

**RATES OF CHRONOMETERS**

**ON TRIAL**

**FOR PURCHASE BY THE BOARD OF ADMIRALTY,**

**AT THE**

**ROYAL OBSERVATORY, GREENWICH.**

1860.

AT THE ROYAL OBSERVATORY, GREENWICH, 1

[illegible]

The order of arrangement of the Chronometers in these Tables is determined solely by consideration of their irregularities of rate, as expressed in the columns "Difference between the Greatest and Least," and "Greatest Difference between one Week and the next," without reference to the duration of the trial in cold; and as, on this account, their rates are not strictly comparable with those of the other Chronometers, they are placed in a division by themselves instead of being arranged in the general list.

One Chronometer which appears to have become deranged from some accidental cause, and which was rated for a few weeks only, is entirely omitted.

| AS DETERMINED GENERALLY BY THE CHRONOMETRICAL THERMOMETER. |         |        |        |        |        |        |       |        |       |       |       |       |       |       |       |       |       |       |       | NAME<br>OF<br>NAVER. |  | No. |
|------------------------------------------------------------|---------|--------|--------|--------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|--|-----|
| Mar.-31                                                    | Mar.-31 | June   | June   | June   | June   | June   | June  | June   | June  | June  | June  | June  | June  | June  | June  | June  | June  | June  | June  | No.                  |  |     |
| Mar.-31                                                    | Mar.-31 | June   | June   | June   | June   | June   | June  | June   | June  | June  | June  | June  | June  | June  | June  | June  | June  | June  | June  | No.                  |  |     |
| + 7.0                                                      | + 8.0   | +10.0  | +11.0  | +12.0  | +13.0  | +14.0  | +15.0 | +16.0  | +17.0 | +18.0 | +19.0 | +20.0 | +21.0 | +22.0 | +23.0 | +24.0 | +25.0 | +26.0 | +27.0 | 648                  |  |     |
| +13.6                                                      | +14.6   | +15.6  | +16.6  | +17.6  | +18.6  | +19.6  | +20.6 | +21.6  | +22.6 | +23.6 | +24.6 | +25.6 | +26.6 | +27.6 | +28.6 | +29.6 | +30.6 | +31.6 | +32.6 | 649                  |  |     |
| -15.4                                                      | -16.4   | -17.4  | -18.4  | -19.4  | -20.4  | -21.4  | -22.4 | -23.4  | -24.4 | -25.4 | -26.4 | -27.4 | -28.4 | -29.4 | -30.4 | -31.4 | -32.4 | -33.4 | -34.4 | 650                  |  |     |
| -10.0                                                      | -10.0   | -8.4   | -8.4   | -10.4  | -10.4  | -5.0   | -7.0  | -8.0   | -9.0  | -10.0 | -11.0 | -12.0 | -13.0 | -14.0 | -15.0 | -16.0 | -17.0 | -18.0 | -19.0 | 651                  |  |     |
| +1.0                                                       | +1.0    | +4.7   | +4.7   | +15.4  | +15.4  | +7.3   | +10.9 | +10.8  | +11.1 | +11.8 | +12.3 | +13.0 | +13.5 | +14.0 | +14.5 | +15.0 | +15.5 | +16.0 | +16.5 | 652                  |  |     |
| +1.0                                                       | +0.7    | +6.3   | +6.3   | +9.9   | +9.9   | +8.2   | +9.0  | +9.3   | +9.6  | +9.8  | +10.0 | +10.2 | +10.4 | +10.6 | +10.8 | +11.0 | +11.2 | +11.4 | +11.6 | 653                  |  |     |
| +4.0                                                       | +5.5    | +12.8  | +12.8  | +24.0  | +24.0  | +16.8  | +19.8 | +19.8  | +20.3 | +20.8 | +21.3 | +21.8 | +22.3 | +22.8 | +23.3 | +23.8 | +24.3 | +24.8 | +25.3 | 654                  |  |     |
| +2.6                                                       | +1.5    | +0.7   | +0.5   | +4.0   | +4.0   | +0.3   | +0.5  | +1.5   | +2.0  | +2.5  | +3.0  | +3.5  | +4.0  | +4.5  | +5.0  | +5.5  | +6.0  | +6.5  | +7.0  | 655                  |  |     |
| -0.0                                                       | -10.7   | -7.8   | -6.3   | -5.4   | -5.4   | -7.9   | -9.7  | -14.1  | -17.0 | -19.0 | -21.0 | -23.0 | -25.0 | -27.0 | -29.0 | -31.0 | -33.0 | -35.0 | -37.0 | 656                  |  |     |
| -6.1                                                       | -8.9    | +0.0   | +0.0   | +0.0   | +0.0   | +0.0   | +0.0  | +1.9   | +2.7  | +3.6  | +4.5  | +5.4  | +6.3  | +7.2  | +8.1  | +9.0  | +9.9  | +10.8 | +11.7 | 657                  |  |     |
| +1.9                                                       | +4.1    | +2.7   | +2.6   | +2.7   | +2.6   | +2.7   | +2.6  | +2.7   | +2.6  | +2.7  | +2.6  | +2.7  | +2.6  | +2.7  | +2.6  | +2.7  | +2.6  | +2.7  | +2.6  | 658                  |  |     |
| -1.5                                                       | -1.7    | -0.3   | -0.3   | -2.3   | -1.6   | +2.5   | +1.4  | +0.3   | -0.3  | -1.9  | +1.0  | +2.0  | +2.7  | +3.6  | +4.5  | +5.4  | +6.3  | +7.2  | +8.1  | 659                  |  |     |
| -15.6                                                      | -16.6   | -8.4   | -8.4   | -12.0  | -10.4  | -6.0   | -2.7  | -11.2  | -13.8 | -16.6 | -19.4 | -22.2 | -25.0 | -27.8 | -30.6 | -33.4 | -36.2 | -39.0 | -41.8 | 660                  |  |     |
| +0.6                                                       | +0.9    | +1.1   | +1.7   | +3.4   | +4.6   | +7.7   | +0.3  | +5.3   | +8.2  | +11.1 | +14.0 | +16.9 | +19.8 | +22.7 | +25.6 | +28.5 | +31.4 | +34.3 | +37.2 | 661                  |  |     |
| -4.4                                                       | -1.7    | -0.5   | -0.1   | -1.9   | +1.0   | +1.0   | +1.0  | -3.3   | +3.0  | +1.4  | -7.1  | -9.9  | -12.7 | -15.5 | -18.3 | -21.1 | -23.9 | -26.7 | -29.5 | 662                  |  |     |
| +10.7                                                      | +10.7   | +10.7  | +10.7  | +10.7  | +10.7  | +10.7  | +10.7 | +10.7  | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | +10.7 | 663                  |  |     |
| +4.0                                                       | +4.0    | -1.5   | -1.0   | -8.8   | -5.6   | +1.1   | +10.0 | -5.0   | -2.9  | -3.5  | -4.2  | -5.0  | -5.8  | -6.6  | -7.4  | -8.2  | -9.0  | -9.8  | -10.6 | 664                  |  |     |
| +4.0                                                       | +4.0    | +19.8  | +20.0  | +23.8  | +23.0  | +28.7  | +29.1 | +30.5  | +27.4 | +27.0 | +27.6 | +28.2 | +28.8 | +29.4 | +30.0 | +30.6 | +31.2 | +31.8 | +32.4 | 665                  |  |     |
| +1.7                                                       | +1.7    | +3.5   | +3.5   | +5.7   | +5.8   | +9.9   | +13.3 | +6.0   | +9.9  | +13.6 | +0.3  | +4.7  | +7.6  | +10.5 | +12.3 | +12.3 | +12.3 | +12.3 | +12.3 | 666                  |  |     |
| -2.3                                                       | -2.3    | +12.9  | +10.4  | +0.6   | +8.0   | +16.2  | +19.3 | +7.2   | +18.0 | +11.7 | +9.9  | +8.9  | +10.8 | +12.6 | +25.4 | +25.4 | +25.4 | +25.4 | +25.4 | 667                  |  |     |
| -5.4                                                       | -3.0    | -5.2   | -5.8   | -5.0   | -2.9   | +4.4   | +7.7  | +4.2   | +3.0  | -3.2  | +4.8  | +7.3  | +11.7 | +11.4 | +4.4  | +5.7  | +4.4  | +3.0  | +6.4  | 668                  |  |     |
| +1.5                                                       | +3.8    | +14.3  | +13.8  | +13.5  | +14.3  | +14.7  | +20.0 | +12.3  | +18.6 | +13.5 | +14.8 | +19.1 | +8.7  | +10.2 | +11.9 | +11.9 | +11.3 | +10.6 | +10.6 | 669                  |  |     |
| -0.0                                                       | -0.0    | -10.4  | -9.9   | -0.7   | -4.2   | -7.9   | -9.7  | -5.8   | -6.5  | -4.6  | -7.8  | -8.4  | -7.2  | -20.7 | -7.2  | -10.9 | -8.0  | -10.6 | -10.6 | 670                  |  |     |
| +7.1                                                       | +6.9    | +1.9   | +1.8   | +1.0   | +1.9   | +2.7   | -0.9  | -0.9   | +0.6  | +1.4  | -3.8  | -6.3  | -9.3  | -9.3  | -7.1  | +1.0  | -11.1 | -10.6 | -10.6 | 671                  |  |     |
| -12.0                                                      | -13.0   | +1.7   | +2.3   | -0.0   | +0.9   | +3.6   | +5.0  | +9.0   | +9.6  | +10.0 | +10.4 | +10.8 | +11.2 | +11.6 | +12.0 | +12.4 | +12.8 | +13.2 | +13.6 | 672                  |  |     |
| -0.1                                                       | -0.1    | +17.7  | +18.0  | +18.3  | +18.6  | +18.9  | +19.2 | +19.5  | +19.8 | +20.1 | +20.4 | +20.7 | +21.0 | +21.3 | +21.6 | +21.9 | +22.2 | +22.5 | +22.8 | 673                  |  |     |
| +0.0                                                       | +0.0    | +18.3  | +17.3  | +11.3  | +14.7  | +18.5  | +20.2 | +14.0  | +23.5 | +16.2 | +24.4 | +19.0 | +29.0 | +21.0 | +32.0 | +24.0 | +35.0 | +27.0 | +38.0 | 674                  |  |     |
| +1.1                                                       | +1.1    | +10.0  | +9.9   | +2.0   | +0.2   | +12.3  | +14.7 | +6.0   | +7.9  | +5.3  | +13.3 | -3.3  | -2.7  | -5.2  | -1.8  | -6.3  | -4.0  | -4.0  | -4.0  | 675                  |  |     |
| -10.1                                                      | -8.3    | +3.9   | +3.4   | +3.4   | +1.2   | +0.7   | +2.5  | +2.6   | +8.0  | +8.0  | +8.5  | +8.5  | +9.0  | +9.5  | +9.5  | +9.5  | +9.5  | +9.5  | +9.5  | 676                  |  |     |
| +0.0                                                       | +0.0    | +18.3  | +18.3  | +18.3  | +18.3  | +18.3  | +18.3 | +18.3  | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | +18.3 | 677                  |  |     |
| +0.9                                                       | +0.9    | +34.1  | +34.1  | +17.3  | +10.9  | +25.4  | +11.7 | +13.3  | +21.1 | +25.2 | +20.4 | +1.4  | +8.3  | +11.3 | +18.5 | +20.5 | +13.4 | +12.3 | +12.3 | 678                  |  |     |
| +15.9                                                      | +15.2   | +22.1  | +19.3  | +10.6  | +11.0  | +22.8  | +13.8 | +14.3  | +14.1 | +15.0 | +28.2 | +3.7  | +0.7  | +2.3  | +19.9 | +18.6 | +18.7 | +18.7 | +18.7 | 679                  |  |     |
| -1.4                                                       | -1.0    | -8.9   | -8.9   | -12.2  | -20.4  | -3.0   | -32.9 | -8.6   | -20.1 | -30.3 | -19.9 | -12.0 | +11.2 | +20.2 | -26.5 | -19.9 | -30.4 | -18.6 | -18.6 | 680                  |  |     |
| +2.3                                                       | +2.3    | +2.3   | +2.3   | +2.3   | +2.3   | +2.3   | +2.3  | +2.3   | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | +2.3  | 681                  |  |     |
| +15.2                                                      | +16.1   | +21.7  | +20.0  | +14.5  | +22.7  | +29.9  | +33.0 | +29.9  | +27.5 | +31.1 | +33.8 | +10.7 | +10.7 | +10.7 | +14.4 | +23.1 | +22.9 | +23.0 | +23.0 | 682                  |  |     |
| +0.2                                                       | +0.2    | -2.0   | -4.0   | -0.9   | -0.1   | +1.5   | +4.1  | +1.9   | +1.1  | +1.9  | +1.1  | +0.7  | +1.8  | +1.9  | +7.4  | +7.1  | +6.1  | +6.1  | +6.1  | 683                  |  |     |
| -19.0                                                      | -20.3   | +2.1   | +1.4   | -20.7  | -20.0  | -21.5  | -21.1 | -20.9  | -21.1 | -21.5 | -21.3 | -21.4 | -21.7 | -22.0 | -22.3 | -22.6 | -22.9 | -23.2 | -23.5 | 684                  |  |     |
| +1.3                                                       | +1.3    | -2.3   | -4.0   | -3.0   | -1.1   | -14.5  | -7.3  | -6.4   | -3.3  | -7.1  | -5.9  | +0.2  | +2.8  | +0.1  | +4.7  | +1.4  | +0.7  | +0.7  | +0.7  | 685                  |  |     |
| +8.8                                                       | +7.8    | +13.9  | +12.6  | +7.2   | +13.5  | +17.7  | +17.7 | +12.4  | +22.2 | +19.4 | +22.9 | +19.4 | +19.3 | +18.1 | +27.5 | +28.3 | +27.0 | +26.4 | +26.4 | 686                  |  |     |
| -1.3                                                       | -4.9    | -7.7   | -6.3   | +3.5   | -7.0   | -0.7   | -19.3 | -13.9  | -10.9 | -13.5 | -10.1 | +10.2 | +10.8 | +11.4 | +6.0  | -0.9  | -3.6  | -10.1 | -10.1 | 687                  |  |     |
| -0.0                                                       | -0.0    | -8.9   | -8.9   | -12.2  | -20.4  | -3.0   | -32.9 | -8.6   | -20.1 | -30.3 | -19.9 | -12.0 | +11.2 | +20.2 | -26.5 | -19.9 | -30.4 | -18.6 | -18.6 | 688                  |  |     |
| -10.1                                                      | -10.1   | +10.0  | +9.9   | +2.0   | +0.2   | +12.3  | +14.7 | +6.0   | +7.9  | +5.3  | +13.3 | -3.3  | -2.7  | -5.2  | -1.8  | -6.3  | -4.0  | -4.0  | -4.0  | 689                  |  |     |
| -10.8                                                      | -9.0    | +8.0   | +8.0   | +0.1   | +0.7   | +10.9  | +19.0 | +2.9   | +17.4 | +8.3  | +18.0 | +12.2 | +11.3 | +14.2 | +2.8  | +1.4  | +1.7  | +1.7  | +1.7  | 690                  |  |     |
| -11.0                                                      | -10.8   | -3.3   | -7.7   | -9.1   | -10.4  | -7.2   | -0.2  | -7.9   | -3.0  | -5.8  | +3.5  | +0.8  | +3.1  | +6.9  | +10.9 | +10.9 | +10.9 | +10.9 | +10.9 | 691                  |  |     |
| -1.2                                                       | -1.2    | +1.2   | +1.2   | +1.2   | +1.2   | +1.2   | +1.2  | +1.2   | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | +1.2  | 692                  |  |     |
| -3.3                                                       | -0.2    | +10.0  | +12.2  | +9.4   | +13.5  | +23.1  | +33.7 | +17.1  | +18.3 | +29.4 | +29.4 | +2.2  | +0.8  | +1.9  | +12.6 | +9.8  | +11.1 | +11.1 | +11.1 | 693                  |  |     |
| +25.1                                                      | +24.1   | +14.9  | +11.8  | +4.5   | +11.5  | +11.1  | +14.9 | +5.8   | +5.3  | +4.9  | +4.8  | +11.2 | +11.4 | +28.1 | +23.2 | +0.4  | +2.6  | +2.6  | +2.6  | 694                  |  |     |
| +13.0                                                      | +13.0   | +13.0  | +13.0  | +13.0  | +13.0  | +13.0  | +13.0 | +13.0  | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | 695                  |  |     |
| +0.0                                                       | +0.0    | +31.1  | +28.5  | +12.9  | +12.9  | +13.9  | +15.4 | +14.1  | +14.1 | +13.9 | +18.0 | +6.7  | -2.0  | -0.2  | +11.9 | -20.0 | +2.5  | +2.5  | +2.5  | 696                  |  |     |
| +140.3                                                     | +140.0  | +102.1 | +102.7 | +145.8 | +158.8 | +156.5 | ...   | +206.5 | ...   | ...   | ...   | ...   | ...   | ...   | ...   | ...   | ...   | ...   | ...   | 697                  |  |     |
| +13.0                                                      | +13.0   | +13.0  | +13.0  | +13.0  | +13.0  | +13.0  | +13.0 | +13.0  | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | 698                  |  |     |
| +13.0                                                      | +13.0   | +13.0  | +13.0  | +13.0  | +13.0  | +13.0  | +13.0 | +13.0  | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | 699                  |  |     |

One Chronometer which appears to have become deranged from some accidental cause, and which was rated for a few weeks only, is entirely omitted.

| NAME OF MAKER.           | No.  | ADDRESS OF MAKER.                                    | Construction of Equipment and Balance, from the description furnished by the Maker. | (III).—ABSTRACT OF THE             |                                  |                  |                   |
|--------------------------|------|------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------|----------------------------------|------------------|-------------------|
|                          |      |                                                      |                                                                                     | First Day of First Week of Rating. | Last Day of Last Week of Rating. | Number of Weeks. | Least Weekly Sum. |
| P. Birchall.....         | 648  | 2, Amwell Terrace, London.                           | Ordinary construction of balance, with a slight alteration.                         | January 14                         | July 28                          | 28               | + 0.5             |
| W. P. Birchall, jun..... | 1    | 2, Amwell Terrace, London.                           | Ordinary construction of balance, with a slight alteration.                         | January 14                         | July 28                          | 28               | + 0.0             |
| J. Mairland and Son..... | 3116 | 80, Buchanan Street, Glasgow.                        | Poole's auxiliary compensation.                                                     | January 7                          | July 28                          | 28               | - 19.8            |
| Lester and Sons.....     | 587  | Newcastle-on-Tyne.                                   | Poole's auxiliary compensation.                                                     | January 7                          | July 28                          | 28               | - 17.1            |
| Forbes.....              | 730  | 16, Northampton Street, London.                      | Ordinary construction.                                                              | January 7                          | July 28                          | 28               | - 8.0             |
| Wood.....                | 523  | 69, Lord Street, Liverpool.                          | Harpur's balance.                                                                   | January 7                          | July 28                          | 28               | - 1.3             |
| Reid and Son.....        | 1397 | 41, Grey Street, Newcastle-on-Tyne.                  | Auxiliary compensation to the balance acting at low temperatures.                   | January 7                          | July 28                          | 28               | - 6.0             |
| Campbell.....            | 588  | 7, South Castle Street, Liverpool.                   | Ordinary construction of balance, with a slight alteration.                         | January 14                         | July 28                          | 28               | - 1.0             |
| Webb.....                | 516  | 4, Pall Mall, London.                                | Auxiliary compensation to the balance, as in former years.                          | January 14                         | July 28                          | 28               | - 4.0             |
| Frederick and Baker..... | 6242 | 31, Gracechurch Street, London.                      | Auxiliary compensation to the balance, as before.                                   | January 7                          | July 28                          | 28               | - 17.5            |
| Mercer.....              | 536  | 20, Spencer Street, Gower Road, London.              | Harpur's balance.                                                                   | January 14                         | July 28                          | 28               | - 13.4            |
| Dell, Brothers.....      | 1681 | 1, Broad Street, Bristol.                            | Ordinary auxiliary compensation, acting at low temperatures.                        | January 7                          | July 28                          | 28               | - 6.2             |
| Marshall.....            | 3273 | 2, King Square, London.                              | Original auxiliary, acting at high and low temperatures.                            | January 14                         | July 28                          | 28               | - 4.9             |
| Crip.....                | 585  | 81, St. John's Street, London.                       | Auxiliary compensation, as in former years.                                         | January 14                         | July 28                          | 28               | - 16.1            |
| Killing.....             | 375  | 1, Denmark Green, Edgware, London.                   | Original balance, consisting of a single lar and rim.                               | January 14                         | July 28                          | 28               | - 9.7             |
| Cartier.....             | 528  | 61, Cornhill, London.                                | Cartier's balance.                                                                  | January 7                          | July 28                          | 28               | - 19.0            |
| Sewell.....              | 1179 | 61, South Castle Street, Liverpool.                  | Birchall's auxiliary to balance.                                                    | January 14                         | July 28                          | 28               | + 2.8             |
| Hart.....                | 1009 | 2, Bath Street, Liverpool.                           | Hart's balance.                                                                     | January 14                         | July 28                          | 28               | - 12.6            |
| Russell and Son.....     | 6064 | 39 and 41, Slater Street, Liverpool.                 | Harpur's balance.                                                                   | January 14                         | July 28                          | 28               | + 3.2             |
| Reid and Son.....        | 1394 | 41, Grey Street, Newcastle-on-Tyne.                  | Auxiliary compensation to the balance, acting at low temperatures.                  | January 7                          | July 28                          | 28               | - 0.1             |
| G. H. and C. Goward..... | 5185 | 3, Sunderland.                                       | Poole's auxiliary compensation.                                                     | January 7                          | July 28                          | 28               | - 14.1            |
| Webb.....                | 5491 | 4, Pall Mall, London.                                | Auxiliary compensation to the balance.                                              | January 14                         | July 28                          | 28               | - 1.6             |
| Cartier.....             | 664  | 61, Cornhill, London.                                | Improved compensation gear, of the maker's design and construction (original).      | January 7                          | July 28                          | 28               | - 14.7            |
| Pool.....                | 3161 | 37, Fenchurch Street, London.                        | Poole's auxiliary compensation to the balance, as in former years.                  | January 7                          | July 28                          | 28               | - 0.3             |
| Blackie.....             | 599  | 44, Amwell Terrace, London.                          | Poole's auxiliary compensation.                                                     | January 14                         | July 28                          | 28               | - 20.7            |
| Moore.....               | 5952 | 114, High Street, Bath.                              | Poole's auxiliary compensation.                                                     | January 7                          | July 28                          | 28               | - 19.0            |
| Dent.....                | 5859 | 61, Strand, London.                                  | Dent's patent balance; see pamphlet "On the Errors of Chronometers," p. 25.         | January 14                         | July 28                          | 28               | - 10.7            |
| Fletcher.....            | 3534 | 148, Lendalsh Street, London.                        | Gridiron balance.                                                                   | January 7                          | July 28                          | 28               | - 8.0             |
| Timewell.....            | 1392 | 25, Stanley Road, Bally Pool Road, London.           | New gridiron balance.                                                               | January 14                         | July 28                          | 28               | - 4.0             |
| Greenock.....            | 519  | 1, Greenock.                                         | Poole's auxiliary compensation.                                                     | January 7                          | July 28                          | 28               | - 6.5             |
| Fletcher.....            | 3731 | 148, Lendalsh Street, London.                        | Gridiron balance.                                                                   | January 7                          | July 28                          | 28               | - 21.9            |
| Frederick and Baker..... | 6177 | 31, Gracechurch Street, London.                      | Auxiliary compensation to balance, as before.                                       | January 14                         | July 28                          | 28               | - 1.7             |
| Timewell.....            | 1335 | 25, Stanley Road, Bally Pool Road, London.           | New gridiron balance.                                                               | January 7                          | July 28                          | 28               | - 1.1             |
| Elff.....                | 602  | 7, Orange Street, Red Lion Square, London.           | Elff's original auxiliary.                                                          | January 14                         | July 28                          | 28               | - 6.7             |
| Herwit and Son.....      | 1410 | 12, John Street, Midland Park, Kingsland, London.    | Harpur's balance.                                                                   | January 7                          | July 28                          | 28               | - 35.1            |
| Forbes.....              | 720  | 16, Northampton Street, London.                      | Auxiliary compensation.                                                             | January 7                          | July 28                          | 28               | - 13.8            |
| Sevell.....              | 1177 | 61, South Castle Street, Liverpool.                  | Auxiliary acting in cold.                                                           | January 14                         | July 28                          | 28               | - 8.9             |
| Crip.....                | 584  | 81, St. John's Street, London.                       | Auxiliary compensation, as in former years.                                         | January 14                         | July 28                          | 28               | - 11.8            |
| Roskell.....             | 1153 | 3, Church Street, Liverpool.                         | Elff's auxiliary to balance.                                                        | January 14                         | July 28                          | 28               | - 23.0            |
| Elff.....                | 602  | 7, Orange Street, Strand, London.                    | Elff's compensation, setting on the pendulum spring.                                | January 14                         | July 28                          | 28               | - 23.0            |
| May.....                 | 512  | 15, Upper Church Street, Northampton Square, London. | Elff's compensation.                                                                | January 14                         | July 28                          | 28               | - 1.2             |
| Elff.....                | 442  | 7, Orange Street, Red Lion Square, London.           | Elff's patent balance.                                                              | January 14                         | July 28                          | 28               | - 29.1            |
| Owen Owens.....          | 517  | 4, South Castle Street, Liverpool.                   | Harpur's balance.                                                                   | January 14                         | July 28                          | 28               | - 28.3            |
| McGregor and Co.....     | 2769 | 38, Clyde Place, Glasgow, and Greenock.              | Harpur's balance.                                                                   | January 14                         | July 28                          | 28               | - 0.7             |
| Hart.....                | 1009 | 2, Bath Street, Liverpool.                           | Ordinary construction.                                                              | January 14                         | July 28                          | 28               | - 8.0             |
| Davis and Sons.....      | 472  | 84, King William Street, City, London.               | May's central balance.                                                              | January 14                         | July 28                          | 28               | - 21.6            |
| Russell and Son.....     | 6023 | 39 and 41, Slater Street, Liverpool.                 | Auxiliary compensation.                                                             | January 14                         | July 28                          | 28               | - 18.9            |
| Herwit and Son.....      | 1410 | 12, John Street, Midland Park, Kingsland, London.    | Herwit's auxiliary compensation.                                                    | January 7                          | July 28                          | 28               | - 28.7            |
| Pool.....                | 3714 | 37, Fenchurch Street, London.                        | Poole's auxiliary compensation to the balance, as in former years.                  | January 7                          | July 28                          | 28               | - 20.4            |
| Lawson.....              | 1318 | 8, 355, City Road, London.                           | Auxiliary acting in cold.                                                           | February 11                        | July 28                          | 24               | + 10.5            |
| Lawson.....              | 1374 | 8, 355, City Road, London.                           | Auxiliary acting in cold.                                                           | February 11                        | July 28                          | 24               | - 22.5            |

\* During these weeks the Chronometers were exposed to the external air outside a North window, excepting on the last two days of the week March 31 to April 7.

† During these weeks the Chronometers were placed in the chamber of a stove heated by gas.

The rate given by the few days preceding the first Saturday of trial is in every case omitted.

| PRINCIPAL CHANGES OF RATE.                  |                         |                      |                                                     |                                                                |                               |                          | NAME OF<br>MAKER. |  | No. |
|---------------------------------------------|-------------------------|----------------------|-----------------------------------------------------|----------------------------------------------------------------|-------------------------------|--------------------------|-------------------|--|-----|
| In what Week.                               | Greatest<br>Weekly Sum. | In what Week.        | Difference<br>between the<br>Greatest and<br>Least. | Greatest<br>Difference<br>between one<br>Week and the<br>next. | Before and after<br>what Day. |                          |                   |  |     |
| January 25 to Feb. 4*                       | + 18.6                  | July 21 to 28        | 15.1                                                | 5.6                                                            | { February 25 *<br>March 5 }  | P. Birchall.....         | 648               |  |     |
| February 11 to 18*                          | + 27.0                  | May 19 to 26         | 11.0                                                | 7.4                                                            | + July 7                      | W. P. Birchall, jun..... | 1                 |  |     |
| January 14 to 21*                           | - 9.3                   | June 25 to 30†       | 10.5                                                | 8.4                                                            | * January 14 *                | J. Mairland and Son..... | 3116              |  |     |
| March 17 to 24*                             | - 0.8                   | January 14 to 21*    | 13.3                                                | 7.7                                                            | June 10 †                     | Lester and Sons.....     | 587               |  |     |
| February 11 to 18*                          | + 2.3                   | July 21 to 28        | 11.8                                                | 8.9                                                            | + July 7                      | Forbes.....              | 730               |  |     |
| February 11 to 18*                          | + 21.1                  | July 21 to 28        | 22.4                                                | 7.1                                                            | * April 7 †                   | Wood.....                | 523               |  |     |
| February 11 to 18*                          | + 8.3                   | July 21 to 28        | 16.3                                                | 7.0                                                            | * April 7 †                   | Reid and Son.....        | 1397              |  |     |
| April 14 to 21†                             | + 15.6                  | July 14 to 21        | 16.0                                                | 8.2                                                            | May 5                         | Campbell.....            | 588               |  |     |
| { February 11 to 18*<br>April 21 to May 5 } | + 11.5                  | July 21 to 28        | 16.1                                                | 9.0                                                            | + April 28                    | Webb.....                | 516               |  |     |
| February 11 to 18*                          | - 6.7                   | July 21 to 28        | 16.8                                                | 9.2                                                            | + July 7                      | Frederick and Baker..... | 6242              |  |     |
| February 11 to 18*                          | + 5.0                   | July 21 to 28        | 15.4                                                | 8.4                                                            | * April 7 †                   | Mercer.....              | 536               |  |     |
| January 14 to 21*                           | + 14.1                  | June 30 to July 7    | 20.3                                                | 8.1                                                            | * February 11 *               | Dell, Brothers.....      | 1681              |  |     |
| January 14 to 21*                           | + 11.4                  | July 21 to 28        | 10.2                                                | 10.2                                                           | June 10 †                     | Marshall.....            | 3273              |  |     |
| June 30 to July 7†                          | + 3.9                   | July 21 to 28        | 25.0                                                | 7.7                                                            | + July 7                      | Crip.....                | 585               |  |     |
| April 7 to 14†                              | + 7.7                   | July 21 to 28        | 10.4                                                | 10.6                                                           | * April 7 †                   | Killing.....             | 375               |  |     |
| February 11 to 18*                          | + 3.0                   | May 19 to 26         | 22.0                                                | 9.9                                                            | + July 7                      | Cartier.....             | 528               |  |     |
| April 21 to May 5                           | + 20.1                  | Feb. 25 to Mar. 8*   | 17.3                                                | 11.1                                                           | * April 7 †                   | Sewell.....              | 1179              |  |     |
| April 21 to 28†                             | + 10.0                  | July 21 to 28        | 22.8                                                | 9.0                                                            | * April 14 †                  | Hart.....                | 1009              |  |     |
| January 14 to 21*                           | + 20.1                  | July 21 to 28        | 25.9                                                | 7.8                                                            | + July 7                      | Russell and Son.....     | 6064              |  |     |
| April 14 to 21†                             | + 15.7                  | March 31 to April 7* | 17.8                                                | 13.0                                                           | * April 7 †                   | Reid and Son.....        | 1394              |  |     |
| February 11 to 18*                          | + 13.3                  | July 21 to 28        | 18.3                                                | 8.3                                                            | * March 17 *                  | G. H. and C. Goward..... | 5185              |  |     |
| January 14 to 21*                           | + 24.1                  | June 30 to July 7†   | 27.7                                                | 8.2                                                            | June 10 †                     | Webb.....                | 5491              |  |     |
| February 11 to 18*                          | + 7.7                   | July 21 to 28        | 22.4                                                | 11.9                                                           | + July 7                      | Cartier.....             | 664               |  |     |
| January 14 to 21*                           | + 20.0                  | July 21 to 28        | 20.3                                                | 7.6                                                            | + July 7                      | Pool.....                | 3161              |  |     |
| April 21 to 28†                             | - 4.2                   | May 6 to 12          | 14.5                                                | 14.0                                                           | + April 28                    | Blackie.....             | 599               |  |     |
| June 10 to July 7†                          | + 7.1                   | March 24 to 31*      | 20.1                                                | 12.4                                                           | * April 7 †                   | Moore.....               | 5952              |  |     |
| February 11 to 18*                          | + 12.9                  | July 21 to 28        | 20.0                                                | 7.2                                                            | June 10 †                     | Dent.....                | 5859              |  |     |
| February 11 to 18*                          | + 21.0                  | July 21 to 28        | 20.0                                                | 8.0                                                            | * April 7 †                   | Fletcher.....            | 3534              |  |     |
| January 14 to 21*                           | + 20.2                  | July 21 to 28        | 20.2                                                | 8.6                                                            | + July 7                      | Timewell.....            | 1392              |  |     |
| June 10 to July 7†                          | + 14.7                  | July 21 to 28        | 21.3                                                | 14.5                                                           | + July 7                      | Dart and Son.....        | 6177              |  |     |
| February 11 to 18*                          | + 9.0                   | July 21 to 28        | 21.4                                                | 9.0                                                            | * April 7 †                   | Fletcher.....            | 3731              |  |     |
| February 4 to 11*                           | + 28.6                  | July 21 to 28        | 20.5                                                | 10.5                                                           | * April 7 †                   | Frederick and Baker..... | 6177              |  |     |
| February 4 to 11*                           | + 31.7                  | July 21 to 28        | 20.8                                                | 7.6                                                            | + July 7                      | Timewell.....            | 1392              |  |     |
| July 21 to 28                               | + 20.8                  | July 21 to 28        | 20.1                                                | 10.5                                                           | * April 7 †                   | Elff.....                | 602               |  |     |
| July 7 to 14                                | + 30.1                  | February 4 to 11*    | 38.1                                                | 10.4                                                           | * April 7 †                   | Herwit and Son.....      | 1410              |  |     |
| April 14 to 21†                             | + 4.0                   | July 21 to 28        | 22.8                                                | 18.8                                                           | * April 7 †                   | Forbes.....              | 720               |  |     |
| February 11 to 18*                          | + 20.8                  | July 21 to 28        | 40.7                                                | 20.0                                                           | * February 25 *               | Sevell.....              | 1177              |  |     |
| February 11 to 18*                          | + 94.5                  | February 11 to 18*   | 30.3                                                | 18.8                                                           | * April 7 †                   | Crip.....                | 584               |  |     |
| June 10 to 18                               | + 1.1                   | June 10 to 18        | 26.1                                                | 20.0                                                           | * April 28                    | Roskell.....             | 1153              |  |     |
| February 11 to 18*                          | + 15.1                  | July 21 to 28        | 18.1                                                | 10.5                                                           | + April 28                    | Kyng.....                | 515               |  |     |
| April 21 to May 5                           | + 20.3                  | June 30 to July 7†   | 20.3                                                | 19.3                                                           | + April 28                    | May.....                 | 512               |  |     |
| July 14 to 21                               | + 10.8                  | April 14 to 21†      | 20.3                                                | 15.1                                                           | * April 7 †                   | Elff.....                | 442               |  |     |
| February 11 to 18*                          | - 20.3                  | January 14 to 21*    | 31.9                                                | 20.4                                                           | * March 10 *                  | Owen Owens.....          | 517               |  |     |
| April 21 to 28†                             | + 30.9                  | June 10 to 18        | 27.2                                                | 23.6                                                           | * April 14 †                  | McGregor and Co.....     | 2769              |  |     |
| July 21 to 28                               | + 20.9                  | July 21 to 28        | 20.9                                                | 20.9                                                           | + July 7                      | Hart.....                | 1009              |  |     |
| February 11 to 18*                          | + 15.0                  | June 30 to July 7†   | 26.6                                                | 15.0                                                           | + July 7                      | Davis and Sons.....      | 472               |  |     |
| July 7 to 14                                | + 9.5                   | June 30 to July 7†   | 24.4                                                | 29.4                                                           | + July 7                      | Russell and Son.....     | 6023              |  |     |
| February 11 to 18*                          | + 20.7                  | July 21 to 28        | 18.1                                                | 18.5                                                           | + July 7                      | Herwit and Son.....      | 1410              |  |     |
| June 30 to July 7†                          | + 22.1                  | March 24 to 31*      | 21.8                                                | 26.4                                                           | * April 7 †                   | Pool.....                | 3714              |  |     |
| { March 24 to 31*<br>June 30 to July 7† }   | + 20.3                  | February 11 to 18*   | 9.0                                                 | 7.2                                                            | * April 7 †                   | Lawson.....              | 1318              |  |     |
|                                             | + 72.8                  | February 11 to 18*   | 105.3                                               | 53.9                                                           | * April 7 †                   | Lawson.....              | 1374              |  |     |

The order of arrangement of the Chronometers in these Tables is determined solely by consideration of their irregularities of rate as expressed in the columns "Difference between the Greatest and Least" and "Greatest Difference between the Greatest and Least," without reference to the duration of the trial. The Chronometers Lawson 1318 and Lawson 1374, not having been deposited until February 4, except the greater part of the trial in cold; and as, on this account, their rates are not strictly comparable with those of the other Chronometers, they are placed in a division by themselves instead of being arranged in the general list.

One Chronometer, which appears to have become damaged from some accidental cause, and which was rated for a few weeks only, is entirely omitted.