \( \cdots \) the point \( O \) is also given, hence.

Construction. Through the upper extremity of the rod \( C \) draw \( CN \) parallel to \( AB \), in \( AP \), the part of the rod immersed, take \( P \) prism \( \Delta \), and in \( CN \) take any point \( n \), from which to the straight line \( CAP \) apply \( nm \), which has to \( Cn \) the given ratio of \( AP : AC \), and through the point \( p \) drawn \( Op \) parallel to \( nm \), meeting \( CN \) in \( O \), the required position of the eye.

Demonstration. For from parallel lines \( Cn : nm : CO : OP : AOp : AP \) the angles \( COA \), \( AOp \) are equal, and consequently \( AC \) and \( AP \) appear equal to the eye at \( O \), and since \( PP = AP \), \( P \) is the apparent place of \( P \). \( \cdots \). &c.

Otherwise, by Mr. Thomas White, of Dumfries.

Let \( abc \) be the vertical rod; \( be \) the part immersed; \( by \) the surface of the water; and \( ec \) the place of the eye in the \( \parallel ax \); \( ay \), the refracted ray; draw the vertical \( ay \); produce \( xy \) to cut \( ac \) in \( p \); and join \( bx \). Since \( ax \) bisects \( \angle axy \), a circular arc, with the distance \( ab \) and centre \( b \), will touch \( xy \) in \( s \); draw \( ks \). Let the sine of the \( \angle \) of incidence \( \frac{ys}{yb} \), be to the sine of the \( \angle \) of refraction \( \frac{ys}{yb} \) as \( n \) to \( m \); then the sine of \( \frac{ys}{yb} \) \( \angle c \). We have \( 1 - \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle : \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle \). and \( 1^2 (\text{rad.}) : by^2 \langle 1 - \sin \frac{yc}{c} \rangle : \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle \). and \( 1^2 (\text{rad.}) : by^2 \langle 1 - \sin \frac{yc}{c} \rangle : \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle \).

Hence, \( 1 - \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle : \sin \frac{yc}{c} : \sin \frac{yc}{c} \langle 1 - \sin \frac{yc}{c} \rangle \). from which a construction may readily be deduced.

It was with great reluctance the solutions to this problem by Messrs. Kay, (the Proposer), Jesse Winward, and W. Wright, were omitted.

Other good answers were given by Messrs. Bagshaw, Baines, jun., Bullenworth, Cook, Farewell, Harper, Jephson, Jones, Maffet, Teesby, and Walshe.
Let $\Delta P G$ be the orbit in which the Earth revolves about the centre of force $S$, infinitely distant from $P$, the place of the Earth at any proposed time, so that all lines drawn to it from $P$ may be considered as parallel. Draw $P Y$ a tangent to the Earth's orbit at $P$, and suppose $S Y$ drawn perpendicular to this tangent. Let $S^1$ be the true place of any Star, and from $S^1$ draw $S^1 Y$ parallel to $P Y$, and make it proportional to the velocity of the revolving body at $P$ in its orbit $\Delta P G$, then will $s$ be the apparent place of the Star $S^1$ upon a plane parallel to the plane of the ecliptic.

Draw any straight line $a b$ perpendicular to the axis of the orbit $\Delta M$, upon which, as a diameter, describe the circle $b c a$, make $b d$ perpendicular to $a b$, and from $b$ draw $b c$ parallel to $P Y$, meeting this circle in $c$, join $a c$ meeting $b d$ in $d$; draw also $S m$ parallel to $a M$, and $S p$, $m q$ parallel to $a b$. Then from similar triangles $S P : S Y :: a b : a c :: a b :: S P \times a b = S Y \times a d$. Since $S P$ and $a b$ are constant $\frac{1}{S Y} \propto a d \propto$ velocity of the Earth at $P C S^1$, whatever be the law of the force, and the angle $d b c = d a b = m S^1 S$.

The point $s$ describes about $S^1$ a line similar to what the point $d$ describes about $a b$, but the point $d$ moves in a straight line. The point $s$ moves also in a straight line.

Otherwise, by Mr. Thomas White.

Let the equation "of the Earth's orbit" be $y = \frac{b}{a} \sqrt{2 a y - x^2}$; $x$ and $y$ originating in the extremity of the greater axis $a f$ the force in direction of the ordinate $y$ towards the transverse; $v$ the velocity therein in a contrary direction; $a$ the initial value of $v$; $\beta$ the velocity in direction of the transverse, which must be invariable, because no force acts in this direction; $a$ and $\beta$ are assignable, and cannot be assumed; also, let the time be $t$. We have $i = \frac{y}{v} \beta$; and $\phi$.

For $v$ decreases. Hence $a^2 - v^2 = 2/\varphi y$, where $\varphi$ may be any function of $a$ or $y$. By the other equation $a^2 = \frac{y^2 \times \beta^2}{\varphi}$; and...
New Mathematical Questions, to be answered in next Year's Diary.

(1) Quest. 1050. By Ambulator.

To find two whole numbers, such that the difference of their squares, and the difference of their cubes, shall be both squares.

(2) Quest. 1051. By Mr. Samuel Treeby, Plymouth.

It is required to exhibit a more concise practical rule for conic and pyramidal frustums, than has yet been given in any treatise of mensuration.

(3) Quest. 1052. By Mr. W. Weston, Birmingham.

Let BAE be a circle, AB the diameter, and CFA a smaller circle, touching the former internally at A, CDA its diameter; from D, the centre of the larger circle, draw DFE at right angles to the diameter AB, cutting the small circle in F and the large one at E, the intercepted parts FE and BC are given to determine the two circles geometrically.

(4) Quest. 1053. By Mr. John Baines, jun, Reading.

In what latitude is the angle included between the hour lines of 12 and 1 on a horizontal dial, double of that included between the said hour lines on a vertical South dial?

(5) Quest. 1054. By Mr. D. T. Sheridan, Stafford.

In every right angled triangle, it will be as the perpendicular is to its adjacent segment of the base made by the line bisecting the vertical angle, so is the base to the difference of the hypothenuse and perpendicular. Required a demonstration.
(6) Quest. 1055. By Mr. Richard Taylor, Carlisle.

To determine, by a geometrical process, the distance of a planet from the sun, at the time of its nearest approach to the middle of the eccentricity of its given elliptical orbit.

(7) Quest. 1056. By Mr. John Butterworth, Haggate, near Oldham.

Having given the point P in a right line given in position, and having given a circle in magnitude and position, it is required to find another point C in the said right line, so that if CB be drawn parallel to another line given in position, meeting the circle in A and B, PC + AB may be either equal to a given line or a maximum.

(8) Quest. 1057. By Mr. Peter Nicholson, 10, Oxford Street.

Let ABC be any given angle, and let D, D, be any number of given points in the line AB, let perpendiculars DE to AB be so drawn as to meet BC in the points E, E; then, if a number of circles of equal radii, be described from E E as centers, and tangents DM be drawn from the several points D to their respective circle, and DF be set off upon DE equal to the corresponding tangent DM; it is required to determine the locus of the points F, F, &c.

(9) Quest. 1058. By Mr. Thomas White, Dumfries.

Let the element, or fluxion, mc, of a curve bounding a plane mMn be projected on a plane mMb by perpendiculars ma and cb, and let the angle aMb be equal to dv; the tangent of the angle mMa=, and the radius vector Mn=r; then cm²=1+2+r², (See Laplace, Mecan. Celeste, tom. i. p. 266.) Required the proof.

(10) Quest. 1059. By Omicron, of Penrith.

Let the body M move uniformly from A towards Q with the celerity m, and let another body N proceed from B at the same time with the celerity n. To determine, geometrically, the direction of the latter so that the distance MN of the two bodies when the latter arrives in the way or direction AQ of the former, may be the greatest possible. (Simpson's Fluxions, Prob. 14. de Max. et Min.)

(11) Quest. 1060. By Mr. W. G. Horner, Bath.

In any right line AD, make AB=DC, and draw the indefinite perpendicular BZ, to any point E, of which draw CE, DE, and produce CE to P, till CP=DE. Required the quadrature of the curve APX, which is the locus of P, and the situation of B and C when the infinite area between the curve and the asymptote is a maximum.

(12) Quest. 1061. By Mr. Thomas White, Dumfries.

Let ABC and A'B'C' be arcs of given circles given in position; B and B' being in the line joining their centres A and A', and their convexities
New Questions, 1816.

Vexities BC and B'C' fronting each other. The line CC', as also the point P therein are given. What is the equation of the locus of P?

N. B. This is not a question of mere speculation, but has reference to a well-known mechanical contrivance. See Gregory's Mechanics, ed. 3, pl. 39, vol. II, No. 9a. D.

(13) Quest. 1062. By Mr. George Harvey, Plymouth.

Required the relation of u to y in the equation \( yu - u^2 - v'y - 2uyy, \)

\( 2v^2y - v'yv - v^2y. \)

Prize Question. By Pater Familias.

Notwithstanding the various solutions which have been given to the problem of the shortest twilight, it is imagined that there is still room for improvement in point of simplicity. It is required, therefore, to give a new solution from the obvious principles of spherical trigonometry or of projection.

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**The Prizes have this year been allotted thus:**

Ten Diaries to Omicron, of Penrith, the first Math. prize.

Eight Diaries to Mr. W. G. Horner, of Bath, the second do.

Nine Diaries, to A Female Incognito, for answering the Prize Enigma.

Nine Diaries to Mr. John Smith, Alton Park, for his Gen. Answer.

They will please to send for their respective prizes to Mr. George Greenhill, at Stationers' Hall.