RESULTS

OF THE

MAGNETICAL AND METEOROLOGICAL

OBSERVATIONS

MADE AT

THE ROYAL OBSERVATORY, GREENWICH,

1869.

(EXTRACTED FROM THE GREENWICH OBSERVATIONS, 1869.)

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INTRODUCTION.

§ 1. *Buildings of the Magnetic Observatory.*

IN consequence of a representation by the Astronomer Royal, dated 1836, January 12, and a memorial by the Board of Visitors of the Royal Observatory, dated 1836, February 26, addressed to the Lords Commissioners of the Admiralty, an additional space of ground on the south-east side of the former boundary of the Observatory grounds was inclosed from Greenwich Park for the site of a Magnetic Observatory, in the summer of 1837, and the Magnetic Observatory was erected in the spring of 1838. Its nearest angle in its present form is about 174 feet from the nearest point of the S.E. dome, and about 30 feet from the office of Clerk of Works. It is based on concrete and built of wood, united for the most part by pegs of bamboo; no iron was intentionally admitted in its construction, or in subsequent alterations. Its form, as originally built, was that of a cross with four equal arms, very nearly in the direction of the cardinal magnetic points as they were in 1838; the length within the walls, from the extremity of one arm of the cross to the extremity of the opposite arm, was 40 feet, the breadth of each arm 12 feet. In the spring of 1862, the northern arm was extended 8 feet. The height of the walls inside is 10 feet, and the ceiling of the room is about 2 feet higher. The northern arm of the cross is separated from the central square by a partition, so as to form an ante-room. The meridional magnet, for observations of absolute declination and of variations of declination (placed in its position in 1838), is mounted in the southern arm; and the theodolite by which the magnet collimator is viewed, and by which circumpolar stars for determination of the astronomical meridian are also observed (for which observation an opening is made in the roof, with proper shutters,) is in the southern arm, near the southern boundary of the central square. The bifilar magnet, for variations of horizontal magnetic force (erected at the end of 1840) was mounted near the northern wall of the eastern arm; and the balance-magnetometer, for variations of vertical magnetic force (erected in 1841) was mounted near the northern wall of the western arm. Important changes have lately been made in the positions of these instruments, as will be mentioned below. The sidereal time-clock is in the south arm, near the south-east re-entering angle. The fire-grate (constructed of copper, as far as possible,) is near the north end of the west side of the ante-room. Some of these fixtures may contain trifling quantities of iron, and, as the ante-room is used as a computing room it is impossible to avoid the introduction of iron in small quantities; great care, however, is taken to avoid it as far as possible.

In 1864, a room, called the Magnetic Basement, was excavated below the whole of the Magnetic Observatory except the ante-room; the descent to it is by a staircase close to the south wall of the western arm of the building.

For the theodolite, a brick pier was built from the ground below the floor of the Basement, rising through the ceiling into the south arm of the upper room, and supporting the theodolite in exactly the same position as before.

Instead of a single meridional magnet performing the double functions of "magnet for determining absolute magnetic declination," and "magnet carrying a mirror for photographic register," there are now two meridional magnets, one in the Upper Room and one in the Basement. The upper magnet is in a position about 10 inches north of the former position of the declination-magnet; it carries a collimator, for observation by the theodolite; but, in reversion of position of the collimator, the collimator is always either above or below the magnet, so that the magnet is always in the same vertical. The lower magnet, which is in the same vertical with the upper magnet, carries the mirror for the photographic register of the continual changes of declination. A massive brick pier is built in the south arm of the Basement, covered by a stone slab; upon it is fixed the gun-metal stand carrying the photographic lamp, and the narrow chink through which it shines; from the stone slab rise three smaller piers, upon which crossed slates are placed; and from these rises a small pier through the ceiling, to the height of 18 inches above the upper floor, carrying the suspension of the lower magnet; the skein of silk, which supports the lower magnet, passes through a hole in one of the slates. Upon the tops of the three piers rest the feet of the original wooden stand carrying the suspension of the upper magnet.

The bifilar-magnetometer is in the Basement, in a position vertically below its former position. A massive brick pier, surmounted by a thick slab of stone (upon which the metal stand carrying the photograph lamp and narrow chink is fixed) carries a pier consisting of a back and return-sides, which rises through the ceiling about 2 feet above the upper floor, and is crowned by a slate slab that carries the suspension of the bifilar-magnetometer.

The vertical-force magnetometer is in the Basement, in a position vertically below its former position; it rests upon a brick pier, capped by a thick stone; to which also is fixed the plate of metal with narrow chink through which passes the light of the photographic lamp.

To the theodolite-pier are fixed telescopes for eye-observation of the bifilar and vertical-force magnetometers.

At the south-east re-entering angle of the Basement (which has been rebated for the purpose) is the horizontal photographic cylinder, which receives the traces of the movements of the declination-magnet and the bifilar-magnet. The angle is so far cut away that the straight line joining their suspensions passes at the distance of one foot from the wall, and thus the cylinder receives the light from the concave mirrors carried by both instruments, at right angles to its surface. The vertical cylinder which receives the traces of the movements of the vertical-force-magnet, and of the self-registering barometer near it, is east of the vertical force pier.

In the south-west corner of the western arm, and partially beneath the staircase, is the apparatus for self-registration of the spontaneous galvanic currents on the wires leading respectively, from Angerstein Wharf to Lady Well Station (on the Mid Kent Railway), and from North Kent Junction (on the Greenwich Railway) to Morden College end of the Blackheath Tunnel (on the North Kent Railway). The straight lines connecting these points intersect each other nearly at right angles, at a point not far distant from the Observatory (see § 13 below).

The mean-time-clock is on the west wall of the south arm of the Basement.

Adjoining the north wall is the table for photographic operations. Much water is used in these operations, and therefore a pump is provided in the grounds at a distance of about 30 feet from the nearest magnetometer, by which the water is withdrawn from the cistern at the east end of the photographic table and at once discharged into a covered drain.

The Basement is warmed by a gas-stove, and ventilated by a large copper tube nearly two feet in diameter, receiving the flues from the stove and all the lamps, and passing through the upper room to a revolving cowl above the roof. Each of the arms of the basement has a window facing the south, but in general the window-wells are closely stopped.

The variations in the temperature of the instruments have been greatly reduced by their location within this Basement.

On the outside of the Magnetic Observatory, near the north-east corner of the ante-room, a pole 79 feet in height is fixed, for the support of the conducting wires to the electrometers; the electrometers, &c., are planted in the window-seat at the north-end of the ante-room.

The apparatus for naphthalizing the gas used in the photographic registration was formerly fixed in a corner of the ante-room, but is now (1869) mounted in a small detached zinc-built room, erected in 1863, near the west side of the ante-room. No naphthalizing process, however, has been in use since the year 1865.

In 1863, a range of seven rooms, usually called the Magnetic Offices, was erected near the southern fence of the grounds. Since the summer of 1863, observations of Dip and Deflexion have been made in the westernmost of these rooms.

At the distance of 28 feet south (magnetic) from the south-east angle of the southern arm is a square shed about $10^{ft}\ 6^{in}$ square, supported by four posts at the height 8 feet, with an adjustible opening at the center of the top. Under this shed are placed the large dry-bulb and wet-bulb thermometers, with a photographic cylinder, whose axis is vertical, between them; and external to these are the gas flames, whose light passing through the thermometer-tubes above the quicksilver makes photographic traces upon the paper which covers the cylinder.

For better understanding of these descriptions, the reader is referred to the Descriptions of Buildings and Grounds with accompanying Maps, attached to the Volumes of Astronomical Observations for the years 1845 and 1862.

§ 2. *Upper Declination-Magnet and Apparatus for observing it.*

The theodolite with which the meridional magnet is observed is by Simms: the radius of its horizontal circle is 8·3 inches: it is divided to 5′, and reads to 5″, by three verniers, carried by the revolving frame of the theodolite. The fixed frame stands upon three foot-screws, which rest in brass channels let into a stone pier, that stands upon the brick pier rising from the ground of the Magnetic Basement. The revolving frame carries the Y's (with vertical adjustment at one end) for a telescope with transit-axis: the length of the axis is 10½ inches: the length of the telescope 21 inches: the aperture of the object glass 2 inches. The Y's are not carried immediately by the T head which crosses the vertical axis of the revolving frame, but by pieces supported by the ends of that T head, and projecting horizontally from it: the use of this construction is to allow the telescope to be pointed sufficiently high to see δ Ursæ Minoris above the pole. The eye-piece of the telescope carries only one fixed horizontal wire, and one vertical wire moved by a micrometer-screw. The opening in the roof of the building permits the observation of circumpolar stars, as high as δ Ursæ Minoris above the pole, and as low as β Cephei below the pole.

For supporting the magnet, a braced wooden tripod-stand is provided, whose feet, as above described, rest upon brick piers in the Magnetic Basement. Upon the cross-bars of the stand rests a double rectangular box (one box completely inclosed within another), both boxes being covered with gilt paper on their exterior and interior sides. On the southern side of the principal upright piece of the stand is a moveable upright bar, turning in the vertical E. and W. plane, upon a pin in its center (which is fixed in the principal upright), and carrying at its top the pulleys for suspension of the magnet; this construction is adopted as convenient for giving an E. and W. movement (now very rarely required) to the point of suspension, by giving a motion to the lower end of the bar. The top of the upright piece carries a brass frame with two pulleys, whose axes are E. and W.: one of these pulleys projects beyond the north side of the principal upright, and from it depends the suspension skein: the other pulley projects on the south side: the suspension skein, being brought from the magnet up to the north pulley, is carried over it and over the south pulley, and thence downwards to a small windlass, carried by the lower part of the moveable upright. The height of the two pulleys above the floor is about 11 ft. 3¾ in., and the height of the magnet is about 2 ft. 10 in.; the length of the metal carrier which bears the magnet is 1 ft. 3 in.; so that the length of the free suspending skein is about 7 ft. 2¾ in.

The magnet was made by Meyerstein, of Göttingen: it is a bar 2 feet long, 1½ inch broad, and about ¼ inch thick: it is of hard steel throughout. The magnet-carrier was also made by Meyerstein, but it has since been altered by Simms. The magnet is inserted sideways and fixed by screws in a double square hook which constitutes the lower part of the magnet-carrier. This lower part turns stiffly by a vertical axis with index in a graduated horizontal circle (usually called the torsion-circle) attached to the upper part. The upper part of the magnet-carrier is simply hooked into the skein.

The suspending skein was originally of silk fibre, in the state in which it is first prepared by silk manufacturers for further operations; namely, when seven or more fibres from the cocoon are united by juxtaposition only (without twist) to form a single thread. The skein was strong enough to support perhaps three times the weight of the magnet, &c.

In the summer and autumn of 1864, an attempt was made to suspend the magnet by a steel wire, capable of supporting the weight 15 lbs.; but the torsion force was found to be so large as greatly to diminish the value of the observations; and the skein was finally restored on 1865, January 20. A similar attempt was made for suspension of the lower magnet; the skein, however, was restored on 1865, January 30.

Upon the magnet there slide two brass frames, firmly fixed in their places by means of pinching-screws. One of these contains, between two plane glasses, a cross of delicate cobwebs; the other holds a lens of 13 inches focal length and nearly 2 inches aperture. This combination, therefore, serves as a reversed telescope without a tube: the cross of cobwebs is seen very well with the theodolite-telescope, when the suspension-bar of the magnet is so adjusted as to place the object-glass of the reversed telescope in front of the object-glass of the theodolite, their axes coinciding. The wires are illuminated by a lamp and lens in the night, and by a reflector in the day.

In the original mounting of this magnet the small vibrations were annihilated by a copper oval or "damper," thus constructed: A copper bar, about one inch square, is bent into a long oval form, intended to contain within itself the magnet (the plane of the oval curve being vertical). A lateral bend is made in the upper half of the oval, to avoid interference with the suspension-piece of the magnet. The effect of this damper was, that after every complete or double vibration of the magnet, the amplitude of the oscillation is reduced in the proportion of 5 : 2 nearly.

On mounting the photographic magnetometer in the basement, the damper was removed from its place surrounding the upper magnet, and was adjusted to encircle the photographic magnet. The upper magnet remained unchecked in its vibrations till 1866, January 23, when the lower part of its magnet-carrier was connected with a brass bar which vibrates in water.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE UPPER DECLINATION-MAGNET AND ITS THEODOLITE.

1. Determination of the inequality of the pivots of the theodolite-telescope.

1862, December 26. The theodolite was clamped, so that the transit-axis was at right angles to the astronomical meridian. The illuminated end of the axis of the telescope was first placed to the East: the level was applied, and its scale was read; the level was then reversed, and its scale was again read; it was then again reversed, and again read, and so on successively six times. The illuminated end of the axis was then placed to the West, and the level was applied and read as before. This process was repeated four times, and the result was that, when the level indicates the axis to be horizontal, the pivot at the illuminated end is really too low by $0''\cdot3$ nearly.

2. Value of one revolution of the micrometer-screw of the theodolite telescope.

On 1862, December 26, observations were made, giving for the value of one revolution of the micrometer 1'. 33''·85. On 1865, December 27, the magnet was made to rest on blocks of wood, and its collimator was used as a fixed mark at an infinite distance. The micrometer of the theodolite was placed in different positions, and the telescope of the theodolite was then turned till the micrometer wire bisected the cross. The result of ten comparisons of theodolite-readings with large values and with small values of the micrometer-reading was, that one revolution = 1'. 34''·8. This is used through the year 1869.

3. Determination of the micrometer-reading for the line of collimation of the theodolite-telescope.

1868, December 30. The vertical axis of the theodolite had been adjusted to verticality, and the transit-axis was made horizontal. The declination-magnet was made to rest on blocks, and the cross-wires carried by it were used as a collimator for determining the line of collimation of the telescope of the theodolite. The telescope was reversed after each observation. The mean of 20 double observations was $100^{r}\cdot107$. This value is used throughout the year 1869.

4. Determination of the effect of the mean-time-clock on the declination-magnet.

The observations by which this has been determined are detailed in the volumes for 1840, 1841, 1844, and 1845. It appeared that it was necessary to add 9''·41 to every reading of the theodolite. The clock was removed to the basement in 1864, having now nearly the same relative position to the lower declination-magnet which formerly it had to the upper. No correction is now applied to the upper declination-magnet.

5. Determination of the compound effects of the vertical-force-magnet and the horizontal-force-magnet on the declination-magnet.

The details applying to the effect of the horizontal-force-magnet and first vertical-force-magnet will be found in the volumes for 1840, 1841, 1844, and 1845. It appeared that it was necessary to subtract 55''·22 from all readings of the theodolite. In 1848 a new vertical-force-magnet was introduced, and the subtractive quantity was then found to be 42''·2. A few experiments in 1865 seemed to show that the correction is now 36''·9. No numerical correction has been applied.

6. Determination of the error of collimation for the plane glass in front of the boxes of the declination-magnet.

1868, December 30. The magnet was made to rest entirely on blocks. The micrometer head of the telescope was to the East. The plane glass has the word "top" engraved on it, and, in ordinary use, this word is always kept east. The cross-wire carried by the collimator of the magnet was observed with the engraved word alternately east and west. The result of 20 double observations was, that in the ordinary position of the glass 17''·1 is to be added to all readings.

7. Determination of the error of collimation of the magnet-collimator, with reference to the magnetic axis of the magnet.

1868, December 30. Observations were made by placing the declination-magnet in its stirrup, with its collimator alternately above and below, and observing the collimator-wire by the theodolite-telescope; the windlass of the suspending skein being so moved that the collimator in each observation was in the line of the theodolite-telescope. Seven pairs of observations were taken. The mean half excess of reading with collimator above, (its usual position) over that with collimator below was 25′. 23″·1. The value used in the reductions for 1869 is 25′. 18″·5 (the mean of the results for the four years 1866–1869).

8. Effect of the damper.

In the volume for 1841 observations are exhibited shewing that the oval copper bar, or damper, which then surrounded what is now the upper declination-magnet, had but little or no effect. Repeated observations, of less formal character, in succeeding years, have confirmed this result. The same bar has encircled the lower declination-magnet since the year 1865. The following observations were made in the year 1865, for ascertaining the effect of the damper on the lower declination-magnet under various circumstances.

On 1865, February 8 and 10, and March 2, the time of vibration of the magnet was observed:—

Mean of times with damper in usual position	23s·888
Mean of times with damper reversed end for end	24s·508
Mean of times when damper was removed	23s·153

These seem to indicate a repulsion of the magnet by the damper, but the magnet came to rest so rapidly that the observations are very uncertain.

On several days from 1865, April 2 to May 12, observations were made for ascertaining the deflexion of the magnet produced by turning the damper through a small angle round a vertical axis, passing through its center.

DAMPER IN USUAL POSITION.

		′ ″
Damper turned through 2°	N. end towards E., increase of western declination	−1. 27
	N. end towards W., „ „ „	+1. 25
Damper turned through 4°	N. end towards E., „ „ „	−2. 16
	N. end towards W., „ „ „	+3. 11
Damper turned through 6°	N. end towards E., „ „ „	−3. 10
	N. end towards W., „ „ „	+2. 55
Damper turned through 8°	N. end towards E., „ „ „	−1. 22
	N. end towards W., „ „ „	+1. 45

DAMPER REVERSED END FOR END.

Damper turned through 2°	N. end towards E., increase of western declination	+0. 12
	N. end towards W., „ „ „	+0. 20
Damper turned through 4°	N. end towards E., „ „ „	0. 0
	N. end towards W., „ „ „	+0. 26
Damper turned through 6°	N. end towards E., „ „ „	+0. 5
	N. end towards W., „ „ „	+0. 5
Damper turned through 8°	N. end towards E., „ „ „	−0. 10
	N. end towards W., „ „ „	+0. 5

The first series shews clearly that the damper in its usual position drags the magnet; the second shews no certain effect. It seems that the damper possesses two kinds of magnetism, one permanent, the other transiently induced, of nearly equal magnitude; their sum being about $\frac{1}{100}$ part of the terrestrial effect for the same deflexion.

From 1865, July 25 to August 9, observations were made to ascertain whether the effect of an external deflecting cause is the same with the damper present and the damper removed. The observation was extremely difficult, as the magnet was perpetually in vibration when the damper was removed. A small magnet on the east side of the N. end of the magnetometer, with its north end pointing towards the East (and therefore diminishing the western declination of the magnetometer), was moved to the distance (about five feet) at which it produced a deviation of 5′ nearly. The apparent western declination was observed, damper present, and damper removed. It appeared to be less with damper present than with damper removed, by 0′. 53″. The separate results are very discordant. If the conclusion has any validity, it tends to shew a repulsive power in the damper, opposite to that found in the preceding experiments. This experiment is regarded as inconclusive.

9. Calculation of the constant used in the reduction of the observations of the upper declination-magnet, the micrometer-head of the theodolite-telescope being East.

		° ′ ″
Micrometer equivalent for reading for line of collimation, $100^{r}\cdot107$	—	2. 38. 10·2
Correction for the plane glass in front of the box, in its usual position......	+	17·1
The collimator above the magnet. Correction for error of collimation ...	—	25. 18·5
Constant to be used in the reduction of the observations......................	—	3. 3. 11·6

10. Determination of the time of vibration of the upper declination-magnet under the action of terrestrial magnetism.

On 1868, January 22, it was found to be $30^{s}\cdot60$; on March 19, $30^{s}\cdot56$; on December 30, $30^{s}\cdot50$; and on 1869, November 13, $30^{s}\cdot50$.

11. Fraction expressing the proportion of the torsion-force to the earth's magnetic force.

By the same process which is described in the Magnetical Observations 1847, but with the silk skein now in use, the proportion was found, on 1865, January 31, $\frac{1}{214}$; on February 17, $\frac{1}{227}$; on April 27, $\frac{1}{207}$; on December 27, $\frac{1}{230}$; and on 1869, December 29, $\frac{1}{262}$.

DETERMINATION OF THE READINGS OF THE HORIZONTAL CIRCLE OF THE THEODOLITE CORRESPONDING TO THE ASTRONOMICAL MERIDIAN.

The error of the level is determined by application of the spirit-level at the time of observation: due regard being paid, in the reduction, to the inequality of pivots already found. One division of the level is considered = 1″·0526. The azimuth-reading is then corrected by this quantity;

Correction = Elevation of W. end of axis × tan star's altitude.

The readings of the azimuth circle increase as the instrument is turned from N. to E., S., and W.; from which it follows that the correction must have the same sign as the elevation of the W. end.

The correction for the azimuth of the star observed has been computed independently in every observation, by a peculiar method, of which the principle is fully explained in the volumes for 1840-1841, 1843, 1844, 1845. The formula and table used are the following:—

Let $A_{\prime\prime}$ = seconds of arc in star's azimuth,
C_s = seconds of time in star's hour-angle,
$a_{\prime\prime}$ = seconds of arc in star's N.P.D. for the day of observation,

Then $\log. A_{\prime\prime} = \log. C_s + \log. E + \log. (a_{\prime\prime} + F) + \log. \cos$

The values of log. E, F, and log. cos φ, are given in the following table:—

TABULATED VALUES of LOG. Cos ϕ, for DIFFERENT VALUES of C_s, and of the QUANTITIES LOG. E and F, for the STARS POLARIS and δ URSÆ MINORIS.

Hour Angle.	Log. Cos ϕ for Polaris.	δ Ursæ Minoris.	Polaris S.P.	δ Ursæ Min. S.P.
m				
1	9·99999	9·99999	9·99999	9·99999
2	999	999	999	999
3	999	999	999	999
4	998	998	998	998
5	996	996	997	997
6	994	994	996	996
7	992	992	994	995
8	990	989	992	993
9	988	986	990	991
10	985	983	988	989
11	981	979	985	987
12	978	975	982	984
13	974	971	979	981
14	970	966	975	978
15	966	961	972	975
16	961	955	968	971
17	956	950	964	968
18	951	944	959	964
19	945	937	955	960
20	939	930	950	956
21	932	923	945	951
22	926	915	939	946
23	919	908	933	941
24	912	900	928	936
25	904	891	922	930
26	896	882	915	925
27	888	873	909	919
28	880	863	902	912
29	871	853	894	906
30	9·99862	9·99843	9·99887	9·99900
Log. E	6·09721	6·13638	−6·03899	−6·00617
F	−186″·79	−944″·71	+181″·57	+886″·86

Observations for determining the theodolite readings corresponding to the astronomical meridian were made on the following days in 1869:—January 4; February 2, 18, 27; March 5, 29; April 10, 12, 21, 27; May 8, 17; June 4, 23; July 7, 10, 21; August 20, 21; October 5, 11, 21; November 6, 8, 10, 15, 18, 20; December 4, 24, 29. As a check on the continued steadiness of the theodolite, observations of a fixed mark (a small hole in a plate of metal above the Observatory Library, illuminated by a reflector of sky-light in the day and by a lamp at night,) have been taken about thirty times at nearly equal intervals through the year.

The following is a description of the method of making and reducing the eye-observations of the declination-magnet:—

A fine horizontal wire (as stated above) is fixed in the field of view of the theodolite-telescope, and another fine vertical wire is fixed to a wire-plate, moved right and left by a micrometer screw. On looking into the telescope, the cross of the magnetometer is seen; and during the vibration of the magnet, this cross is seen to pass alternately right and left. The observation is made by turning the micrometer till its wire bisects the image of the magnet-cross at the pre-arranged times, and reading the micrometer. The verniers of the horizontal circle are read.

The mean-time clock is kept very nearly to Greenwich mean time (its error being ascertained each day), and the clock-time for each determination is arranged beforehand. Chronometer M'Cabe 649 has usually been employed for observation.

If the magnet is in a state of disturbance, the first observation is made by the observer applying his eye to the telescope about one minute before the pre-arranged time; he bisects the magnet-cross by the micrometer wire at 45^s, and again at 15^s before that time, also at 15^s and 45^s after that time. The intervals of these four observations are therefore the same as the time of vibration of the magnet, and the mean of all the times is the same as the Greenwich pre-arranged mean time.

The mean of each pair of adjacent readings of the micrometer is taken (giving three means), and the mean of these three is adopted as the result. In practice, this is done by adding the first and fourth readings to the double of the second and third, and dividing the sum by 6.

Till 1866, January 23, the magnet was usually in a state of vibration; but, since the introduction of the water-damper on that day, the number of instances of vibration has been very small. When it is found to be quite free from vibration, two bisections only of the cross are made, one about 15^s before the time recorded, the other about 15^s after that time, 30^s being nearly the time of a single vibration. (The lower magnet, furnished with the copper damper, never exhibits any troublesome vibrations.)

The adopted result is converted into arc, supposing $1^r = 1'. 34''\cdot 8$, and the quantity thus deduced is added to the mean of the vernier-readings, from which is subtracted the constant given in article 9 of the permanent adjustments; the difference between this number and the adopted reading for the Astronomical South Meridian is taken;

and thus is deduced the magnetic declination, which is used in determining the zero for the photographic register.

§ 3. *General principle of construction of Photographic self-registering Apparatus for continuous Record of Magnetic and other Indications.*

The general principle adopted for all the photographic instruments is the same. For the register of each indication, a cylinder is provided, whose material is ebonite, and which is very accurately turned in the lathe. The axis of the cylinder is placed parallel to the direction of the change of indication which is to be registered. If there are two indications whose movements are in the same direction, both may be registered on the same cylinder; thus, the Declination and the Horizontal Force, whose indications of changes of the respective elements are both made to travel horizontally, can both be registered upon one cylinder with axis horizontal: the same remark applies to the register of two different galvanic Earth-Currents; the Vertical Force and the reading of the Barometer can both be registered upon one cylinder with axis vertical; and similarly the Dry-Bulb Thermometer and the Wet-Bulb Thermometer.

To the ends of each ebonite cylinder there are fixed circular brass plates, that which is near the clock-work having a diameter somewhat greater than that of the cylinder. In the further fittings there is a little difference between those for vertical and those for horizontal cylinders. Each horizontal cylinder has a pivot fixed in the brass plate at each end; these revolve each upon two antifriction wheels of the fixed frame. The vertical cylinders have no pivots; there is a perforation through the center of the lower or larger brass plate which, when the cylinder is mounted, is fitted upon a vertical spindle projecting upwards from the center of a second horizontal brass plate; this second brass plate sustains the weight of the vertical cylinder and turns horizontally, being supported by three antifriction wheels (each in a vertical plane) carried by the fixed frame.

Uniform rotatory motion is given to the cylinders by the action of clock-work, or rather chronometer-work, regulated by either duplex-escapement or chronometer-escapement. For two of the cylinders, which revolve in 24 hours, and for the thermometer-cylinder which revolves in 48 hours, the axis is placed in the center of the chronometer, and a fork at the end of the hour hand takes hold of a winch fixed to the plate of the cylinder, or (in the vertical cylinders) to the plate that sustains the cylinder. In the cylinder for galvanic earth-currents only, the connexion is made by toothed wheels. For the horizontal cylinders, the plane of the chronometer work is vertical; for the vertical cylinders, it is horizontal.

Three of the cylinders are $11\frac{1}{2}$ inches high, $14\frac{1}{4}$ inches in circumference; that for the thermometers is 10 inches high, and 19 inches in circumference.

Each cylinder is covered, when in use, by a tube of glass, which is open at one end, and has at the other end a circular plate of ebonite, perforated at its center. The tube is a little larger than the cylinder; its open end is kept in position by a narrow collar of ebonite, and the opposite end by a circular piece of brass fixed to the smaller brass plate at the end of the cylinder.

To prepare the cylinder for register of indications, it is covered with a sheet of photographic paper; the moisture on the paper usually agglutinates its overlapping ends with sufficient firmness; the glass tube is then slipped over it, and the cylinder thus loaded is placed (if horizontal,) with its pivots in bearing upon its two sets of antifriction wheels, or, (if vertical,) with its end-brass-plate upon the rotating brass plate, and its central perforation upon the spindle of that plate; care is taken to ensure connection with the clock-work, and the apparatus is ready for action.

The light, by which the trace of each magnet is made, originates in a lamp, formerly of camphine, but, since 1849, of coal gas, sometimes charged with the vapour of coal-naphtha. Before the flame of the lamp is placed a metallic plate, with a small aperture about $0^{in}\cdot3$ high and $0^{in}\cdot1$ broad, independent of the lamp, and supported (for the magnetometers) by a part of the stone capping of the brick pier which carries the magnet; or (for the earth-current apparatus and thermometers) by the upper platform of the braced frame which carries the rest of the apparatus. The following arrangements are for the purpose of throwing on the photographic paper of the revolving cylinder a spot of light which shall travel in the direction of the cylinder's axis with every motion of either magnetometer, or of either galvanometer, or with the rise or fall of the mercury of the barometer or of either thermometer.

For each of the three magnetometers, a large concave mirror of speculum metal is carried by a part of the magnet-carrier; although it has a small movement of adjustment relative to the magnet-carrier, yet in practice it is very firmly clamped to it, so that the mirror receives all the angular movements of the magnet. The lamp above mentioned is placed slightly out of the direction of the straight line drawn from the center of the concave mirror to the center of the cylinder which carries the photographic paper. By the concave mirror, the light diverging from the aperture is made to converge to a place nearly on the surface of the cylinder of photographic paper. The form of the aperture, however, and the astigmatism caused by the inclined reflexion from the mirror, produce this effect, that the image is somewhat elongated in the vertical direction, and is at the same time slightly curved. To diminish the length there is placed near the cylinder a plano-convex cylindrical lens of glass, with its axis parallel to the axis of the cylinder, and the image is thus reduced to a neat spot of light.

For the registers of galvanic earth-currents, the light, which falls upon a plane mirror carried by each galvanometer, is made to converge to a spot by a system of cylindrical lenses.

For the barometer, the light shines through a small aperture in a plate of blackened mica, which moves with the fluctuations of the quicksilver, and thus forms a spot of light.

For the thermometers, the light shines through the vacant part of the tube, and thus forms a sheet of light.

The spot of light (for the magnets, the earth-currents, and the barometer) or the boundary of the line of light (for the thermometers) moves, with the movements which are to be registered, in the direction of the axis of the cylinder, while the cylinder itself is turned round. Consequently, when the paper is unwrapped from its cylindrical form, there is traced upon it (though not visible till the proper chemical agents have been applied) a curve, of which the abscissa measured in the direction of a line surrounding the cylinder is proportional to the time, while the ordinate measured in the direction parallel to the axis of the cylinder is proportional to the movement which is the subject of measure.

In the instruments for registering the motions of the magnets, the earth-currents, and the barometer, a line of abscissæ is actually traced on the paper, by a lamp giving a spot of light in an invariable position, the effect of which on the revolving paper is to trace a line surrounding the cylinder. For the thermometers this is not necessary, as the thermometer-scales are made to carry and to transfer to the photographic paper sufficient indications of the actual reading of the thermometers.

Every part of the cylinder-apparatus for the declination and horizontal force, except those on which the spots of light fall, is covered with a double case of blackened zinc, having a slit for each moveable spot of light and a hole for the invariable spot; and every part of the path of the photographic light is protected by blackened zinc tubes from the admixture of extraneous light. The cylinder-apparatus for the thermometers is protected in the same manner, except that the whole space including the gas-light is enclosed in a zinc case, blackened internally. The earth-current apparatus is enclosed in a mahogany case, similarly blackened.

In all the instruments, the following method is used for attaching, to the sheet of photographic paper, indications of the time when certain parts of the photographic trace were actually made, and for giving the means of laying down a time-scale applicable to every part of the trace. By means of a small moveable plate, arranged expressly for this purpose, the light which makes the trace can at any moment be completely cut off. An assistant, therefore, occasionally cuts off the light (registering in the proper book the clock-time of doing so), and after a few minutes withdraws the plate (again registering the time). The effect of this is to make a visible interruption in the trace, corresponding to registered times. By drawing lines from these points of interruption parallel to the axis of the cylinder, to meet the photographic line of abscissæ, or an adopted line of abscissæ parallel to it, points are defined upon the line of abscissæ corresponding to registered times. The whole length of the photographic sheet (except where one end, in the cylindrical arrangement, laps over the other) corresponds to the known time of revolution of the cylinder. A scale being prepared beforehand, whose value for the time of revolution corresponds to the circumference of the cylinder, and the scale-reading for the registered time of interruption of light being applied to the foot of the ordinate corresponding to that interruption, the divisions of hours and minutes may be transferred at once from the scale to the line of abscissæ. In practice it is found that the length of the paper is not always the same, and it is necessary, therefore, to use for each instrument several pasteboard scales of different lengths, adapted to various lengths of the photographic sheets.

In the present year (1870), an opening has been made in the chimney of each of the lamps of the concave mirror; and the light in each instance falls upon the cylindrical lens, and produces a dark line upon the photographic paper. An apparatus of clock-work, specially arranged by Messrs. E. Dent and Co. for this purpose, uncovers simultaneously the chimney-holes in all the lamps about $2\frac{1}{2}$ minutes before each hour, and covers them all simultaneously about $2\frac{1}{2}$ minutes after each hour. In this manner a good series of hour-lines in the direction of the ordinates is formed. The system of cutting off the trace by hand is still retained, as giving means of correcting any error in the clock, &c.; the correction thus found will be common to all the hour-lines. It is anticipated that the accuracy of the time-registers will be much increased by this arrangement.

§ 4. *Lower Declination-Magnet; and Photographic self-registering Apparatus for Continuous Record of Magnetic Declination.*

The lower declination-magnet is made by Simms. It is 2 feet long, $1\frac{1}{2}$ inch broad, $\frac{1}{4}$ inch thick, of hard steel throughout, much harder than the upper declination-magnet.

The magnet-frame consists of an upper piece, whose top is a hook, (to be hooked into the suspension-skein), and which carries a concave mirror used for the photographic record in the manner described above. The lower part of this upper piece turns in a graduated horizontal circle, similar to the torsion circle of the upper magnet, and attached to the lower piece or magnet-carrier proper. The lowest part of the carrier is a double square hook, in which the magnet is inserted and is kept in position by the pressure of three screws.

It has been mentioned in § 1 that a small pier, built upon one of the crossed slates which are laid upon three piers rising from below, carries the suspension-pulleys. The suspension-skein rises to one of these pulleys, passes horizontally over a second pulley about 5 inches south of it, and then descends obliquely to a windlass which is fixed to the stone slab about 2 ft. 3 in. south of the center of the magnet.

The height of the pulley above the floor of the Basement is 10 ft. $4\frac{3}{4}$ in. As the height of the magnet above the floor is 2 ft. $10\frac{1}{2}$ in., and the length of the magnet frame is 1 ft. 3 in., there remains 6 ft. $3\frac{1}{4}$ in. of free suspending skein.

One of the revolving cylinders is used for the photographic record of the Declination-Magnet and the Horizontal Force Magnet. In the preparation of the basement in 1864, as has been stated, the south-eastern re-entering angle was cut away, so that the straight line from the suspending skein of the declination-magnet to the center of those of the bifilar magnet passes through a clear space, in which the registering apparatus is placed.

The concave mirror of the declination-magnet is 5 inches in diameter, and is above the top of the magnet-box. The distance of the light-aperture from the mirror is about 25·3 inches. The bright spot formed by the reflection of light from the mirror is received on the south side of the cylinder, near its west end.

For the declination-magnet, the values, in minutes and seconds of arc, of movements of the photographic spot in the direction of the ordinate, are thus deduced from a geometrical calculation founded on the measures of different parts of the apparatus. The distance of the cylinder from the concave mirror is about $11^{ft.}\ 0^{in.}\cdot 1$, and a movement of 1° of the mirror produces a movement of 2° in the reflected ray. From this it is found that 1° of movement of the mirror is represented by 4·611 inches upon the photographic paper. A small scale of pasteboard is prepared, whose graduations correspond in value to minutes and seconds so calculated. The zero of the ordinate-scale is found in the following manner. The time-scale having been laid down as is already described, and actual observations of the position of the upper declination-magnet having been made with the eye and the telescope, (as has been fully described above), at certain registered times, there is no difficulty (by means of these registered times) in defining the points of the photographic trace which correspond to the observed positions. The pasteboard scale being applied as an ordinate to one of these points, and being slid up and down till the scale reading which represents the reading actually taken by the eye-observation falls on that point, the reading of the scale where it crosses the line of abscissæ is immediately found. This process rests on the assumption that the movements of the upper and lower magnets are exactly similar. The various readings given by different observations, so long as there is no instrumental change, will scarcely differ, and may be combined in groups, and thus an adopted reading for the line of abscissæ may be obtained. From this, with the assistance of the same pasteboard scale, there will be laid down without difficulty a new line, parallel to that line of abscissæ whose ordinate would represent some whole number of degrees, or other convenient quantity.

§ 5. *Horizontal-Force-Magnet and Apparatus for observing it.*

The horizontal-force-magnet, furnished by Meyerstein of Göttingen, is, like the declination-magnet, 2 feet long, 1½ inch broad, and about ¼ inch thick. For its support (as is mentioned above), a brick pier in the eastern arm of the Magnetic Observatory, built on the ground below the basement floor, rises through the floor of the upper room, and carries a slate slab, to the top of which a brass frame is attached, carrying two brass pulleys (with their axes in the same east and west line) in front of the pier, and two (in a similar position) at the back of the pier; these constitute the upper suspension-piece. A small windlass is attached to the back of the pier at a convenient height. The magnet-carrier consists of two parts. The upper part is a horizontal bar, $2\frac{1}{2}$ inches long, whose ends are furnished with verniers for reading the graduations of the torsion-circle (a portion of the lower part, to be mentioned below). On the upper side of this horizontal bar are two small pulleys with axes horizontal and at right angles to the vertical plane passing through the length of the bar: by these pulleys the apparatus is suspended, as will be mentioned. From the lower side of the horizontal bar, a vertical axis projects downwards through the center of the torsion-circle, in which it turns by stiff friction. The lower part of the magnet-carrier consists, first of the torsion-circle, a graduated circle about 3 inches in diameter: next, immediately below the central part of the torsion-circle, is attached (but not firmly fixed) a circular piece of metal from which projects downwards a frame that, by means of three cramps and screws, carries the photographic concave mirror, with the plane of its front under the center of the vertical axis: this circular piece of metal has a radial arm upon which acts a screw carried by the torsion-circle, for giving to the concave mirror small changes of azimuthal position. Thirdly, there is fixed to the torsion-circle, at the back of the mirror-frame but not touching it, a bar projecting downwards, bent horizontally under the mirror-frame and then again bent downwards, carrying the cramps in which the magnet rests; and, still lower, a small plane mirror, to which a fixed telescope is directed for observing by reflexion the graduations of a fixed scale (to be mentioned shortly). Under the two small pulleys mentioned above passes a skein of silk; its two branches rise up and pass over the front pulleys of the suspension-piece, then over its back pulleys, and then descend and pass under a single large pulley, whose axis is attached to a wire that passes down to the windlass. Supported by the two branches of the skein, the magnet swings freely, but the direction that it takes will depend on the angular position of its stirrup with respect to the upper horizontal bar; it is intended that the index should be brought to such a position on the torsion-circle that the two suspending branches should not hang in one plane, but should be so twisted that their torsion-force will maintain the magnet in a direction very nearly E. and W. magnetic (its marked end being W.); in which state an increase of the earth's magnetic force draws the marked end towards the N., till the torsion-force is sufficiently increased to resist it; or a diminution allows the torsion-force to draw it towards the S. The magnet, with its plane mirror, hangs within a double rectangular box (one box completely inclosed within another) covered with gilt paper, similar to that used for the declination-magnet; in its S. side there is one long hole, covered with glass, through which the rays of light from the scale enter to fall on the plane mirror, and the rays reflected by the mirror pass to the fixed telescope. The vertical rod (below the torsion-circle), which carries the magnet-stirrup, passes through a hole in the top of the box. Above the magnet box is the concave mirror above mentioned. The height of the brass pulleys of the suspension-piece above the floor is $11^{ft.}\ 8^{in.}\ 5$; that of the pulleys of the magnet-carrier is $4^{ft.}\ 2^{in.}\ 5$; and that of the center of the plane mirror is about $3^{ft.}\ 1^{in.}$. The distance between the branches of the silk skein, where they pass over the upper pulleys, is $1^{in.}{\cdot}14$; at the lower part the distance between them is $0^{in.}{\cdot}80$.

An oval copper bar (exactly similar to that for the declination-magnet), embraces the magnet, for the purpose of diminishing its vibrations.

The scale, which is observed by means of the plane mirror, is in a horizontal position, and is fixed to the South wall of the East arm of the Magnetic Basement. The numbers of the scale increase from East to West, so that when the magnet is inserted in the magnet-cell with its marked end towards the West, increasing readings of the scale (as seen with a fixed telescope directed to the mirror which the magnet carries) denote an increasing horizontal force. A normal from the plane-mirror to the scale meets it at the division 51 nearly; the distance from the center of the plane-mirror to the scale is $7^{ft.}\ 6^{in.}{\cdot}8$.

The telescope is fixed on the east side of the brick pier which supports the stone pier of the declination-theodolite in the upper observing room. The angle between the normal to the scale (which usually coincides nearly with the normal to the axis of the magnet) and the axis of the telescope, is about 38°, and the plane of the mirror is therefore inclined to the axis of the magnet about 19°.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE HORIZONTAL-FORCE-MAGNET.

1. Determination of the times of vibration and of the different readings of the scale for different readings of the torsion-circle, and of the reading of the torsion-circle and the time of vibration when the magnet is transverse to the magnetic meridian.

To render the process intelligible, it may be convenient to premise the following explanation.

Suppose that the magnet is suspended in its stirrup which is firmly connected with the small plane mirror, with its marked end in a magnetic westerly direction (not exactly W., but in any westerly direction between N. and S.), and suppose that, by means of the telescope directed towards that mirror, the scale is read, or (which is the same thing) the position of the plane mirror and of the stirrup, and therefore that of the axis of the magnet, are defined. Now let the magnet be taken out of the stirrup and replaced with its marked end easterly. The terrestrial magnetic power will now act, as regards torsion, in the direction opposite to that in which it acted before, and therefore the magnet will not take the same position as before. But by turning the torsion-circle, which changes the amount and direction of the torsion-power produced by the oblique tension of the suspending cords, the magnet may be made to take the same position as at first (which will be proved by the reading of the scale, as viewed in the plane mirror, being the same). The reading of the torsion-circle will be different from what it was. The effect of this operation then is, to give us the difference of torsion-circle-readings for the same position of the magnet-axis with the marked end opposite ways, but it gives no information as to whether the magnet-axis is accurately transverse to the meridian, inasmuch as the same operation can be performed whether the magnet-axis is transverse or not.

But there is another observation which will inform us whether the magnet-axis is or is not accurately transverse. Let the time of vibration be taken in each position of the magnet. Resolve the terrestrial magnetic force acting on the poles of the magnet into two parts, one transverse to the magnet, the other longitudinal. In the two positions of the magnet (marked end westerly and marked end easterly, with axis in the same position), the magnitude of the transversal force is the same, and the changes which the torsion undergoes in a vibration of given extent are the same, and the time of vibration (if there were no other force) would be the same. But there is another force, namely, the longitudinal force; and when the marked end is northerly, this tends from the center of the magnet's length, and when it is southerly it tends towards the center of the magnet's length; and in a vibration of given extent this produces force, in one case increasing that from the torsion and in the other case diminishing it. The times of vibration therefore will be different. There is only one exception to this, which is when the magnet-axis is transverse to the magnetic meridian, in which case the longitudinal force vanishes.

The criterion then of the position truly transverse to the meridian (which position is necessary in order that the indications of our instrument may apply truly to changes of the magnitude of terrestrial magnetic force without regard to changes of direction) is this. Find the readings of the torsion-circle which, with magnet in reversed positions, will give the same readings of the scale as viewed by reflexion in the plane mirror, and will also give the same time of vibration for the magnet. With these readings of the torsion-circle the magnet is transverse to the meridian; and the difference of the readings of the torsion-circle is the difference between the position when terrestrial magnetism acting on the magnet twists it one way, and the position when the same force twists it the opposite way, and is therefore double the angle due to the torsion-force of the suspending lines when they neutralize the force of terrestrial magnetism.

The following table exhibits the elements of one of the determinations made for 1869:—

1868. Day.	The Marked end of the Magnet.							
	West.				East.			
	Torsion-Circle Reading.	Scale Reading.	Difference of Scale Readings for 1° of Torsion.	Mean of the Times of Vibration.	Torsion-Circle Reading.	Scale Reading.	Difference of Scale Readings for 1° of Torsion.	Mean of the Times of Vibration.
	°	div.	div.	s	°	div.	div.	s
Dec. 29					222	10·36		19·96
	140	17·58		21·52	223	18·35	7·99	20·14
	141	26·84	9·26	21·56	224	25·77	7·42	20·24
	142	35·39	8·55	21·28	225	33·39	7·62	20·40
	143	43·48	8·09	21·06	226	41·77	8·38	20·50
	144	51·80	8·32	20·86	227	49·16	7·39	20·58
	145	59·88	8·08	20·70	228	57·45	8·29	20·70
	146	68·48	8·60	20·60	229	65·97	8·52	20·80
	147	76·08	7·60	20·46	230	74·21	8·24	21·02
	148	84·22	8·14	20·36	231	82·38	8·17	21·20
	149	92·16	7·94	20·22	232	91·58	9·20	21·40

The times of vibration and scale readings were sensibly the same, when the torsion-circle read 145°., marked end West, and 228°. 18′, marked end East, differing 83°. 18′. Half this difference, or 41°. 39′, is the angle of torsion when the magnet is transverse to the meridian.

The mean of several similar determinations gave 41°. 35′·0. The value previously determined on 1868, March 17, was 41°. 34′·0. The mean of these two values, namely 41°. 34′·5, was adopted in the reduction of observations from 1868, March 17, to the end of the year 1869.

The reading adopted for the torsion-circle, marked end of magnet west, was 145° through the year.

2. Computation of the angle corresponding to one division of the scale, and of the variation of the horizontal force (in terms of the whole horizontal force) which moves the magnet through a space corresponding to one division of the scale.

It was found by accurate measurements, on 1864, November 3, that the distance from $51^{div.}$ on the scale to the center of the face of the plane mirror is $7^{ft.}\ 6^{in.}\ 84$, and that the length of $30^{div.}{\cdot}85$ of the scale is exactly 12 inches; consequently the angle at the mirror subtended by one division of the scale is 14′. 43″·25, or, for one division of the scale, the magnet is turned through an arc of 7′. 21″·625.

The variation of horizontal force (in terms of the whole horizontal force) for a disturbance through one division of the scale, is computed by the formula, "Cotan. angle of torsion × value of one division in terms of radius." Using the numbers of the last article, the value is found to be 0·00241365 from 1868, March 17, to the end of the year 1869.

3. Determination of the compound effect of the vertical-force-magnet and the decli-

nation-magnet on the horizontal-force-magnet, when suspended with its marked end towards the West.

The details of the experiments, made while the old vertical-force-magnet was in use, will be found in the volumes for 1841, 1842, 1843, 1844, 1845. The effect was to increase the readings by $0^{div}\cdot487$. On mounting a new vertical-force-magnet in 1848, similar experiments were made, and the resulting number was $0^{div}\cdot45$. These quantities are totally unimportant in their influence on the registers of changes of horizontal force. No experiments have been made since the magnets were placed in the basement.

4. Effect of the damper.

In the year 1865, from May 17 to May 25, observations were made for ascertaining the deflection of the magnet produced by turning the damper through a small angle round a vertical axis passing through its center.

DAMPER IN USUAL POSITION.

			div.
Damper turned through 2°	W. end towards S., increase of scale-reading	....	−0·251
	W. end towards N., " "	....	+0·050
Damper turned through 4°	W. end towards S., " "	....	−0·34
	W. end towards N., " "	....	+0·16

DAMPER REVERSED END FOR END.

Damper turned through 2°	W. end towards S., increase of scale-reading	....	−0·15
	W. end towards N., " "	....	−0·02
Damper turned through 4°	W. end towards S., " "	....	−0·12
	W. end towards N., " "	....	+0·08

On 1865, July 25, observations were made to ascertain whether the effect of an external deflecting cause is the same with the damper present and the damper removed. A small magnet was placed with its marked end pointing N. at the distance 4 feet S. of the unmarked end of the horizontal-force-magnet, deflecting the magnet through $1^{div.}$ of the scale, and the scale-readings were observed with the damper in its usual place and the damper away. Three experiments were made, containing twenty-four observations of position. Not the smallest difference of position of the horizontal-force-magnet was produced by the presence or absence of the damper. The observations were very easy, and the result is certain.

No experiments on the damper have been made since 1865.

5. Determination of the correction for the effect of temperature on the horizontal-force-magnet.

In the Introduction to the volume of Magnetical and Meteorological Observations for 1847 will be found a detailed account of observations made in the years 1846 and 1847 for determination of this element. The principle adopted was that of observing the deflection which the magnet (to be tried) produces on another magnet; the magnet (to be tried) being carried by the same frame which carries the telescope that is directed to the plane mirror attached to the other magnet, and which also carries the scale that is viewed in these experiments by reflection in that plane mirror. The rotation of the frame was measured by a graduated circle about 23 inches in diameter. The magnet (to be tried) was always on the eastern side of the other magnet. It was enclosed in a copper trough, which was filled with water at different temperatures. One end of the magnet (to be tried) was directed towards the other magnet. The values found for correction of the results as to horizontal force determined with the magnet at temperature t° in order to reduce them to what they would have been if the temperature of the magnet had been 32°, expressed as multiples of the whole horizontal force, were,*

When the marked end of the magnet (to be tried) was West,

$$0{\cdot}00007137\ (t-32) + 0{\cdot}000000898\ (t-32)^2.$$

When the marked end of the magnet (to be tried) was East,

$$0{\cdot}00009050\ (t-32) + 0{\cdot}000000626\ (t-32)^2.$$

The mean, or

$$0{\cdot}00008093\ (t-32) + 0{\cdot}000000762\ (t-32)^2$$

has been embodied in tables which have been used in the computation of the "Reduction of Magnetic Observations 1848–1857," attached to the Volume of Observations 1859, and in the computation for "Days of Great Magnetic Disturbance 1841–1857," attached to the volume for 1862. The same formula has been employed in the Reduction of Magnetic Observations 1858–1863, published in the volume for 1867.

In the year 1864 observations were made for ascertaining the temperature-coefficient by heating the magnet by hot air. The magnet, whose variation of power in different temperatures was to be determined, was placed in a copper box planted upon the top of a copper gas-stove, whose heat could be regulated by manipulation of a tap, and from which rose a stream of heated air (not the air vitiated by combustion) through a large opening in the bottom of the box. The stove used for this purpose was the same which is now used for warming the Magnetic Basement. It was placed in the Magnetic Office, No. 7, in a position magnetic south of the deflexion-apparatus used in the operation for ascertaining the absolute measure of horizontal magnetic force. The hot air which rose through the opening in the center of the bottom was discharged by adjustible openings near the extreme ends of the top. Three windows were provided for reading three thermometers. The box, and the magnet which it inclosed, were placed in a magnetic E. and W. position. The needle whose deflection exhibited the power of the magnet was that which is employed in the ordinary use of the deflexion-apparatus. The proportion of the power of the magnet (under definite circumstances) to the earth's directive horizontal power was expressed by the tangent of the angle of deviation. Observations were made with temperatures both ascending and descending.

* By inadvertence in printing the Introduction 1847, the letter t has been used in two different senses.

The intervals of observation at different temperatures were sufficiently small to permit the assumption that the earth's force had not sensibly changed. The following is an abstract of the principal results :—

Omitting some days of less perfect series, satisfactory series of observations were made on 1864, February 21, 22, 23, and March 10. The tangents of angle of deflection were as follows :—

13 observations	with marked end E	at mean temperature	36°·8	Fahrenheit	gave	0·403711
13 ,,	,, W					
21 ,,	marked end E	,,	61·3	,,		0·400836
25 ,,	,, W					
17 ,,	marked end E	,,	90·3	,,		0·400579
16 ,,	,, W					

From these it was inferred that the tangent of angle of deflection could be represented by—

$$0{\cdot}404559 \times \left\{1 - 0{\cdot}0004610 \times (t - 32) + 0{\cdot}000005061 \times (t - 32)^2\right\}$$

On comparing the quantity within the bracket (which expresses the law of magnetic power as depending on temperature) with that found in 1847, which, as above stated, is—

$$\left\{1 - 0{\cdot}00008093 \times (t - 32) - 0{\cdot}000000762 \times (t - 32)^2\right\}$$

it will be seen that the difference is great. The second terms differ greatly in magnitude, and the third terms in sign.

Possibly some light may be thrown on the difference by the following remark. The two formulæ give the same values for $t = 32°$ and for $t = 97°{\cdot}3$. And they give equal degrees of change per degree when $t = 65°$. It would seem therefore that the real discordance is in the experimental values for the mean temperatures only, or principally; and that it is probable that there is some error in the hot-air process for the middle temperatures.

I insert here (although not applying to the observations of the present volume) the results of a similar examination of the Old Vertical Force Magnet, which was in use to the end of 1863. Omitting less perfect series, observations made on 1864, February 21 and 24, gave the following values for tangents of angles of deflection :—

7 observations	with marked end E	at mean temperature	34°·2	Fahrenheit	gave	0·279985
7 ,,	,, W					
9 ,,	marked end E	,,	57·0	,,		0·275111
11 ,,	,, W					
7 ,,	marked end E	,,	86·5	,,		0·270778
7 ,,	,, W					

From these it was inferred that the tangent of angle of deflection could be represented by—

$$0{\cdot}280526 \times \left\{1 - 0{\cdot}00088607 \times (t - 32) + 0{\cdot}0000045594 \times (t - 32)^2\right\}$$

The expression found in 1847 for the law of force was—

$$\left\{1 - 0{\cdot}00015816 \times (t - 32) - 0{\cdot}000001172 \times (t - 32)^2\right\}$$

giving a discordance of the same kind as that found for the horizontal force, but still larger. The formulæ agree only when $t = 32°$ and when $t = 159°{\cdot}0$. The discordance cannot be removed by a supposition similar to that made above.

Returning now to the temperature-correction of the Horizontal Force Magnet. The unsatisfactory character of the comparisons just given induced me at the beginning of 1868 to try the method of heating the air of the Magnetic Basement generally (by means of the gas-stove), leaving the magnets in all respects in their ordinary state, and comparing their indications as recorded in the ordinary way, but at different temperatures.* Experiments were at first made at intervals of a few hours in the course of one day, but it was soon found that the magnet did not acquire the proper temperature; moreover, the result was evidently affected by diurnal inequality. After this, an entire day was in each case devoted to the effects of each temperature (high or low, as the case might be). The principal series of observations were made with the horizontal force magnet in its ordinary position, or marked end to the west; but a few were made with the marked end to the east. In some instances, the numbers given are the result each of several observations; but in other instances, the result is that of a single observation, taken when all the apparatus had acquired unusual steadiness. The following are the results:—

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET
MARKED END WEST.

1868. MONTH and DAY. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	3	56·8	60·82	6·3	0·65	0·001579	0·000250
	3	50·5	61·47				
	4	49·5	61·47	6·0	0·12	·000292	·000049
	4	55·5	61·35				
	6	59·3	60·91	10·0	0·71	·001725	·000172
	7	49·3	61·62	7·4	0·57	·001385	·000187
	9	56·7	61·05				
	10	58·9	60·91	7·6	0·80	·001943	·000256
	11	51·3	61·71	8·0	0·53	·001288	·000161
	12	59·3	61·18				

* This method was first used for magnets, so far as I am aware, at the Kew Observatory. It had been used for pendulums by Lieut.-General Sabine and by myself.

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET MARKED END WEST—*continued.*

1868. Month and Day. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	13	59·5	61·26	5·6	0·16	0·000389	0·000070
	14	53·9	61·42				
	14	55·2	61·74	2·7	0·31	·000753	·000279
	16	52·5	62·05	9·0	1·27	·003086	·000343
	17	61·5	60·78	8·0	0·46	·001118	·000143
	18	53·5	61·24	6·1	0·31	·000753	·000123
	19	59·6	60·93				
January	31	60·7	58·63	10·1	0·31	·000753	·000075
February	4	50·6	58·94	9·7	0·88	·002138	·000220
	5	60·3	58·06	9·2	0·80	·001943	·000211
	7	51·1	58·86	8·5	0·82	·001992	·000234
	10	59·6	58·04				
	14	59·7	58·64	9·6	0·82	·001992	·000208
	16	50·1	59·46	9·7	0·49	·001190	·000123
	18	59·8	58·97	11·6	0·48	·001166	·000100
	20	48·2	59·45	10·6	0·43	·001045	·000099
	21	58·8	59·02				
Mean . . .		..	..	..	..	....	0·000174

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET MARKED END EAST.

1868. Month and Day. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	21	60·2	60·73	9·7	1·42	0·003449	0·000355
	22	50·5	59·31				
	24	58·6	62·56	7·3	1·02	·002477	·000339
	24	51·3	61·54	8·0	0·32	·000777	·000097
	27	59·3	61·86	10·3	0·35	·000850	·000083
	29	49·0	61·51	11·9	0·30	·000729	·000061
	31	60·9	61·81				
Mean . . .		..	...	..	..	....	0·000187

These results do not differ greatly from those which are given by application of the formula found in 1847. It is important to observe that they include the entire effects of temperature upon all the various parts of the mounting of the magnet, as well as on the magnet itself; and for this reason I think them deserving of great confidence. Still I have thought it prudent, at present, to omit application of corrections for temperature.

The method of observing with the horizontal-force-magnet is the following:—

A fine vertical wire is fixed in the field of view of the telescope, which is directed to the plane mirror carried by the magnet. On looking into the telescope, the graduations of the fixed scale, mentioned in pages *xviii* and *xix*, are seen; and during the oscillations of the magnet, the divisions of the scale are seen to pass alternately right and left across the wire. The clock-time, for which the position of the magnet is to be determined, is the same as that for the observation of declination. The first observation is made by the observer applying his eye to the telescope 40^s before that time, and, if the magnet is in a state of vibration, he observes the next four extreme points of vibration of the scale, and the mean of these is adopted in the same manner as for the declination-observations; but if it is at rest, then at 10^s before the pre-arranged time, he notes the division of the scale bisected by the wire; and 10^s after the pre-arranged time he notes whether the same division continues bisected, and if it does, that reading is adopted as the result.

The number of instances when the magnet was observed in a state of vibration during the year 1869 is very small.

Outside the double box is suspended a thermometer which is read on every day except Sundays, at 21^h, 22^h, 23^h, 0^h, 1^h, 2^h, 3^h, and 9^h, with many observations at 6^h. Occasional observations have been taken at other hours. Self-registering maximum and minimum thermometers placed outside the box were read twice every day, but in consequence of the very small diurnal range of temperature, their readings are not printed in the volume.

§ 6. *Photographic self-registering Apparatus for Continuous Record of Magnetic Horizontal Force.*

Referring to the general description of photographic apparatus, the following remarks apply more particularly to that which is attached to the horizontal-force-magnet. A concave mirror of speculum-metal, 4 inches in diameter, is carried by the magnet-carrier. The light of a gas-lamp shines through a small aperture $0^{in.}\cdot3$ high, and $0^{in.}\cdot01$ broad (which is supported by the solid base of the brick pier carrying the magnet-support), at the distance of about 21·25 inches from the concave mirror, and is made to converge to a point, on the north surface and near the east end of the same revolving cylinder which receives the light from the concave mirror of the declination-magnet. A cylindrical lens parallel to the axis of the cylinder receives the somewhat elongated image of the source of light, and converts it into a well-defined spot. The motions of this spot parallel to the axis represent the angular movements of the magnet which are produced by an increase of terrestrial magnetic force overcoming more completely the torsion-force of the bifilar suspension, or by a diminution of terrestrial force yielding to the torsion-force.

As the spot of light from the horizontal-force-mirror falls on the side of the cylinder opposite to that on which the light from the declination-mirror falls, the same time-scale will not apply to both; it is necessary to prepare a time-scale independently for each.

The following is the calculation by which the scale of horizontal force on the photographic sheet is determined. The distance between the surface of the concave mirror and the surface of the cylinder is 134·436 inches; consequently, one degree of angular motion of the magnet, producing two degrees of angular motion of the reflected ray, moves the spot of light through 4·6927 inches. From 1868, March 17, to the end of the year 1869, the adopted value of variation of horizontal force for one degree of angular motion of the magnet is $\sin 1^\circ \times \text{cotan } 41^\circ.\ 34'\cdot 5 = 0\cdot 019676$; and the movement of the spot of light for 0·01 part of the whole horizontal force is 2·385 inches. With this fundamental number, the graduations of the pasteboard scale for measure of horizontal force have been prepared.

§ 7. *Vertical-Force-Magnet, and Apparatus for observing it.*

The vertical-force-magnet in use to 1848 was made by Robinson; that in use from 1848 to 1864, January 20, was by Barrow. The magnet now in use is by Simms. Its length is $1^{\text{ft.}}\ 6^{\text{in.}}$; it is pointed at the ends. After some trials, it was re-magnetized by Mr. Simms on 1864, June 15. Between 1864, August 27, and September 27, a new knife-edge was attached to it, to remedy a defect which, as was afterwards found, arose from a cause that had no relation to the knife-edge. Its supporting frame rests upon a solid pier, built of brick and capped with a thick block of Portland stone, in the western arm of the magnetic basement. Its position is as nearly as possible symmetrical with that of the horizontal-force-magnet in the eastern arm. Upon the stone block is fixed the supporting frame, consisting of two pillars (connected at their bases) on whose tops are the agate planes upon which vibrate the extreme parts of the knife-edge (to be mentioned immediately). The carrier of the magnet is an iron frame, to which is attached, by clamps and pinching screws, a steel knife-edge, about 8 inches long. The steel knife-edge passes through an aperture in the magnet. The axis of the magnet is as nearly as possible transverse to the meridian, its marked end being E. The axis of vibration is as nearly as possible N. and S. To the southern end of the iron frame, and projecting further south than the end of the knife-edge, is fixed a small plane mirror, whose plane makes with the axis of the magnet an angle of $52\frac{3}{4}^{\circ}$ nearly. The fixed telescope (to be mentioned) is directed to this mirror, and by reflexion at the surface of the mirror it views a vertical scale (to be mentioned shortly). The height of this mirror above the floor is about $2^{\text{ft.}}\ 10^{\text{in.}}\ 6$. Before the introduction of the photographic methods, the magnet was placed in a perforation of a brass frame midway between its knife-edges. But since the photographic method was introduced, the magnet has been placed excentrically; the distance of its southern face from the nearest end of the southern knife-edge being nearly 2 inches, and a space of $4\frac{1}{2}$ inches in the northern part of the iron frame being left disposable. In this disposable space there is attached to the iron frame by three clips a concave mirror of speculum-metal, with its face at right angles to the length of the magnet; it is used in the photographic system (shortly to be described). Near the north end of the iron frame are fixed in it two screw-stalks, upon which are adjustible screw-weights; one stalk is horizontal, and the movement of its weight affects the position of equilibrium of the magnet (which depends on the equilibrium between the moments of the vertical force of terrestrial magnetism on the one hand and of the magnet's center of gravity on the other hand); the other stalk is vertical, and the movement of its weight affects the delicacy of the balance, and varies the magnitude of its change of position produced by a change in the vertical force of terrestrial magnetism.

The whole is inclosed in a rectangular box. This box is based upon the stone block above mentioned; and in it, in a space separated from the rest by a thin partition, the magnet can vibrate freely in the vertical plane. In the south side of the box is a hole covered by glass, through which pass the rays of light from the scale to the plane mirror, and through which they are reflected from the plane mirror to the telescope. And at the east end is a large hole covered by glass, through which passes the light from the lamp to the concave mirror, and through which it is reflected to the photographic cylinder (to be described hereafter).

The telescope is fixed to the west side of the brick pier which supports the stone pier in the upper room carrying the declination-theodolite. Its position is symmetrical with that of the telescope by which the horizontal-force-magnet is observed; so that a person seated in a convenient position can, by an easy motion of the head left and right, observe the vertical-force and horizontal-force-magnets.

The scale is vertical: it is fixed to the pier which carries the telescope, and is at a very small distance from the object-glass of the telescope. The wire in the field of view of the telescope is horizontal. The telescope being directed towards the mirror, the observer sees in it the divisions of the scale passing upwards and downwards over the fixed wire as the magnet vibrates. The numbers of the scale increase from top to bottom; so that, when the magnet is placed with its marked end towards the East, increasing readings (as seen with the fixed telescope) denote an increasing vertical force.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE VERTICAL-FORCE-MAGNET.

1. Determination of the compound effect of the declination-magnet, the horizontal-force-magnet, and the iron affixed to the electrometer pole, on the vertical-force-magnet.

The experiments applying to the magnets are given in the volumes for 1840–1841 to 1845: and those applying to the electrometer pole in the volume for 1842. It appeared that no sensible disturbance was produced on the magnet formerly in use. No experiments have been made with the new magnet.

2. Determination of the time of vibration of the vertical-force-magnet in the vertical plane.

In the year 1869, vibrations of the vertical-force-magnet were observed on 171 different days, and with readings of various divisions of the scale. The mean time of vibration adopted for the year was $16^{s}\cdot45$.

3. Determination of the time of vibration of the vertical-force-magnet in the horizontal plane.

1868, December 31. The magnet with all its apparatus was suspended from a tripod in Magnetic Office, No. 5, its broad side being in a plane parallel to the horizon; therefore, its moment of inertia was the same as when it is in observation. A telescope, with a wire in its focus, was directed to the reflector carried by the magnet. A scale of numbers was placed on the floor of the room, at right angles to the long axis of the magnet, or parallel to the mirror. The magnet was observed only at times when it was swinging through a small arc. From 500 vibrations, the mean time of one vibration $=16^{s}\cdot3192$. This number is used through the year 1869.

4. Computation of the angle through which the magnet moves for a change of one division of the scale; and calculation of the disturbing force producing a movement through one division, in terms of the whole vertical force.

The distance from the scale to the mirror is 186·07 inches, and each division of the scale $=\frac{12}{30\cdot85}$ inches. Hence the angle which one division subtends, as seen from the mirror, is $7'.\ 11''\cdot19$; and therefore the angular movement of the normal to the mirror, corresponding to a change of one division of the scale, is half this quantity, or $3'.\ 35''\cdot60$.

But the angular movement of the normal to the mirror is not the same as the angular movement of the magnet; but is less in the proportion of unity to the cosine of the angle which the normal to the mirror makes with the magnet, or in the proportion of unity to the sine of the angle which the plane of the mirror makes with the magnet. This angle has been found to be $52\frac{3}{4}°$; therefore, dividing the result just obtained by sine $52\frac{3}{4}°$, we have, for the angular motion of the magnet corresponding to a change of one division of the scale, 4′. 30″·85.

From this, the value, in terms of the whole vertical force, of the disturbing force, producing a change of one division, is to be computed by the formula, "Value of Division in terms of radius × cotan dip × $\frac{T'^2}{T^2}$;" where T' is the time of vibration in the horizontal plane, and T the time of vibration in the vertical plane.

For the year 1869, T' was assumed = 16s·319, T = 16s·45, dip = 67°. 54′. 36″. From these numbers, the change of the vertical force, in terms of the whole vertical force, corresponding to one division of the scale, is found = 0·00052447.

5. Investigation of the temperature-correction of the vertical-force-magnet.

The new vertical-force-magnet was subjected to experiments by inclosing it in a copper box, and warming it by an injection of hot air, and observing the amount of deviation which it produced on the suspended magnet used in the deflexion-apparatus for absolute measure of horizontal force, at the same time and in the same manner as were the horizontal-force-magnet and the old vertical-force-magnet, in the experiments described in pages *xxiii* to *xxv*. Observations made on 1864, February 20, 25, March 3, 9, gave, for the tangents of the angles of deflection,—

16 observations with marked end E 18 " " W	at mean temperature	36°·6	Fahrenheit,	gave	0·172352
33 " marked end E 29 " " W	"	62·2	"		0·171657
26 " marked end E 27 " " W	"	93·3	"		0·171389

From these it appeared that the angle of deflection might be represented by—

$$0{\cdot}172522 \times \left\{1 - 0{\cdot}0002233 \times (t - 32) + 0{\cdot}000001894 \times (t - 32)^2\right\}$$

The quantity within the brackets (which represents the variation of magnetic power in terms of the whole power of the magnet) shows the same peculiarities as those found for the other magnets; that the third term is large, and has a sign opposite to that of the second term.

The factor of variation for 1° of Fahrenheit, when $t = 62°$, is − 0·0001097.

After these observations, the new vertical-force-magnet was re-magnetized by Mr. Simms, on 1864, June 15.

In the beginning of 1868, observations were made in the method already described for the horizontal-force-magnet, by heating the magnetic basement to different temperatures, and observing the scale-reading in the ordinary way. The results are as follows:—

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE VERTICAL-FORCE-MAGNET.

1868. MONTH and DAY.		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Vertical Force.	Change of V.F. corresponding to a change of 1° of Temperature (in Parts of the whole V.F.)
		°	div.	°	div.		
January	3	56·0	56·45				
	4	48·2	46·52	7·8	9·93	0·006482	·000831
	5	59·6	61·49	11·4	14·97	·009772	·000857
January	6	59·6	61·73				
	7	49·0	46·84	10·6	14·89	0·009720	·000917
	10	59·5	61·62	10·5	14·78	·009648	·000919
	11	49·7	48·70	9·8	12·92	·008434	·000861
	12	62·0	64·40	12·3	15·70	·010249	·000833
	13	53·4	53·33	8·6	11·07	·007226	·000840
	14	55·4	55·72	2·0	2·39	·001560	·000780
	16	52·3	50·79	3·1	4·93	·003218	·001038
	17	63·7	66·13	11·4	15·34	·010014	·000878
	18	52·4	53·26	11·3	12·87	·008402	·000743
	20	60·7	62·19	8·3	8·93	·005829	·000702
	22	50·6	47·82	10·1	14·37	·009381	·000929
	23	59·6	59·60	9·0	11·78	·007690	·000854
	25	49·6	46·67	10·0	12·93	·008441	·000844
	26	60·5	60·62	10·9	13·95	·009107	·000836
	29	49·3	44·78	11·2	15·84	·010340	·000923
	31	63·1	64·55	13·8	19·77	·012906	·000935
February	4	51·0	47·11	12·1	17·44	·011385	·000941
	5	62·3	64·02	11·3	16·91	·011039	·000977
	6	50·6	46·43	11·7	17·59	·011483	·000981
	7	53·3	49·10	2·7	2·67	·001743	·000646
	8	50·6	45·55	2·7	3·55	·002317	·000858
	10	62·1	62·76	11·5	17·21	·011235	·000977
February	14	60·6	57·70				
	16	49·0	36·75	11·6	20·95	·011298	·000974
	18	61·9	58·85	12·9	22·10	·011919	·000924
February	18	61·9	58·05				
	20	50·0	41·96	11·9	16·09	·011749	·000987
	21	62·6	56·82	12·6	14·86	·010851	·000861
Mean . .		..	..	..	..	...	0·000880

The coefficient of temperature-correction given by these experiments is enormously greater than any that has been found in any previous experiments. Yet I conceive that there can be no doubt of its accuracy. And it is easy to see that an instrument, subjected to the effects of gravity working differentially on its two ends, is liable to great changes depending on temperature which have no connexion with magnetism. For instance, if the point, at which the magnet is grasped by its carrier, is not absolutely coincident with its center of gravity, a great change of position may be produced by a small change of temperature. There appears to be no way of avoiding these evils but by maintaining almost uniform temperature; a condition which has been almost perfectly preserved in the year 1869.

The method of observing with the vertical-force-magnet is the following:—

A fine horizontal wire is fixed in the field of view of the telescope, which is directed to the small plane mirror carried by the magnet. On looking into the telescope, the graduations of the fixed vertical scale are seen; and during the oscillations of the magnet, the divisions of the scale are seen to pass alternately upwards and downwards across the wire. The clock-time, for which the position of the magnet is to be determined, is the same as that for the other two magnets. The observer applies his eye to the telescope about two vibrations before the arranged time, and if the magnet is in motion he observes its places at four extreme vibrations; and the mean of these is taken as for the horizontal-force-magnet. But if the magnet is at rest, then at one-half time of vibration before the arranged time, and at an equal interval after the arranged time, the division of the scale is noted; if there is a slight difference, the mean is taken.

The number of instances in 1869 in which the magnet was found in a state of vibration is very small.

Outside the box is placed a thermometer, which is read on every day except Sundays, at the hours 21^h, 22^h, 23^h, 0^h, 1^h, 2^h, 3^h, and 9^h, and frequently at 6^h. Occasional readings of the thermometer are also taken at other hours.

A maximum and a minimum thermometer have also been read twice daily; but the results are not printed.

§ 8. *Photographic self-registering Apparatus for Continuous Record of Magnetic Vertical Force.*

The concave mirror which is carried by the vertical-force-magnet is 4 inches in diameter; its mounting has been described in the last article. At the distance of about 22 inches from that mirror, and external to the box, is the horizontal aperture, about $0^{in}\cdot3$ in length and $0^{in}\cdot01$ in breadth, carried by the same stone block which carries the supports of the agate planes. The lamp which shines through this aperture is carried by a wooden stand. The light reflected from the mirror passes through a cylindrical lens with its axis vertical, very near to the cylinder carrying the photographic paper, and finally forms a well-defined spot of light on the cylinder of paper, at the distance of 100·18 inches from the mirror. As the movements of the magnet are vertical, the axis of the cylinder is vertical. The cylinder is about 14¼ inches in circumference, being of the same dimensions as those used for the declination and horizontal-force magnets, and for the earth-currents. The forms of the exterior and interior cylinders, and the method of mounting the paper, are in all respects the same as for the declination and horizontal-force magnets; but the cylinder is supported by being merely planted upon a circular horizontal plate (its position being defined by fitting a central hole in the metallic cap of the cylinder upon a central pin in the plate), which rests on anti-friction rollers and is turned by watchwork once in twenty-four hours. The trace of the vertical-force-magnet is on the west side of the cylinder.

On the east side, the cylinder receives the trace produced by the barometer (to be described hereafter). A pencil of light from the lamp which is used for the barometer shines through a fixed aperture with a small cylindrical lens, for tracing a photographic base-line upon the cylinder of paper, similar to that for the cylinder of the declination and horizontal-force magnets.

The scale for the ordinates of the photographic curve of the vertical force is thus computed. Remarking that the radius which determines the range of the motion of the spot of light is double the distance 100·18 inches, and is therefore = 200·36 inches, the formula used in the last section, when applied to $\frac{\text{disturbing force}}{\text{whole vertical force}} = 0·01$, gives value of division $= 200·36 \times \text{tan. dip.} \times \left(\frac{T}{T'}\right)^2 \times 0·01$. The value of the ordinate of the photographic curve for $\frac{\text{disturbing force}}{\text{whole vertical force}} = 0·01$, thus obtained, is, for the year 1869, = 5·016 inches. With this value, the pasteboard scales, used for measuring the photographic ordinates, have been prepared.

§ 9. *Dipping Needles, and Method of observing the Magnetic Dip.*

The instrument with which all the dips in the year 1869 have been observed, is that which, for distinction, is called Airy's instrument. The following description will probably suffice to convey an idea of its peculiarities :—

The form of the needles, the form of their axes, the form of the agate bearings, and the general arrangement of the relieving apparatus, are precisely the same as those in Robinson's and other needles. But the form of the observing apparatus is greatly modified, in order to secure the following objects :—

I. To obtain a microscopic view of the points of the needles, as in the instruments introduced by Dr. Lloyd and Lieut.-General Sabine.

II. To possess at the same time the means of observing the needles while in a state of vibration.

III. To have the means of observing needles of different lengths.

IV. To give an illumination to the field of view of each microscope, directed from the side opposite to the observer's eye, so that the light may enter past the point of the needle into the object glass of the microscope, forming a black image of the needle-point in a bright field of view.

V. To give facility for observing by day or night.

With these views, the following form is given to the apparatus :—

The needle, and the bodies of the microscopes, are inclosed in a square box. The base of the box, two vertical sides, and the top, are made of gun-metal (carefully selected to insure its freedom from iron); but the sides parallel to the plane of vibration of the needle are of glass. Of the two glass sides, that which is next the observer is firmly fixed; it is hereafter called "the graduated glass-plate." The other glass side can be withdrawn, to open the box, for inserting the needle, &c.

An axis, whose length is perpendicular to the plane of vibration of the needles, and is as nearly as possible in the line of the axis of the needle, supported on two bearings (of which one is cemented in a hole in the graduated glass-plate, the other being upon a horizontal bar near to the agate support of the needle-axis), carries a transverse arm, about 11 inches long, or rather two arms, projecting about $5\frac{1}{2}$ inches on each side of the axis. Each of these projecting arms originally had a long opening, or slot, about 1 inch wide, extending from the neighbourhood of the center-work nearly to the end of the arm. Through this opening the tube of a microscope passed, in a direction parallel to the axis of the needle, and was firmly fixed by a shoulder-bearing on one side of the arm, and a circular nut, working in a thread cut upon the microscope-tube, on the other side of the arm. The microscope could thus be fixed at any distance from the central axis, within the limits of the length of the projecting arm. In 1863, between February 24 and May 11, the slot for a single moveable microscope on each side was changed for three fixed microscopes on each side, adapted in position to the lengths of the needles to be mentioned shortly.

The microscope-tube thus carried is not the entire microscope, but so much as contains the object-glass and the field-glass. Upon the plane side of the field-glass (which is turned towards the object-glass), a series of parallel lines is engraved by etching with fluoric acid. The object-glass is so adjusted that the image of the needle-point is formed upon the plane side of the field-glass; and thus the parallel lines can be used for observing the needle in a state of vibration; and, one of them being adopted as standard, the lines can be used for reference to the graduated circle (to be mentioned). All this requires that there be an eye-glass also for the microscope.

The axis of which we have spoken is continued through the graduated glass-plate, and there it carries another transverse arm parallel to the former, and generally similar to it. In each part of this there was originally a sliding eye-socket carrying the eye-glass. In 1863, at the time mentioned above, the slotted arm and moveable eye-socket were changed for an arm with three sockets and eye-glasses. Thus, reckoning from the observer's eye, there are the following parts :—

(1.) The eye-glass.

(2.) The graduated glass-plate (its graduations, however, not intervening in this part of the glass, the graduated circle being so large as to include all the microscopes).

(3.) The field-glass, on the further surface of which the parallel lines are engraved.

(4.) The object-glass.

(5.) The needle.

(6.) The removeable glass side of the box.

(7.) The illuminating reflector, to be described hereafter.

The optical part of the apparatus being thus described, we may proceed to speak of the graduated circle.

The graduations of the circle (whose diameter is about $9\frac{3}{4}$ inches) are etched on the inner surface of the graduated glass-plate. These divisions (as well as the parallel lines on the field glasses of the microscopes) are beautifully neat and regular, and are, I think, superior to any that I have seen on metal. The same piece of metal, which carries the transverse arms supporting the microscope bodies, carries also two arms with verniers for reading their graduations. These verniers (being adapted to transmitted light) are thin plates of metal, with notches instead of lines. The reading of the verniers is very easy. The portion of the axis which is external to the graduated glass-plate (towards the observer), and which has there, as already stated, two arms for carrying the microscope eye-glasses, has also two arms for carrying the lenses by which the verniers and glass-plate graduations are viewed. These four arms are the radii of a circle, which can be fixed in position by a clamp, attached to the gun-metal casing of the graduated glass-plate, and furnished with the usual slow-motion screw.

The entire system of the two arms carrying the microscope-bodies, the two arms carrying the microscope eye-glasses, the two arms carrying the verniers, and the two arms carrying the reading-glasses for the verniers, is turned rapidly by means of a button on the external side of the graduated glass-plate, or is moved slowly by means of the slow-motion screw just mentioned.

It now remains only to describe the illuminating apparatus. On the outside of the removeable glass plate, there are supports for the axis of a metallic circle turning in a plane parallel to the plane of needle-vibration. This circle has four slotted radii, and in these slots or openings there slide small frames carrying prismatic glass reflectors, each of which can turn on an axis, in the plane of the circle but transverse to the radius. Two of these reflectors are for the purpose of sending light through the verniers, and therefore are fixed in radial distance; the other two were intended for sending light past the ends of the needle through the microscopes, and therefore required adjustment on change of needle and corresponding change of position of microscopes. In 1863 these were changed for fixed reflectors, corresponding to the fixed microscopes. The circle was originally turned by a small winch near the observer's hand; at present, the winch is removed, as its axis was found to be slightly magnetic. At each observation, it is necessary to turn the circle which carries the reflectors; but this is the work of an instant.

The light which illuminates the whole is a gas-burner, in the line of the axis of rotation. Its rays fall upon the glass prisms, and each of these is adjusted, by turning on its axis, to throw the reflected light in the required direction.

The whole of the apparatus, as thus described, is planted upon a horizontal plate admitting of rotation in azimuth: the plate is graduated in azimuth, and verniers are fixed to the gun-metal tripod stand. The gas-pipe is led down the central vertical axis, and there communicates by a rotatory joint with the fixed gas-pipes.

The needles adapted for use with this instrument are—

B_1, a plain needle	each 9 inches long.
B_2, a plain needle	
B_3, a loaded needle with adjustible load	
B_4, a needle whose plane passes through the axis of the needle	
C_1, a plain needle	each 6 inches long.
C_2, a plain needle	
C_3, a loaded needle with adjustible load	
C_4, a needle whose plane passes through the axis of the needle	
D_1, a plain needle	each 3 inches long.
D_2, a plain needle	
D_3, a loaded needle with adjustible load	
D_4, a needle whose plane passes through the axis of the needle	

The needles constantly employed are B_1, C_1, D_1, B_2, C_2, D_2.

In discussing carefully the observations taken with this instrument (as well as with other dip-instruments), great trouble was experienced in determining the zenith-point (or reading of the vertical circle when the points of the needle are in the same vertical). To remedy this, a "zenith-point-needle" was constructed under my instructions by Mr. Simms; and it has since been used as need required. It is a flat bar of brass; with pivots similar to those of the dip-needles; and with three pairs of points corresponding to the three lengths of needles used; loaded at one end so as to take a position perfectly definite with respect to the direction of gravity; observed with the microscopes, and reversed for another observation, exactly as the dip-needles. For each of the different lengths of dip-needles, the zenith-point is determined by observation of that pair of points of the zenith-point-needle whose interval is the same as the length of the dip-needle.

The Dip Instrument and all the needles are examined, at the close of each year and at other times if thought desirable, by Mr. Simms.

§ 10. *Observations for the absolute Measure of the Horizontal Force of Terrestrial Magnetism.*

In the spring of 1861, a Unifilar Instrument, similar in all respects (as is understood) to those used in and issued by the Kew Observatory, was procured by the courteous application of Lieut.-General Sabine, from the makers, Messrs. J. T. Gibson and Son; and after having been subjected to the usual examinations, at the Kew

Observatory, for determination of its constants (for which I am indebted to the kindness of Balfour Stewart, Esq.), was mounted at the Royal Observatory. Observations with this instrument commenced on 1861, June 11, and were continued through the year; and, after some slight modifications of its verniers, it is still maintained in use (1869).

The deflected magnet (whose use is merely to ascertain the proportion which the power of the deflecting magnet at a given distance bears to the power of terrestrial magnetism) is 3 inches long, carrying a small plane mirror. The deflecting magnet is 4 inches long; it is a hollow cylinder, carrying in its internal tube a collimator, by means of which its time of vibration is observed in another apparatus. The frame which supports the suspension-piece of the deflected magnet carries also the telescope directed to the magnet-mirror; it rotates round the vertical axis of a horizontal graduated circle whose external diameter is 10 inches. The deflecting magnet is always placed on the E. or W. side of the deflected magnet, with one end towards the deflected magnet. In the reduction of the observations, the precepts contained in the Skeleton Form prepared by the Kew Observatory have received the strictest attention.

The following is the explanation of the method of reduction.

The distance of the centers of the deflected and deflecting magnet being known, it is supposed (from observations made at Kew, of which the details have not reached me) that the magnetism of the deflecting magnet is so altered by induction that the following multipliers ought to be used in computing the Absolute Force:—

At distance 1·0 foot, factor is	1·00031
1·1	1·00023
1·2	1·00018
1·3	1·00014
1·4	1·00011
1·5	1·00009

The correction of the magnetic power for temperature t_0 of Fahrenheit, reducing all to 35° of Fahrenheit, is

$$0·000131261\ (t_0-35) + 0·000000259\ (t_0-35)^2$$

A_1 is $\frac{1}{2}(\text{distance})^3 \times$ sine deflection, corrected by the two last-mentioned quantities, for distance 1 foot; A_2 is the similar expression for distance 1·3 foot; A'_2 is $\frac{A_2}{(1·3)^2}$; P is $\frac{A_1-A_2}{A_1-A'_2}$. A mean value of P is adopted from various observations; then $\frac{m}{X}=A_1 \times \left(1-\frac{P}{1}\right)$ for smaller distance, or $= A_2 \times \left(1-\frac{P}{1·69}\right)$ for larger distance. The mean of these is usually adopted for the true value of $\frac{m}{X}$.

For computing the value of mX from observed vibrations, it is necessary to know K, the moment of inertia of the magnet as mounted. The value of log. $\pi^2 K$ furnished by

Mr. Stewart is 1·66073 at temperature 30° and 1·66109 at temperature 90°. Then putting T for the time of the magnet's vibration as corrected for induction, temperature, and torsion-force, the value of mX is $= \frac{\pi^2 K}{T^2}$. From the combination of this value of mX with the former value of $\frac{m}{X}$, m and X are immediately found.

It appears, from a comparison of observations given in the Introduction to the *Magnetical and Meteorological Observations*, 1862, that the determinations with the Old Instrument (in use to 1861) ought to be diminished by $\frac{1}{117}$ part, to make them comparable with those of the Kew Unifilar.

The computation of the values of m and X has, to the year 1857, been made in reference to English measure only, using the foot and the grain as the units of length and weight; but, for comparison with foreign observations of the Absolute Intensity of Magnetism, it is desirable that X should be expressed also in reference to Metric measure, in terms of the millimètre and milligramme. If an English foot be supposed equal to α times the millimètre, and a grain be equal to β times the milligramme, then it is seen that, for the reduction of $\frac{m}{X}$ and mX to Metric measure, these must be multiplied by α^3 and $\alpha^2\beta$ respectively. Hence X^2 must be multiplied by $\frac{\beta}{\alpha}$, and X by $\sqrt{\frac{\beta}{\alpha}}$. Assuming that the mètre is equal to 39·37079 inches, and the gramme equal to 15·43249 grains, log. $\sqrt{\frac{\beta}{\alpha}}$ will be found to be $=$ 9·6637805, and the factor for reducing the English values of X to Metric values will be 0·46108 or $\frac{1}{2 \cdot 1689}$. The values of X in Metric measure thus derived from those in English measure are given in the proper table.

§ 11. *Explanation of the Tables of Reductions of the Magnetic Observations (excluding the days of great Magnetic Disturbance).*

The Indications, on which the reductions of this section and the next are founded, are derived entirely from the measures of the ordinates of the Photographic Curves.

The first step taken was to divide the days of observation into two groups; in one of which the magnetism was generally so tranquil that it appeared proper to use those days for determination of the laws of diurnal inequality; while in the other group the movements of the magnetic instruments were so violent, and the photographic curves traced by them so irregular, that it appeared impossible to employ them, except by the exhibition of every motion of the magnet during the day. A similar division into groups had been made in two Memoirs printed in the Philosophical Transactions. For the year 1869, the following days, five in number, were selected by Mr. Glaisher as exhibiting practically the same amount of irregularity which he had considered as defining the class of Days of Great Disturbance in the Memoirs to which I have alluded:—

February 3, April 15, May 13, September 13, 27.

On the suggestion of some magnetical friends, who desired the list of days in which every motion was exhibited to be liberally extended, the following days were added:—

January 20, 21, February 2, 22, March 2, 3, 9, 10, 18, April 2, 16, June 6, 7, 29, 30, August 6, 24, September 3, 11, 29, October 6, 25.

The whole number of days thus referred to the next section is twenty-seven.

These days being separated, the photographic sheets for the remaining days were thus treated. Through each photographic curve a pencil line was drawn, representing, as well as could be judged, the general form of the curve without its petty irregularities. These pencil curves only were then used; and their ordinates were measured, with the proper pasteboard scales, at every hour. The methods of forming from these the various tables of this section require no special explanation.

The temperature of the Magnetometers was maintained in so great uniformity through each day that no apprehension is entertained of the slightest appreciable error in the diurnal inequalities of horizontal force and vertical force, as a consequence of the omission of temperature-correction. But it was impossible to maintain perfect uniformity of temperature through all the seasons. I have, therefore, exhibited, in the Tables of Mean Force in each month, the mean temperature of the month. It will be borne in mind, therefore, that the numbers exhibited are *not* corrected for temperature, but require the correction corresponding to the printed mean temperatures.

§ 12. *Explanation of the Tables of Indications of Magnetometers on twenty-seven days of Great Magnetic Disturbance.*

Telescope-observations of the Magnetometers have usually been made four times every day, except on Sundays, on which days two or three observations only have been taken; but, though these observations are employed in forming the base lines on the photographic sheets, their immediate results are not necessarily given in the Tables.

For each photographic record, a new base-line, representing a convenient reading in round numbers of the element to which it applies, has been drawn on the sheet. Then the Assistant, who is charged with the translation of the curve-ordinates into numbers, remarks the salient points of the curve, or the points which if connected by straight lines would produce a polygon not sensibly differing from the photographic curve; to each of these he applies the pasteboard scale proper for the element under consideration; the base of the pasteboard scale determines the time on the time-scale, and the reading of the pasteboard scale for the point of the photographic curve gives the quantity which is to be added to the value for the new base-line. The ordinate-reading so formed is printed without alteration in the Tables. It is particularly to be remarked that the indications for horizontal force and vertical force are *not corrected for temperature.*

In preceding years, allusion has been made to the occasional dislocations of the curve of Vertical Force. No instance of such dislocation has presented itself in 1869. It is believed that these dislocations were produced by bringing a magnet into the proximity (though not very close) of the magnetometer; and this supposed cause of error has, in late years, been carefully avoided.

§ 13. *Wires and Photographic self-registering Apparatus for continuous Record of Spontaneous Terrestrial Galvanic Currents.*

In order to obtain an exhibition of the spontaneous galvanic currents which in some measure are almost always discoverable in the earth, and which occasionally are very powerful, it was necessary to extend two insulated wires from an earth connexion at the Royal Observatory, in two directions nearly at right angles to each other, to considerable distances, where they would again make connexion with the earth. By the kindness of the Directors of the South Eastern Railway Company, to whom the Royal Observatory has on several occasions been deeply indebted, two connexions were made; one to a station near Dartford, at the direct distance $9\frac{3}{4}$ miles nearly, in azimuth (measured from North, to East, South, West), 102° astronomical or 122° magnetical, the length of the connecting wire being about $15\frac{2}{3}$ miles; the other to a station near Croydon, at the direct distance 8 miles, in azimuth, 209° astronomical, or 229° magnetical, the length of the connecting wire being about $10\frac{1}{2}$ miles. At these two stations connexion was made with earth. The details of the course were as follows. The wires were soldered to a water pipe in the Magnetic Ground at the Royal Observatory. Thence they entered the Magnetic Basement, and passed through the photographic self-registering apparatus (to be shortly described). From it they were led up the electrometer mast to a height exceeding 50 feet, and thence they were swung across the grounds to a chimney above the Octagon Room. They descended thence, and were led to a terminal board in the Astronomical Computing Room, to which an intermediate galvanometer can be attached for eye-observation of the currents. From this point they were led to the "Battery Basement," and, with other wires, passed under the Park to the Greenwich Railway Station, and upon the telegraph poles. One wire branched off at the junction with the North Kent Railway to Dartford, the other at the junction with the Croydon Branch Railway to Croydon. At both places their connexion with earth was made by soldering to water-pipes, as at the Royal Observatory.

These wires remained in the places described till the end of 1867. It had been discovered in experience that a much smaller separation of the extreme points of earth-connexion would suffice, and it was conjectured that advantage might arise from making the two earth-connexions of each wire on opposite sides of the Observatory and nearly equidistant from it, instead of making one earth-connexion of each within the Observatory grounds. In 1868, therefore, the following wire-courses were substituted. One wire is connected with earth, by a copper plate, at the Lady Well station of the Mid-Kent Railway; it is thence led by a circuitous course to the North Kent Junction with the Greenwich Railway, to the Royal Observatory (for communication with the self-registering apparatus), back to the North Kent Junction, then by North Kent Railway and Angerstein Branch to the Angerstein Wharf, where it is connected with earth by a copper plate. The other wire is connected with earth by a copper plate at the North Kent Junction, then passes to the Royal Observatory and back to the Junction, and then along the North Kent Railway to the Morden College end of the Blackheath Tunnel, where it is connected with earth in the same manner. The straight lines connecting the extreme points of the wires cross each other near the middle of their lengths and near the Royal Observatory; the length of the first line is nearly 3 miles, and its azimuth 56° N. to E. (magnetic); that of the second line is nearly $2\frac{1}{2}$ miles, and its azimuth 136°. But, in the circuitous courses above described, the length of the first wire is about $10\frac{3}{8}$ miles, and that of the second $6\frac{1}{4}$ miles. These wires were established and brought into use on 1868, August 20.

The apparatus for receiving the effects of the galvanic currents consists essentially of two magnetic needles (one for each wire), each suspended by a hair so as to vibrate horizontally within a galvanic coil, exactly as in the ordinary speaking telegraph (supposed to be laid horizontally); these coils being respectively in the courses of the two long wires. A current of one kind, in either wire, causes the corresponding needle to turn itself through an angle nearly proportioned to the strength of the current, in one direction; a current of the opposite kind causes it to turn in the opposite direction. These turnings are registered by the following apparatus.

The carrier of each magnet carries also a small plane mirror, which receives all the azimuthal motions of the magnet. The light of a gas-lamp passes through a minute aperture, and shines upon the mirror; the divergent pencil is converted into a convergent pencil by refraction through crossed cylindrical lenses (with axes vertical before the pencil reaches the mirror, and with axes horizontal where the pencil is received from the mirror), which, under the circumstances, were more convenient than spherical lenses. A spot of light is thus formed upon the photographic paper wrapped upon a cylinder of ebonite, which is covered by a glass cylinder, and made to rotate in twenty-four hours by clock-work, exactly as for the register of the magnetic elements. As in the case of declination and horizontal-force, the two earth currents make their registers upon opposite sides of the same barrel, and upon different parts of the sheet; the same gaslight serving for the illumination of both.

A portion of a base-line for either record is obtained at any time by simply breaking the galvanic communication.

The photograph records were regularly made, with the wires in the first position, from 1865, March 15, to the end of 1867. Fifty-three days, on which the magnetic disturbances were active, were selected for special examination; and for these the equivalent galvanic currents in the north and west directions were computed, and their effects in producing apparent magnetic disturbances in the west and north directions were inferred. They correspond almost exactly with those indicated by the magnetometers. Then the records for all the days of tranquil magnetism were reduced in the same manner, not for comparison with the magnetometer-results, but for ascertaining the diurnal laws of the galvanic currents. These laws were found to be very different from the laws of magnetic diurnal inequalities. These discussions have been communicated to the Royal Society in two papers, of which the first is printed in the Philosophical Transactions, 1868.

The records with the wires in the new positions have been regularly made since 1868, August 20, but have not yet been discussed.

§ 14. *Standard Barometer.*

The Barometer is a standard, by Newman, mounted in 1840. It is fixed on the South wall of the West arm of the Magnetic Observatory. The graduated scale which measures the height of the mercury is made of brass, and to it is affixed a brass rod, passing down the inside of one of the upright supports, and terminating in a conical point of ivory; this point in observation is made just to touch the surface of the mercury in the cistern, and the contact is easily seen by the reflected and the actual point appearing *just* to meet each other. The rod and scale are made to slide up and down by means of a slow-motion screw. The scale is divided to $0^{in.}05$.

The vernier subdivides the scale divisions to $0^{in.}002$; it is moved by a slow-motion screw, and in observation is adjusted so that the ray of light, passing under the back and front of the semi-cylindrical plate carried by the vernier, is a tangent to the highest part of the convex surface of the mercury in the tube.

The tube is $0^{in.}565$ in diameter; the correction for the effect of capillary attraction is therefore only $+ 0^{in.}002$. The cistern is of glass.

At the bottom of the instrument are three screws, turning in the fixed part of the support, and acting on the piece in which the lower pivot of the barometer-frame turns, for adjustment to verticality: this adjustment is examined weekly.

The readings of this barometer, until 1866, August 20^d, 0^h, are considered to be coincident with those of the Royal Society's flint-glass standard barometer. On that day a change was made in the barometer. It had been remarked that the slow-motion-screw at the bottom of the sliding rod (for adjusting the ivory point to the surface of the mercury in the cistern) was partly worn away: and on August 20 the sliding rod was removed from the barometer by Mr. Zambra to remedy this defect. It was restored on 1866, August 30^d, 3^h. Before the removal of the sliding rod, barometric comparisons had been made with a standard barometer the property of Messrs. Murray and Heath, and with two barometers, Negretti and Zambra, Nos. 646 and 647. While the sliding rod of the Greenwich standard was removed, Negretti and Zambra 647 was used for daily observations. After the new equipment of the standard barometer, another series of comparisons with the same barometers was made: from which it was found (the three auxiliaries giving accordant results) that the readings of the barometer, in its new state, required a correction of $-0^{in}\cdot006$. This is applied in the printed observations commencing with 1866, August 30.

The height of the cistern above the mean level of the sea is 159 feet. This element is founded upon the determination of Mr. Lloyd, in the *Phil. Trans.*, 1831; the elevation of the cistern above the brass piece inserted in a stone in the transit-room (to which Mr. Lloyd refers) being $5^{ft}.2^{in}$.

The barometer has been read at 21^h, 0^h, 3^h, 9^h (astronomical), on every day, excepting on Sundays, and on Good Friday and Christmas Day, on which days fewer observations have been taken. Every reading has been reduced to the reading which would have been obtained at the temperature 32° of the mercury and scale, by application of the correction given in Table II. (pages 82 to 87) of the Report of the Committee of Physics of the Royal Society. The mean of the reduced readings has then been taken for each civil day, and finally converted into mean daily reading, by application of the correction inferred from Mr. Glaisher's paper in the *Philosophical Transactions*, 1848, Part I, Table I, page 127.

In the printed record of the barometrical and all other meteorological observations, the day is to be understood, generally, as defined in civil reckoning.

§ 15. *Photographic self-registering Apparatus for continuous Record of the Readings of the Barometer.*

The Photographic self-registering Apparatus for continuous Record of Magnetic Vertical Force is furnished (as has been stated) with a vertical cylinder covered with photographic paper and revolving in 24 hours. North of the surface of this cylinder, at the distance of about 30 inches, is a large syphon barometer, the bore of the upper and lower extremities of its arms being about 1·1 inch. A glass float partly immersed in the quicksilver of the lower extremity is partially supported by a counterpoise acting on a light lever (which turns on delicate pivots), so that the wire supporting the float is constantly stretched, leaving a definite part of the weight of the float to be supported by the quicksilver. This lever is lengthened to carry a vertical plate of opaque mica with a small aperture, whose distance from the fulcrum is nearly eight times the distance of the point of attachment of the float wire, and whose movement, therefore, is nearly four times the movement of the column of a cistern-barometer. Through this hole the light of a lamp, collected by a cylindrical lens, shines upon the photographic paper.

The scale of time is established by means of occasional interruptions of the light, and the scale of measure is established by comparison with occasional eye-observations.

This barometer was brought into use in 1848, but its indications were not satisfactory till the mercury was boiled in the tube by Messrs. Negretti and Zambra on 1853, August 18, since which time they have appeared unexceptionable. Results of the indications are printed in the *Maxima and Minima of the Barometer*, near the end of the Meteorological Results.

§ 16. *Thermometers for ordinary Observation of the Temperature of the Air and Evaporation.*

The Dry-Bulb Thermometer, the Wet-Bulb Thermometer, the Maximum Self-Registering Thermometers, both dry and wet, and the Minimum Self-Registering Thermometers, dry and wet, all for determination of the temperature of the air and of evaporation, are mounted on a revolving frame whose fixed vertical axis is planted in the ground. From the year 1846 to 1863 the post forming the vertical axis was about 23 feet south (magnetic) of the S.S.E. angle of the south arm of the Magnetic Observatory; in 1863 it was moved to a position about 35 feet south (astronomical) of the south angle. A frame revolves on this post, consisting of a horizontal board as base, of a vertical board projecting upwards from it connected with one edge of the horizontal board, and of two parallel inclined boards (separated about three inches) connected at the top with the vertical board, and at the bottom with the other edge of the horizontal board. The outer inclined board is covered with zinc. The air passes freely between all these boards.

The dry and wet-bulb thermometers are attached to the outside, and near the center of the vertical board; the maximum and minimum thermometers for air towards one vertical edge, and those for evaporation towards the other vertical edge, with their bulbs at almost the same level, and near to those of the dry and wet-bulb thermometers; their bulbs are about 4 feet above the ground and projecting from 2 inches to 3 inches below the horizontal board. Above the thermometers is a small projecting roof to protect them from rain. The frame is always turned with the inclined side towards the sun. It is presumed that the thermometers are thus sufficiently protected.

The graduations of all the thermometers used in the Royal Observatory rest fundamentally upon those of a Standard Thermometer, the property of Mr. Glaisher, which derives its authority from comparison with original thermometers constructed by the late Rev. R. Sheepshanks about the years 1840–1843, in the course of his preparations for the construction of the National Standard of Length. The whole of the radical determinations of Freezing Point, Boiling Point, and Subdivision of Volume of Tube, were made by Mr. Sheepshanks with the utmost care: it is believed that these were the first original thermometers that had been constructed in England for many years. Mr. Glaisher's thermometer has been adopted as the standard of reference for all the thermometers used in the Royal Observatory since 1840.

The Dry-Bulb Thermometer is by Newman. The corrections required for its readings, as found by comparison with the standard above-mentioned, are as follows :—

Between 8° and 11°	subtract	0°·4
12 and 19		0·5
20 and 24		0·6
25 and 30		0·7
31 and 37		0·8
38 and 44		0·9
45 and 52		1·0
53 and 59		1·1
60 and 64		1·2
65 and 68		1·3
69 and 71		1·4
72 and 74		1·5
75 and 77		1·6
78 and 79		1·7
80 and 82		1·8
83 and 84		1·9
85 and 86		2·0
87 and 90		2·1
91 and 95		2·2
96 and 100		2·3
101 and 104		2·4

The wet-bulb thermometer is by Negretti and Zambra, and is in every respect similar to the dry-bulb thermometer. The corrections required to the readings of this thermometer are—

Between 32° and 49°		0°·0
50 and 81	add	0·2
82 and 91		0·0
92 and 105	subtract	0·2

Dry-bulb and wet-bulb thermometers, with pea-bulbs and porcelain scales, Negretti and Zambra 1179, are also mounted on the roof of the library, 4 feet above the leads and 22 feet above the ground. No corrections for index error are applied to the readings of these thermometers.

On 1869, September 30, dry-bulb and wet-bulb thermometers were mounted on the roof of the cabinet containing the registering mechanism of Robinson's Anemometer, but below the revolving cups, at the height 4 feet above the flat roof and 50 feet above the ground. No corrections for index errors are applied to their readings.

The eye-readings of the dry-bulb and wet-bulb thermometers have usually been taken at the hours (astronomical reckoning) 21^h, 0^h, 3^h, 9^h, and corrected by application of the numbers given above. They are not printed in the present volume.

The dew-point has been inferred exclusively from the simultaneous observations of the dry-bulb and wet-bulb thermometers, by multiplying the difference between the readings of these thermometers by a factor peculiar to the temperature of the air, and subtracting the product from the reading of the dry-bulb thermometer.

These factors have been found by Mr. Glaisher from the comparison of a great number of dew-point determinations, obtained by use of Daniell's hygrometer, with simultaneous observations of dry-bulb and wet-bulb thermometers. The first part of this investigation was published in full, in the volume of *Magnetical and Meteorological Observations* for 1844, pages 67–72; it was based upon all the observations made up to that time. Subsequently, the comparison was extended to include all the simultaneous observations of these instruments made at the Royal Observatory, Greenwich, from 1841 to 1854, with some observations taken at high temperatures in India, and others at low and medium temperatures at Toronto. The results at the same temperature were found to be the same at these different localities, so far as the climatic circumstances permitted comparison. (See Glaisher's Hygrometrical Tables, 4th Edition). The following table exhibits the result of the entire comparison; it has been used in forming the dew-points in the present volume.

TABLE OF FACTORS by which the DIFFERENCE of READINGS of the DRY-BULB and WET-BULB THERMOMETERS is to be MULTIPLIED in order to PRODUCE the DIFFERENCE between the READINGS of the DRY-BULB and DEW-POINT THERMOMETERS.

Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.
°		°		°		°	
10	8·78	33	3·01	56	1·94	79	1·69
11	8·78	34	2·77	57	1·92	80	1·68
12	8·78	35	2·60	58	1·90	81	1·68
13	8·77	36	2·50	59	1·89	82	1·67
14	8·76	37	2·42	60	1·88	83	1·67
15	8·75	38	2·36	61	1·87	84	1·66
16	8·70	39	2·32	62	1·86	85	1·65
17	8·62	40	2·29	63	1·85	86	1·65
18	8·50	41	2·26	64	1·83	87	1·64
19	8·34	42	2·23	65	1·82	88	1·64
20	8·14	43	2·20	66	1·81	89	1·63
21	7·88	44	2·18	67	1·80	90	1·63
22	7·60	45	2·16	68	1·79	91	1·62
23	7·28	46	2·14	69	1·78	92	1·62
24	6·92	47	2·12	70	1·77	93	1·61
25	6·53	48	2·10	71	1·76	94	1·60
26	6·08	49	2·08	72	1·75	95	1·60
27	5·61	50	2·06	73	1·74	96	1·59
28	5·12	51	2·04	74	1·73	97	1·59
29	4·63	52	2·02	75	1·72	98	1·58
30	4·15	53	2·00	76	1·71	99	1·58
31	3·70	54	1·98	77	1·70	100	1·57
32	3·32	55	1·96	78	1·69		

The maximum self-registering thermometer is a mercurial thermometer, of the construction invented by Messrs. Negretti and Zambra. There is a small detached piece of glass in the tube, just above a bent part of the tube (near the bulb), through which the piece of glass cannot pass down. The column of mercury in rising lifts the glass up and passes freely; but in descending it is unable to pass the glass, and the lower mass of mercury descends, leaving a vacant space below the glass, and leaving a portion of the mercury above it. The piece of glass operates as an efficient valve. The corrections to the readings of this thermometer are as follows:—

Between 32° and 54°	subtract	0°·3
54 and 72		0·2
72 and 80		0·1
80 and 93		0·0
93 and 96	add	0·1
96 and 99		0·2
99 and 102		0·4

There is a similar thermometer for the maximum wet-bulb reading (Negretti and Zambra No. 7537): no corrections have been applied to its readings.

The minimum self-registering thermometers are alcohol thermometers, of the construction known as Rutherford's. A sliding glass index allows the alcohol in rising to pass above it, but is drawn down by the peculiar action of the bounding surface of the fluid when it sinks. The readings of that which gives the minimum temperature of the air, used to November 9, require the following corrections, viz.:—

Below 12°	add	0°·2
Between 13 and 18°		0·3
19 and 25		0·4
26 and 35		0·5
36 and 39		0·6
40 and 43		0·7
44 and 47		0·8
48 and 50		0·9
51 and 54		1·0
55 and 57		1·1
58 and 61		1·2
62 and 64		1·3
65 and 67		1·4
68 and 70		1·5
71 and 74		1·6
75 and 77		1·7
78 and 80		1·8

A new minimum thermometer for air-temperature (Negretti and Zambra, No. 4386) was introduced on 1869, November 10. No correction for index-error is required to the readings of this instrument.

The readings of the minimum wet-bulb thermometer, used till September 13, require the following corrections:—

Between 31° and 37°	add	1°·0
37 and 78		0·7

A new minimum wet-bulb thermometer (Negretti and Zambra, No. 3627) was introduced on 1869, September 14. No correction for index-error is required to the readings of this instrument.

The mean daily values of dry thermometer in the printed columns are found by combining two results derived from different sources. The first and simpler result is the mean of the maximum and minimum, corrected by a small quantity depending on the month, given in Table III. of Mr. Glaisher's paper in the *Philosophical Transactions*, 1848, page 130. The second result is formed by taking the means of the four eye-observations at 21^h, 0^h, 3^h, 9^h, and applying a correction thus investigated. The daily range being found by taking the difference between the maximum and minimum, this daily range is multiplied by the mean of the factors in Table IV. of Mr. Glaisher's paper before mentioned corresponding to the hours of observation; the application of this correction to the mean of the eye-observations gives the second result. (It is evident that this process is applicable to any number of eye-observations.) These two results are then combined to form a mean, weights being given proportional to the number of observations contributing to each result.

For the mean daily value of dew point, the usual process is,—by observing the difference between dry and wet thermometers, and by use of the table of factors printed in page *xlvii* above, to form the difference between air-temperature and dew point at each of the hours of reading; to take the mean of the deduced dew-points; and to apply a correction which is the mean of the corrections in Mr. Glaisher's Table VIII. for the several hours of observation. Sometimes, however, the following process is used. The correction for diurnal range applicable to the mean of the eye-observations of the dry thermometer having been found (as is described above), this correction is multiplied by a fraction, whose numerator is the mean of corrections to wet bulb thermometer in Table VII. for the hours of observations, and whose denominator is the mean of corrections to dry thermometer in Table II. for the same hours; and thus a correction is found which is applied to the mean of the eye-observations of wet bulb thermometer, to form the mean wet bulb for the day. Then by use of the mean dry bulb reading for the day and the mean wet bulb reading for the day and the table of factors above, the mean dew point for the day is formed.

§ 17. *Photographic self-registering Apparatus for continuous Record of the Readings of the Dry-Bulb and Wet-Bulb Thermometers.*

About 28 feet south (magnetic) of the south-east angle of the south arm of the Magnetic Observatory, and about 25 feet east of the thermometers for eye-observations, is a shed 10 ft. 6 in. square, standing upon posts 8 feet high, under which are placed the photographic thermometers, the dry-bulb thermometer towards the east, and the wet-bulb thermometer towards the west. The bulbs of the thermometers are 8 inches in length, and 0·4 inch internal bore, and their centers are about 4 feet above the ground. The bulb of one of the thermometers is covered with muslin throughout its whole length, which is kept moist by means of capillary passage of water along cotton wicks leading to a vessel filled with water.

There are small adjustments admitting the raising or dropping of the thermometers, so that the register of their changing readings may be on a convenient part of the paper. The thermometer frames are covered by plates having longitudinal apertures, so narrow, that any light which may pass through them is completely, or almost completely, intercepted by the broad flat column of mercury in the thermometer-tube. Across these plates a fine wire is placed at every degree; and at the decades of the degrees, and also at 32°, 52°, and 72°, a coarser wire is placed. A gas lamp is placed about 9 inches from each thermometer (east of the dry bulb and west of the wet bulb), and its light, condensed by a cylindrical lens, whose axis is vertical, shines through the thermometer-tube above the surface of the mercury, and forms a well-defined line of light upon the photographic paper, which is wrapped around the cylinder. The axis of this cylinder is vertical; its mounting is in all respects similar to that of the Vertical Force cylinder. As the cylinder, covered with photographic paper, revolves under the light, which passes through the thermometer-tube, it receives a broad sheet of photographic trace, whose breadth (in the direction of the axis of the cylinder) varies with the varying height of the mercury in the thermometer-tube. The light in its passage is intercepted by the wires placed across the tube at every degree, and there are, therefore, left upon the paper corresponding lines in which there is no photogenic action.

The cylinder revolves in 48 hours; the daily photographic traces of the two thermometers are thus simultaneously registered on opposite sides of the cylinder without intermixing. The length of the glass cylinder used till 1869, March, is 13½ inches, and its circumference is about 19 inches. On 1869, March 5, an ebonite cylinder was introduced, whose length is 10 inches, and circumference about 19 inches; and at a later time the cylinder was made to revolve in 50 hours instead of 48 hours, to insure the separation of the records of the two thermometers.

§ 18. *Thermometers for Solar Radiation and Radiation to the Sky.*

The thermometer for Solar Radiation, which to the end of the year 1864 was placed in an open box about 10 feet south of the south-west angle of the south arm of the Magnetic Observatory, is now laid on the grass, near the same place.

The thermometer is a self-registering maximum mercurial thermometer of Negretti and Zambra's construction; its bulb is blackened, and enclosed in a glass sphere from which the air has been exhausted. Its graduations are correct, and the numbers inserted in the tables are those read from the instrument without alteration. The thermometer is read at 9^h a.m., noon, 3^h p.m., and occasionally at 9^h p.m.; the highest of these readings is adopted as the maximum for the day.

The use of a thermometer with blackened bulb not inclosed in an exhausted sphere was discontinued at the end of 1865.

The thermometer for radiation to the sky is placed near to the Solar Radiation thermometer, with its bulb resting on short grass, and fully exposed to the sky. It is a self-registering minimum spirit thermometer of Rutherford's construction, made by Negretti and Zambra. Its graduation is correct, and the numbers inserted in the table are those read from the scale without alteration. It is read every day at 9^h a.m., and occasionally at 9^h p.m.

This thermometer was out of order on April 19 and August 2. It was broken on August 2, and was replaced by a new thermometer, Negretti and Zambra No. 1424, on August 3. The latter instrument was out of order on August 12.

§ 19. *Thermometers sunk below the Surface of the Soil at different Depths.*

These thermometers were made by Messrs. Adie of Edinburgh, under the immediate superintendence of the late Professor J. D. Forbes. The graduation was made by Professor Forbes himself.

The thermometers are four in number. They are all placed in one hole in the ground, the diameter of which in its upper half is 1 foot, and in its lower half about 6 inches. Each thermometer is attached in its whole length to a slender piece of wood, which is planted in the hole with it. The place of the hole is 20 feet south of the extremity of the south arm of the Magnetic Observatory, and opposite the center of its south front.

The soil consisted of beds of sand; of flint-gravel with a large proportion of sand; and of flints with a small proportion of sand, cemented almost to the consistency of pudding-stone. Every part of the gravel and sand extracted from the hole was perfectly dry.

The bulbs of the thermometers are cylindrical, 10 or 12 inches long and 2 or 3 inches in diameter. The bore of the principal part of the tubes, from the bulb to the graduated scale, is very small. In that part to which the scale is attached, the tube is larger.

The thermometer No. 1 was dropped into the hole to such a depth that the center of its bulb was 24 French feet (25·6 English feet) below the surface: then dry sand was poured in till the hole was filled to nearly half its height. Then No. 2 was dropped in till the center of its bulb was 12 French feet below the surface; No. 3 and No. 4 till the centers of their bulbs were respectively 6 and 3 French feet below the surface; and the hole was then completely filled with dry sand. The upper parts of the tubes, carrying the scales, were left projecting above the surface: No. 1 by 27·5 inches, No. 2 by 28·0 inches, No. 3 by 30·0 inches, and No. 4 by 32·0 inches. Of these lengths, the parts 8·5, 10·0, 11·0, and 14·5 inches, respectively are tube with narrow bore.

The projecting parts of the tubes are protected by a wooden case or box fixed to the ground; the sides of the box are perforated with numerous holes, and it has a double roof. In the North face of this box is a large plate of glass through which the thermometers are read. Within the box are two smaller thermometers, one (No. 5) whose bulb is sunk one inch in the ground, and one (No. 6) whose bulb is in the free air nearly in the center of the box.

The fluid of the four long thermometers is alcohol tinged with a red colour.

The lengths of 1° on the scales of Nos. 1, 2, 3 and 4, are respectively $2^{in.}$, $1^{in.}1$, $0^{in.}9$, and $0^{in.}55$; and the ranges of the scales, as first mounted, were, 43°·0 to 52°·7, 42°·0 to 56°·8, 39°·0 to 57°·5, and 34°·2 to 64°·5.

These ranges for Nos. 2, 3, and 4, were found to be insufficient in some years, particularly those of Nos. 3 and 4, or the thermometers sunk to the depth of 6 feet and 3 feet.

In 1857, June 22, Messrs. Negretti and Zambra removed from Nos. 3 and 4 a quantity of fluid corresponding to the extent of 5° on their scales, and the scales of these two thermometers were then lowered by that linear extent, making the readings the same as before. Their ranges are now, respectively, 44° to 62°·5, and 39°·2 to 69°·5.

In subsequent years it was found that the amount of fluid removed was somewhat too great, for now at the lower end of the scale the 6-foot thermometer sometimes falls below the limit of its scale or 44°; and the 3-foot thermometer below 39°·0; in which cases the alcohol sinks into the capillary tube.

The readings at the early part of the series were at times defective at high temperatures, but always complete at low temperatures; now, they are generally complete at high temperatures, and are at times defective at low temperatures. The two combined, however, will enable us to complete all readings.

These thermometers are read once a day, at noon, and the readings appear in the printed volumes as read from their scales without correction.

On 1869, July 21, Mr. Zambra removed fluid from No. 1 to the amount of 2°·7, and from No. 2 to the amount of 1°·5, and inserted in No. 4 fluid to the amount of 1°·5. The scales were re-engraved, to make the reading at every temperature the same as before.

§ 20. *Thermometers immersed in the Water of the Thames.*

The self-registering maximum and minimum thermometers for determining the highest and lowest temperatures of the water of the Thames are by Messrs. Negretti and Zambra, and are observed every day at 9^h a.m.

A strong wooden trunk is firmly fixed to the side of the Dreadnought Hospital Ship, about 5 feet in length, and closed at the bottom; the bottom and the sides, to the height of 3 feet, are perforated with a great number of holes, so that the water can easily flow through; the thermometers are suspended within this trunk so as to be about 2 feet below the surface of the water, and 1 foot from the bottom of the trunk.

The regular observations are made under the superintendence of the Medical Officers of the Ship.

These thermometers were not read on April 11, May 30, June 11, 12, 14, July 18, 19, September 10, 12, 26, October 31, November 14, 21, December 26.

The index-error corrections to these thermometers were:—

For the maximum thermometer,	subtract 1°·6
For the minimum thermometer,	subtract 0·6

§ 21. *Osler's Anemometer.*

This anemometer is self-registering: it was made by Newman, on a plan furnished by A. Follett Osler, Esq., F.R.S., but has received several changes since it was originally constructed. A large vane, which is turned by the wind, and from which a vertical spindle proceeds down nearly to the table in the north-western turret of the ancient part of the Observatory, gives motion by a pinion upon the spindle to a rack-work carrying a pencil. This pencil makes a mark upon a paper affixed to a board which is moved uniformly in a direction transverse to the direction of the rack-motion. The movement of the board is effected by means of a second rack connected with the pinion of a clock. The paper has lines printed upon it corresponding to the positions which the pencil must take when the direction of the vane is N., E., S., or W.; and also has transversal lines corresponding to the positions of the pencil at every hour. The first adjustment for azimuth was obtained by observing from a certain point the time of passage of a star behind the vane-shaft, and computing from that observation the azimuth; then on a calm day drawing the vane by a cord to that position, and adjusting the rack, &c., so that the pencil position on the sheet corresponded to that azimuth.

This construction originally arranged by Mr. Osler was in use till the middle of 1866, when the following modifications were made in it by Mr. Browning:—

The vane-shaft was made to bear upon anti-friction-rollers running in a cup of oil. For elucidation of the following description of the apparatus which it carries, I refer to Figure 3 on the engraving at the end of the Introduction to the volume of 1866. To the vane-shaft is attached a rectangular frame C, which rotates with the vane. To this frame are firmly attached the ends of four strong springs D, which rise from the point of attachment in a vertical direction, are then bent so as to descend below the frame C, and are then bent upwards so as to rise a short distance, where they terminate, each of them thus forming a large hook. To the interior of each strong spring, near to its upper bend, is affixed a very weak spring, which descends free into the lower bend or hook of the strong spring, so that its lower end may be moved by a light pressure till it reaches and takes bearing against the bent-up part of the strong spring, after which it cannot be further moved without moving the strong spring, and will therefore require much greater pressure. The four ends of these four light springs carry the circular pressure-plate A by the following connexions. The two which are farthest from A, or which are below the wide part of the vane, are united by a light horizontal cross-bar G; and from the ends of these springs proceed four light bars E, which are attached to points of the pressure-plate A, near its circumference. The two ends of light springs which are nearest to A are also united by a light horizontal cross bar, which is attached to a projection from the center of the plate A. (The diagonal lines upon A, in the diagram, represent indistinctly two strengthening edge-bars upon the pressure-plate, and the projection above-mentioned is fixed to their intersection.) The weight of the pressure-plate thus rests entirely on the slender springs; it is held steadily in position, as regards the opposition to the wind, and it moves without sensible friction. A light wind drives it through a considerable space, until the ends of one pair of light springs touch their large hooks; then for every additional pound of pressure the movement is smaller, till the ends of the other pair of light springs touch their large hooks; after this the movement for every additional pound of pressure is still further diminished. This apparatus was arranged by Mr. Browning. The communication with the pencil below is similar to that in the first construction: the cord and pulley are omitted in the drawing to avoid confusion.

The pressure-pencil below is carried by a radial bar, whose length is parallel to the scale of hours; it is brought to zero by a small weight on a cord running over a pulley.

The surface of the pressure-plate is 2 square feet, or double that in the old construction. The scale of indications on the recording-sheet was determined experimentally as in the old instrument; yet it is remarked that the pressures of wind per square foot appear generally greater than formerly.

The scale for small pressures is much larger, and their indications much more certain than formerly. A pressure of an ounce per square foot is clearly shown.

A rain gauge of peculiar construction is carried by this instrument, by which the fall of rain is registered with reference to the time of the fall. It is described in § 23.

A fresh sheet of paper is applied to this instrument every day at 22^h mean solar time.

§ 22. *Robinson's Anemometer.*

In the latter part of the year 1866, a new instrument, on the principles described by Dr. Robinson in the Transactions of the Royal Irish Academy, vol. xxii., adapted to give a continuous record of the velocity of the wind, was mounted by Mr. Browning, of which the principal parts are represented in Figures 1 and 2 of the engraving in the Introduction 1866. The motion is given (as in the former instrument) by the pressure of the air on four hemispherical cups, the distance of the center of each from the axis of rotation being 15·00 inches. The foot of the axis is a hollow flat one bearing upon a sharp cone which rises up from the base of a cup of oil. The horizontal arms are connected with a vertical spindle, upon which is an endless screw, working in a toothed wheel connected with a train of wheels, furnished with indices capable of registering one mile and decimal multiples of a mile up to 1,000 miles. A pinion C upon the axis of one of the wheels (which, in the figure, occupies a place too high) acts in a rack J, drawing it upwards by the ordinary motion of the revolving cups. The rack is pressed to the pinion by a spring, and, when it has been drawn up, it can be pressed by hand in opposition to the spring so as to release it from the pinion, and can then be pushed down, again to be raised by the action of the wheel-work. The rack is connected at the bottom with a sliding rod D, which passes down into the chamber below, where it draws up the sliding pencil-carrier E. The pencil F, which it carries, traces its indications upon the sheet of paper wrapped round a barrel, whose axis is vertical, and which by spindle connexion with the clock H is made to revolve in 24 hours. The revolving cups and wheel-work are so adjusted that a motion of the pencil upwards of one inch represents a motion of the air through 100 miles. The curve traced upon the barrel exhibits, therefore, the aggregate of the air's movements, and also the air's velocity, at every instant of the day.

In the year 1860, on July 3, 4, and 13, experiments were made in Greenwich Park, with the instrument then in use, to ascertain the correctness of the theory of Robinson's anemometer; the point to be verified being that the scale of the instrument, founded on the supposition that the horizontal motion of the air is about three times the space described by the centers of the cups, is correct.

A post about 5 feet high with a vertical spindle in the top was erected, and on this spindle turned a horizontal arm, carrying at the extremity of its longer portion Robinson's anemometer, and on its shorter portion a counterpoise. The distance from the vertical spindle of the post to the vertical axis of the anemometer was $17^{ft.}\ 8^{in.}\cdot7$. The reading of the dial was taken, and then the arm was made to revolve in the horizontal plane 50 or 100 times, an attendant counting the number of revolutions, and the reading of the dial was again taken. In this manner 1,000 revolutions were made in the direction N.E.S.W.N., and 1,000 revolutions in the direction N.W.S.E.N. In some of the experiments the air was sensibly quiet, and in others there was a little wind; the result was,

For a movement of the instrument through one mile,

Beam revolving N.E.S.W. (opposite to the direction of rotation of the Anemometer-cups)	1·15 was registered.
Beam revolving N.W.S.E. (in the same direction as the Anemometer-cups)	0·97 was registered.

The results from rapid revolutions and from slow revolutions were sensibly the same.

This may be considered as confirming in a very high degree the accuracy of the theory.

§ 23. *Rain Gauges.*

The rain-gauge connected with Osler's anemometer is 50 feet 8 inches above the ground, and 205 feet 6 inches above the mean level of the sea. It exposes to the rain an area of 200 square inches (its horizontal dimensions being 10 by 20 inches).

The collected water passes through a tube into a vessel suspended in a frame by spiral springs, which lengthen as the water increases, until 0·24 of an inch is collected in the receiver; it then discharges itself by means of the following modification of the syphon. A copper tube, open at both ends, is fixed in the receiver, in a vertical position, with its end projecting below the bottom. Over the top of this tube a larger tube, closed at the top, is placed loosely. The smaller tube thus forms the longer leg, and the larger tube the shorter leg, of a syphon. The water, having risen to the top of the smaller tube, gradually falls through it into the uppermost portion of a tumbling bucket, fixed in a globe under the receiver. When full, the bucket falls over, throwing the water into a small pipe at the lower part of the globe; the water completely fills the bore of the pipe; its descent causes an imperfect vacuum in the globe, sufficient to cause a draught in the longer leg of the syphon, and the whole contents run off. After leaving the globe, the water is carried away by a waste-pipe attached to the building. The springs then shorten and raise the receiver. The ascent and descent of the water-vessel move a radius-bar which carries a pencil; and this pencil makes a trace upon the paper carried by the sliding board of the self-registering anemometer. As the trace is rather long in proportion to the length of the radius-bar, the bar has now been furnished by Mr. Browning with a "parallel motion," which makes the trace sensibly straight.

The scale of the printed paper was adjusted by repeatedly filling the water-vessel until it emptied itself, then weighing the water, and thus ascertaining its bulk, and dividing this bulk by the area of the surface of the rain receiver.

A second gauge, with an area 77 square inches nearly, is placed close to the preceding, the receiving surface of both being on the same horizontal plane.

A third gauge is placed on the roof of the Octagon room, at 38 feet $4\frac{1}{2}$ inches above the ground, and 193 feet $2\frac{1}{2}$ inches above the mean level of the sea. It is a simple cylinder gauge, 8 inches in diameter and about $50\frac{1}{4}$ square inches in area. The height of the cylinder is $13\frac{1}{2}$ inches; at the depth of 1 inch from the top within the cylinder is fixed a funnel (an inverted cone) of 6 inches perpendicular height; with the point of this funnel is connected a tube, $\frac{1}{5}$ of an inch in diameter, and $1\frac{1}{2}$ inch in length; $\frac{3}{4}$ of an inch of this tube is slightly curved, and the remaining $\frac{3}{4}$ of an inch is bent upwards, terminating in an aperture of $\frac{1}{8}$ of an inch in diameter. By this arrangement, the last few drops of water remain in the bent part of the tube, and the water is some days evaporating. The upper part of the funnel or bore of the cone is connected with a brass ring, which has been turned in a lathe, and this is connected with a circular piece 6 inches in depth, which passes outside the cylinder, and rests in a water joint, attached to the inner cylinder, and extending all round.

A fourth gauge is placed on the top of the Library; it is a funnel, whose top has a diameter of 6 inches; its exposed area is $28\frac{1}{4}$ square inches nearly. The receiving surface of the gauge is 22 feet 4 inches above the ground, and 177 feet 2 inches above the mean level of the sea.

A fifth gauge is planted on the roof of the Photographic Thermometer shed, 10 feet above the ground, and 164 feet 10 inches above the mean level of the sea. Its construction is the same as that of the third gauge.

A sixth gauge is a self-registering rain-gauge on Crosley's construction, made by Watkins and Hill. The surface exposed to the rain is 100 square inches. The collected water falls into a vibrating bucket, whose receiving concavity is entirely above the center of motion, and which is divided into two equal parts by a partition whose plane passes through the axis of motion. The pipe from the rain-receiver terminates immediately above the axis. Thus that part of the concavity which is highest is always in the position for receiving water from the pipe. When a certain quantity of water has fallen into it, it preponderates, and, falling, discharges its water into a cistern below; then the other part of the concavity receives the rain, and after a time preponderates. Thus the bucket is kept in a state of vibration. To its axis is attached an anchor with pallets, which acts upon a toothed wheel by a process exactly the reverse of that of a clock-escapement. This wheel communicates motion to a train of wheels, each of which carries a hand upon a dial-plate; and thus inches, tenths, and hundredths are registered. Sometimes, when the escapement has obviously failed, the water which has descended to the lower cistern has again been passed through the gauge, in order to enable an assistant to observe the indication of the dial-plates without fear of an imperfection in the machinery escaping notice. The gauge is placed on the ground, 21 feet South of the Magnetic Observatory, and 156 feet 6 inches above the mean level of the sea.

The seventh and eighth gauges are placed near together, about 16 feet south of the Magnetic Observatory, 5 inches above the ground, and 155 feet 3 inches above the mean level of the sea. They are similar in construction and area to No. 3. These cylinders are sunk about 8 inches in the ground.

All these gauges, except No. 7, are read at 22^h daily; in addition, Crosley's gauge and No. 8 are read daily at 9^h p.m., and No. 7 at the end of each month only, to check the summation of the daily readings of No. 8. All are read at midnight of the last day of each month.

At the end of 1868 a leak was found in the gauge No. 7, and its indications for that year have not been used. The instrument was repaired in 1869, January. No observations were taken in that month.

Gauges Nos. 1, 2, 3, 5, 8 were made by Messrs. Negretti and Zambra; No. 4 by Troughton; No. 6 by Watkins and Hill; and No. 7 is an old gauge.

§ 24. *Electrical Apparatus.*

The electrical apparatus consists of two parts, namely, the Moveable Apparatus, which is connected with a pole nearly 80 feet high planted 7 feet North and 2 feet East of the north-east angle of the north arm of the Magnetic Observatory (as extended in 1862); and the Fixed Apparatus, which is mounted in a projecting window in the ante-room of the Magnetic Observatory.

On the top of the pole is fixed a projecting cap, to which are fastened the ends of two iron rods, which terminate in a pit sunk in the ground, and are kept in tension by attached weights. These rods are to guide the moveable apparatus in its ascents and descents. Near the bottom of the pole is fixed a windlass; the rope upon which it acts passes over a pulley in the cap, and is used to raise the moveable apparatus, which when raised to the top is suspended on a hook.

The moveable apparatus consists of the following parts:—A plank in a nearly vertical position is attached to perforated iron bars, which slide upon the iron rods. On the upper part of this plank is a cubical box. The box incloses a stout pillar of glass, having a conical hollow in its lower part. In the bottom of the box there is a large hole through which a cone of copper passes into the conical hollow of the glass pillar. In the lower part of the box a gas-lamp is placed, by the flame of which the copper cone and the lower part of the glass pillar are kept in a state of warmth. A copper wire is fastened round the glass pillar; its end is carried to a similar glass pillar, warmed in the same manner, near the north-western turret of the Octagon room; by this wire, whose length is about 400 feet, the atmospheric electricity is collected. To this wire, near the box, is attached another copper wire (now covered with gutta percha) 0·1 inch in diameter, and about 73 feet long, at the end of which is a hook; a loaded brass lever connected with the fixed apparatus presses upon this hook, and thus keeps the wire in a state of tension, and at the same time establishes the electrical communication between the long horizontal wire and the fixed apparatus.

The fixed apparatus consists of these parts:—A glass bar, nearly 3 feet long, and thickest at its middle, is supported in a horizontal position, its ends being fixed in pieces of wood projecting downwards from the roof of the projecting window. Near to each end is placed a small gas-lamp, whose chimney encircles the glass, and whose heat keeps the glass in a state of warmth proper for insulation. A brass collar surrounds the center of the glass bar; it carries one brass rod, projecting vertically upwards through a hole in the roof of the window-recess, to which rod are attached a small metallic umbrella and the loaded lever above-mentioned; and it carries another rod projecting vertically downwards, to which is attached a horizontal brass tube in an East and West direction. On the North and South sides of this tube there project four horizontal rods, through the ends of which there pass vertical rods, which can be fixed by screws at any elevation; these are placed in connexion with the electrometers, which rest on the window seat.

The electrometers during the year 1869 consisted of two Volta's Electrometers, denoted by Nos. 1 and 2; a Henley's Electrometer; a Ronalds' Spark Measurer; a Dry-pile Apparatus; and a Galvanometer.

Volta 1 and Volta 2 are of the same construction; each is furnished with a pair of straws 2 Paris inches in length; those of the latter being much heavier than those of the former: each instrument is furnished with a graduated ivory scale, whose radius is 2 Paris inches, and it is graduated into half Paris lines. In the original construction of these instruments it was intended that each division of No. 2 should correspond to five of No. 1: the actual relation between them has not yet been determined by observations at the Royal Observatory. The straws are suspended by hooks of fine copper wire to the suspension-piece, and they are separated by an interval of half a line.

Henley's Electrometer is supported on the West end of the large horizontal tube by means of a vertical rod fixed in it. On each side of the upper part of this rod is affixed a semicircular plate of ivory, whose circumference is graduated; at the centers of these ivory plates two pieces of brass are fixed, which are drilled to receive fine steel pivots, carrying a brass axis, into which the index or pendulum is inserted; the pendulum terminates with a pith ball. The relation between the graduations of this instrument and those of the other electrometers has not been determined. This instrument has seldom been affected till Volta 2 has risen to above 100 divisions of its scale.

The spark measurer consists of a vertical sliding rod terminated by a brass ball, which ball can be brought into contact with one of the vertical rods before referred to, also terminating in a ball; and it can be moved from it or towards it by means of a lever, with a wooden handle. During the operation of separating the balls, an index runs along a graduated scale, and exhibits the distance between the balls, and this distance measures the length of the spark.

The electrometers and the spark measurer were originally constructed under the superintendence of Francis Ronalds, Esq., but have since received small alterations.

The dry-pile apparatus was made by Watkins and Hill; it is placed in connexion with the brass bar by a system of wires and brass rods. The indicator, which vibrates between the two poles, is a small piece of gold leaf. This instrument is very delicate, and it indicates at once the quality of the electricity. When the inclination of the gold leaf is such that it is directed towards the top of either pile, it remains there as long as the quantity of electricity continues the same or becomes greater: the position is sometimes expressed in the notes by the words "as far as possible." The angle which the gold leaf makes with the vertical at this time is about 40°.

The galvanometer was made by Gourjon of Paris, and consists of an astatic needle, composed of two large sewing needles, suspended by a split silk fibre, one of the needles of the pair vibrating within a ring formed by 2,400 coils of fine copper wire. The connexions of the two portions of wire forming these 2,400 coils are so arranged that it is possible to use a single system of 1,200 coils of single wire, or a system of 1,200 coils of double wire, or a system of 2,400 coils of single wire: in practice the last has always been used. A small ball communicating by a wire with one end of the coils is placed in contact at pleasure with the electric conductor, and a wire leading from the other end of the coil communicates with the earth. An adjustible circular card, graduated to degrees, is placed immediately below the upper needle; the numeration of its divisions proceeds in both directions from a zero. One of these directions is distinguished by the letter A, and the other by the letter B; and the nature of the indication represented by the deflection of the needle towards A or towards B will be ascertained from the following experiment. A voltaic battery being formed by means of a silver coin and a copper coin, having a piece of blotting paper moistened with saliva between them: when the copper touches the small ball, and the wire which usually communicates with the earth is made to touch the silver, the needle turns towards A; when the silver touches the small ball, and the wire is made to touch the copper, the needle turns towards B.

§ 25. *Explanation of the Tables of Meteorological Observations.*

The mean daily value of the difference between dew-point temperature and air-temperature is the difference between the two numbers in the sixth and seventh columns. The Greatest and Least are the greatest and least among the differences corresponding to the times of observation in the civil day, or they are found from the absolute maxima and minima, as determined by comparing the observations of the self-registering wet-bulb thermometers with those of the self-registering dry-bulb thermometers.

The difference between the mean temperature for the day and the mean for the same day of the year on an average of fifty years, is found by comparison with a table of results deduced by Mr. Glaisher from fifty years' observations, made at the Royal Observatory, ending 1863.

Little explanation of the results deduced from Osler's Anemometer appears to be necessary. It may be understood generally that the greatest pressure occurred in gusts of short duration.

To 1867, October 31, the indication of Robinson's Anemometer was read off every day at 22^h (10^h A.M.), and the difference between consecutive readings was entered opposite to the civil day on which the first reading was taken. From 1867, November 1, the daily values have been extracted from the sheets of the continuous record, applying to the interval from midnight to midnight, and are entered opposite to the civil day to which each value belongs.

The daily register of rain is given for each civil day ending at midnight. This applies to the Cylinder Rain-gauge partly sunk in the ground, described above as the "eighth."

For understanding the divisions of time under the heads of Electricity and Weather, the following remarks are necessary:—The day is divided by columns into two parts (from midnight to noon, and from noon to midnight), and each of these parts is roughly subdivided into two or three parts by colons (:). Thus, when there is a single colon in the first column, it denotes that the remarks before it apply (roughly) to the interval from midnight to 6 A.M., and those following it to the interval from 6 A.M. to noon. When there are two colons in the first column, it is to be understood that the twelve hours are divided into three nearly equal parts of four hours each. And similarly for the second column.

The following is the explanation of the notation employed for record of electrical observations, it being premised that the quality of the Electricity is always to be supposed positive when no indication of quality is given:—

g cur.	denotes	*galvanic currents*
m	...	*moderate*
N	...	*negative*
P	...	*positive*
s	denotes	*strong*
sp	...	*sparks*
v	...	*variable*
w	...	*weak*

The duplication of the letter denotes an intensity of the modification described, thus, s s is very strong; v v, very variable.

The Clouds and Weather are described generally by Howard's Nomenclature; the figure denotes the proportion of sky covered by clouds, the whole sky being represented by 10. The notation is as follows:

a	denotes	*aurora borealis*
ci	...	*cirrus*
ci-cu	...	*cirro-cumulus*
ci-s	...	*cirro-stratus*
cu	...	*cumulus*
cu-s	...	*cumulo-stratus*
d	...	*dew*
h-d	...	*heavy dew*
f	...	*fog*
sl-f	...	*slight fog*
th-f	...	*thick fog*
fr	...	*frost*
g	...	*gale*
h-g	...	*heavy gale*
glm	...	*gloom*
gt-glm	..	*great gloom*
h-fr	...	*hoar frost*
h	...	*haze*
hl	...	*hail*
so-ha	...	*solar halo*
l	...	*lightning*
li-cl	...	*light clouds*
lu-co	...	*lunar corona*
lu-ha	...	*lunar halo*
m	...	*meteor*
ms	...	*meteors*
mt	...	*mist*
n	denotes	*nimbus*
r	...	*rain*
th-r	...	*thin rain*
oc-r	...	*occasional rain*
oc-th-r	...	*occasional thin rain*
fr-r	...	*frozen rain*
h-r	...	*heavy rain*
shs-r	...	*showers of rain*
c-r	...	*continued rain*
c-h-r	...	*continued heavy rain*
m-r	...	*misty rain*
fr-m-r	...	*frequent misty rain*
oc-m-r	...	*occasional misty rain*
sl-r	...	*slight rain*
h-shs	...	*heavy showers*
fr-shs	...	*frequent showers*
fr-h-shs	...	*frequent heavy showers*
li-shs	...	*light showers*
oc-shs	...	*occasional showers*
oc-h-shs	...	*occasional heavy showers*
sq	...	*squall*
sqs	...	*squalls*
fr-sqs	...	*frequent squalls*
h-sqs	...	*heavy squalls*
fr-h-sqs	...	*frequent heavy squalls*
oc-sqs	...	*occasional squalls*
sc	...	*scud*

li-sc	denotes *light scud*	t-s	denotes *thunder storm*
sl	... *sleet*	th-cl	... *thin clouds*
sn	... *snow*	v	... *variable*
oc-sn	... *occasional snow*	vv	... *very variable*
sl-sn	... *slight snow*	w	... *wind*
s	... *stratus*	st-w	... *strong wind*
t	... *thunder*		

The foot-notes show the means and extremes of readings, and their departure in each month from average values, as found from the preceding Twenty-eight Years' Observations; those relating to Humidity have been calculated from the Fourth Edition of Glaisher's Hygrometrical Tables.

§ 26. *Observations of Luminous Meteors.*

In arranging for the observations of meteors, the directions circulated by the Committee of the British Association have received the most careful attention. The observers have been educated in the knowledge of the principal stars by observations of the stars themselves, and by means of globes and maps. The general instruction to all observers has been, to look out for meteors on every clear night; but the observer specially appointed for the evening's duties has been more particularly charged with this observation.

On the nights specially mentioned in the directions of the British Association Committee, greater attention was given to the sky, and the observations of meteors were made more systematically. The principal nights are, January 2 and 10; February 6; March 1; April 19; May 18; June 6 and 20; July 17, 20, and 29; August 3, August 7–13; September 10; October 1 and 23; November 9–14, November 19, 28, and 30; December 8–14, especially December 11. A more extended list of days has been published by the British Association Committee.

Special arrangements were made in the August period for observing till the morning; and in the November period for observing through the night, one or two observers being on duty till midnight, and then all the observers till daybreak. The observers were so stationed as to command different views of the sky, to secure observation of all the meteors which might present themselves, and to guard against the observation of the same meteor by different observers.

The observers in the year 1869 were Mr. Nash, Mr. Wright, Mr. Schultz, Mr. Marriott, and Mr. J. Barber. Their observations are distinguished by the initials N., W., S., M., and J. B., respectively.

§ 27. *Details of the Chemical Operations for the Photographic Records.*

Mr. Glaisher has drawn up the following account of the Chemical Processes employed in the Photographic Operations for the self-registration of the Magnetical and Meteorological Indications.

CHEMICAL PREPARATION AND TREATMENT OF THE PHOTOGRAPHIC PAPER FOR PRIMARIES.

The paper used is similar to that made by Whatman; it is made by his successor Hollingsworth; it is strong and of even texture, and is prepared expressly for Photographic purposes.

First Operation.—Preliminary Preparation of the Paper.

The chemical solutions used in this process are the following:—

(1.) Sixteen grains of Iodide of Potassium are dissolved in one ounce of distilled water.

(2.) Twenty-four grains of Bromide of Potassium are dissolved in one ounce of distilled water.

(3.) When the crystals are dissolved, the two solutions are mixed together, forming the iodising solution. The mixture will keep through any length of time. Immediately before use, it is filtered through filtering paper.

A quantity of the paper, sufficient for the consumption of several weeks, is treated in the following manner, sheet after sheet.

> The sheet of paper is pinned by its four corners to a horizontal board. Upon the paper, a sufficient quantity (about 50 minims, or $\frac{5}{48}$ of an ounce troy) of the iodising solution is applied, by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution. Or, the solution may be evenly distributed by means of a camel-hair brush.

The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer, and may be kept through any length of time.

Second Operation.—Rendering the Paper sensitive to the Action of Light.

A solution of Nitrate of Silver is prepared by dissolving 50 grains of crystallized Nitrate of Silver in one ounce of distilled water. Since the magnetic basement has been used for photography, 15 grains of Acetic Acid have always been added to the solution.

Then the following operation is performed in a room illuminated by yellow light.

> The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod, as before,) its surface is wetted with 50 minims of the Nitrate of Silver solution. It is allowed to remain a short time in a horizontal position, and, if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting paper.

The paper, still damp, is immediately placed upon the cylinder, and is covered by the exterior glass tube, and the cylinder is mounted upon the revolving apparatus, to receive the spot of light formed by the mirror, which is carried by the magnet; or to receive the line of light passing through the thermometer tube.

Third Operation.—Development of the Photographic Trace.

When the paper is removed from the cylinder, it is placed as before upon a board, and a saturated solution of Gallic Acid, to which a few drops of Aceto-Nitrate of Silver are occasionally added, is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. The solutions are kept in the magnetic basement, and are always used at the temperature of that room. When the trace is well developed, the paper is placed in a vessel with water, and repeatedly washed with several waters; a brush being passed lightly over both sides of the paper to remove any crystalline deposit.

Fourth Operation.—Fixing the Photographic Trace.

The Photograph is placed in a solution of Hyposulphite of Soda, made by dissolving four or five ounces of the Hyposulphite in a pint of water; it is plunged completely in the liquid, and allowed to remain from one to two hours, until the yellow tint of the Iodide of Silver is removed. After this the sheet is washed repeatedly with water, allowed to remain immersed in water for 24 hours, and afterwards placed within folds of cotton cloths till nearly dry. Finally it is placed between sheets of blotting-paper, and is pressed.

CHEMICAL PREPARATION AND TREATMENT OF THE PHOTOGRAPHIC PAPER FOR SECONDARIES.

Before taking a Secondary, the Primary is examined to ascertain whether the tint of the photographic curve is sufficiently dark. If it is not, the Primary is laid, face downwards, upon a desk of transparent plate-glass, below which is a large silvered plane mirror, so placed that the light from the sky is reflected upwards through the transparent glass and through the Primary; and the photographic curve is seen from the upper side or back with perfect distinctness. An assistant then darkens the back of the photographic curve by the application of sepia; the original photograph being untouched.

The paper used for the Secondaries is made by Rive; it is a strong wove paper, of tolerably even texture, thin, but able to bear a great deal of wear.

First Operation.—Preliminary Preparation of the Paper.

The chemical solution required for this purpose is as follows:—

Two grains of Chloride of Ammonium are dissolved in one ounce of distilled water. A sufficient quantity of this solution is placed in a flat-bottomed porcelain dish, and sheets of paper, one by one, are plunged within it; care being taken that no air bubbles remain between the paper and the solution; this may be prevented by slight pressure over the sheet by means of a bent glass rod. When a few sheets are thus immersed, they are turned over, and are taken out and hung to dry. Any number of sheets may thus be prepared.

An equally good result is obtained, by spreading over one side by means of a glass rod, as in the preparation of the Primaries, a solution of Chloride of Ammonium made by dissolving five grains of the chloride in one ounce of distilled water.

Second Operation.—Rendering the Paper sensitive to the Action of Light.

The solution required for this purpose is as follows:—

To a filtered solution of Nitrate of Silver (made by dissolving 50 grains of Crystallized Nitrate of Silver in one ounce of distilled water) some strong solution of Ammonia is added; the whole becomes at first of a dark brown colour, but when a sufficient quantity of Ammonia is added the solution becomes perfectly clear; a few crystals of Nitrate of Silver are then added till the solution is a little dull, forming "Ammoniacal Nitrate of Silver"; it is then ready for use.

The following operation is performed in a room illuminated by yellow light:—

By means of a glass rod this solution is spread over the paper, whilst pinned on a board; the paper is dried before a fire, and is then in a fit state to be used for producing a Secondary.

Third Operation.—Formation of the Photographic Copy.

A sheet of the paper so prepared is placed in a printing frame with its prepared side upwards, upon a bed of blotting paper resting upon a sheet of plate-glass; the Primary is then placed on the paper with its own face downwards; and as it is necessary, for obtaining a correct copy of the Primary, that it should be in close contact with the prepared surface, a second sheet of plate-glass is placed over it, and the two are pressed together by clamps and screws. The whole is then exposed to the light (the Primary to be copied being above the paper on which the copy is to be made). The time required to produce a copy depends, in a great measure, upon the thickness of the paper on which the Primary is made, and on the actinic quality of the light; a period of five minutes in a bright sunshine, or one hour in clear daylight, is generally sufficient.

Fourth Operation.—Fixing the Photographic Secondary.

When an impression has been thus obtained, it is necessary that the undecomposed Salts of Silver remaining in the paper be removed.

For this purpose the Secondary is at once plunged into water and well washed on both sides, passing a camel-hair brush over every part of it; it is then plunged into a solution of Hyposulphite of Soda (made by dissolving two or three ounces of the Hyposulphite in a pint of water), and is left through a period varying from half an hour to an hour. It is then removed, and washed in plain water several times; and running water is allowed to pass over it for twenty-four hours.

The sheets are then placed within the folds of drying cloths, till nearly dry, and finally between sheets of blotting paper.

The process of obtaining a Tertiary from a Secondary is in every respect the same as that of obtaining a Secondary from a Primary.

§ 28. *Personal Establishment.*

The personal establishment during the year 1869 has consisted of James Glaisher, Esq., F.R.S., Superintendent of the Magnetical and Meteorological Department, and Mr. William Carpenter Nash, Assistant.

Three or four computers have usually been attached to the Department.

Royal Observatory, Greenwich,
1870, October 24.

G. B. AIRY.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

MAGNETICAL OBSERVATIONS.

1869.

ROYAL OBSERVATORY, GREENWICH.

REDUCTION

OF THE

MAGNETIC OBSERVATIONS

(EXCLUDING THE DAYS OF GREAT MAGNETIC DISTURBANCE).

1869.

TABLE I.—MEAN WESTERLY DECLINATION of the MAGNET on each ASTRONOMICAL DAY, as deduced from the MEAN of TWENTY-FOUR HOURLY MEASURES of ORDINATES of the PHOTOGRAPHIC REGISTER on that DAY.

1869.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°
d	′	′	′	′	′	′	′	′	′	′	′	′
1	..	68·7	67·4	67·9	66·7	64·5	64·5	63·2	62·1	59·3	..	58·6
2	69·3	..	..	..	66·5	64·8	63·4	63·0	63·3	60·4	..	58·7
3	69·	..	..	67·7	66·0	64·8	64·7	62·4	..	60·4	..	58·4
4	68·4	68·3	68·3	66·2	68·8	64·3	65·4	63·7	60·7	61·5	..	58·0
5	68·9	..	69·0	66·5	67·1	..	..	64·3	60·5	61·6	..	..
6	68·9	68·3	67·7	66·6	66·1	..	..	..	62·3	..	..	58·3
7	68·4	67·8	67·9	65·1	65·9	..	63·6	63·7	61·2	61·8	..	58·7
8	69·3	68·4	68·1	67·6	67·4	64·8	64·4	63·4	62·0	60·7	..	58·6
9	68·4	68·2	..	66·0	65·9	65·3	65·5	63·1	61·4	60·5	57·5	58·6
10	69·3	68·2	..	67·1	65·5	65·9	64·3	62·9	62·6	60·7	..	59·9
11	69·1	67·1	69·0	66·5	65·7	68·1	63·1	63·6	..	61·3	59·2	..
12	68·3	66·8	68·3	67·0	65·7	65·5	63·6	63·9	60·4	59·7	58·5	..
13	68·9	68·4	67·5	66·6	..	65·8	64·4	63·4	..	61·5	58·7	..
14	68·9	68·0	66·9	67·0	65·9	66·9	63·1	63·5	61·2	61·0	59·1	..
15	69·2	68·1	67·3	..	67·3	66·7	62·6	64·5	62·1	61·2	58·5	..
16	68·7	68·7	68·6	..	65·8	65·9	62·9	65·4	61·6	61·1	58·6	58·2
17	67·6	68·2	68·3	66·9	65·3	65·1	63·9	64·2	61·7	60·8	60·6	58·7
18	69·4	67·6	..	66·9	66·1	65·6	62·5	62·8	60·8	60·0	58·9	58·3
19	69·5	68·4	68·0	66·8	66·1	63·8	64·5	62·6	61·6	61·3	58·9	58·3
20	..	67·8	67·9	66·9	66·1	63·9	64·3	62·2	61·2	60·2	58·4	58·6
21	..	68·6	67·8	66·1	65·5	64·6	63·7	63·4	60·6	61·5	57·4	58·7
22	69·0	..	68·1	66·0	65·5	64·4	64·6	64·1	62·3	61·2	58·6	..
23	69·0	68·8	67·8	66·1	66·5	64·4	64·0	63·7	61·7	61·5	58·6	58·0
24	69·1	67·5	68·2	66·6	65·9	63·2	63·1	..	61·4	60·0	58·9	58·1
25	69·9	68·1	68·3	66·7	65·2	65·7	64·6	63·4	61·8	..	58·2	58·4
26	69·3	68·2	67·8	65·8	65·4	64·0	63·9	63·0	60·3	60·1	58·6	58·4
27	68·9	68·3	67·3	67·1	65·6	63·6	63·6	62·9	..	59·7	58·7	58·4
28	68·3	67·9	66·5	66·3	63·9	64·0	63·1	63·4	60·0	60·0	58·3	58·2
29	68·7		68·0	67·4	65·0	..	63·6	63·3	..	59·3	58·3	..
30	69·4		68·0	66·2	65·7	..	63·6	62·5	61·1	59·6	57·7	56·6
31	69·0		66·2		65·5		63·4	63·6		..		55·9

TABLE II.—MEAN MONTHLY DETERMINATION of the WESTERN DECLINATION of the MAGNET at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through the MONTH.

1869.

Hour, Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°	19°
h	′	′	′	′	′	′	′	′	′	′	′	′
0	71·2	72·5	73·6	72·8	71·8	70·2	68·9	69·6	68·6	66·0	62·6	60·8
1	72·1	73·1	75·1	74·6	73·1	71·6	70·7	71·0	69·4	66·8	63·4	61·5
2	72·6	73·3	74·9	74·6	72·5	72·2	71·5	70·9	68·7	66·5	63·0	60·9
3	71·5	71·9	73·3	73·0	71·2	71·1	70·5	69·1	66·5	65·2	61·7	60·5
4	70·3	70·1	71·3	71·0	69·5	69·8	68·6	67·0	64·3	63·7	61·0	59·9
5	70·0	69·2	69·5	68·9	67·8	67·9	67·1	65·0	62·3	61·8	59·6	59·1
6	69·4	68·2	68·0	67·0	66·3	66·3	65·5	63·7	60·9	60·6	59·4	58·8
7	69·0	67·3	66·6	64·8	65·5	65·4	64·9	63·3	60·4	59·3	57·9	58·1
8	67·9	66·4	66·2	64·6	65·5	64·5	64·5	63·1	59·9	59·1	57·3	57·5
9	66·6	66·2	65·1	64·4	65·2	64·4	63·5	62·6	59·5	58·1	56·4	56·7
10	66·5	65·5	65·3	64·3	65·4	64·5	62·9	62·1	59·2	58·0	55·7	55·9
11	66·6	65·3	65·5	64·5	65·4	64·1	62·6	61·8	59·3	57·8	56·1	56·1
12	66·0	65·1	65·9	65·2	64·5	63·9	62·2	60·8	59·0	58·3	56·3	56·4
13	66·8	66·0	65·7	65·0	64·5	63·8	62·2	60·3	58·5	58·6	56·6	56·3
14	67·6	66·8	65·3	65·2	64·2	63·9	61·2	60·6	59·0	58·4	56·8	56·3
15	68·5	67·0	65·5	64·5	63·8	63·1	60·6	60·5	59·5	59·2	57·2	57·3
16	68·5	66·9	66·1	64·4	63·0	61·8	60·8	60·7	59·3	59·1	57·6	57·3
17	68·3	67·7	65·8	64·0	61·9	60·2	59·5	60·5	59·2	59·2	57·8	57·6
18	68·9	67·6	66·1	63·6	61·3	59·2	58·6	59·3	58·1	59·0	57·7	57·5
19	68·6	67·4	65·8	62·8	61·2	58·9	58·3	58·9	57·9	58·8	57·9	57·7
20	68·8	66·8	65·2	62·4	61·7	59·4	59·0	59·4	58·2	58·2	57·8	57·8
21	68·5	66·7	65·6	63·1	63·3	61·1	60·4	61·2	59·4	58·6	57·7	58·2
22	69·4	67·9	67·6	65·7	66·0	63·9	62·8	63·9	62·0	61·1	59·1	59·4
23	70·4	70·0	71·0	69·2	69·1	67·2	65·8	66·7	65·4	63·6	61·2	60·4

TABLE III.

1869.		
Month.	MEAN WESTERLY DECLINATION of the MAGNET IN EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each MONTH (Table II.).	MONTHLY MEANS of all the Actual DIURNAL RANGES of the WESTERN DECLINATION, as deduced from the Twenty-four Hourly Measures of each day.
	° ′	′
January	20. 8·9	8·8
February	20. 8·1	11·6
March	20. 7·9	13·9
April	20. 6·7	15·5
May	20. 6·0	14·2
June	20. 4·9	14·1
July	20. 3·9	14·9
August	20. 3·4	14·5
September	20. 1·4	15·3
October	20. 0·6	11·9
November	19. 58·7	10·2
December	19. 58·3	6·8
Mean	20. 4·1	12·6

TABLE IV.—MEAN HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly) on each ASTRONOMICAL DAY, as deduced from the MEAN of TWENTY-FOUR HOURLY MEASURES of ORDINATES of the PHOTOGRAPHIC REGISTER on that DAY.

1869.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d												
1	0·1426	0·1435	0·1429	0·1429	0·1435	0·1450	0·1431	0·1415	0·1421	0·1412	..	0·1464
2	·1427	..	..	..	·1436	·1449	·1433	·1416	·1409	·1415	..	·1464
3	·1444	..	..	·1424	·1441	·1446	·1432	·1422	..	·1412	..	·1460
4	·1443	·1418	·1431	·1423	·1429	·1442	·1421	·1420	·1409	·1413	..	·1453
5	·1444	..	·1435	·1427	·1422	..	·1429	·1416	·1401	·1417	..	·1445
6	·1443	·1423	·1434	·1427	·1443	..	..	..	·1409	..	..	·1453
7	·1439	·1424	·1425	·1436	·1427	..	·1427	·1414	·1407	·1411	..	·1457
8	·1442	·1431	·1431	·1423	·1426	·1412	·1429	·1413	·1410	·1416	..	·1463
9	·1445	·1424	..	·1420	·1424	·1418	·1420	·1403	·1407	·1414	0·1442	·1467
10	·1437	·1428	..	·1425	·1428	·1425	·1421	·1416	·1405	·1414	..	·1470
11	·1441	·1426	·1427	·1423	·1419	·1430	·1420	·1415	..	·1413	·1452	..
12	·1444	·1429	·1430	·1427	·1413	·1424	·1420	·1419	·1406	·1415	·1450	..
13	·1439	·1426	·1435	·1424	..	·1428	·1432	·1411	..	·1410	..	..
14	·1441	·1430	·1437	·1430	·1408	·1424	·1433	·1421	·1405	·1408	·1460	..
15	·1441	·1433	·1435	..	·1422	·1424	·1432	·1423	·1410	·1410	·1461	·1452
16	·1442	·1432	·1437	..	·1427	·1433	·1434	·1406	·1409	·1410	·1463	·1464
17	·1440	·1434	·1434	·1414	·1430	·1434	·1425	·1407	·1418	·1411	·1452	·1469
18	·1441	·1431	..	·1420	·1435	·1437	·1417	·1413	·1412	·1428	·1451	·1478
19	·1431	·1432	·1434	·1423	·1438	·1434	·1418	·1416	·1408	·1426	·1457	·1472
20	..	·1427	·1434	·1429	·1438	·1432	·1419	·1404	·1408	·1422	·1456	·1474
21	..	·1433	·1434	·1427	·1439	·1436	·1422	·1410	·1411	·1422	·1456	·1470
22	·1434	..	·1435	·1422	·1439	·1443	·1424	·1417	·1413	·1420	·1453	..
23	·1439	·1426	·1433	·1428	·1439	·1447	·1418	·1414	·1414	·1414	·1455	·1471
24	·1434	·1427	·1436	·1430	·1435	·1447	·1424	..	·1422	·1419	·1454	·1470
25	·1438	·1428	·1441	·1430	·1439	·1434	·1424	·1409	·1417	..	·1442	·1467
26	·1443	·1433	·1433	·1427	·1441	·1435	·1419	·1415	·1413	·1418	·1456	·1465
27	·1441	·1431	·1428	·1422	·1440	·1441	·1418	·1406	..	·1418	·1458	·1456
28	·1426	·1431	·1430	·1427	·1440	·1432	·1430	·1394	·1408	·1419	·1460	·1461
29	·1436		·1427	·1434	·1429	..	·1422	·1404	..	·1418	·1466	·1464
30	·1434		·1432	·1430	·1432	..	·1420	·1412	·1412	·1423	·1460	·1467
31	·1439		·1427		·1438		·1421	·1420		..		..

TABLE V.—MEAN MONTHLY DETERMINATION of the HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly), uncorrected for TEMPERATURE, at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through each MONTH.

1869.

Hour, Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
h 0	0·1432	0·1421	0·1421	0·1411	0·1422	0·1419	0·1411	0·1399	0·1395	0·1404	0·1444	0·1460
1	·1435	·1424	·1428	·1418	·1427	·1427	·1417	·1404	·1401	·1409	·1449	·1463
2	·1436	·1425	·1432	·1424	·1430	·1435	·1422	·1409	·1407	·1412	·1451	·1464
3	·1437	·1427	·1435	·1429	·1436	·1439	·1427	·1413	·1410	·1413	·1450	·1464
4	·1438	·1429	·1436	·1430	·1439	·1442	·1430	·1418	·1412	·1414	·1452	·1463
5	·1439	·1431	·1436	·1433	·1442	·1446	·1434	·1420	·1416	·1415	·1456	·1465
6	·1442	·1431	·1437	·1436	·1446	·1450	·1435	·1421	·1416	·1419	·1457	·1466
7	·1441	·1432	·1438	·1435	·1444	·1451	·1439	·1421	·1417	·1420	·1458	·1467
8	·1439	·1432	·1438	·1433	·1440	·1449	·1435	·1421	·1418	·1418	·1459	·1466
9	·1439	·1431	·1438	·1434	·1439	·1442	·1435	·1421	·1418	·1420	·1458	·1464
10	·1437	·1431	·1438	·1433	·1438	·1440	·1433	·1421	·1420	·1421	·1458	·1465
11	·1437	·1430	·1435	·1434	·1437	·1439	·1430	·1419	·1420	·1421	·1457	·1463
12	·1438	·1429	·1437	·1433	·1435	·1436	·1430	·1419	·1417	·1421	·1457	·1462
13	·1437	·1429	·1435	·1431	·1434	·1436	·1429	·1418	·1416	·1421	·1455	·1462
14	·1438	·1429	·1434	·1430	·1435	·1436	·1427	·1417	·1416	·1419	·1456	·1464
15	·1439	·1430	·1433	·1429	·1433	·1435	·1427	·1418	·1415	·1420	·1456	·1464
16	·1441	·1430	·1433	·1428	·1432	·1436	·1426	·1417	·1415	·1421	·1456	·1467
17	·1442	·1432	·1435	·1426	·1431	·1433	·1427	·1416	·1416	·1422	·1458	·1469
18	·1443	·1434	·1433	·1427	·1427	·1429	·1425	·1415	·1414	·1422	·1459	·1468
19	·1444	·1433	·1432	·1423	·1422	·1424	·1419	·1412	·1410	·1419	·1458	·1466
20	·1441	·1431	·1428	·1418	·1420	·1418	·1414	·1405	·1402	·1414	·1455	·1463
21	·1438	·1427	·1422	·1413	·1417	·1414	·1407	·1398	·1396	·1409	·1449	·1462
22	·1435	·1424	·1418	·1408	·1416	·1413	·1405	·1394	·1392	·1404	·1447	·1459
23	·1432	·1420	·1417	·1408	·1417	·1415	·1407	·1394	·1393	·1403	·1445	·1459

The Thermometer on the box inclosing the Horizontal Force Magnetometer was read generally nine times every day. The means of the readings taken for the same nominal hour through each month show no sensible Mean Diurnal Inequality of Temperature.

TABLE VI.

1869.

Month.	MEAN HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly) IN EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each MONTH (Table V.), uncorrected for Temperature.	Mean Temperature.
		°
January	0·1438	60·6
February	·1429	60·6
March	·1432	60·7
April	·1426	60·9
May	·1432	60·7
June	·1433	61·7
July	·1425	65·1
August	·1413	65·4
September	·1411	65·3
October	·1416	63·1
November	·1454	61·1
December	·1464	60·8

TABLE VII.—MEAN VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) on each ASTRONOMICAL DAY, as deduced from the MEAN of TWENTY-FOUR HOURLY MEASURES of ORDINATES of the PHOTOGRAPHIC REGISTER on that DAY.

1869.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d 1	0·0380	0·0364	0·0354	0·0343	0·0328	0·0316	0·0317	0·0321	0·0266	0·0265	0·0222	0·0194
2	·0378	..	..	..	·0330	·0328	·0318	·0302	·0268	·0264	·0221	·0198
3	·0375	..	..	·0341	·0327	·0328	·0316	·0302	..	·0266	·0220	·0201
4	·0375	·0371	·0356	·0342	·0320	·0319	·0330	·0317	·0301	·0253	·0211	·0196
5	·0377	·0369	·0354	·0340	·0331	..	·0341	·0310	·0315	·0244	·0213	·0202
6	·0377	·0371	·0352	·0345	·0338	..	·0338	..	·0306	..	·0207	·0203
7	·0382	·0368	·0354	·0347	·0338	..	·0336	·0304	·0315	·0252	·0208	·0204
8	·0383	·0366	·0357	·0346	·0328	·0341	·0337	·0312	·0323	·0261	·0212	·0194
9	·0374	·0365	..	·0343	·0329	·0332	·0329	..	·0314	..	·0212	·0197
10	·0372	·0371	..	·0347	·0339	·0309	·0324	·0286	·0289	·0260	·0211	·0199
11	·0376	·0372	·0353	·0356	·0331	·0316	·0323	·0284	..	·0257	·0209	·0206
12	·0372	·0358	·0353	·0355	·0327	·0322	·0341	·0296	·0272	·0257	·0213	·0196
13	·0371	·0369	·0349	·0350	..	·0329	·0325	·0303	..	·0246	·0210	·0202
14	·0372	·0365	·0346	·0352	·0330	·0317	·0328	·0292	·0288	·0234	·0215	·0201
15	·0372	·0362	·0349	..	·0328	·0310	·0341	·0300	·0271	·0242	·0211	·0201
16	·0375	·0360	·0352	..	·0326	·0302	·0348	·0311	·0272	·0231	·0203	·0196
17	·0373	·0361	·0350	·0334	·0331	·0306	·0343	·0289	·0285	·0218	·0202	·0201
18	·0371	·0358	..	·0328	·0328	·0304	·0345	·0292	·0283	·0220	·0205	·0211
19	·0365	·0359	·0348	·0330	·0318	·0302	·0322	·0283	·0263	·0209	·0205	·0197
20	..	·0361	·0346	·0329	·0318	·0309	·0304	·0286	·0255	·0224	·0199	·0192
21	..	·0360	·0352	·0329	·0323	·0306	·0315	·0292	·0253	·0230	·0202	·0193
22	·0372	..	·0344	·0336	·0319	·0311	·0332	·0307	·0261	·0233	·0210	·0201
23	·0374	·0358	·0342	·0341	·0318	·0313	·0323	·0315	·0276	·0243	·0208	·0195
24	·0370	·0358	·0347	·0337	·0328	·0314	·0309	..	·0284	·0238	·0203	·0189
25	·0367	·0360	·0349	·0338	·0336	·0323	·0307	·0329	·0278	..	·0210	·0185
26	·0368	·0361	·0342	·0331	·0336	·0316	·0312	·0325	·0267	·0219	·0206	·0190
27	·0370	·0349	·0338	·0340	·0318	·0318	·0309	·0324	..	·0207	·0208	·0190
28	·0371	·0350	·0342	·0337	·0305	·0315	·0291	·0326	·0257	·0210	·0202	·0189
29	·0365		·0345	·0323	·0321	..	·0304	·0290	..	·0215	·0199	·0186
30	·0362		·0346	·0325	·0319	..	·0328	·0274	·0278	·0220	·0192	·0186
31	·0364		·0346		·0316		·0328	·0274		·0216		·0193

TABLE VIII.—MEAN MONTHLY DETERMINATION of the VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) uncorrected for TEMPERATURE, at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through each MONTH.

1869.

Hour. Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
h 0	0·0372	0·0359	0·0343	0·0333	0·0320	0·0310	0·0319	0·0297	0·0276	0·0235	0·0206	0·0193
1	·0373	·0361	·0345	·0336	·0323	·0314	·0323	·0301	·0280	·0237	·0207	·0194
2	·0374	·0362	·0347	·0340	·0326	·0317	·0327	·0305	·0283	·0239	·0209	·0195
3	·0374	·0363	·0349	·0342	·0328	·0320	·0330	·0309	·0286	·0241	·0209	·0195
4	·0374	·0363	·0350	·0344	·0330	·0323	·0333	·0312	·0287	·0243	·0210	·0196
5	·0374	·0363	·0351	·0346	·0332	·0325	·0336	·0314	·0288	·0243	·0211	·0198
6	·0374	·0364	·0351	·0346	·0332	·0326	·0338	·0314	·0288	·0242	·0211	·0200
7	·0373	·0365	·0352	·0346	·0331	·0326	·0339	·0314	·0288	·0242	·0211	·0200
8	·0373	·0365	·0352	·0345	·0330	·0326	·0338	·0312	·0287	·0241	·0211	·0200
9	·0373	·0365	·0352	·0344	·0328	·0324	·0336	·0310	·0286	·0240	·0210	·0200
10	·0372	·0364	·0351	·0342	·0327	·0322	·0333	·0308	·0284	·0238	·0209	·0199
11	·0372	·0364	·0352	·0341	·0328	·0322	·0330	·0306	·0283	·0239	·0209	·0199
12	·0373	·0364	·0351	·0341	·0328	·0320	·0328	·0304	·0282	·0238	·0209	·0198
13	·0373	·0363	·0351	·0340	·0328	·0319	·0324	·0302	·0281	·0237	·0208	·0198
14	·0372	·0363	·0350	·0339	·0327	·0317	·0322	·0300	·0280	·0237	·0208	·0197
15	·0372	·0363	·0350	·0338	·0326	·0316	·0319	·0297	·0280	·0237	·0208	·0197
16	·0372	·0362	·0349	·0338	·0326	·0315	·0317	·0296	·0279	·0236	·0208	·0196
17	·0372	·0362	·0348	·0337	·0326	·0314	·0314	·0294	·0278	·0236	·0208	·0195
18	·0372	·0362	·0348	·0337	·0325	·0313	·0313	·0292	·0277	·0235	·0208	·0195
19	·0372	·0362	·0348	·0337	·0324	·0312	·0313	·0291	·0276	·0235	·0207	·0195
20	·0372	·0361	·0347	·0336	·0323	·0312	·0314	·0291	·0276	·0234	·0206	·0194
21	·0372	·0361	·0346	·0335	·0322	·0311	·0315	·0291	·0275	·0234	·0206	·0194
22	·0371	·0359	·0344	·0333	·0320	·0310	·0316	·0292	·0275	·0233	·0205	·0193
23	·0371	·0358	·0343	·0332	·0319	·0309	·0317	·0293	·0274	·0232	·0204	·0193

The Thermometer on the box inclosing the Vertical Force Magnetometer was read generally nine times every day. The means of the readings taken for the same nominal hour through each month show no sensible Mean Diurnal Inequality of Temperature.

TABLE IX.

1869.

Month.	MEAN VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) in EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each Month (Table VIII.), uncorrected for Temperature.	Mean Temperature.
January	0·0373	60·7°
February	·0362	60·9
March	·0349	60·8
April	·0339	61·8
May	·0326	61·4
June	·0318	62·8
July	·0325	66·8
August	·0302	66·8
September	·0281	66·3
October	·0238	63·5
November	·0208	61·1
December	·0196	61·0

TABLE X.—MEAN, through the Range of Months, of the MONTHLY MEAN DETERMINATIONS of the DIURNAL INEQUALITIES of DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE for the Year 1869.

January to December.

Hour. Greenwich Mean Solar Time.	Declination.	Horizontal Force.	Vertical Force.
h	′		
0	+ 4·98	− 0·00112	− 0·00045
1	+ 6·13	− 59	− 19
2	+ 6·07	− 22	+ 6
3	+ 4·73	+ 6	+ 24
4	+ 3·14	+ 25	+ 40
5	+ 1·62	+ 50	+ 53
6	+ 0·44	+ 69	+ 58
7	− 0·53	+ 75	+ 58
8	− 1·02	+ 63	+ 52
9	− 1·67	+ 55	+ 42
10	− 1·96	+ 52	+ 27
11	− 1·98	+ 41	+ 23
12	− 2·10	+ 34	+ 16
13	− 2·04	+ 25	+ 6
14	− 1·96	+ 23	− 4
15	− 1·84	+ 22	− 12
16	− 1·94	+ 24	− 19
17	− 2·26	+ 28	− 28
18	− 2·66	+ 19	− 33
19	− 2·88	− 9	− 37
20	− 2·84	− 53	− 43
21	− 2·07	− 101	− 46
22	0·00	− 132	− 55
23	+ 2·60	− 136	− 60

ROYAL OBSERVATORY, GREENWICH.

INDICATIONS

OF

MAGNETOMETERS

ON TWENTY-SEVEN DAYS OF GREAT MAGNETIC DISTURBANCE.

1869.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Jan. 20		Jan. 20		Jan. 20		Jan. 20		
h m	° ′ ″	h m		h m		h m	°	°
0. 0	20. 19. 45	0. 0	·1402	0. 0	·03640	0. 0	60·5	60·5
0. 5	18. 10	0. 6	·1404	0. 10	·03661	1. 0	60·2	60·4
0. 9	17. 45	0. 11	·1399	0. 21	·03659	3. 0	60·7	60·8
0. 13	22. 55	0. 18	·1405	0. 32	·03679	6. 0	60·8	61·0
0. 23	19. 55	0. 32	·1385	0. 37	·03702	9. 0	60·7	60·7
0. 27	16. 5	0. 37	·1388	0. 41	·03699	21. 0	61·4	61·8
0. 36	16. 0	0. 38	·1386	0. 50	·03700	22. 0	61·0	60·9
0. 42	21. 15	0. 49	·1406	0. 53	·03716	23. 0	60·7	60·5
0. 47	20. 40	1. 6	·1399	0. 58	·03702			
0. 51	22. 20	1. 23	·1408	1. 2	·03716			
0. 57	22. 10	1. 35	·1402	1. 8	·03717			
0. 59	23. 10	1. 38	·1404	1. 13	·03725			
1. 2	19. 50	1. 50	·1393	1. 48	·03755			
1. 12	19. 50	1. 52	·1395	2. 3	·03795			
1. 22	23. 25	1. 59	·1384	2. 20	·03818			
1. 37	23. 0	2. 5	·1388	2. 33	·03787			
1. 40	24. 5	2. 12	·1392	2. 40	·03797			
1. 42	23. 30	2. 15	·1388	2. 43	·03790			
1. 52	26. 0	2. 27	·1400	2. 58	·03809			
2. 2	26. 0	2. 40	·1375	3. 13	·03787			
2. 7	25. 0	2. 45	·1379	3. 32	·03800			
2. 20	24. 20	2. 48	·1375	3. 55	·03793			
2. 27	21. 55	3. 4	·1401	4. 4	·03778			
2. 38	15. 0	3. 13	·1390	4. 23	·03765			
2. 47	13. 0	3. 20	·1392	4. 35	·03770			
3. 2	21. 30	3. 25	·1390	5. 4	·03758			
3. 16	17. 25	3. 38	·1398	5. 23	·03766			
3. 23	15. 55	3. 46	·1407	5. 42	·03756			
3. 27	16. 5	3. 58	·1413	6. 32	·03750			
3. 38	13. 45	4. 6	·1407	6. 43	·03755			
3. 42	13. 40	4. 15	·1412	6. 57	·03749			
3. 46	13. 0	4. 24	·1408	7. 14	·03742			
3. 53	13. 55	4. 40	·1415	7. 40	·03745			
4. 10	12. 20	4. 56	·1414	9. 31	·03730			
4. 22	11. 20	5. 8	·1411	9. 36	·03733			
4. 31	11. 25	5. 28	·1415	9. 40	·03725			
4. 39	12. 0	5. 39	·1413	10. 31	·03740			
5. 10	10. 25	5. 51	·1415	11. 18	·03770			
5. 29	11. 45	6. 5	·1414	11. 38	·03778			
5. 53	11. 20	6. 17	·1415	11. 48	·03780			
6. 10	10. 35	6. 26	·1413	12. 3	·03778			
6. 17	10. 40	6. 35	·1413	12. 20	·03785			
6. 33	9. 35	6. 44	·1417	12. 32	·03765			
6. 46	9. 30	6. 50	·1415	12. 36	·03770			
7. 4	9. 0	7. 7	·1414	12. 40	·03762			
7. 29	8. 20	7. 17	·1413	12. 46	·03772			
8. 7	8. 20	7. 37	·1415	12. 52	·03772			
8. 13	8. 0	8. 8	·1413	13. 3	·03743			
9. 30	8. 0	8. 42	·1413	13. 33	·03721			
10. 8	7. 5	8. 53	·1416	14. 28	·03772			
10. 22	6. 45	9. 8	·1412	14. 43	·03770			
10. 59	4. 30	9. 25	·1416	14. 53	·03756			
11. 40	5. 30	9. 32	·1413	15. 16	·03742			
11. 46	5. 5	9. 39	·1418	15. 25	·03750			
11. 52	5. 55	9. 46	·1411	15. 40	·03740			
12. 24	20. 4. 20	9. 48	·1414	15. 57	·03744			
12. 39	19. 49. 25	9. 55	·1410	16. 3	·03733			
12. 47	19. 52. 45	10. 0	·1414	16. 15	·03745			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Jan. 20		Jan. 20		Jan. 20				
h m	° ′ ″	h m		h m		h m	°	°
12. 58	20. 5. 5	10. 10	·1411	16. 30	·03739			
13. 10	7. 55	10. 24	·1413	16. 42	·03743			
13. 19	6. 0	10. 53	·1405	16. 57	·03739			
13. 35	7. 0	11. 8	·1403	17. 5	·03730			
13. 50	3. 30	11. 33	·1403	17. 15	·03744			
14. 10	20. 0. 30	11. 45	·1405	17. 37	·03752			
14. 21	19. 58. 20	12. 2	·1401	17. 48	·03763			
14. 30	58. 5	12. 16	·1395	18. 22	·03762			
14. 34	59. 0	12. 26	·1413	18. 40	·03775			
14. 40	19. 59. 0	12. 35	·1430	18. 46	·03770			
14. 50	20. 1. 0	12. 40	·1423	19. 3	·03782			
15. 0	0. 25	12. 45	·1428	19. 24	·03790			
15. 10	1. 20	12. 54	·1430	19. 30	·03784			
15. 16	20. 0. 30	13. 10	·1421	20. 2	·03798			
15. 24	19. 59. 10	13. 17	·1417	20. 6	·03790			
15. 30	59. 35	13. 36	·1399	20. 17	·03806			
15. 41	56. 45	13. 57	·1393	20. 34	·03815			
15. 48	54. 55	14. 6	·1391	20. 38	·03810			
15. 58	54. 0	14. 19	·1399	20. 42	·03818			
16. 3	54. 50	14. 27	·1407	20. 51	·03822			
16. 10	53. 50	14. 40	·1410	20. 57	·03815			
16. 20	55. 30	14. 46	·1406	21. 1	·03828			
16. 36	19. 58. 30	14. 50	·1407	21. 8	·03820			
17. 0	20. 6. 30	15. 1	·1402	21. 26	·03822			
17. 10	4. 20	15. 13	·1400	21. 35	·03814			
17. 20	5. 45	15. 25	·1407	22. 10	·03826			
17. 24	5. 40	15. 32	·1412	22. 16	·03812			
17. 31	6. 10	15. 37	·1409	22. 45	·03808			
17. 45	6. 0	15. 55	·1417	22. 52	·03812			
17. 51	7. 20	16. 4	·1410	23. 16	·03807			
18. 0	7. 40	16. 15	·1410	23. 25	·03811			
18. 7	7. 5	16. 27	·1406	23. 28	·03804			
18. 17	7. 50	16. 37	·1407	23. 40	·03814			
18. 26	7. 30	16. 50	·1403	23. 53	·03808			
18. 37	9. 20	17. 1	·1395	23. 59	·03817			
18. 50	8. 30	17. 26	·1416					
19. 1	9. 50	17. 28	·1414					
19. 3	10. 50	17. 33	·1419					
19. 9	9. 40	17. 37	·1417					
19. 27	13. 35	17. 45	·1424					
19. 32	13. 5	17. 50	·1422					
19. 40	13. 25	18. 0	·1426					
19. 45	14. 30	18. 7	·1428					
19. 57	11. 40	18. 16	·1426					
20. 0	12. 0	18. 21	·1428					
20. 8	9. 55	18. 31	·1425					
20. 12	10. 40	18. 36	·1424					
20. 21	12. 0	18. 46	·1419					
	(†)	18. 51	·1415					
20. 37	16. 5	18. 57	·1417					
20. 40	15. 20	19. 2	·1414					
20. 49	20. 25	19. 9	·1416					
20. 51	19. 40	19. 14	·1418					
20. 53	21. 25	19. 27	·1409					
21. 2	19. 40	19. 48	·1394					
21. 3	22. 0	19. 51	·1395					
21. 12	19. 20	20. 0	·1382					
21. 31	17. 40	20. 9	·1390					
			(†)					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Jan. 20		Jan. 20						
h m	° ′ ″	h m		h m		h m	°	°
21. 33	20. 18. 0	20. 36	·1383					
21. 47	14. 40	20. 40	·1387					
21. 50	15. 10	20. 47	·1382					
	***	20. 56	·1378					
22. 16	14. 50	21. 0	·1388					
22. 21	13. 10	21. 4	·1382					
22. 31	17. 0	21. 12	·1397					
22. 37	16. 5	21. 25	·1401					
22. 46	16. 10	21. 35	·1392					
22. 50	15. 25	21. 42	·1387					
23. 0	16. 10	21. 47	·1390					
23. 5	15. 30	21. 50	·1386					
23. 19	15. 30	21. 53	·1389					
23. 26	18. 5	21. 56	·1385					
23. 32	17. 0	22. 0	·1387					
23. 49	24. 25	22. 2	·1384					
23. 59	23. 15	22. 8	·1391					
		22. 14	·1384					
		22. 17	·1392					
		22. 25	·1386					
		22. 38	·1376					
		22. 47	·1381					
		22. 49	·1377					
		23. 0	·1383					
		23. 6	·1381					
		23. 16	·1384					
		23. 26	·1391					
		23. 31	·1389					
		23. 40	·1396					
		23. 57	·1387					
		23. 59	·1384					
Jan. 21		Jan. 21		Jan. 21		Jan. 21		
0. 0	20. 23. 15	0. 0	·1384	0. 0	·03817	0. 0	61·0	60·8
0. 14	20. 55	0. 8	·1388	0. 23	·03882	1. 0	60·9	60·9
0. 17	18. 30	0. 13	·1384	0. 31	·03910	2. 0	60·8	60·7
0. 20	19. 10	0. 25	·1392	0. 38	·03914	3. 0	60·8	60·8
0. 28	16. 45	0. 32	·1397	0. 43	·03901	6. 0	61·1	61·1
0. 31	17. 0	0. 40	·1400	0. 47	·03910	9. 0	61·0	60·9
0. 39	13. 15	0. 50	·1413	0. 57	·03890	21. 0	60·7	60·7
0. 40	13. 45	1. 0	·1417	1. 40	·03850	22. 0	60·7	60·7
0. 47	10. 0	1. 27	·1422	1. 56	·03845	23. 0	60·7	60·7
0. 50	11. 0	1. 48	·1414	2. 3	·03854			
0. 56	9. 55	1. 57	·1414	2. 20	·03855			
1. 0	10. 25	2. 15	·1416	2. 31	·03835			
1. 7	9. 20	2. 26	·1410	2. 50	·03839			
1. 25	13. 20	2. 29	·1405	2. 57	·03837			
1. 32	13. 30	2. 38	·1400	3. 8	·03845			
1. 42	16. 0	2. 43	·1400	3. 46	·03845			
1. 47	15. 30	2. 48	·1397	4. 18	·03821			
1. 51	16. 0	2. 55	·1389	4. 32	·03833			
1. 59	16. 0	3. 4	·1397	4. 50	·03833			
2. 6	18. 10	3. 13	·1403	5. 35	·03830			
2. 13	19. 5	3. 17	·1406	6. 32	·03819			
2. 22	19. 10	3. 29	·1409	6. 52	·03827			
2. 33	15. 20	3. 34	·1411	7. 17	·03820			
2. 49	18. 0	3. 39	·1408	7. 31	·03805			
2. 58	15. 0	3. 47	·1412	7. 42	·03820			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Jan. 21		Jan. 21		Jan. 21				
h m	° ′ ″	h m		h m		h m	°	°
3. 5	20. 12. 25	3. 57	·1413	8. 7	·03774			
3. 12	11. 20	4. 10	·1409	8. 25	·03790			
3. 21	11. 5	4. 20	·1413	8. 37	·03765			
3. 22	11. 45	4. 30	·1413	9. 4	·03730			
3. 30	11. 30	4. 45	·1409	9. 23	·03738			
3. 32	12. 0	4. 55	·1415	9 42	·03758			
3. 42	11. 15	4. 59	·1412	11. 45	·03770			
4. 3	13. 0	5. 10	·1418	11. 57	·03768			
4. 16	12. 30	5. 20	·1417					
4. 23	11. 45	5. 33	·1421					
4. 32	12. 10	5. 40	·1420					
4. 38	12. 0	5. 48	·1421					
4. 48	10. 25	5. 58	·1419					
5. 7	9. 30	6. 16	·1419					
5. 14	10. 10	6. 33	·1414					
5. 28	10. 55	6. 46	·1419					
5. 32	11. 45	7. 0	·1419					
5. 53	12. 20	7. 10	·1426					
6. 7	11. 10	7. 22	·1421					
6. 12	11. 10	7. 29	·1438					
6. 32	8. 5	7. 37	·1447					
6. 40	5. 30	7. 46	·1431					
7. 8	1. 5	7. 56	·1428					
7. 12	20. 1. 0	8. 2	·1421					
7. 30	19. 52. 55	8. 7	·1427					
7. 47	20. 3. 5	8. 9	·1433					
7. 51	2. 5	8. 17	·1466					
8. 0	20. 1. 55	8. 24	·1474					
8. 17	19. 45. 50	8. 35	·1463					
8. 33	56. 45	8. 37	·1466					
8. 38	19. 58. 10	8. 42	·1459					
8. 50	20. 5. 15	8. 52	·1444					
9. 0	7. 15	9. 4	·1429					
9. 11	4. 5	9. 15	·1428					
9. 21	5. 15	9. 27	·1417					
9. 33	3. 50	9. 38	·1420					
9. 50	6. 0	9. 48	·1420					
9. 52	6. 0	9. 57	·1424					
10. 1	6. 55	10. 2	·1422					
10. 9	6. 45	10. 8	·1427					
10. 13	7. 20	10. 30	·1426					
10. 29	7. 30	10. 49	·1429					
10. 53	7. 0	10. 56	·1426					
11. 10	7. 40	11. 7	·1429					
11. 23	7. 0	11. 21	·1428					
11. 49	7. 15	11. 37	·1428					
12. 5	8. 20	11. 48	·1429					
12. 10	8. 0	11. 56	·1424					
		12. 2	·1429					
		12. 10	·1437					
		12. 20	·1429					
		12. 28	·1432					
		12. 41	·1429					
Feb. 2		Feb. 2		Feb. 2		Feb. 2		
10. 0	20. 6. 30	10. 39	·1437	11. 48	·03634	0. 0	60·8	60·9
10. 15	6. 15	10. 47	·1438	12. 3	·03602	1. 0	60·5	60·7
10. 36	7. 35	10. 57	·1433	12. 18	·03605	2. 0	60·1	60·1

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Feb. 2		Feb. 2		Feb. 2		Feb. 2			Feb. 2		Feb. 2						
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
10. 52	20. 7. 45	11. 3	·1435	12. 30	·03590	3. 0	60 ·3	60 ·2	20. 23	20. 5. 35	18. 32	·1444					
11. 17	20. 4. 45	11. 10	·1431	12. 48	·03595	6. 0	60 ·5	60 ·8	20. 33	5. 5	18. 37	·1440					
11. 41	19. 51. 50	11. 20	·1440	12. 57	·03590	9. 0	60 ·4	60 ·5	20. 37	3. 45	18. 41	·1445					
11. 42	52. 25	11. 25	·1435	13. 31	·03600	21. 0	60 ·7	60 ·6	20. 44	7. 40	18. 46	·1441					
12. 7	45. 15	11. 36	·1449	13. 38	·03598	22. 0	60 ·7	60 ·6	20. 53	8. 20	18. 49	·1444					
12. 19	50. 30	11. 48	·1468	13. 47	·03605	23. 0	60 ·8	60 ·7	21. 3	11. 45	18. 54	·1441					
12. 30	54. 20	11. 58	·1464	14. 8	·03610				21. 10	12. 45	18. 59	·1443					
12. 42	19. 58. 15	12. 6	·1468	14. 11	·03605				21. 13	9. 30	19. 3	·1436					
12. 51	20. 1. 25	12. 8	·1466	14. 21	·03608				21. 19	14. 50	19. 18	·1435					
13. 3	0. 20	12. 11	·1468	14. 24	·03600				21. 24	13. 30	19. 27	·1433					
13. 14	1. 10	12. 20	·1452	14. 33	·03610				21. 28	14. 35	19. 31	·1435					
13. 23	1. 0	12. 30	·1438	15. 36	·03619				21. 41	14. 25	19. 36	·1431					
13. 39	3. 0	12. 40	·1429	15. 42	·03608				21. 47	13. 20	19. 40	·1434					
13. 43	2. 50	12. 52	·1415	15. 57	·03610				21. 53	15. 40	19. 46	·1427					
13. 47	3. 30	13. 5	·1420	16. 0	·03602				22. 1	14. 40	19. 58	·1430					
13. 52	3. 55	13. 13	·1419	16. 10	·03620				22. 7	17. 25	20. 6	·1426					
14. 4	6. 50	13. 24	·1424	16. 16	·03618				22. 13	16. 35	20. 13	·1422					
14. 19	8. 20	13. 35	·1417	16. 32	·03622				22. 17	18. 10	20. 23	·1415					
14. 27	6. 30	13. 40	·1423	17. 14	·03610				22. 22	18. 25	20. 27	·1417					
14. 33	7. 55	13. 45	·1420	17. 33	·03617				22. 28	17. 35	20. 30	·1412					
14. 43	8. 0	14. 1	·1431	17. 38	·03606				22. 32	19. 0	20. 35	·1404					
14. 51	7. 25	14. 15	·1430	17. 47	·03612				22. 42	19. 40	20. 39	·1412					
15. 3	8. 35	14. 18	·1421	18. 5	·03608				22. 49	21. 0	20. 44	·1416					
15. 12	8. 20	14. 23	·1423	18. 25	·03593				22. 51	19. 0	20. 48	·1412					
15. 20	8. 35	14. 28	·1428	18. 29	·03582				23. 3	17. 10	20. 53	·1415					
15. 28	7. 50	14. 31	·1426	18. 34	·03586				23. 7	15. 55	21. 1	·1411					
15. 32	9. 5	14. 39	·1431	18. 47	·03566				23. 12	15. 30	21. 17	·1416					
15. 38	6. 35	14. 44	·1427	18. 55	·03561				23. 18	17. 30	21. 24	·1412					
15. 40	6. 50	14. 47	·1430	19. 3	·03546				23. 22	16. 20	21. 29	·1410					
15. 44	5. 45	14. 53	·1427	19. 18	·03558				23. 28	16. 55	21. 36	·1407					
15. 57	5. 0	15. 0	·1430	19. 42	·03568				23. 32	19. 0	21. 44	·1402					
16. 2	2. 25	15. 7	·1426	20. 2	·03558				23. 34	18. 0	21. 47	·1395					
16. 7	5. 20	15. 14	·1430	20. 28	·03564				23. 38	19. 10	21. 53	·1397					
16. 33	5. 35	15. 20	·1429	20. 32	·03558				23. 42	17. 20	22. 0	·1391					
16. 43	7. 50	15. 22	·1426	20. 40	·03566				23. 48	19. 0	22. 7	·1388					
17. 0	8. 10	15. 30	·1431	21. 0	·03579				23. 50	18. 0	22. 10	·1390					
17. 12	4. 40	15. 36	·1428	21. 27	·03560				23. 53	20. 10	22. 17	·1381					
17. 16	5. 10	15. 46	·1425	21. 32	·03565				23. 59	20. 10	22. 20	·1384					
17. 25	3. 45	15. 50	·1428	21. 47	·03560						22. 23	·1382					
17. 32	4. 20	15. 55	·1419	21. 52	·03571						22. 27	·1389					
17. 39	3. 15	16. 5	·1426	22. 3	·03568						22. 30	·1387					
17. 48	6. 20	16. 15	·1423	22. 27	·03590						22. 36	·1394					
18. 3	13. 0	16. 40	·1425	22. 33	·03605						22. 41	·1400					
18. 10	11. 25	16. 47	·1422	22. 40	·03600						22. 47	·1398					
18. 20	10. 0	16. 53	·1427	22. 54	·03618						22. 49	·1397					
18. 30	10. 15	17. 4	·1427	23. 3	·03623						22. 54	·1406					
18. 37	11. 55	17. 8	·1423	23. 7	·03615						22. 57	·1402					
18. 41	10. 40	17. 15	·1426	23. 18	·03636						22. 59	·1406					
18. 50	10. 20	17. 22	·1426	23. 23	·03625						23. 5	·1401					
19. 0	8. 10	17. 29	·1430	23. 26	·03637						23. 17	·1406					
19. 5	5. 0	17. 35	·1423	23. 31	·03625						23. 20	·1411					
19. 20	6. 45	17. 39	·1426	23. 34	·03642						23. 27	·1408					
19. 24	8. 5	17. 46	·1426	23. 38	·03632						23. 30	·1410					
19. 38	9. 45	17. 54	·1418	23. 40	·03645						23. 35	·1408					
19. 42	12. 20	18. 7	·1424	23. 43	·03629						23. 37	·1410					
19. 53	11. 20	18. 16	·1430	23. 47	·03645						23. 39	·1406					
20. 0	11. 40	18. 20	·1435	23. 52	·03640						23. 43	·1409					
20. 19	7. 50	18. 23	·1428	23. 59	·03641						23. 47	·1402					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
h m	° ′ ″	Feb. 2 h m		h m		h m	°	°
		23. 49	·1405					
		23. 55	·1401					
		23. 59	·1404					
Feb. 3		Feb. 3		Feb. 3		Feb. 3		
0. 0	20. 20. 10	0. 0	·1404	0. 0	·03640	0. 0	60·9	61·1
0. 15	19. 40	0. 5	·1399	0. 21	·03661	1. 0	61·1	61·3
0. 21	22. 35	0. 17	·1397	0. 28	·03655	3. 0	61·0	61·1
0. 32	27. 20	0. 23	·1404	0. 37	·03683	6. 0	61·4	61·2
0. 37	26. 10	0. 26	·1412	1. 9	·03742	9. 0	61·1	61·4
0. 41	31. 20	0. 29	·1408	1. 32	·03757	21. 0	61·4	61·8
0. 44	30. 50	0. 34	·1414	1. 55	·03766	22. 0	61·2	61·6
0. 48	33. 45	0. 36	·1409	2. 0	·03755	23. 0	61·1	61·4
0. 57	28. 30	0. 37	·1412	2. 11	·03780			
1. 3	21. 40	0. 39	·1404	2. 26	·03829			
1. 8	19. 25	0. 46	·1412	2. 35	·03840			
1. 10	20. 0	0. 48	·1410	2. 39	·03859			
1. 20	18. 45	0. 50	·1412	2. 43	·03862			
1. 32	16. 5	0. 54	·1406	2. 47	·03880			
1. 43	20. 5	0. 57	·1390	2. 53	·03865			
1. 48	19. 55	0. 59	·1392	3. 23	·03902			
2. 3	31. 20	1. 3	·1383	3. 33	·03898			
2. 7	31. 0	1. 7	·1390	3. 47	·03946			
2. 10	33. 45	1. 11	·1401	3. 51	·03942			
2. 16	32. 40	1. 15	·1406	3. 58	·03957			
2. 20	33. 25	1. 20	·1408	4. 9	·03919			
2. 28	30. 20	1. 29	·1402	4. 27	·03967			
2. 37	23. 50	1. 38	·1409	4. 33	·04092			
2. 46	28. 50	1. 43	·1413	4. 43	·04058			
2. 50	28. 5	1. 47	·1412	4. 48	·04015			
2. 52	30. 35	1. 53	·1409	4. 58	·04170			
3. 0	25. 10	2. 7	·1427		(†)			
3. 3	25. 55	2. 10	·1415	5. 7	·04170			
3. 10	24. 35	2. 13	·1409	5. 17	·03980			
3. 17	21. 50	2. 17	·1398	5. 24	·04110			
3. 20	23. 50	2. 20	·1391	5. 34	·04009			
3. 30	20. 50	2. 24	·1387	5. 45	·04049			
3. 34	21. 25	2. 27	·1371	5. 49	·04044			
3. 40	21. 40	2. 30	·1375	5. 57	·04082			
3. 50	28. 45	2. 35	·1371	6. 2	·04094			
3. 59	23. 0	2. 37	·1380	6. 3	·04139			
4. 0	23. 55	2. 42	·1387	6. 4	·04132			
4. 6	19. 20	2. 47	·1396	6. 7	·04170			
4. 10	20. 55	2. 49	·1403		(†)			
4. 13	21. 50	2. 51	·1401	6. 15	·04170			
4. 18	24. 10	2. 58	·1412	6. 16	·04150			
4. 30	21. 10	3. 1	·1410	6. 19	·04170			
4. 33	24. 45	3. 6	·1415		(†)			
4. 39	10. 20	3. 10	·1411	6. 29	·04170			
4. 40	16. 40	3. 14	·1415	6. 33	·04125			
4. 43	12. 5	3. 18	·1412	6. 38	·04133			
4. 50	33. 20	3. 20	·1417	6. 39	·04073			
4. 52	13. 20	3. 27	·1409	6. 56	·03985			
4. 56	14. 30	3. 30	·1412	7. 8	·03938			
5. 0	6. 0	3. 36	·1408	7. 12	·03940			
5. 3	3. 20	3. 40	·1410	7. 25	·03910			
5. 6	20. 4. 40	3. 46	·1419	7. 32	·03922			
5. 8	19. 50. 40	3. 48	·1428	7. 47	·03880			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 3 h m	° ′ ″	Feb. 3 h m		Feb. 3 h m		h m	°	°
5. 15	20. 3. 40	3. 53	·1437	7. 52	·03888			
5. 22	32. 20	3. 57	·1434	8. 12	·03839			
5. 29	5. 50	3. 58	·1436	8. 27	·03835			
5. 31	8. 25	4. 1	·1419	8. 38	·03820			
5. 32	7. 30	4. 5	·1421	8. 54	·03830			
5. 36	13. 20	4. 8	·1408	9. 0	·03832			
5. 39	9. 10	4. 14	·1415	9. 22	·03846			
5. 40	12. 30	4. 17	·1410	9. 45	·03837			
5. 44	8. 55	4. 22	·1415	9. 48	·03825			
5. 50	12. 50	4. 26	·1411	10. 10	·03821			
5. 53	9. 5	4. 28	·1414	10. 20	·03800			
5. 59	16. 0	4. 32	·1409	10. 31	·03800			
6. 0	12. 55	4. 38	·1417	10. 44	·03792			
6. 4	21. 10	4. 42	·1401	10. 49	·03764			
6. 12	13. 45	4. 45	·1420	11. 0	·03750			
6. 13	16. 45	4. 47	·1430	11. 13	·03798			
6. 20	4. 50	4. 49	·1421	11. 24	·03793			
6. 23	19. 0	4. 50	·1440	11. 31	·03800			
6. 31	10. 35	4. 56	·1449	11. 39	·03792			
6. 37	5. 55	4. 58	·1399	11. 44	·03779			
6. 42	6. 10	4. 59	·1419	11. 48	·03777			
6. 50	4. 5	5. 1	·1412	11. 58	·03743			
6. 57	7. 55	5. 7	·1424	12. 8	·03747			
7. 0	6. 35	5. 10	·1403	12. 14	·03737			
7. 9	4. 20	5. 14	·1433	12. 25	·03739			
7. 14	9. 0	5. 17	·1446	12. 32	·03724			
7. 23	9. 25	5. 19	·1427	12. 43	·03678			
7. 29	8. 10	5. 25	·1436	12. 53	·03600			
7. 33	8. 20	5. 28	·1371	13. 3	·03566			
7. 37	7. 40	5. 35	·1408	13. 9	·03557			
7. 42	9. 25	5. 38	·1413	13. 16	·03526			
7. 52	10. 40	5. 40	·1399	13. 28	·03520			
8. 11	5. 25	5. 46	·1409	13. 37	·03535			
8. 36	4. 20	5. 48	·1405	13. 41	·03520			
8. 42	10. 0	5. 53	·1410	13. 50	·03518			
9. 3	3. 50	5. 58	·1400	14. 1	·03460			
9. 12	5. 0	6. 3	·1415	14. 12	·03367			
9. 21	9. 5	6. 6	·1413	14. 17	·03375			
9. 30	5. 45	6. 8	·1428	14. 20	·03404			
9. 31	5. 25	6. 11	·1443	14. 26	·03410			
9. 38	3. 25	6. 17	·1419	14. 36	·03450			
9. 52	3. 0	6. 19	·1423	14. 40	·03450			
9. 57	3. 45	6. 24	·1408	14. 46	·03437			
10. 2	3. 20	6. 28	·1422	14. 52	·03446			
10. 5	4. 25	6. 33	·1397	14. 58	·03410			
10. 9	3. 55	6. 37	·1373	15. 3	·03401			
10. 12	5. 25	6. 40	·1370	15. 7	·03404			
10. 22	4. 40	6. 43	·1380	15. 11	·03395			
10. 24	5. 25	6. 48	·1390	15. 14	·03395			
10. 32	4. 20	6. 52	·1387	15. 16	·03385			
10. 39	6. 20	6. 54	·1390	15. 24	·03385			
10. 50	5. 50	6. 57	·1413	15. 27	·03408			
10. 55	0. 40	6. 59	·1420	15. 35	·03417			
10. 59	20. 1. 0	7. 6	·1410	15. 39	·03440			
11. 2	19. 59. 0	7. 15	·1427	15. 52	·03467			
11. 8	56. 5	7. 18	·1422	15. 59	·03475			
11. 11	19. 58. 45	7. 22	·1409	16. 6	·03500			
11. 18	20. 5. 10	7. 25	·1402	16. 17	·03476			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Feb. 3. The spot of light for Vertical Force was off the sheet in the direction of *increasing* force from $4^h. 58^m.$ to $5^h. 7^m.$; from $6^h. 7^m.$ to $6^h. 15^m.$; and from $6^h. 19^m.$ to $6^h. 29^m.$

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 3		Feb. 3		Feb. 3				
h m	° ′ ″	h m		h m		h m	°	°
11.22	20. 6.20	7.28	·1405	16.26	·03500			
11.32	2. 0	7.30	·1394	16.43	·03430			
11.38	2.30	7.35	·1398	16.52	·03450			
11.40	3.20	7.37	·1392	16.59	·03442			
11.50	1. 5	7.41	·1400	17. 6	·03478			
11.57	0.30	7.45	·1395	17.10	·03475			
12. 7	2.25	7.49	·1405	17.12	·03498			
12.16	2. 5	7.56	·1410	17.40	·03537			
12.23	4.55	8. 4	·1404	17.42	·03525			
12.36	20. 3.30	8. 6	·1407	17.47	·03532			
12.42	19.59.20	8.11	·1402	17.58	·03530			
12.58	49.10	8.15	·1407	18.15	·03575			
13. 2	49.15	8.18	·1404	18.20	·03576			
13.10	50.35	8.27	·1413	18.50	·03658			
13.28	46.40	8.35	·1409	18.56	·03680			
13.32	46.10	8.38	·1401	19. 3	·03691			
13.47	43.25	8.46	·1395	19.10	·03693			
13.52	43.15	9. 3	·1404	19.14	·03706			
14.12	59.20	9.15	·1411	19.19	·03702			
14.29	19.59.10	9.27	·1401	19.39	·03720			
14.40	20. 4.20	9.37	·1407	19.55	·03733			
14.43	3.55	9.45	·1416	19.58	·03730			
14.57	9. 0	9.50	·1411	20. 6	·03745			
15. 7	20. 5. 0	9.56	·1413		***			
15.17	19.54.10	10. 1	·1419	20.37	·03756			
15.22	52.10	10. 6	·1415	21. 2	·03757			
15.32	19.56.45	10. 9	·1421	21.11	·03753			
15.43	20. 5.25	10.16	·1419	21.16	·03761			
15.47	7. 5	10.18	·1422	21.19	·03757			
15.59	5.50	10.22	·1417	21.43	·03746			
16.10	12.55	10.26	·1421	21.57	·03755			
16.12	12.40	10.32	·1427	22. 3	·03744			
16.19	17. 0	10.37	·1423	22.10	·03757			
16.22	17.35	10.43	·1417	22.17	·03749			
16.35	11.55	10.47	·1413	22.42	·03749			
16.40	10. 0	10.52	·1418	23. 1	·03740			
16.49	2.20	10.58	·1425	23.22	·03740			
16.57	6. 0	11. 3	·1430	23.33	·03750			
17. 2	0.10	11. 6	·1426	23.53	·03747			
17. 7	5. 5	11.10	·1436	23.59	·03755			
17.10	4.40	11.16	·1424					
17.15	10.55	11.20	·1416					
17.23	6. 0	11.28	·1427					
17.29	12.30	11.32	·1424					
17.37	11.55	11.35	·1427					
17.40	13.40	11.40	·1418					
17.44	13.20	11.45	·1425					
17.53	13.40	11.50	·1420					
18. 4	10.40	11.58	·1416					
18.16	14.20	12. 2	·1419					
18.22	10.50	12.10	·1421					
18.30	11.40	12.20	·1419					
18.40	9.20	12.35	·1430					
18.47	9. 5	12.51	·1412					
18.50	7.10	12.55	·1414					
19. 0	9. 0	13. 0	·1403					
19. 9	9.10	13. 6	·1392					
19.17	6.20	13.13	·1383					
19.20	8.15	13.20	·1385					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 3		Feb. 3						
h m	° ′ ″	h m		h m		h m	°	°
19.27	20. 6.55	13.25	·1389					
19.37	7.45	13.33	·1391					
19.40	7.10	13.39	·1378					
19.46	8.20	13.46	·1370					
19.52	6.30	13.50	·1364					
19.57	7.40	13.52	·1347					
20. 0	7. 0	13.56	·1342					
20. 2	5.30	14. 0	·1336					
20. 7	8.50	14. 7	·1340					
20.13	7.25	14.10	·1337					
20.18	9. 0	14.15	·1343					
20.22	7.10	14.17	·1357					
20.26	9.10	14.26	·1366					
20.32	8.15	14.34	·1376					
20.37	7.30	14.43	·1369					
20.42	9.25	14.50	·1376					
20.49	9.20	15. 0	·1366					
20.50	8.10	15. 3	·1369					
21. 0	9.40	15. 8	·1364					
21. 2	8.50	15.17	·1374					
21.11	8.15	15.25	·1388					
21.18	11.45	15.33	·1384					
21.23	10.40	15.37	·1386					
21.29	10.15	15.47	·1378					
21.37	10.50	16. 2	·1386					
21.41	9.30	16. 7	·1374					
22. 1	11.25	16.15	·1364					
22. 9	9. 5	16.24	·1387					
22.12	11.25	16.30	·1400					
22.19	10. 0	16.37	·1409					
22.33	9.45	16.40	·1404					
22.41	10.50	16.47	·1415					
23. 2	11.30	16.53	·1403					
23.10	10.50	16.56	·1389					
23.22	11.55	16.58	·1382					
23.30	11.50	17. 3	·1393					
	(†)	17. 7	·1379					
23.59	15. 0	17.10	·1387					
		17.17	·1365					
		17.23	·1374					
		17.26	·1380					
		17.30	·1377					
		17.37	·1392					
		17.40	·1389					
		17.45	·1396					
		17.49	·1400					
		17.55	·1395					
		18. 6	·1404					
		18.15	·1392					
		18.22	·1396					
		18.33	·1391					
		18.40	·1396					
		18.44	·1392					
		18.54	·1403					
		18.57	·1400					
		19. 3	·1406					
		19. 8	·1397					
		19.17	·1403					
		19.22	·1397					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Feb. 3						
h m	° ′ ″	h m		h m		h m	°	°
		19. 29	·1403					
		19. 34	·1400					
		19. 37	·1404					
		19. 43	·1400					
		19. 45	·1402					
		19. 47	·1397					
		19. 52	·1400					
		19. 58	·1396					
		20. 3	·1402					
		20. 8	·1396					
		20. 13	·1402					
		20. 15	·1394					
			***					
		20. 23	·1400					
			***					
		20. 31	·1395					
		20. 34	·1398					
		20. 36	·1395					
		20. 42	·1398					
		20. 49	·1393					
		21. 0	·1396					
		21. 3	·1393					
		21. 12	·1393					
		21. 16	·1397					
		21. 24	·1394					
		21. 33	·1393					
		21. 50	·1384					
		21. 58	·1387					
		22. 6	·1375					
		22. 11	·1381					
		22. 18	·1380					
		22. 28	·1384					
		22. 43	·1389					
		23. 4	·1390					
		23. 15	·1391					
		23. 24	·1394					
		23. 33	·1391					
		23. 42	·1396					
		23. 50	·1394					
		23. 59	·1396					
Feb. 22		Feb. 22		Feb. 22		Feb. 22		
10. 0	20. 7. 30	10. 0	·1434	10. 0	·03618	0. 0	60·3	60·3
10. 9	8. 0	10. 13	·1435	10. 30	·03610	1. 0	60·5	60·5
10. 30	4. 45	10. 20	·1434	10. 35	·03601	2. 0	60·3	60·3
10. 38	4. 20	10. 33	·1439	10. 41	·03585	3. 0	60·3	60·3
10. 51	20. 1. 50	10. 37	·1438	10. 50	·03594	9. 0	60·9	61·1
11. 1	19. 56. 40	10. 55	·1442	11. 0	·03585	21. 0	60·8	61·1
11. 3	55. 0	11. 5	·1432	11. 4	·03594	22. 0	60·3	60·3
11. 17	46. 0	11. 12	·1437	11. 10	·03582	23. 0	60·5	60·4
11. 24	46. 15	11. 18	·1449	11. 17	·03586			
11. 36	46. 20	11. 27	·1460	11. 26	·03576			
11. 37	47. 5	11. 30	·1457	11. 32	·03578			
11. 47	47. 20	11. 33	·1459	11. 44	·03563			
11. 54	48. 0	11. 38	·1452	11. 54	·03576			
12. 8	46. 30	11. 47	·1443	12. 0	·03589			
12. 17	46. 50	11. 49	·1446	12. 9	·03595			
12. 21	50. 10	11. 57	·1431	12. 17	·03609			
12. 30	52. 45	12. 12	·1407	12. 39	·03613			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 22		Feb. 22		Feb. 22				
h m	° ′ ″	h m		h m		h m	°	°
12. 43	19. 58. 45	12. 14	·1409	12. 49	·03605			
13. 0	20. 5. 0	12. 25	·1401	12. 53	·03596			
13. 8	9. 10	12. 37	·1406	13. 0	·03596			
13. 10	9. 45	12. 50	·1406	13. 16	·03560			
13. 20	13. 20	13. 6	·1420	13. 30	·03561			
13. 33	11. 10	13. 8	·1418	13. 39	·03568			
13. 42	7. 0	13. 23	·1433	14. 0	·03563			
13. 52	6. 25	13. 31	·1425	14. 13	·03570			
13. 54	6. 40	13. 35	·1429	14. 20	·03569			
14. 13	2. 5	13. 37	·1426	14. 31	·03577			
14. 21	1. 35	13. 43	·1429	14. 47	·03587			
14. 34	0. 5	13. 53	·1433	15. 2	·03586			
14. 45	0. 0	14. 0	·1431	15. 40	·03608			
15. 10	4. 15	14. 7	·1433	16. 7	·03612			
15. 20	3. 25	14. 23	·1427	16. 17	·03600			
15. 29	5. 0	14. 33	·1426	16. 38	·03602			
15. 48	6. 10	14. 48	·1418	17. 40	·03590			
15. 53	7. 40	15. 9	·1418	18. 7	·03590			
16. 1	10. 25	15. 23	·1415	18. 37	·03607			
16. 8	11. 25	15. 36	·1416	18. 53	·03598			
16. 13	13. 0	15. 45	·1419	19. 33	·03602			
16. 22	12. 5	15. 49	·1416	19. 37	·03598			
16. 32	9. 30	15. 54	·1419	19. 54	·03603			
16. 40	8. 40	16. 1	·1414	20. 2	·03600			
16. 53	8. 0	16. 13	·1416	20. 12	·03608			
16. 58	8. 20	16. 23	·1423	20. 50	·03602			
17. 12	4. 20	16. 35	·1425	21. 28	·03593			
17. 19	4. 20	16. 45	·1428	21. 48	·03582			
17. 28	3. 5	16. 54	·1434	21. 57	·03591			
17. 37	3. 5	16. 58	·1429	22. 43	·03575			
17. 40	2. 45	17. 7	·1433	23. 59	·03580			
17. 57	3. 30	17. 16	·1438					
18. 2	4. 55	17. 30	·1442					
18. 12	5. 25	17. 40	·1442					
18. 20	5. 10	17. 57	·1438					
18. 56	11. 15	18. 8	·1431					
19. 10	8. 25	18. 16	·1427					
19. 20	7. 55	18. 25	·1426					
19. 22	7. 40	18. 28	·1424					
19. 41	7. 45	18. 38	·1427					
19. 47	8. 50	18. 49	·1431					
19. 52	7. 30	18. 57	·1435					
20. 7	8. 40	19. 7	·1429					
20. 18	7. 35	19. 16	·1434					
20. 23	8. 0	19. 23	·1430					
20. 49	7. 50	19. 31	·1432					
20. 52	9. 10	19. 38	·1429					
21. 5	10. 0	19. 45	·1432					
21. 12	9. 45	19. 53	·1425					
21. 19	10. 20	20. 4	·1429					
21. 30	10. 20	20. 11	·1424					
21. 58	12. 0	20. 17	·1421					
22. 2	11. 30	20. 26	·1424					
22. 26	11. 20	20. 35	·1421					
22. 45	12. 25	20. 47	·1425					
22. 57	12. 20	21. 0	·1426					
23. 5	13. 20	21. 5	·1422					
23. 20	12. 55	21. 16	·1422					
23. 42	11. 55	21. 27	·1419					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 22		Feb. 22						
h m	° ′ ″	h m		h m		h m	°	°
23. 59	20. 12. 15	21. 37	·1419					
		21. 45	·1415					
		21. 48	·1417					
		21. 53	·1412					
		21. 58	·1416					
		22. 3	·1414					
		22. 17	·1418					
		22. 24	·1416					
		22. 42	·1419					
		22. 55	·1417					
		23. 0	·1421					
		23. 11	·1415					
		23. 44	·1415					
			(†)					
Mar. 2		Mar. 2		Mar. 2		Mar. 2		
0. 0	20. 11. 30	0. 0	·1412	0. 0	·03472	0. 0	60·7	60·6
0. 4	10. 55	0. 5	·1410	0. 33	·03482	1. 0	60·7	60·5
0. 22	13. 20	0. 23	·1417	0. 40	·03478	2. 0	60·6	60·4
0. 41	12. 0	0. 30	·1415	0. 49	·03484	3. 0	60·6	60·5
0. 48	12. 55	0. 38	·1417	0. 57	·03480	9. 0	60·5	60·5
0. 53	12. 55	0. 41	·1414	1. 50	·03500	21. 0	59·4	58·6
1. 2	11. 45	0. 49	·1419	2. 3	·03495	22. 0	59·7	59·3
1. 15	13. 25	0. 55	·1420	2. 20	·03510	23. 0	60·1	60·1
1. 42	13. 40	1. 5	·1416	3. 2	·03518			
1. 50	14. 20	1. 13	·1423	3. 35	·03521			
1. 57	12. 25	1. 26	·1424	3. 58	·03531			
2. 2	12. 10	1. 31	·1422	4. 22	·03534			
2. 15	14. 25	1. 45	·1423	4. 46	·03526			
2. 25	12. 35	1. 50	·1426	5. 10	·03530			
2. 32	13. 5	2. 5	·1418	5. 32	·03523			
2. 42	12. 40	2. 17	·1426	5. 47	·03516			
2. 52	13. 0	2. 26	·1424	6. 46	·03523			
2. 58	12. 40	2. 35	·1428	6. 57	·03520			
3. 0	13. 25	2. 44	·1427	7. 7	·03527			
3. 10	12. 0	2. 53	·1432	7. 17	·03525			
3. 46	9. 10	2. 58	·1429	7. 32	·03537			
4. 2	10. 0	3. 4	·1431	7. 48	·03532			
4. 11	10. 5	3. 15	·1424	7. 57	·03541			
4. 17	10. 30	3. 22	·1422	8. 14	·03536			
4. 33	10. 20		(†)	8. 20	·03540			
4. 52	11. 5	3. 38	·1423	8. 26	·03538			
5. 17	10. 45	3. 49	·1428	8. 42	·03550			
5. 23	11. 20	4. 3	·1436	8. 51	·03545			
5. 53	10. 0	4. 14	·1434	9. 7	·03558			
6. 0	9. 25	4. 25	·1437	9. 30	·03559			
6. 10	9. 55	4. 44	·1432	9. 48	·03546			
6. 22	9. 10	4. 59	·1432	10. 2	·03555			
6. 33	9. 10	5. 15	·1435	10. 13	·03545			
6. 42	9. 45	5. 34	·1429	10. 33	·03530			
6. 52	9. 0	5. 39	·1430	10. 49	·03538			
7. 2	8. 30	5. 47	·1428	11. 6	·03475			
7. 8	9. 5	5. 53	·1426	11. 8	·03470			
7. 18	7. 20	6. 4	·1430	11. 16	·03441			
7. 27	8. 20	6. 17	·1430	11. 31	·03478			
7. 40	8. 0	6. 26	·1428	11. 44	·03465			
7. 47	7. 5	6. 47	·1433	12. 2	·03478			
7. 59	11. 25	6. 55	·1431	12. 17	·03474			
8. 4	11. 10	7. 6	·1425	12. 46	·03505			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 2		Mar. 2		Mar. 2				
h m	° ′ ″	h m		h m		h m	°	°
8. 7	20. 11. 55	7. 15	·1427	13. 24	·03509			
8. 14	10. 15	7. 22	·1424	13. 32	·03519			
8. 19	10. 45	7. 28	·1427	13. 43	·03500			
8. 27	9. 15	7. 35	·1425	13. 46	·03504			
8. 34	20. 9. 0	7. 40	·1427	13. 50	·03496			
8. 54	19. 59. 5	7. 48	·1424	13. 57	·03500			
9. 4	58. 25	7. 57	·1434	14. 3	·03495			
9. 12	59. 25	8. 5	·1428	14. 12	·03502			
9. 17	19. 58. 50	8. 7	·1430	14. 26	·03479			
9. 23	20. 1. 0	8. 16	·1423	14. 46	·03470			
9. 42	20. 1. 55	8. 24	·1426	14. 53	·03480			
9. 53	19. 59. 0	8. 30	·1417	15. 0	·03479			
10. 18	20. 2. 0	8. 39	·1419	15. 11	·03486			
10. 23	0. 20	8. 49	·1415	15. 31	·03470			
10. 39	20. 0. 30	9. 6	·1428	15. 40	·03474			
10. 47	19. 57. 45	9. 18	·1414	15. 58	·03457			
10. 52	19. 58. 0	9. 27	·1410	16. 12	·03460			
11. 6	20. 6. 0	9. 36	·1404	16. 48	·03420			
11. 20	13. 0	9. 47	·1400	17. 51	·03422			
11. 29	20. 0. 0	9. 56	·1399	18. 32	·03412			
11. 32	19. 56. 35	10. 5	·1401	18. 53	·03419			
11. 42	58. 15	10. 10	·1398	18. 58	·03410			
11. 57	53. 20	10. 20	·1401	19. 12	·03408			
12. 3	52. 0	10. 27	·1403	19. 37	·03382			
12. 16	53. 55	10. 33	·1402	19. 47	·03382			
12. 23	53. 45	10. 39	·1396	20. 8	·03370			
12. 47	19. 58. 0	10. 49	·1401	20. 13	·03375			
13. 1	20. 2. 25	10. 51	·1402	20. 29	·03360			
13. 35	6. 30	11. 4	·1435	20. 33	·03365			
13. 41	10. 25	11. 7	·1441	20. 46	·03342			
13. 45	10. 50	11. 15	·1428	20. 48	·03353			
14. 2	6. 20	11. 21	·1402	21. 9	·03330			
14. 8	6. 15	11. 26	·1411	21. 28	·03322			
14. 17	4. 0		(†)	21. 43	·03342			
14. 23	5. 55	11. 37	·1418	22. 17	·03346			
14. 29	6. 0	11. 47	·1401	22. 32	·03349			
14. 42	20. 0. 0	12. 3	·1411	22. 53	·03363			
14. 52	19. 59. 30	12. 13	·1409	23. 0	·03360			
14. 59	19. 59. 0	12. 30	·1400	23. 33	·03401			
15. 4	20. 1. 50	12. 41	·1402	23. 59	·03412			
15. 9	1. 55	12. 56	·1408					
15. 25	7. 0	13. 8	·1414					
15. 33	6. 10	13. 25	·1415					
15. 39	6. 45	13. 36	·1423					
15. 43	6. 10	13. 45	·1421					
16. 7	9. 15	13. 49	·1424					
16. 12	8. 30	13. 58	·1419					
16. 28	11. 10	14. 4	·1422					
16. 59	1. 30	14. 11	·1416					
17. 3	0. 30	14. 16	·1421					
17. 9	1. 5	14. 21	·1424					
17. 22	0. 50	14. 32	·1416					
17. 28	20. 1. 15	14. 37	·1414					
17. 42	19. 59. 50	14. 49	·1408					
17. 58	20. 2. 45	15. 7	·1406					
18. 2	2. 40	15. 17	·1413					
18. 6	3. 0	15. 24	·1409					
18. 12	2. 50	15. 29	·1412					
18. 17	3. 50	15. 37	·1408					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 2		Mar. 2						
h m	° ′ ″	h m		h m		h m	°	°
18. 27	20. 3. 30	15. 45	·1412					
18. 36	4. 10	15. 50	·1413					
18. 42	2. 50	16. 5	·1407					
18. 46	4. 0	16. 25	·1418					
18. 52	2. 20	16. 39	·1427					
18. 58	3. 45	16. 49	·1429					
19. 2	6. 0	17. 7	·1421					
19. 11	5. 45	17. 30	·1414					
19. 14	8. 30	17. 42	·1420					
19. 25	9. 40	17. 51	·1422					
19. 32	11. 55	17. 59	·1421					
19. 39	13. 20	18. 7	·1422					
19. 45	11. 25	18. 17	·1418					
19. 53	12. 0	18. 28	·1419					
20. 18	10. 5	18. 38	·1411					
20. 23	11. 10	18. 44	·1415					
20. 33	11. 5	18. 46	·1412					
20. 38	10. 25	18. 50	·1422					
20. 42	13. 0	18. 55	·1420					
20. 53	10. 25	18. 59	·1425					
20. 57	12. 15	19. 7	·1420					
21. 3	10. 5	19. 17	·1418					
21. 11	10. 55	19. 26	·1412					
21. 18	12. 25	19. 34	·1401					
21. 27	12. 20	19. 38	·1397					
21. 34	8. 55	19. 45	·1400					
21. 41	7. 45	19. 50	·1404					
21. 52	10. 55	20. 1	·1403					
21. 54	10. 10	20. 8	·1411					
22. 0	12. 45	20. 14	·1409					
22. 2	12. 15	20. 20	·1422					
22. 9	13. 45	20. 32	·1422					
22. 10	13. 20	20. 39	·1430					
22. 16	16. 0	20. 47	·1425					
22. 23	17. 0	20. 54	·1431					
22. 30	19. 30	20. 57	·1424					
	***	21. 10	·1421					
22. 46	19. 0	21. 18	·1414					
22. 58	20. 20	21. 27	·1405					
23. 13	11. 30	21. 34	·1406					
23. 23	10. 15	21. 47	·1411					
23. 32	10. 20	21. 54	·1407					
23. 37	10. 0	21. 57	·1410					
23. 52	10. 40	22. 3	·1405					
23. 59	11. 25	22. 6	·1409					
		22. 11	·1404					
		22. 20	·1409					
		22. 29	·1406					
		22. 39	·1406					
		22. 45	·1404					
		22. 57	·1406					
		23. 10	·1398					
		23. 20	·1399					
		23. 25	·1403					
		23. 36½	·1414					
		23. 44	·1418					
		23. 53	·1425					
		23. 59	·1426					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 3		Mar. 3		Mar. 3		Mar. 3		
h m	° ′ ″	h m		h m		h m	°	°
0. 0	20. 11. 25	0. 0	·1426	0. 0	·03412	0. 0	60·0	60·1
0. 13	13. 0	0. 10	·1427	0. 18	·03420	1. 0	60·0	60·0
0. 20	15. 10	0. 19	·1428	0. 32	·03412	2. 0	60·0	60·2
0. 32	14. 5	0. 25	·1433	0. 41	·03430	3. 0	60·0	60·2
0. 37	13. 0	0. 28	·1429	0. 50	·03435	9. 0	61·3	61·5
0. 47	18. 45	0. 33	·1432	0. 53	·03422	21. 0	60·4	59·8
0. 51	19. 50	0. 36	·1427	1. 1	·03430	22. 0	60·4	59·9
0. 57	19. 10	0. 42	·1420	1. 37	·03431	22. 10	60·4	60·1
1. 5	20. 35	0. 49	·1430	1. 52	·03467	23. 0	60·5	60·5
1. 12	19. 0	0. 52	·1428	2. 3	·03481			
1. 17	19. 20	0. 55	·1432	2. 8	·03477			
1. 29	17. 20	0. 59	·1425	2. 17	·03495			
1. 34	17. 10	1. 7	·1429	2. 21	·03479			
1. 41	15. 10	1. 17	·1420	2. 31	·03525			
1. 47	17. 55	1. 25	·1417	2. 38	·03521			
1. 57	22. 0	1. 30	·1408	2. 47	·03577			
1. 58	21. 35	1. 37	·1403	2. 57	·03555			
2. 3	23. 25	1. 40	·1397	3. 2	·03577			
2. 16	22. 5	1. 45	·1390	4. 4	·03680			
2. 20	22. 40	1. 48	·1400	4. 24	·03642			
2. 25	20. 15	1. 51	·1396	4. 46	·03647			
2. 33	26. 0	1. 58	·1406	5. 32	·03613			
2. 40	24. 25	2. 3	·1410	5. 51	·03607			
2. 47	30. 30	2. 9	·1404	6. 0	·03600			
2. 51	25. 35	2. 18	·1402	7. 8	·03600			
2. 54	23. 50	2. 26	·1387	7. 53	·03617			
3. 2	27. 10	2. 33	·1398	8. 11	·03609			
3. 17	19. 40	2. 36	·1404	8. 20	·03616			
3. 22	20. 0	2. 43	·1400	8. 30	·03610			
3. 29	19. 20	2. 50	·1425	9. 0	·03610			
3. 36	22. 15	2. 57	·1415					
3. 47	15. 45	3. 0	·1417					
3. 52	18. 20	3. 6	·1400					
3. 56	16. 15	3. 13	·1378					
4. 2	18. 10	3. 20	·1368					
4. 11	19. 45	3. 25	·1372					
4. 23	15. 0	3. 28	·1378					
4. 30	14. 50	3. 33	·1387					
4. 36	14. 0	3. 36	·1391					
4. 46	17. 5	3. 39	·1388					
4. 52	17. 25	3. 44	·1395					
5. 0	16. 30	3. 47	·1391					
5. 8	18. 25	3. 51	·1401					
5. 16	18. 25	3. 55	·1399					
5. 27	14. 25	4. 0	·1409					
5. 39	14. 0	4. 5	·1406					
5. 46	14. 25	4. 11	·1407					
6. 0	11. 15	4. 20	·1394					
6. 3	10. 25	4. 29	·1399					
6. 12	10. 25	4. 36	·1404					
6. 20	12. 20	4. 48	·1419					
6. 30	13. 30	4. 57	·1411					
6. 38	13. 0	5. 3	·1415					
6. 42	13. 0	5. 7	·1417					
6. 52	11. 25	5. 16	·1409					
7. 2	12. 20	5. 20	·1412					
7. 11	9. 55	5. 25	·1409					
7. 18	9. 45	5. 33	·1417					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.
Mar. 3	
h m	° ′ ″
7. 20	20. 8. 50
7. 24	9. 0
7. 30	8. 30
7. 42	8. 20
7. 47	9. 50
7. 53	9. 25
8. 11	9. 45
8. 41	9. 0
9. 0	8. 10

Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.
Mar. 3	
h m	
5. 40	·1415
5. 52	·1417
6. 0	·1413
6. 6	·1417
6. 10	·1421
6. 16	·1420
6. 23	·1425
6. 37	·1421
6. 46	·1424
6. 55	·1427
7. 3	·1424
7. 7	·1415
7. 17	·1420
7. 24	·1418
7. 28	·1420
7. 35	·1416
7. 45	·1416
7. 51	·1422
7. 56	·1419
8. 3	·1421
8. 9	·1413
8. 18	·1421
8. 26	·1418
8. 35	·1415
8. 46	·1421
8. 53	·1415
8. 58	·1418

Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
h m		h m	°	°

Greenwich Mean Solar Time.	Western Declination.
Mar. 9	
0. 0	20. 13. 40
0. 20	14. 0
0. 42	13. 0
0. 52	13. 30
1. 2	13. 25
1. 13	14. 0
1. 22	13. 55
1. 50	14. 10
2. 0	15. 0
2. 7	14. 0
2. 29	16. 30
2. 52	15. 35
3. 12	17. 5
3. 18	16. 30
3. 23	16. 55
3. 37	15. 0
3. 43	16. 45
3. 50	16. 20
3. 57	18. 30
4. 3	14. 40
4. 18	11. 0
4. 31	16. 0
4. 37	16. 0
4. 42	16. 40
4. 58	12. 10
5. 3	15. 5
5. 13	18. 5
5. 20	17. 25
5. 23	18. 10
5. 32	20. 17. 5
5. 40	17. 10
5. 59	11. 25
6. 5	10. 40
6. 10	12. 0
	(†)
6. 30	12. 15
6. 50	17. 0
6. 57	14. 20
7. 2	14. 0
7. 10	12. 35
7. 18	13. 20
7. 26	12. 5
7. 32	13. 0
7. 38	11. 20
7. 48	10. 5
7. 54	5. 0
8. :0	1. 45
8. 12	20. 6. 0
8. 22	19. 59. 45
8. 37	53. 10
8. 48	19. 57. 20
8. 56	20. 6. 0
9. 3	8. 0
9. 17	1. 0
9. 27	6. 50
9. 38	1. 25
9. 48	20. 5. 40
10. 12	19. 55. 20
10. 17	54. 5
10. 28	47. 45
10. 42	46. 0
11. 0	55. 0
11. 13	59. 0
11. 21	59. 0
11. 28	57. 10
11. 37	56. 25
11. 51	50. 5
12. 0	54. 0
12. 13	47. 45
12. 22	50. 0
12. 26	50. 0
12. 32	51. 50
12. 38	52. 0
12. 52	58. 25
13. 1	59. 0
13. 20	19. 58. 0
13. 40	20. 5. 50
13. 47	6. 25
13. 59	5. 45
14. 7	7. 0
14. 17	7. 0
14. 33	5. 20
14. 40	5. 55
14. 50	6. 0
14. 58	7. 0
15. 4	7. 30
15. 20	5. 55

Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.
Mar. 9	
0. 0	·1430
0. 7	·1427
0. 17	·1429
0. 25	·1426
0. 30	·1423
0. 37	·1426
0. 50	·1425
1. 7	·1430
1. 17	·1427
1. 24	·1430
1. 27	·1427
1. 34	·1432
1. 39	·1429
1. 49	·1429
1. 56	·1432
2. 2	·1429
2. 6	·1433
2. 26	·1439
2. 37	·1436
2. 45	·1439
2. 50	·1436
2. 56	·1438
3. 3	·1439
3. 12	·1446
3. 15	·1443
3. 20	·1438
3. 23	·1440
3. 34	·1428
3. 40	·1418
3. 45	·1425
3. 50	·1416
3. 56	·1422
3. 59	·1433
4. 4	·1428
4. 7	·1425
4. 12	·1430
4. 16	·1425
4. 21	·1435
4. 26	·1431
4. 30	·1434
4. 35	·1429
4. 38	·1425
4. 40	·1428
4. 45	·1425
4. 47	·1427
4. 51	·1418
5. 6	·1431
5. 13	·1429
5. 20	·1420
5. 27	·1424
5. 33	·1420
5. 40	·1426
5. 48	·1421
5. 55	·1425
6. 0	·1423
6. 6	·1427
	(†)
6. 20	·1433
6. 26	·1428
6. 29	·1431
6. 36	·1427
6. 44	·1424
6. 51	·1417
6. 57	·1421
7. 0	·1423
7. 7	·1422
7. 15	·1429
7. 19	·1426
7. 26	·1429
7. 31	·1428
7. 38	·1433
7. 45	·1439
7. 49	·1438
7. 55	·1445
7. 58	·1439
8. 4	·1444
8. 7	·1435
8. 13	·1420
8. 18	·1404
8. 25	·1401
8. 30	·1403
8. 36	·1407
8. 44	·1418
8. 47	·1416
8. 49	·1421
8. 55	·1415
8. 59	·1416

Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.
Mar. 9	
0. 0	·03520
0. 13	·03520
0. 37	·03523
0. 41	·03530
1. 44	·03540
1. 52	·03544
2. 0	·03540
2. 27	·03556
2. 41	·03558
2. 58	·03570
3. 28	·03610
3. 40	·03600
3. 50	·03636
3. 52	·03622
4. 3	·03670
4. 8	·03660
4. 12	·03673
4. 17	·03662
4. 22	·03680
4. 26	·03667
4. 38	·03682
4. 47	·03703
4. 52	·03698
5. 12	·03689
5. 26	·03662
5. 32	·03663
5. 37	·03662
6. 2	·03644
6. 20	·03660
6. 27	·03658
6. 32	·03659
6. 53	·03650
7. 3	·03663
7. 10	·03660
7. 17	·03670
7. 22	·03666
7. 48	·03680
8. 1	·03660
8. 10	·03673
8. 22	·03643
8. 28	·03650
8. 51	·03642
9. 10	·03644
9. 18	·03630
9. 28	·03650
9. 42	·03601
9. 44	·03605
9. 54	·03579
10. 3	·03583
10. 12	·03561
10. 18	·03567
10. 25	·03540
10. 31	·03550
10. 37	·03537
11. 3	·03595
11. 10	·03565
11. 18	·03561
11. 29	·03523
11. 42	·03537
11. 53	·03512
12. 5	·03517
12. 13	·03502
12. 22	·03522
12. 33	·03502
12. 39	·03519
12. 43	·03513
12. 52	·03522
13. 2	·03503
13. 7	·03500
13. 18	·03521
13. 37	·03528
13. 47	·03518
14. 8	·03539
14. 16	·03539
14. 24	·03538
14. 44	·03542
15. 3	·03548
15. 32	·03537
15. 38	·03539
15. 43	·03537
16. 7	·03530
	***
18. 8	·03491
18. 49	·03486
	***
19. 12	·03480
19. 43	·03465

Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Mar. 9	°	°
0. 0	61·1	61·0
1. 0	61·1	61·3
2. 0	61·1	61·2
3. 0	61·1	61·5
9. 0	60·7	60·9
21. 0	59·7	59·5
22. 0	60·0	59·9
23. 0	60·3	60·3

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 9		Mar. 9		Mar. 9				
h m	° ′ ″	h m		h m		h m	°	°
15. 28	20. 5. 30	9. 15	·1401	19. 47	·03460			
15. 33	6. 45	9. 19	·1411	20. 5	·03455			
15. 40	6. 0	9. 25	·1413	20. 10	·03457			
15. 55	7. 0	9. 30	·1409	21. 7	·03422			
16. 2	7. 45	9. 35	·1415	21. 32	·03430			
16. 19	6. 30	9. 38	·1412	21. 38	·03417			
16. 26	7. 10	9. 41	·1417	21. 47	·03415			
16. 37	6. 5	9. 46	·1409	21. 56	·03423			
16. 42	6. 5	9. 54	·1394	22. 13	·03421			
16. 46	7. 0	9. 58	·1386	22. 22	·03410			
16. 52	6. 5	10. 2	·1388	22. 26	·03420			
17. 0	6. 30	10. 7	·1384	22. 39	·03425			
17. 19	6. 55	10. 11	·1381	22. 42	·03420			
17. 30	6. 0	10. 16	·1386	23. 2	·03421			
17. 40	6. 45	10. 18	·1381	23. 40	·03430			
17. 45	6. 0	10. 20	·1383	23. 59	·03440			
18. 2	5. 10	10. 25	·1377					
18. 7	6. 15	10. 28	·1380					
18. 14	7. 0	10. 37	·1371					
18. 21	6. 30	10. 40	·1375					
18. 43	7. 5	10. 45	·1381					
18. 48	6. 20	10. 47	·1379					
18. 52	7. 15	10. 50	·1386					
18. 57	5. 50	10. 55	·1393					
18. 59	6. 0	11. 0	·1397					
19. 3	4. 20	11. 5	·1395					
19. 11	6. 20	11. 7	·1401					
19. 33	6. 20	11. 10	·1395					
19. 37	6. 50	11. 20	·1405					
19. 46	6. 5	11. 25	·1403					
19. 52	3. 25	11. 33	·1410					
20. 0	4. 55	11. 37	·1413					
20. 3	7. 5	11. 44	·1410					
20. 9	6. 0	11. 48	·1409					
20. 12	8. 25	11. 57	·1422					
20. 16	6. 0	12. 4	·1415					
20. 20	7. 0	12. 7	·1408					
20. 37	5. 30	12. 14	·1403					
20. 49	6. 25	12. 20	·1407					
20. 52	6. 0	12. 26	·1402					
20. 55	7. 25	12. 33	·1396					
21. 3	7. 5	12. 40	·1395					
21. 8	5. 35	12. 46	·1390					
21. 20	5. 45	12. 49	·1398					
21. 23	7. 10	12. 53	·1408					
21. 29	6. 55	12. 56	·1413					
21. 36	10. 45	13. 3	·1418					
21. 39	10. 25	13. 8	·1415					
21. 42	11. 25	13. 16	·1419					
21. 50	9. 20	13. 26	·1425					
21. 54	11. 20	13. 28	·1423					
21. 58	10. 20	13. 35	·1422					
22. 2	12. 25	13. 46	·1417					
22. 8	10. 55	13. 50	·1420					
22. 12	11. 40	13. 56	·1418					
22. 24	8. 20	14. 5	·1420					
22. 30	10. 30	14. 14	·1418					
22. 37	10. 55	14. 16	·1419					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 9		Mar. 9						
h m	° ′ ″	h m		h m		h m	°	°
22. 40	20. 12. 35	14. 22	·1415					
22. 46	11. 0	14. 30	·1415					
22. 52	11. 20	14. 37	·1418					
23. 2	10. 0	14. 50	·1417					
23. 22	12. 55	15. 6	·1421					
23. 28	12. 30	15. 16	·1419					
23. 32	13. 10	15. 20	·1416					
23. 37	13. 0	15. 24	·1419					
23. 50	16. 15	15. 29	·1415					
23. 59	18. 10	15. 36	·1421					
		15. 40	·1417					
		15. 55	·1419					
		15. 58	·1421					
		16. 2	·1419					
		16. 4	·1422					
		16. 7	·1419					
		16. 10	·1421					
		16. 13	·1419					
		16. 16	·1421					
		16. 18	·1419					
		16. 27	·1424					
		16. 33	·1421					
		16. 38	·1423					
		16. 40	·1421					
		16. 46	·1423					
		16. 50	·1423					
		16. 54	·1419					
		17. 0	·1422					
		17. 5	·1421					
		17. 14	·1423					
		17. 17	·1422					
		17. 25	·1424					
		17. 28	·1421					
		17. 35	·1421					
		17. 40	·1424					
		17. 48	·1421					
		17. 58	·1423					
		18. 4	·1419					
		18. 7	·1425					
		18. 9	·1423					
		18. 15	·1422					
		18. 24	·1419					
		18. 30	·1421					
		18. 35	·1418					
		18. 39	·1421					
		18. 50	·1417					
		18. 55	·1421					
		18. 58	·1417					
		19. 1	·1420					
		19. 5	·1415					
		19. 10	·1422					
		19. 15	·1419					
		19. 22	·1423					
		19. 26	·1421					
		19. 32	·1422					
		19. 36	·1419					
		19. 38	·1422					
		19. 45	·1421					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Readings of Thermometers. Of V.F. Magnet.
h m	° ′ ″	Mar. 9 h m		h m		h m	°	°
		19. 53	·1417					
		19. 58	·1422					
		20. 5	·1422					
		20. 8	·1417					
		20. 14	·1420					
		20. 17	·1416					
		20. 20	·1418					
		20. 25	·1413					
		20. 32	·1417					
		20. 36	·1413					
		20. 45	·1415					
		20. 53	·1412					
		20. 57	·1416					
		21. 1	·1412					
		21. 7	·1415					
		21. 20	·1411					
		21. 25	·1413					
		21. 30	·1410					
		21. 36	·1418					
		21. 52	·1405					
		21. 58	·1410					
		22. 0	·1407					
		22. 5	·1410					
		22. 8	·1405					
		22. 15	·1409					
		22. 24	·1403					
		22. 33	·1409					
		22. 36	·1413					
		22. 39	·1410					
		22. 43	·1414					
		22. 48	·1409					
		22. 55	·1407					
		22. 57	·1409					
		22. 58	·1403					
		23. 1	·1408					
		23. 5	·1405					
		23. 8	·1410					
		23. 16	·1413					
		23. 24	·1417					
		23. 29	·1414					
		23. 34	·1418					
		23. 37	·1414					
		23. 40	·1417					
		23. 44	·1414					
		23. 53	·1421					
		23. 59	·1424					
Mar. 10		Mar. 10		Mar. 10		Mar. 10		
0. 0	20. 18. 10	0. 0	·1424	0. 0	·03439	0. 0	60·7	61·0
0. 10	17. 0	0. 10	·1418	0. 3	·03440	1. 0	60·6	60·9
0. 20	18. 55	0. 18	·1420	0. 13	·03450	2. 0	60·4	60·5
0. 35	13. 45	0. 29	·1410	0. 30	·03445	3. 0	60·5	60·5
0. 45	12. 55	0. 45	·1403	1. 0	·03492	6. 0	60·9	61·1
0. 49	11. 40	0. 57	·1413	1. 24	·03500	9. 0	61·0	61·5
0. 55	14. 55	1. 7	·1421	1. 42	·03502	21. 0	61·0	61·1
1. 7	16. 15	1. 15	·1424	1. 57	·03503	22. 0	60·8	60·8
1. 23	15. 55	1. 21	·1422	2. 3	·03524	23. 0	60·6	60·6
1. 30	16. 55	1. 27	·1420	2. 17	·03532			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Readings of Thermometers. Of V.F. Magnet.
Mar. 10 h m	° ′ ″	Mar. 10 h m		Mar. 10 h m		h m	°	°
1. 35	20. 15. 45	1. 30	·1426	2. 30	·03550			
1. 41	15. 55	1. 35	·1421	3. 4	·03548			
1. 52	19. 25	1. 43	·1413	3. 20	·03538			
1. 58	17. 55	1. 48	·1419	5. 2	·03572			
2. 8	20. 45	1. 57	·1412	5. 22	·03562			
2. 11	21. 0	2. 8	·1420	5. 37	·03598			
2. 28	17. 0	2. 19	·1424	5. 43	·03590			
2. 30	17. 40	2. 27	·1427	5. 52	·03598			
2. 42	13. 5	2. 33	·1430	6. 0	·03580			
2. 56	12. 20	2. 37	·1426	6. 4	·03579			
3. 0	11. 30	2. 44	·1417	6. 12	·03560			
3. 7	12. 40	2. 51	·1418	6. 16	·03560			
3. 20	13. 10	2. 56	·1417	6. 24	·03545			
3. 38	12. 45	3. 6	·1426	6. 37	·03554			
3. 43	13. 10	3. 17	·1417	6. 43	·03546			
3. 50	12. 40	3. 25	·1422	7. 0	·03549			
4. 9	12. 55	3. 33	·1420	7. 27	·03540			
4. 12	14. 10	3. 36	·1421	7. 33	·03557			
	(†)	3. 45	·1418	7. 40	·03535			
4. 33	13. 20	3. 50	·1418	7. 47	·03541			
4. 43	14. 25	4. 0	·1424	7. 52	·03523			
4. 49	13. 30	4. 6	·1426	7. 56	·03517			
4. 58	12. 55	4. 10	·1430	8. 3	·03519			
5. 8	8. 5		(†)	8. 16	·03506			
5. 17	8. 10	4. 34	·1427	8. 34	·03512			
5. 18	7. 20	4. 38	·1423	8. 42	·03501			
5. 22	20. 7. 10	4. 43	·1425	8. 53	·03503			
5. 37	19. 44. 35	4. 47	·1423	8. 59	·03497			
5. 47	44. 55	4. 55	·1418	9. 9	·03506			
6. 10	59. 25	5. 0	·1420	9. 24	·03509			
6. 16	19. 59. 40	5. 5	·1418	9. 32	·03502			
6. 24	20. 3. 5	5. 7	·1420	9. 46	·03517			
6. 30	2. 50	5. 10	·1416	10. 8	·03510			
6. 40	5. 25	5. 13	·1418	10. 17	·03520			
6. 51	4. 40	5. 18	·1411	10. 22	·03524			
6. 58	6. 10	5. 30	·1378	10. 30	·03518			
7. 17	6. 35	5. 33	·1375	10. 50	·03524			
7. 30	0. 10	5. 46	·1434	11. 0	·03538			
7. 37	4. 0	5. 53	·1444	11. 10	·03513			
7. 42	0. 0	5. 55	·1449	11. 29	·03420			
7. 46	20. 1. 40	5. 58	·1453	11. 34	·03422			
7. 58	19. 54. 50	6. 5	·1448	11. 42	·03412			
8. 8	57. 45	6. 13	·1443	11. 52	·03442			
8. 13	55. 50	6. 17	·1437	12. 2	·03446			
8. 23	19. 56. 25	6. 22	·1438	12. 11	·03453			
8. 33	20. 0. 10	6. 26	·1430	12. 37	·03442			
8. 45	19. 59. 20	6. 30	·1427	12. 53	·03470			
8. 52	20. 2. 0	6. 41	·1433	13. 0	·03478			
8. 59	2. 0	6. 49	·1428	13. 7	·03485			
9. 6	0. 10	6. 58	·1431	13. 25	·03492			
9. 18	20. 0. 55	7. 13	·1427	13. 46	·03515			
9. 32	19. 58. 10	7. 24	·1417	14. 0	·03510			
9. 42	20. 0. 15	7. 28	·1420	14. 13	·03520			
9. 51	2. 35	7. 33	·1435	14. 46	·03517			
10. 3	2. 5	7. 36	·1445	15. 7	·03505			
10. 10	1. 20	7. 38	·1450	15. 17	·03510			
10. 27	3. 30	7. 44	·1440	15. 24	·03501			
10. 41	3. 20	7. 50	·1451	15. 53	·03524			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Mar. 10		Mar. 10		Mar. 10				
h m	° ′ ″	h m		h m		h m	°	°
10. 53	20. 3. 45	7. 55	·1440	16. 20	·03522			
11. 11	20. 40	8. 5	·1457	16. 23	·03524			
11. 16	22. 0	8. 15	·1450	16. 44	·03515			
11. 28	15. 55	8. 20	·1455	16. 53	·03524			
11. 37	14. 40	8. 24	·1453	17. 0	·03525			
11. 49	7. 0	8. 32	·1456	17. 27	·03535			
12. 2	11. 0	8. 46	·1441	18. 8	·03537			
12. 7	10. 20	8. 53	·1444	18. 13	·03539			
12. 16	10. 0	9. 0	·1428	18. 53	·03526			
12. 21	8. 40	9. 5	·1416	19. 0	·03530			
12. 27	8. 25	9. 11	·1425	19. 7	·03525			
12. 40	2. 0	9. 20	·1427	19. 10	·03522			
12. 48	1. 15	9. 25	·1430	19. 11	·03530			
13. 2	0. 45	9. 30	·1428	19. 15	·03523			
13. 18	5. 0	9. 36	·1432	19. 48	·03526			
13. 23	5. 5	9. 47	·1432	20. 1	·03522			
13. 32	6. 40	9. 54	·1421	20. 16	·03530			
13. 39	6. 35	9. 58	·1418	20. 26	·03523			
13. 57	9. 0	10. 2	·1420	21. 26	·03521			
14. 2	8. 55	10. 10	·1414	22. 22	·03505			
14. 20	12. 20	10. 16	·1420	22. 53	·03489			
14. 30	11. 10	10. 25	·1421	23. 1	·03503			
14. 44	10. 50	10. 35	·1416	23. 12	·03498			
14. 56	8. 55	10. 44	·1417	23. 38	·03484			
15. 4	8. 25	10. 53	·1414	23. 59	·03496			
15. 13	9. 50	10. 58	·1419					
15. 23	8. 0	11. 9	·1455					
15. 33	7. 50	11. 20	·1436					
15. 46	9. 0	11. 28	·1424					
15. 57	9. 5	11. 35	·1428					
16. 20	7. 40	11. 44	·1424					
16. 32	8. 10	11. 48	·1429					
16. 40	6. 10	11. 53	·1442					
16. 53	6. 15	12. 3	·1433					
17. 0	7. 40	12. 9	·1436					
17. 9	6. 40	12. 16	·1428					
17. 13	6. 35	12. 26	·1419					
17. 26	7. 40	12. 32	·1415					
17. 48	8. 10	12. 37	·1412					
18. 9	10. 20	12. 40	·1414					
18. 13	9. 30	12. 45	·1411					
18. 30	10. 50	12. 58	·1415					
18. 42	10. 55	13. 7	·1420					
18. 58	10. 0	13. 16	·1413					
19. 8	11. 25	13. 29	·1411					
19. 12	9. 50	13. 35	·1412					
19. 15	10. 40	13. 45	·1417					
19. 22	9. 30	13. 54	·1414					
19. 32	9. 25	14. 1	·1409					
19. 36	10. 35	14. 10	·1416					
19. 40	9. 20	14. 16	·1415					
19. 45	9. 5	14. 23	·1419					
19. 50	10. 20	14. 29	·1416					
20. 10	6. 10	14. 35	·1419					
20. 23	8. 50	14. 40	·1417					
20. 32	9. 10	14. 46	·1420					
20. 38	10. 50	14. 57	·1419					
20. 42	9. 20	15. 5	·1416					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Mar. 10		Mar. 10						
h m	° ′ ″	h m		h m		h m	°	°
20. 47	20. 10. 25	15. 10	·1419					
21. 3	11. 0	15. 22	·1412					
21. 10	10. 20	15. 39	·1416					
21. 27	10. 25	15. 47	·1416					
21. 31	9. 40	16. 0	·1419					
21. 33	10. 30	16. 11	·1425					
21. 51	9. 50	16. 18	·1423					
22. 16	10. 15	16. 25	·1430					
22. 27	9. 35	16. 34	·1426					
22. 42	11. 0	16. 46	·1426					
22. 46	10. 5	16. 54	·1421					
22. 53	11. 55	17. 8	·1417					
22. 59	10. 25	17. 19	·1421					
23. 3	13. 5	17. 24	·1417					
23. 14	15. 40	17. 40	·1418					
23. 38	14. 45	17. 58	·1422					
23. 47	15. 20	18. 5	·1420					
23. 59	16. 20	18. 12	·1416					
		18. 15	·1419					
		18. 22	·1422					
		18. 33	·1419					
		18. 40	·1421					
		18. 47	·1418					
		18. 51	·1420					
		18. 58	·1418					
		19. 3	·1420					
		19. 12	·1412					
		19. 16	·1415					
		19. 19	·1408					
		19. 24	·1410					
		19. 28	·1409					
		19. 36	·1405					
			***					
		19. 48	·1407					
			***					
		20. 3	·1405					
		20. 12	·1412					
		20. 25	·1416					
		20. 33	·1412					
		20. 43	·1407					
		21. 1	·1406					
		21. 12	·1404					
		21. 23	·1408					
		21. 31	·1403					
		21. 36	·1408					
		21. 43	·1405					
		21. 58	·1413					
		22. 13	·1414					
		22. 16	·1411					
		22. 20	·1414					
		22. 24	·1410					
		22. 30	·1416					
		22. 36	·1413					
		22. 45	·1412					
		22. 55	·1412					
		23. 3	·1423					
		23. 5	·1416					
		23. 14	·1424					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
h m	° ′ ″	Mar. 10 h m		h m		h m	°	°
		23. 17	·1412					
		23. 22	·1409					
		23. 28	·1410					
		23. 35	·1405					
		23. 59	·1416					
Mar. 18		Mar. 18		Mar. 18		Mar. 18		
0. 0	20. 20. 0	0. 0	·1403	1. 0	·03491*	0. 0	60·4	60·7
0. 12	19. 35	0. 15	·1403	3. 0	·03637*	1. 0	60·4	60·7
0. 22	20. 10	0. 23	·1408	9. 0	·03606*	3. 0	60·6	60·9
0. 56	18. 0	0. 29	·1406	21. 0	·03534*	9. 0	61·2	61·5
1. 3	18. 30	0. 34	·1407			21. 0	60·8	61·2
1. 12	21. 25	0. 37	·1405			22. 0	60·7	60·8
1. 20	19. 20	0. 45	·1410			23. 0	60·4	60·5
1. 23	20. 50	0. 49	·1408					
1. 32	19. 55	0. 56	·1412					
1. 42	23. 45	1. 0	·1417					
1. 50	19. 55	1. 8	·1420					
1. 52	20. 15	1. 14	·1428					
	(†)	1. 20	·1420					
2. 14	17. 0	1. 24	·1418					
2. 26	24. 25	1. 28	·1421					
2. 39	6. 15	1. 34	·1416					
2. 56	8. 30	1. 40	·1421					
3. 12	14. 0	1. 46	·1425					
3. 27	21. 40	1. 50	·1423					
3. 38	28. 25		(†)					
3. 47	21. 30	2. 15	·1436					
3. 52	21. 20	2. 18	·1432					
4. 8	25. 10	2. 30	·1447					
4. 16	17. 25	2. 36	·1431					
4. 33	15. 45	2. 40	·1415					
4. 41	17. 5	2. 46	·1428					
4. 50	17. 5	2. 55	·1436					
4. 52	16. 10	2. 59	·1434					
4. 57	16. 25	3. 5	·1435					
5. 4	13. 55	3. 15	·1446					
5. 14	15. 40	3. 17	·1449					
5. 22	15. 45	3. 26	·1450					
5. 38	10. 55	3. 40	·1459					
5. 52	9. 20	3. 45	·1444					
5. 58	10. 5	3. 49	·1433					
6. 16	9. 30	3. 53	·1430					
6. 22	9. 40	3. 59	·1434					
6. 33	8. 45	4. 9	·1433					
6. 40	8. 50	4. 14	·1426					
7. 4	20. 3. 45	4. 18	·1409					
7. 24	19. 59. 30	4. 26	·1418					
7. 32	55. 35	4. 31	·1411					
7. 47	19. 59. 50	4. 35	·1418					
7. 52	20. 2. 45	4. 39	·1413					
7. 57	1. 55	4. 46	·1415					
8. 13	6. 30	4. 53	·1414					
8. 24	12. 5	4. 57	·1405					
8. 41	9. 0	5. 0	·1413					
8. 52	9. 30	5. 3	·1417					
9. 33	5. 45	5. 7	·1412					
9. 47	4. 55	5. 11	·1425					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Of V. F. Magnet.
Mar. 18 h m	° ′ ″	Mar. 18 h m		h m		h m	°	°
10. 3	20. 5. 55	5. 17	·1434					
10. 13	5. 45	5. 23	·1424					
10. 23	20. 6. 0	5. 33	·1416					
10. 47	19. 55. 50	5. 40	·1409					
10. 53	19. 55. 15	5. 45	·1415					
11. 17	20. 0. 55	5. 47	·1414					
11. 26	0. 50	5. 51	·1422					
12. 0	4. 20	5. 55	·1418					
		6. 3	·1426					
		6. 6	·1424					
		6. 10	·1427					
		6. 15	·1424					
		6. 26	·1431					
		6. 45	·1435					
		6. 50	·1427					
		6. 57	·1428					
		7. 6	·1423					
		7. 14	·1425					
		7. 18	·1422					
		7. 24	·1422					
		7. 28	·1426					
		7. 33	·1434					
		7. 36	·1422					
		7. 46	·1439					
		7. 50	·1436					
		8. 0	·1449					
		8. 5	·1444					
		8. 10	·1450					
		8. 14	·1448					
		8. 21	·1458					
		8. 29	·1465					
		8. 34	·1445					
		8. 36	·1428					
		8. 39	·1433					
		8. 45	·1425					
		8. 49	·1431					
		8. 55	·1437					
		9. 4	·1439					
		9. 24	·1443					
		9. 44	·1440					
		10. 4	·1442					
		10. 23	·1435					
		10. 36	·1440					
		10. 50	·1464					
		10. 54	·1461					
		10. 59	·1466					
		11. 5	·1470					
		11. 23	·1451					
		11. 30	·1449					
		11. 36	·1444					
		11. 45	·1439					
		11. 58	·1427					
		12. 7	·1425					
Apr. 2		Apr. 2		Apr. 2		Apr. 2		
0. 0	20. 12. 0	0. 0	·1412	0. 0	·03332	0. 0	60·9	61·2
0. 22	14. 55	0. 18	·1415	0. 32	·03354	1. 0	60·7	60·7
0. 38	17. 45	0. 24	·1413	1. 2	·03362	2. 0	60·6	60·6

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 2		Apr. 2		Apr. 2		Apr. 2			Apr. 2		Apr. 2		Apr. 2				
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
0. 58	20. 17. 40	0. 30	·1415	1. 48	·03362	3. 0	60·6	60·9	12. 55	19. 54. 0	8. 16	·1438	12. 39	·03165			
1. 8	19. 0	0. 36	·1413	1. 54	·03370	9. 0	60·4	60·4	13. 5	20. 4. 20	8. 23	·1427	12. 49	·03187			
1. 36	20. 10	0. 40	·1416	2. 9	·03362	21. 0	60·3	60·3	13. 12	20. 7. 20	8. 29	·1419	12. 57	·03150			
1. 46	19. 20	0. 45	·1413	2. 23	·03362	22. 0	60·3	60·3	13. 40	19. 52. 25	8. 39	·1428	13. 7	·03150			
1. 55	19. 50	0. 51	·1416	2. 54	·03378	23. 0	60·0	59·5	13. 46	53. 0	8. 45	·1423	13. 16	·03112			
2. 13	17. 55	0. 55	·1414	3. 27	·03389				13. 49	51. 55	8. 47	·1427	13. 22	·03120			
2. 47	19. 45	1. 9	·1421	4. 7	·03421				13. 56	57. 10	8. 52	·1422	13. 33	·03043			
3. 15	19. 0	1. 17	·1422	4. 28	·03430				14. 4	56. 10	8. 56	·1424	13. 40	·03061			
3. 50	19. 30	1. 34	·1425	4. 58	·03456				14. 9	57. 10	9. 2	·1409	13. 46	·03047			
4. 0	18. 50	1. 43	·1420	5. 8	·03467				14. 18	55. 25	9. 12	·1416	14. 0	·03107			
4. 13	20. 0	1. 56	·1424	5. 13	·03472				14. 29	54. 45	9. 15	·1424	14. 9	·03023			
4. 32	19. 30	2. 8	·1417	5. 22	·03490				14. 35	55. 50	9. 23	·1442	14. 17	·03046			
4. 38	19. 35	2. 23	·1423	5. 26	·03489				14. 42	53. 15	9. 27	·1450	14. 22	·03043			
4. 49	18. 55	2. 31	·1429	5. 34	·03517				14. 49	51. 10	9. 34	·1436	14. 23	·03050			
4. 55	18. 45	2. 37	·1433	5. 43	·03520				14. 53	53. 25	9. 38	·1430	14. 24	·03047			
5. 3	16. 20	2. 45	·1439	5. 50	·03532				15. 3	49. 20	9. 44	·1424	14. 30	·03050			
5. 18	12. 20	3. 14	·1435	6. 16	·03492				15. 8	49. 55	9. 47	·1429	14. 33	·03042			
5. 30	20. 2. 5	3. 35	·1438	6. 24	·03500				15. 16	47. 10	9. 52	·1419	14. 38	·03050			
5. 48	19. 54. 5	3. 49	·1443	6. 39	·03483				15. 21	46. 35	9. 56	·1422	14. 43	·03018			
6. 1	58. 55	4. 9	·1442	6. 47	·03489				15. 22	44. 40	10. 0	·1418	14. 49	·03023			
6. 13	59. 40	4. 25	·1446	6. 52	·03480				15. 29	47. 0	10. 5	·1411	14. 57	·03083			
6. 22	19. 58. 45	4. 31	·1443	7. 7	·03483				15. 40	44. 10	10. 7	·1420	14. 59	·03088			
6. 34	20. 5. 35	4. 38	·1447	7. 14	·03478				15. 50	48. 10	10. 11	·1424	15. 4	·03075			
6. 50	12. 0	4. 49	·1443	7. 26	·03486				15. 56	49. 30	10. 15	·1425	15. 8	·03085			
7. 0	7. 30	4. 55	·1445	7. 37	·03478				16. 11	56. 0	10. 24	·1432	15. 12	·03084			
7. 9	9. 15	5. 4	·1441	7. 41	·03483				16. 20	53. 0	10. 34	·1423	15. 16	·03090			
7. 19	7. 45	5. 7	·1445	7. 57	·03481				16. 30	59. 15	10. 38	·1420	15. 22	·03083			
7. 28	9. 10	5. 16	·1437	7. 59	·03477				16. 39	19. 59. 45	10. 44	·1426	15. 27	·03095			
7. 35	8. 20	5. 20	·1437	8. 6	·03483				16. 52	20. 1. 50	10. 47	·1420	15. 31	·03138			
7. 43	7. 40	5. 26	·1432	8. 10	·03478				17. 0	3. 35	10. 53	·1425	15. 34	·03144			
7. 53	3. 15	5. 30	·1440	8. 16	·03480				17. 39	2. 50	10. 57	·1422	15. 42	·03144			
8. 3	0. 20	5. 35	·1452	8. 30	·03452				17. 43	1. 5	11. 4	·1418	15. 50	·03166			
8. 24	10. 0	5. 42	·1462	8. 39	·03454				17. 51	2. 25	11. 7	·1420	15. 57	·03163			
8. 36	7. 5	5. 51	·1485	8. 47	·03442				18. 10	2. 25	11. 13	·1415	16. 14	·03214			
8. 42	6. 40	5. 59	·1477	8. 50	·03442				18. 13	1. 40	11. 16	·1416	16. 16	·03203			
8. 50	4. 0	6. 4	·1474	9. 2	·03393				18. 27	2. 50	11. 23	·1410	16. 19	·03217			
8. 58	20. 1. 55	6. 17	·1455	9. 23	·03422				18. 33	1. 55	11. 33	·1405	16. 22	·03210			
9. 8	19. 45. 45	6. 25	·1461	9. 47	·03350				18. 50	2. 20	11. 36	·1407	16. 26	·03238			
9. 19	40. 35	6. 35	·1457	9. 57	·03360				18. 57	2. 0	11. 43	·1404	16. 38	·03270			
9. 34	57. 0	6. 40	·1450	10. 1	·03353				19. 0	3. 0	11. 55	·1417	16. 51	·03314			
9. 50	50. 50	6. 48	·1445	10. 8	·03362				19. 11	2. 10	12. 2	·1418	17. 9	·03338			
10. 3	59. 10	6. 54	·1430	10. 12	·03358				19. 16	3. 0	12. 7	·1404	17. 42	·03361			
10. 17	57. 10	7. 0	·1434	10. 20	·03362				19. 20	2. 20	12. 15	·1392	17. 48	·03360			
10. 31	59. 0	7. 5	·1436	10. 30	·03346				19. 33	2. 40	12. 23	·1377	17. 53	·03367			
10. 42	58. 20	7. 9	·1431	10. 38	·03347				19. 50	2. 0	12. 26	·1386	18. 45	·03388			
10. 43	58. 0	7. 12	·1433	10. 40	·03340				19. 57	2. 45	12. 31	·1403		***			
11. 8	48. 55	7. 16	·1422	10. 47	·03344				20. 8	2. 0	12. 37	·1416	19. 32	·03395			
11. 17	48. 20	7. 20	·1425	10. 57	·03314				20. 20	2. 20	12. 44	·1407		***			
11. 28	50. 55	7. 25	·1430	11. 15	·03290				20. 30	3. 0	12. 55	·1425	20. 32	·03390			
11. 40	48. 45	7. 27	·1427	11. 20	·03294				20. 40	2. 55	12. 58	·1411		***			
11. 47	50. 45	7. 32	·1430	11. 25	·03290				20. 41	3. 40	13. 6	·1405	20. 59	·03391			
11. 53	50. 0	7. 37	·1423	11. 32	·03292				20. 57	3. 30	13. 13	·1385	21. 6	·03386			
12. 5	53. 40	7. 45	·1426	11. 41	·03280				21. 0	2. 50	13. 18	·1377	21. 10	·03400			
12. 18	19. 56. 0	7. 47	·1425	11. 56	·03274				21. 4	5. 5	13. 23	·1380	21. 17	·03390			
12. 25	20. 3. 0	7. 55	·1430	12. 6	·03230				21. 20	4. 0	13. 28	·1371	21. 32	·03387			
12. 32	19. 58. 5	7. 59	·1415	12. 12	·03217				21. 30	5. 10	13. 35	·1373	22. 20	·03395			
12. 43	52. 5	8. 4	·1427	12. 20	·03194				21. 40	5. 0	13. 38	·1376		(†)			
12. 50	50. 40	8. 7	·1431	12. 30	·03230				21. 44	6. 0	13. 43	·1373	23. 0	·03345			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 2		Apr. 2		Apr. 2				
h m	° ′ ″	h m		h m		h m	°	°
21. 56	20. 6. 5	13. 46	·1359	23. 24	·03320			
22. 0	7. 0	13. 50·	·1361	23. 42	·03327			
22. 18	7. 55	13. 56	·1356	23. 59	·03338			
	(†)	14. 3	·1361					
23. 4	9. 30	14. 8	·1357					
23. 11	10. 15	14. 15	·1369					
23. 35	11. 30	14. 22	·1385					
23. 59	14. 0	14. 27	·1399					
		14. 33	·1411					
		14. 41	·1423					
		14. 48	·1416					
		14. 55	·1415					
		14. 59	·1420					
		15. 6	·1409					
		15. 15	·1401					
		15. 19	·1393					
		15. 25	·1386					
		15. 27	·1389					
		15. 30	·1385					
		15. 35	·1394					
		15. 42	·1389					
		15. 46	·1395					
		15. 56	·1417					
		16. 5	·1416					
		16. 15	·1417					
		16. 22	·1410					
		16. 25	·1401					
		16. 33	·1413					
		16. 46	·1399					
		17. 0	·1398					
		17. 6	·1401					
		17. 12	·1398					
		17. 23	·1403					
		17. 45	·1406					
		17. 50	·1406					
		17. 53	·1402					
		17. 58	·1407					
		18. 9	·1405					
		18. 14	·1407					
		18. 17	·1405					
		18. 28	·1407					
		18. 42	·1404					
		18. 49	·1408					
		19. 3	·1406					
		19. 8	·1408					
		19. 15	·1405					
		19. 24	·1408					
		19. 29	·1403					
		19. 40	·1406					
		19. 44	·1403					
		19. 50	·1407					
		19. 55	·1403					
		20. 3	·1406					
		20. 10	·1402					
		20. 24	·1405					
		20. 28	·1402					
		20. 33	·1405					
		20. 36	·1402					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Apr. 2						
h m	° ′ ″	h m		h m		h m	°	°
		20. 45	·1401					
		20. 49	·1404					
		20. 55	·1399					
		20. 58	·1401					
		21. 1	·1398					
		21. 6	·1400					
		21. 11	·1397					
		21. 16	·1401					
		21. 25	·1396					
		21. 33	·1399					
		21. 37	·1397					
		21. 43	·1399					
		21. 49	·1397					
		21. 55	·1400					
		22. 4	·1398					
		22. 13	·1401					
		22. 20	·1399					
			(†)					
		23. 5	·1404					
		23. 9	·1408					
		23. 15	·1407					
		23. 25	·1410					
		23. 35	·1407					
		23. 45	·1413					
		23. 50	·1410					
		23. 59	·1416					
Apr. 14		Apr. 14		Apr. 14				
23. 0	20. 9. 30	23. 0	·1403	23. 5	·03370			
23. 26	12. 15	23. 15	·1404	23. 41	·03375			
23. 29	6. 20	23. 25	·1404	23. 52	·03318			
23. 42	14. 10	23. 38	·1464					
23. 52	4. 0	23. 54	·1390					
Apr. 15		Apr. 15		Apr. 15		Apr. 15		
0. 0	20. 4. 0	0. 5	·1416	0. 15	·03366	0. 0	60·7	62·1
0. 2	11. 40	0. 12	·1404	0. 28	·03434	1. 0	60·7	61·7
0. 12	6. 20	0. 16	·1418	0. 33	·03420	3. 0	61·2	62·1
0. 16	12. 5	0. 24	·1398	0. 40	·03441	9. 0	59·8	60·0
0. 19	3. 55	0. 27	·1422	0. 42	·03437	21. 0	61·1	61·1
0. 22	8. 0		(†)	0. 58	·03480	22. 0	60·7	60·7
0. 25	7. 20	0. 58	·1436	1. 2	·03505	23. 0	60·8	60·8
0. 32	7. 30	1. 7	·1448	1. 9	·03478			
0. 35	11. 5	1. 17	·1422	1. 11	·03486			
0. 42	8. 20	1. 27	·1480	1. 25	·03437			
0. 50	14. 20	1. 36	·1447	1. 43	·03435			
0. 53	12. 45	1. 41	·1453	2. 12	·03458			
0. 57	21. 5	1. 55	·1429	2. 20	·03505			
1. 4	17. 30	2. 8	·1466	2. 29	·03578			
1. 10	21. 40	2. 15	·1451	2. 31	·03565			
1. 12	20. 0	2. 25	·1466	2. 34	·03598			
1. 14	22. 40	2. 39	·1442	2. 38	·03620			
1. 17	20. 20	2. 47	·1481	2. 40	·03605			
1. 23	26. 45	2. 57	·1500	2. 48	·03650			
1. 27	20. 40	3. 4	·1486	2. 52	·03658			
1. 30	23. 20	3. 10	·1523	3. 2	·03646			
1. 35	24. 0	3. 24	·1465	3. 7	·03673			
1. 53	34. 5	3. 34	·1446	3. 12	·03721			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 15		Apr. 15		Apr. 15					Apr. 15		Apr. 15		Apr. 15				
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
2. 0	20. 32. 20	3. 36	·1449	3. 17	·03698				6. 53	20. 11. 35	8. 8	·1357	7. 19	·03604			
2. 12	38. 55	3. 38	·1426	3. 19	·03720				6. 57	10. 45	8. 10	·1328	7. 20	·03555			
2. 22	35. 20	3. 48	·1478	3. 22	·03699				7. 3	20. 18. 55	8. 17	·1436	7. 27	·03523			
2. 23	32. 20	3. 55	·1438	3. 29	·03741				7. 10	19. 59. 0	8. 25	·1391	7. 32	·03505			
2. 27	34. 55	4. 0	·1410	3. 30	·03730				7. 12	20. 0. 20	8. 29	·1394	7. 39	·03401			
2. 30	33. 20	4. 4	·1413	3. 32	·03746				7. 20	19. 47. 20	8. 35	·1371	7. 43	·03442			
2. 32	34. 30	4. 6	·1398	3. 37	·03717				7. 29	20. 11. 20	8. 37	·1396	7. 46	·03437			
2. 37	29. 50	4. 12	·1387	3. 42	·03690				7. 32	14. 0	8. 41	·1377	8. 2	·03927			
2. 38	30. 30	4. 23	·1415	3. 43	·03702				7. 37	6. 30	8. 45	·1373	8. 5	·03552			
2. 42	25. 50	4. 26	·1408	3. 44	·03683				7. 42	11. 30	8. 47	·1376	8. 6	·03580			
2. 47	19. 50	4. 30	·1415	3. 48	·03699				7. 47	13. 15	8. 54	·1366		(†)			
3. 0	30. 55	4. 33	·1405	3. 50	·03686				7. 57	20. 3. 40	9. 1	·1381	8. 27	·03376			
3. 4	27. 20	4. 37	·1419	3. 52	·03695				8. 3	19. 37. 0	9. 5	·1372	8. 32	·03413			
3. 10	24. 5	4. 40	·1416	3. 57	·03682				8. 8	27. 10	9. 15	·1310	8. 35	·03402			
3. 20	17. 30	4. 44	·1420	4. 1	·03693				8. 20	50. 20		(†)	8. 39	·03434			
3. 27	16. 0	4. 47	·1413	4. 7	·03697				8. 22	45. 45	9. 26	·1341	8. 45	·03382			
3. 33	22. 55	4. 51	·1432	4. 11	·03684				8. 24	47. 25	9. 28	·1356	8. 53	·03226			
3. 38	21. 20	4. 55	·1419	4. 18	·03688				8. 29	34. 30	9. 33	·1323	8. 56	·03233			
3. 40	22. 50	4. 59	·1440	4. 21	·03704				8. 33	39. 25	9. 37	·1367	8. 58	·03220			
3. 42	21. 20	5. 3	·1433	4. 27	·03710				8. 38	30. 20	9. 42	·1359	9. 2	·03373			
3. 46	22. 30	5. 13	·1460	4. 28	·03724				8. 42	29. 15	9. 48	·1357	9. 12	·03098			
3. 48	21. 30	5. 18	·1441	4. 30	·03717				8. 53	50. 20	9. 55	·1367	9. 17	·03188			
3. 51	23. 50	5. 23	·1445	4. 33	·03744				8. 57	49. 15	10. 6	·1353	9. 19	·03130			
3. 59	17. 45	5. 29	·1454	4. 37	·03739				8. 59	50. 0	10. 14	·1364	9. 32	·03370			
4. 7	20. 45	5. 35	·1472	4. 42	·03767				9. 3	41. 55	10. 19	·1370	9. 43	·03495			
4. 12	19. 20	5. 43	·1435	4. 52	·03800				9. 12	47. 20	10. 26	·1333	9. 57	·03414			
4. 13	20. 0	5. 46	·1451	5. 0	·03749				9. 13	54. 0	10. 35	·1382	10. 2	·03454			
4. 22	17. 35	5. 48	·1447	5. 11	·03743				9. 21	19. 45. 10	10. 38	·1370	10. 7	·03485			
4. 29	17. 5	5. 57	·1499	5. 16	·03759				9. 33	20. 9. 5	10. 43	·1379	10. 12	·03413			
4. 32	18. 0	6. 0	·1493	5. 21	·03750				9. 40	4. 55	10. 44	·1369	10. 14	·03433			
4. 36	16. 20	6. 3	·1504	5. 24	·03766				9. 51	2. 30	10. 47	·1383	10. 23	·03062			
4. 40	17. 45	6. 6	·1495	5. 29	·03757				10. 2	3. 0	10. 53	·1333	10. 30	·03142			
4. 43	15. 0	6. 8	·1502	5. 32	·03780				10. 11	6. 35	10. 56	·1390	10. 33	·03058			
4. 48	17. 20	6. 15	·1479	5. 37	·03773				10. 14	4. 55	11. 5	·1446	10. 39	·03276			
4. 52	14. 30	6. 19	·1422	5. 39	·03791				10. 16	20. 5. 25	11. 7	·1444	10. 45	·03155			
4. 58	8. 30	6. 24	·1451	5. 43	·03738				10. 33	19. 15. 25	11. 14	·1469	10. 47	·03163			
5. 3	11. 25	6. 28	·1441	5. 47	·03746				10. 47	26. 50	11. 18	·1450	10. 50	·03133			
5. 11	17. 25	6. 37	·1463	5. 51	·03736					(†)	11. 24	·1423	10. 52	·03157			
5. 17	13. 20	6. 45	·1418	5. 57	·03759				11. 11	31. 30	11. 30	·1430	10. 57	·03206			
5. 23	16. 55	6. 48	·1463	6. 0	·03729				11. 13	38. 30	11. 36	·1386	11. 2	·03195			
5. 28	20. 55	6. 53	·1443	6. 1	·03734				11. 22	35. 0	11. 42	·1396	11. 8	·03213			
5. 32	10. 20	6. 56	·1460	6. 3	·03683				11. 30	45. 10	11. 49	·1319	11. 12	·03203			
5. 36	7. 15	7. 0	·1438	6. 9	·03742				11. 35	40. 35	11. 54	·1334	11. 17	·03210			
5. 41	6. 0	7. 3	·1426	6. 11	·03733				11. 41	48. 55	11. 56	·1310	11. 23	·03162			
5. 42	6. 45	7. 7	·1446	6. 15	·03765				11. 44	53. 10		(†)	11. 30	·03137			
5. 47	2. 35	7. 14	·1434	6. 18	·03778				11. 50	36. 10	13. 39	·1310	11. 32	·03060			
5. 59	31. 5	7. 20	·1392	6. 25	·03743				11. 57	44. 25	13. 52	·1396	11. 37	·03003			
6. 3	18. 10	7. 23	·1412	6. 28	·03705				12. 0	41. 10	14. 0	·1300	11. 41	·03047			
6. 7	20. 5. 10	7. 25	·1404	6. 33	·03728				12. 15	5. 15	14. 13	·1390	11. 43	·02952			
6. 12	19. 57. 20	7. 28	·1411	6. 37	·03687				12. 21	21. 20	14. 18	·1375	11. 50	·02902			
6. 16	59. 55	7. 30	·1402	6. 40	·03700				12. 30	14. 55	14. 31	·1409	12. 0	·02990			
6. 19	55. 45	7. 34	·1433	6. 47	·03659				12. 40	20. 30	14. 44	·1304	12. 3	·03083			
6. 22	53. 35	7. 36	·1438	6. 49	·03650				12. 52	18. 30	14. 53	·1342	12. 5	·02845			
6. 29	59. 25	7. 47	·1404	6. 51	·03660				12. 58	20. 10	15. 0	·1359	12. 7	·02800			
6. 36	52. 10	7. 56	·1384	7. 3	·03610				13. 1	20. 15	15. 6	·1345	12. 17	·02914			
6. 42	19. 53. 50	8. 0	·1390	7. 7	·03638				13. 9	30. 15	15. 9	·1350	12. 21	·02833			
6. 47	20. 5. 30	8. 3	·1375	7. 12	·03588				13. 11	56. 20	15. 23	·1310	12. 24	·02802			
6. 50	5. 0	8. 5	·1390	7. 16	·03637				13. 17	47. 10		(†)	12. 27	·02830			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

April 15. The photographic trace for Horizontal Force was off the sheet in the direction of *diminishing* force from 9h. 15m. to 9h. 26m.; from 11h. 56m. to 13h. 39m.; and from 15h. 23m. to 16h. 18m.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Apr. 15		Apr. 15		Apr. 15				
h m	° ′ ″	h m		h m		h m	°	°
13. 18	19. 49. 30	16. 18	·1318	12. 28	·02820			
13. 20	51. 20	16. 23	·1325	12. 32	·02850			
13. 37	11. 0	16. 25	·1318	12. 36	·02837			
13. 48	37. 35	16. 32	·1337	12. 40	·02786			
13. 50	36. 30	16. 36	·1320	12. 43	·02795			
13. 58	57. 30	16. 39	·1330	12. 52	·02686			
14. 10	21. 50	16. 46	·1312	12. 57	·02715			
14. 14	19. 40	16. 57	·1356	13. 1	·02558			
14. 20	26. 55	17. 10	·1380	13. 6	·02440			
14. 29	25. 0	17. 13	·1372	13. 12	·02630			
14. 38	44. 40	17. 28	·1396	13. 17	·02980			
14. 59	11. 15	17. 34	·1381	13. 19	·02857			
15. 19	26. 0	17. 38	·1397	13. 21	·03022			
15. 22	25. 5	17. 42	·1382	13. 25	·02813			
15. 36	47. 10	17. 49	·1372	13. 30	·02907			
15. 38	46. 25	17. 52	·1380	13. 44	·03027			
15. 40	47. 20	17. 56	·1364	13. 51	·02863			
15. 59	25. 20	18. 1	·1371	14. 0	·03003			
16. 8	36. 55	18. 3	·1354	14. 7	·02854			
16. 11	35. 25	18. 9	·1361	14. 12	·02837			
16. 16	38. 10	18. 11	·1354	14. 19	·02880			
16. 19	19. 33. 50	18. 17	·1366	14. 23	·02928			
16. 30	20. 0. 30	18. 19	·1354	14. 29	·02794			
16. 38	19. 57. 45	18. 25	·1365	14. 38	·02707			
16. 41	57. 5	18. 30	·1360	14. 40	·02691			
16. 50	50. 45	18. 33	·1371	14. 42	·02710			
16. 56	50. 0	18. 40	·1360	14. 47	·02810			
16. 58	52. 45	18. 44	·1376	15. 1	·02738			
17. 5	57. 15	18. 53	·1356	15. 7	·02726			
17. 20	51. 5	18. 57	·1373	15. 12	·02745			
17. 26	55. 35	19. 0	·1359	15. 19	·02778			
17. 30	54. 0	19. 5	·1374	15. 22	·02768			
17. 32	58. 5	19. 7	·1361	15. 37	·02903			
17. 39	56. 5	19. 10	·1368	15. 40	·02845			
17. 41	58. 25	19. 17	·1353	15. 41	·02805			
17. 44	57. 20	19. 20	·1366	15. 42	·02816			
17. 51	56. 45	19. 23	·1358	15. 44	·02800			
17. 55	58. 0	19. 29	·1369	15. 50	·02862			
18. 0	57. 30	19. 37	·1372	15. 54	·02933			
18. 4	59. 0	19. 40	·1367	15. 58	·02957			
18. 7	56. 20	19. 47	·1374	16. 3	·02880			
	***	19. 52	·1365	16. 7	·02980			
18. 23	57. 30	19. 57	·1374	16. 18	·02987			
18. 40	19. 55. 25	19. 58	·1372	16. 27	·03016			
18. 47	20. 0. 20	20. 2	·1382	16. 32	·02938			
18. 51	19. 57. 20	20. 14	·1368	16. 34	·02942			
18. 57	20. 1. 50	20. 19	·1372	16. 38	·02887			
19. 0	19. 57. 20	20. 28	·1368	16. 50	·02923			
19. 3	19. 59. 45	20. 33	·1375	16. 54	·02985			
19. 13	20. 0. 0	20. 37	·1368	17. 3	·03037			
19. 16	19. 55. 45	20. 44	·1366	17. 7	·03029			
19. 20	58. 55	20. 50	·1372	17. 10	·03020			
19. 22	19. 57. 10	20. 58	·1369	17. 11	·03027			
19. 27	20. 0. 30	21. 4	·1366	17. 14	·03022			
19. 37	20. 1. 40	21. 24	·1374	17. 20	·03038			
19. 39	19. 59. 55	21. 32	·1372	17. 27	·03025			
19. 48	20. 2. 55	21. 39	·1379	17. 36	·03047			
19. 50	20. 0. 5	21. 45	·1380	17. 42	·03070			
	***							

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Apr. 15		Apr. 15		Apr. 15				
h m	° ′ ″	h m		h m		h m	°	°
20. 1	20. 4. 10	21. 50	·1376	17. 50	·03087			
20. 6	3. 30	21. 56	·1382	17. 56	·03112			
20. 9	6. 5	22. 4	·1377	18. 0	·03106			
20. 11	3. 35	22. 19	·1378	18. 13	·03169			
20. 12	5. 10	22. 24	·1373	18. 20	·03190			
20. 22	4. 5	22. 30	·1383	18. 30	·03217			
20. 27	5. 0	22. 45	·1375	18. 37	·03220			
20. 44	4. 30	22. 50	·1382	18. 43	·03254			
20. 49	6. 15	22. 59	·1383	18. 47	·03242			
21. 10	5. 55	23. 3	·1389	18. 52	·03278			
21. 29	7. 20	23. 10	·1385	18. 56	·03268			
21. 32	6. 20	23. 19	·1395	19. 0	·03286			
21. 40	9. 10	23. 23	·1382	19. 2	·03280			
21. 46	7. 55	23. 27	·1391	19. 6	·03300			
21. 55	10. 5	23. 32	·1388	19. 13	·03297			
22. 2	9. 0	23. 36	·1392	19. 20	·03303			
22. 9	11. 20	23. 50	·1396	19. 22	·03326			
22. 13	10. 5	23. 59	·1393	19. 33	·03342			
22. 23	10. 45			19. 37	·03339			
22. 31	12. 55			19. 42	·03350			
22. 38	11. 30			19. 47	·03343			
22. 46	11. 20			20. 0	·03365			
22. 52	12. 20				***			
22. 57	11. 15			20. 30	·03380			
23. 3	13. 5			20. 32	·03377			
23. 16	12. 10			20. 49	·03394			
23. 20	11. 30			21. 8	·03393			
23. 23	12. 50			21. 30	·03403			
23. 30	12. 45			21. 37	·03415			
23. 59	13. 0			21. 47	·03410			
				21. 56	·03417			
				22. 3	·03412			
				22. 12	·03420			
				23. 1	·03400			
				23. 34	·03390			
				23. 49	·03382			
				23. 53	·03390			
				23. 58	·03380			
				23. 59	·03380			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force.	Greenwich Mean Solar Time.	Vertical Force.	Greenwich Mean Solar Time.	Of H. F. Magnet.	Of V. F. Magnet.
Apr. 16		Apr. 16		Apr. 16		Apr. 16		
0. 0	20. 13. 0	0. 0	·1393	0. 0	·03381	0. 0	61·0	61·2
0. 6	13. 20	0. 10	·1401	0. 15	·03382	1. 0	60·2	60·5
0. 10	12. 45	0. 18	·1393	0. 39	·03374	2. 0	60·3	60·5
0. 32	14. 5	0. 20	·1403	0. 49	·03380	3. 0	60·8	61·0
0. 43	13. 20	0. 25	·1400	0. 52	·03373	9. 0	61·0	61·0
0. 50	15. 0	0. 32	·1412	0. 54	·03383	21. 0	60·5	60·7
0. 57	14. 0	0. 40	·1411	0. 55	·03374	22. 0	60·6	60·7
1. 2	15. 5	0. 45	·1415	1. 2	·03365	23. 0	59·5	59·5
1. 8	14. 5	0. 54	·1407	1. 6	·03376	23. 35	59·7	59·5
1. 18	14. 10	1. 4	·1424	1. 12	·03363			
1. 23	13. 5	1. 8	·1419	1. 17	·03375			
1. 40	13. 5	1. 14	·1431	1. 22	·03357			
1. 45	14. 0	1. 25	·1416	1. 24	·03374			
1. 49	13. 10	1. 32	·1423	1. 28	·03366			
1. 56	14. 0	1. 38	·1407	1. 33	·03364			
2. 7	11. 20	1. 41	·1415	1. 43	·03383			
2. 13	11. 55	1. 43	·1411	1. 48	·03362			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 16		Apr. 16		Apr. 16				
h m	° ′ ″	h m		h m		h m	°	°
2. 20	20. 11. 25	1. 47	·1416	1. 53	·03380			
2. 30	11. 35	1. 52	·1413	1. 59	·03364			
2. 37	12. 20	2. 3	·1437	2. 12	·03381			
2. 46	10. 45	2. 9	·1437	2. 18	·03373			
2. 51	10. 45	2. 20	·1412	2. 32	·03380			
2. 56	12. 15	2. 30	·1424	2. 38	·03387			
3. 7	12. 0	2. 34	·1416	2. 42	·03387			
3. 10	10. 25	2. 38	·1424	2. 43	·03377			
3. 16	11. 55	2. 42	·1422	2. 50	·03384			
3. 24	10. 10	2. 45	·1426	2. 57	·03400			
3. 37	10. 30	2. 48	·1424	3. 3	·03381			
3. 42	9. 25	2. 53	·1431	3. 19	·03390			
3. 49	10. 0	3. 0	·1419	4. 41	·03395			
3. 59	9. 20	3. 10	·1443	4. 50	·03403			
4. 7	9. 50	3. 16	·1432	4. 59	·03398			
	***	3. 22	·1440	5. 10	·03403			
5. 20	8. 20	3. 28	·1432	5. 14	·03397			
5. 30	9. 0	3. 31	·1436	5. 30	·03403			
5. 34	8. 5	3. 36	·1424	5. 34	·03394			
5. 52	8. 40	3. 39	·1436	5. 46	·03400			
5. 57	8. 20	3. 44	·1425	5. 50	·03398			
6. 3	9. 0	3. 48	·1428	5. 56	·03402			
6. 10	8. 0	3. 55	·1419	5. 58	·03397			
6. 18	7. 50	4. 5	·1427	6. 3	·03404			
6. 37	8. 0	4. 10	·1420	6. 10	·03386			
7. 5	7. 30	4. 19	·1428	6. 14	·03393			
7. 9	8. 0	4. 23	·1423	6. 27	·03398			
7. 13	7. 20	4. 25	·1427	7. 19	·03395			
7. 20	7. 45	4. 33	·1421	8. 6	·03380			
7. 23	8. 5	4. 38	·1425	8. 8	·03380			
7. 59	8. 0	4. 43	·1421	8. 22	·03403			
8. 8	6. 55	4. 47	·1426	8. 29	·03390			
8. 20	8. 0	4. 50	·1422	8. 37	·03392			
8. 37	8. 15	4. 54	·1425	8. 41	·03384			
8. 44	7. 20	4. 57	·1419	8. 48	·03392			
8. 53	8. 10	5. 2	·1426	8. 50	·03387			
9. 9	7. 35	5. 5	·1423	8. 55	·03398			
9. 38	7. 50	5. 8	·1427	9. 3	·03387			
9. 39	7. 35	5. 12	·1420	9. 12	·03395			
9. 48	6. 25	5. 15	·1422	9. 37	·03393			
10. 8	7. 0	5. 17	·1419	9. 40	·03402			
10. 12	6. 5	5. 20	·1425	9. 46	·03393			
10. 27	4. 55	5. 24	·1420	10. 9	·03396			
10. 30	5. 20	5. 30	·1416	10. 14	·03410			
10. 38	2. 45	5. 36	·1424	10. 19	·03390			
10. 43	1. 55	5. 39	·1421	10. 24	·03403			
10. 53	3. 10	5. 43	·1426	10. 27	·03398			
10. 59	2. 45	5. 49	·1415	10. 37	·03410			
11. 10	3. 50	5. 58	·1422	10. 43	·03392			
11. 22	1. 45	6. 3	·1417	11. 0	·03405			
11. 30	13. 55	6. 9	·1427	11. 3	·03400			
11. 32	30. 40	6. 12	·1423	11. 10	·03406			
11. 40	29. 15	6. 17	·1430	11. 14	·03398			
11. 49	23. 0	6. 24	·1412	11. 18	·03401			
11. 55	22. 0	6. 30	·1417	11. 25	·03375			
12. 2	19. 20	6. 34	·1416	11. 38	·03363			
12. 7	21. 20	6. 40	·1422	11. 40	·03384			
12. 11	20. 25	6. 47	·1418	11. 47	·03235			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 16		Apr. 16		Apr. 16				
h m	° ′ ″	h m		h m		h m	°	°
12. 19	20. 25. 0	6. 50	·1421	11. 52	·03184			
12. 22	22. 0	7. 0	·1420	11. 58	·03200			
12. 27	20. 55	7. 10	·1418	12. 2	·03184			
12. 30	16. 5	7. 15	·1420	12. 20	·03260			
12. 32	19. 5	7. 22	·1417	12. 27	·03241			
12. 42	14. 45	7. 28	·1419	12. 34	·03205			
12. 48	14. 50	7. 32	·1417	12. 38	·03186			
12. 51	11. 55	7. 43	·1422	12. 42	·03219			
12. 54	9. 5	8. 15	·1418	12. 52	·03188			
13. 0	10. 0	8. 20	·1403	12. 58	·03230			
13. 3	7. 25	8. 35	·1435	13. 0	·03198			
13. 13	5. 20	8. 40	·1424	13. 7	·03218			
13. 23	5. 10	8. 45	·1428	13. 10	·03217			
13. 32	1. 55	8. 52	·1417	13. 24	·03255			
13. 38	1. 0	8. 55	·1424	13. 31	·03250			
13. 46	2. 0	9. 0	·1419	13. 33	·03258			
13. 57	8. 20	9. 5	·1430	13. 37	·03242			
14. 1	7. 0	9. 8	·1425	13. 43	·03250			
14. 10	7. 30	9. 10	·1428	13. 45	·03244			
14. 17	10. 0	9. 14	·1420	13. 50	·03253			
14. 37	3. 50	9. 17	·1425	14. 3	·03263			
14. 57	4. 50	9. 24	·1420	14. 10	·03247			
15. 2	3. 0	9. 26	·1423	14. 19	·03237			
15. 26	12. 0	9. 35	·1419	14. 20	·03240			
15. 32	11. 5	9. 38	·1421	14. 33	·03198			
15. 40	11. 40	9. 45	·1418	14. 40	·03195			
15. 49	11. 5	9. 48	·1424	14. 57	·03212			
15. 55	10. 10	9. 50	·1420	15. 2	·03203			
16. 0	11. 20	10. 4	·1421	15. 7	·03208			
16. 10	15. 25	10. 9	·1417	15. 10	·03197			
16. 21	13. 0	10. 16	·1419	15. 20	·03240			
16. 30	12. 0	10. 20	·1436	15. 29	·03248			
16. 32	13. 20	10. 26	·1414	15. 37	·03230			
16. 40	9. 10	10. 31	·1427	15. 52	·03224			
16. 42	9. 35	10. 35	·1420	16. 2	·03240			
17. 0	6. 20	10. 40	·1428	16. 13	·03260			
17. 15	6. 5	10. 47	·1442	16. 17	·03243			
17. 20	6. 20	10. 52	·1432	16. 26	·03260			
17. 37	6. 0	11. 2	·1425	16. 41	·03263			
17. 45	4. 55	11. 7	·1431	16. 46	·03255			
17. 49	6. 45	11. 12	·1426	16. 50	·03270			
17. 57	6. 0	11. 18	·1435	16. 56	·03272			
18. 8	8. 20	11. 21	·1430	17. 21	·03302			
18. 14	8. 15	11. 27	·1440	17. 32	·03304			
18. 22	10. 0	11. 38	·1432	17. 56	·03317			
18. 29	9. 25	11. 43	·1421	18. 10	·03320			
18. 39	11. 20	11. 49	·1440	18. 23	·03315			
18. 55	9. 10	11. 58	·1407	18. 32	·03320			
19. 8	7. 25	12. 5	·1419	18. 38	·03315			
19. 11	5. 30	12. 7	·1417	18. 43	·03317			
19. 19	4. 30	12. 22	·1455	18. 47	·03325			
19. 28	6. 20	12. 33	·1467	18. 51	·03320			
19. 38	2. 50	12. 38	·1461	19. 20	·03328			
19. 45	5. 5	12. 45	·1442	19. 36	·03340			
19. 47	2. 5	12. 48	·1449	19. 43	·03323			
19. 52	5. 45	12. 51	·1436	19. 52	·03333			
19. 58	4. 0	12. 58	·1427	19. 55	·03327			
20. 2	6. 5	13. 0	·1429	20. 0	·03339			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 16		Apr. 16		Apr. 16				
h m	° ′ ″	h m		h m		h m	°	°
20. 10	20. 2. 10	13. 8	·1411	20. 3	·03334			
20. 18	2. 20	13. 10	·1413	20. 10	·03338			
20. 22	20. 4. 30	13. 15	·1402	20. 27	·03335			
20. 27	19. 58. 0	13. 29	·1408	20. 32	·03310			
20. 30	19. 59. 30	13. 33	·1406	20. 37	·03322			
20. 40	20. 3. 50	13. 37	·1416	20. 42	·03325			
20. 50	5. 15	13. 42	·1411	20. 47	·03338			
21. 0	2. 15	13. 46	·1420	21. 18	·03337			
21. 10	6. 25	13. 53	·1411	21. 22	·03325			
21. 18	4. 10	13. 58	·1419	22. 29	·03335			
21. 22	6. 5	14. 0	·1417		(†)			
21. 30	4. 20	14. 5	·1422	23. 33	·03274			
21. 32	6. 0	14. 21	·1402	23. 59	·03270			
21. 52	6. 10	14. 25	·1406					
21. 57	5. 40	14. 52	·1389					
21. 59	7. 0	15. 2	·1394					
22. 2	6. 20	15. 9	·1391					
22. 8	7. 30	15. 17	·1395					
22. 11	6. 55	15. 23	·1394					
22. 15	7. 25	15. 36	·1402					
22. 30	7. 55	15. 43	·1397					
	(†)	15. 47	·1400					
23. 33	10. 30	15. 58	·1385					
23. 55	12. 40	16. 1	·1382					
23. 59	12. 55	16. 2	·1386					
		16. 8	·1381					
		16. 13	·1387					
		16. 15	·1384					
		16. 20	·1399					
		16. 24	·1388					
		16. 32	·1401					
		16. 34	·1399					
		16. 38	·1404					
		16. 41	·1402					
		16. 45	·1404					
		16. 47	·1402					
		16. 48	·1404					
		16. 52	·1398					
		16. 56	·1405					
		16. 59	·1403					
		17. 6	·1406					
		17. 10	·1406					
		17. 22	·1415					
		18. 3	·1416					
		18. 16	·1420					
		18. 28	·1416					
		18. 37	·1418					
		18. 45	·1413					
		18. 53	·1416					
		19. 26	·1407					
		19. 37	·1410					
		19. 54	·1401					
		20. 4	·1405					
		20. 20	·1391					
		20. 25	·1395					
		20. 28	·1390					
		20. 33	·1396					
		20. 38	·1377					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Apr. 16						
h m	° ′ ″	h m		h m		h m	°	°
		20. 49	·1404					
		21. 0	·1396					
		21. 5	·1398					
		21. 14	·1393					
		21. 20	·1398					
		21. 28	·1387					
		21. 33	·1401					
		21. 40	·1390					
		21. 44	·1398					
		21. 48	·1392					
		21. 52	·1397					
		21. 55	·1396					
		21. 57	·1391					
		22. 4	·1395					
		22. 7	·1390					
		22. 11	·1396					
		22. 16	·1393					
		22. 20	·1395					
		22. 28	·1388					
		22. 33	·1387					
			(†)					
		23. 44	·1395					
		23. 59	·1399					
May 13		May 13		May 13		May 13		
0. 0	20. 11. 15	0. 0	·1413	0. 0	·03155	0. 0	60·7	61·7
1. 11	12. 25	0. 8	·1425	1. 2	·03210	1. 0	60·5	61·9
1. 30	14. 45	0. 20	·1422	1. 30	·03244	3. 0	60·0	61·1
1. 39	14. 40	0. 25	·1424	1. 31	·03232	9. 0	59·8	60·7
1. 48	16. 40	0. 36	·1423	1. 42	·03252	12. 0	59·5	60·5
1. 50	18. 30	1. 3	·1430	1. 50	·03285	21. 0	59·3	59·8
1. 58	13. 25	1. 8	·1434	1. 56	·03245	22. 0	59·7	60·4
2. 15	13. 25	1. 12	·1431	2. 11	·03265	23. 0	59·9	60·7
2. 30	16. 55	1. 18	·1438	2. 30	·03267			
2. 37	13. 50	1. 23	·1445	2. 37	·03243			
2. 40	16. 20	1. 29	·1453	2. 40	·03275			
2. 46	14. 55	1. 31	·1465	2. 47	·03260			
2. 54	18. 10	1. 33	·1444	2. 52	·03280			
3. 0	16. 10	1. 40	·1459	2. 56	·03258			
3. 7	20. 55	1. 43	·1449	3. 2	·03302			
3. 16	20. 5	1. 49	·1498	3. 7	·03295			
3. 22	17. 20	1. 55	·1462	3. 12	·03293			
3. 27	17. 0	1. 58	·1471	3. 18	·03270			
3. 38	28. 50	2. 0	·1463	3. 20	·03280			
3. 43	22. 30	2. 12	·1466	3. 23	·03255			
3. 50	30. 0	2. 15	·1458	3. 30	·03298			
3. 55	24. 0	2. 17	·1466	3. 31	·03277			
3. 58	26. 20	2. 20	·1460	3. 34	·03310			
4. 0	23. 5		***	3. 40	·03255			
4. 3	26. 10	2. 26	·1478	3. 41	·03270			
4. 9	19. 40		***	3. 46	·03340			
4. 13	31. 50	2. 33	·1463	3. 50	·03300			
4. 27	16. 5	2. 35	·1442	3. 52	·03346			
4. 34	8. 35	2. 40	·1478	3. 54	·03317			
4. 48	25. 45	2. 43	·1451	4. 2	·03395			
4. 52	18. 25	2. 52	·1496	4. 4	·03340			
4. 58	12. 10	2. 59	·1452	4. 11	·03437			
5. 4	17. 10	3. 10	·1533	4. 15	·03402			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
May 13		May 13		May 13				
h m	° ′ ″	h m		h m		h m	°	°
5. 11	20. 9. 20	3. 15	·1534	4. 21	·03417			
5. 15	11. 0	3. 17	·1524	4. 27	·03282			
5. 28	6. 15	3. 20	·1514	4. 36	·03291			
5. 42	19. 5	3. 24	·1516	4. 37	·03306			
5. 50	15. 45	3. 29	·1484	4. 42	·03327			
5. 54	20. 50	3. 33	·1492	4. 48	·03407			
6. 2	10. 25	3. 35	·1518	5. 2	·03454			
6. 12	13. 0	3. 37	·1510	5. 5	·03435			
6. 28	24. 55	3. 40	·1532	5. 7	·03457			
6. 33	16. 5	3. 44	·1493	5. 12	·03426			
6. 40	18. 35	3. 50	·1566	5. 20	·03457			
6. 47	12. 55	3. 57	·1596	5. 25	·03444			
6. 52	15. 30	4. 10	·1692	5. 30	·03470			
6. 58	8. 50	4. 14	·1644	5. 33	·03458			
7. 3	20. 20. 0	4. 20	·1701	5. 36	·03464			
7. 11	19. 56. 40	4. 24	·1651	5. 39	·03450			
7. 17	28. 15	4. 26	·1621	5. 45	·03460			
7. 21	24. 55	4. 30	·1635	5. 49	·03484			
7. 28	49. 25	4. 38	·1522	5. 52	·03517			
7. 37	59. 30	4. 42	·1534	5. 56	·03463			
7. 47	45. 45	4. 45	·1499	6. 1	·03472			
7. 52	55. 30	4. 47	·1482	6. 11	·03438			
8. 8	41. 5	4. 50	·1447	6. 19	·03525			
8. 12	58. 5	5. 7	·1521	6. 22	·03537			
8. 19	19. 39. 0	5. 14	·1541	6. 28	·03515			
8. 20	20. 3. 5	5. 21	·1510	6. 32	·03522			
8. 23	9. 30	5. 23	·1520	6. 36	·03562			
8. 30	8. 50	5. 24	·1499	6. 43	·03527			
8. 40	20. 11. 30	5. 27	·1503	6. 50	·03545			
8. 48	19. 55. 55	5. 28	·1489	6. 53	·03530			
8. 50	53. 30	5. 30	·1500	6. 57	·03677			
8. 57	0. 15	5. 32	·1487	7. 0	·03086			
9. 1	6. 5	5. 35	·1496	7. 7	·03183			
9. 6	3. 20	5. 36	·1481	7. 8	·03140			
9. 10	20. 10	5. 38	·1486	7. 9	·03158			
9. 16	21. 25	5. 43	·1463	7. 11	·03061			
	(†)	5. 48	·1470	7. 12	·03117			
9. 20	52. 10	5. 53	·1519	7. 13	·03110			
9. 27	19. 54. 30	5. 57	·1466	7. 18	·03163			
9. 28	20. 7. 55	6. 4	·1483	7. 22	·03148			
9. 35	19. 25. 10	6. 8	·1465	7. 28	·03187			
9. 40	21. 10	6. 10	·1444	7. 30	·03150			
9. 43	20. 0	6. 17	·1490	7. 32	·03170			
9. 46	16. 40	6. 24	·1528	7. 33	·03107			
9. 50	31. 5	6. 33	·1491	7. 35	·03138			
9. 55	27. 0	6. 39	·1523	7. 36	·02726			
9. 59	28. 0	6. 48	·1514	7. 40	·02957			
10. 2	23. 20	6. 54	·1522	7. 42	·02680			
10. 9	37. 0	7. 2	·1586	7. 45	·02720			
10. 11	36. 25	7. 6	·1458	7. 47	·02616			
10. 17	41. 55	7. 10	·1480	7. 48	·02850			
10. 23	54. 55	7. 22	·1556	7. 52	·02940			
10. 32	54. 50	7. 25	·1505	7. 54	·02473			
10. 38	52. 40	7. 30	·1540	8. 0	·02862			
10. 49	19. 52. 40	7. 34	·1469	8. 1	·02570			
11. 9	20. 16. 10	7. 40	·1425	8. 5	·02773			
11. 13	19. 51. 35	7. 44	·1435	8. 9	·03124			
11. 18	19. 48. 35	7. 52	·1367	8. 12	·03015			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
May 13		May 13		May 13				
h m	° ′ ″	h m		h m		h m	°	°
11. 22	20. 2. 5	7. 56	·1372	8. 16	·03050			
11. 37	19. 7. 50	7. 57	·1342	8. 20	·03108			
11. 48	30. 5	8. 8	·1426	8. 24	·03148			
11. 52	24. 10	8. 13	·1341	8. 32	·03162			
12. 2	21. 0	8. 15	·1363	8. 35	·03237			
12. 10	27. 15		(†)	8. 37	·03130			
12. 18	24. 55	8. 40	·1310	8. 39	·03240			
12. 28	30. ·5	8. 48	·1445	8. 41	·03288			
12. 33	27. 10	8. 49	·1405	8. 43	·03377			
12. 41	32. 40	8. 54	·1424	8. 50	·03303			
12. 56	41. 0	8. 57	·1310	8. 52	·02650			
13. 7	39. 0		(†)	8. 55	·02680			
13. 18	48. 0	9. 47	·1310	9. 0	·02542			
13. 25	47. 25	9. 55	·1360	9. 7	·02713			
13. 27	48. 30	9. 59	·1342	9. 12	·02863			
13. 32	43. 0	10. 5	·1333	9. 17	·02585			
13. 38	19. 50. 25	10. 8	·1343	9. 22	·02985			
13. 47	20. 1. 55	10. 10	·1338	9. 27	·02890			
13. 52	19. 56. 20	10. 17	·1354	9. 32	·02999			
13. 59	57. 30	10. 20	·1335	9. 33	·02943			
14. 2	55. 15	10. 29	·1387	9. 37	·02990			
14. 11	57. 50	10. 31	·1352	9. 40	·02943			
14. 14	57. 0	10. 34	·1356	9. 45	·03315			
14. 17	58. 30	10. 36	·1351	9. 48	·03325			
14. 26	57. 5	10. 39	·1361	9. 52	·03400			
14. 30	59. 5	10. 42	·1350	10. 2	·03268			
14. 51	54. 20	10. 50	·1310	10. 7	·03302			
14. 59	54. 25		(†)	10. 11	·03243			
15. 4	56. 20	11. 0	·1194*	10. 15	·03272			
15. 12	55. 25	11. 5	·1259*	10. 17	·03263			
15. 20	57. 5	11. 10	·1232*	10. 22	·03384			
15. 32	55. 15	11. 15	·1235*	10. 26	·03318			
15. 41	56. 15	11. 20	·1231*	10. 31	·03360			
15. 52	55. 50	11. 25	·1248*	10. 33	·03340			
16. 9	58. 5	11. 28	·1265*	10. 38	·03357			
16. 22	57. 5	11. 34	·1310	10. 40	·03137			
16. 29	59. 45	11. 37	·1366	10. 45	·03217			
16. 42	59. 0	11. 42	·1371	10. 46	·03101			
16. 46	19. 57. 45	11. 46	·1353	10. 47	·03047			
16. 52	20. 0. 0	11. 55	·1382	10. 48	·02900			
17. 5	20. 0. 20	11. 58	·1377	10. 49	·02802			
17. 7	19. 59. 20	12. 3	·1382	10. 51	·02693			
17. 16	58. 45	12. 7	·1374	10. 52	·02730			
17. 50	19. 59. 55	12. 14	·1353	10. 53	·02428			
17. 53	20. 1. 0	12. 18	·1357	10. 57	·02582			
18. 8	0. 0	12. 23	·1336	11. 3	·03030			
18. 10	20. 1. 0	12. 28	·1336	11. 4	·02918			
18. 15	19. 59. 10	12. 32	·1349	11. 10	·03055			
18. 19	20. 0. 30	12. 35	·1338	11. 12	·02950			
18. 32	0. 20	12. 37	·1340	11. 18	·03028			
18. 38	1. 10	12. 43	·1333	11. 22	·03110			
19. 8	2. 20	12. 48	·1346	11. 25	·03043			
19. 10	3. 55	12. 52	·1348	11. 32	·03374			
19. 17	3. 0	12. 56	·1339	11. 37	·03213			
19. 23	4. 45	12. 59	·1343	11. 50	·03320			
19. 30	3. 15	13. 3	·1310	11. 54	·03290			
19. 36	6. 10		(†)	12. 0	·03260			
19. 40	4. 55	13. 16	·1310	12. 2	·03267			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

May 13. The photographic trace for Horizontal Force was off the sheet in the direction of *diminishing* force from $8^h. 15^m$ to $8^h. 40^m$; from $8^h. 57^m$ to $9^h. 47^m$; from $10^h. 50^m$ to $11^h. 34^m$; and from $13^h. 3^m$ to $13^h. 16^m$.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
May 13		May 13		May 13				
h m	° ′ ″	h m		h m		h m	°	°
19.50	20. 4.25	13.29	·1358	12. 3	·03235			
19.51	5.50	13.32	·1350	12.10	·03240			
19.58	4.45	13.35	·1362	12.14	·03273			
20.10	5.45	13.37	·1358	12.19	·03242			
20.15	7. 0	13.45	·1376	12.23	·03247			
20.21	4.40	13.47	·1367	12.29	·03207			
20.27	6.40	13.54	·1377	12.33	·03225			
20.31	4. 0	13.56	·1371	12.34	·03253			
20.35	7. 0	13.59	·1376	12.40	·03260			
20.41	4.45	14. 1	·1372	12.43	·03257			
20.46	6.50	14.11	·1387	12.56	·03292			
20.52	6. 0	14.14	·1383	13. 0	·03274			
20.53	8.50	14.17	·1387	13. 1	·03280			
21. 3	6.20	14.19	·1383	13. 8	·03193			
21.10	7. 0	14.22	·1387	13.14	·03203			
21.13	11.25	14.29	·1377	13.20	·03146			
21.22	7. 5	14.32	·1380	13.27	·03194			
21.26	9.25	14.34	·1375	13.33	·03222			
21.31	8. 5	14.37	·1380	13.38	·03267			
21.36	9.50	14.42	·1371	13.42	·03241			
21.40	7.20	14.46	·1377	13.44	·03244			
21.44	8.40	14.50	·1368	13.52	·03176			
21.57	9.20	14.57	·1374	13.57	·03140			
22. 0	11.40	15. 0	·1368	14. 2	·03115			
22. 7	11.40	15. 5	·1375	14.10	·03130			
22.20	10.30	15. 8	·1370	14.17	·03173			
22.22	11. 2	15.13	·1368	14.24	·03170			
22.36	10.55	15.17	·1372	14.34	·03183			
22.40	11.30	15.20	·1369	14.51	·03228			
22.50	11. 5	15.28	·1377	14.57	·03223			
22.51	11.55	15.32	·1371	15. 2	·03243			
23. 3	11.50	15.39	·1378	15.17	·03248			
23. 5	12.35	15.44	·1367	15.30	·03267			
23.17	12. 5	15.47	·1363	15.37	·03266			
23.28	13.25	15.51	·1367	15.44	·03277			
23.40	13. 0	15.54	·1360	15.50	·03266			
23.59	14. 0	15.57	·1368	16. 2	·03268			
		15.59	·1365	16.10	·03275			
		16. 3	·1370	16.16	·03280			
		16. 5	·1366	16.18	·03274			
		16.14	·1371	16.26	·03293			
		16.24	·1378	16.30	·03282			
		16.29	·1372		***			
		16.35	·1379	17. 0	·03280			
		16.38	·1373	17. 3	·03272			
		16.42	·1379	17.34	·03270			
		16.44	·1374	18.20	·03267			
		16.48	·1379	18.27	·03260			
		16.50	·1372	18.52	·03266			
		16.54	·1379	19. 0	·03258			
		16.55	·1372	19.10	·03262			
		16.59	·1378	19.16	·03250			
		17. 1	·1371	19.20	·03258			
		17. 3	·1377	19.27	·03246			
		17. 4	·1371	19.32	·03252			
		17. 7	·1379	19.36	·03242			
		17. 9	·1371	19.48	·03242			
		17.12	·1380	19.57	·03237			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		May 13		May 13				
h m	° ′ ″	h m		h m		h m	°	°
		17.14	·1372	20.12	·03239			
		17.16	·1380	20.21	·03225			
		17.18	·1375	20.23	·03235			
		17.21	·1382	20.30	·03221			
		17.24	·1378	20.35	·03231			
		17.27	·1384	20.40	·03212			
		17.29	·1377	20.47	·03220			
		17.33	·1384	20.50	·03205			
		17.35	·1380	20.55	·03218			
		17.45	·1389	20.57	·03204			
		17.49	·1383	21.10	·03194			
		17.55	·1389	21.17	·03217			
		17.58	·1385	21.20	·03187			
		18. 2	·1390	21.28	·03202			
		18. 7	·1387	21.32	·03190			
		18.10	·1391	21.37	·03202			
		18.14	·1387	21.42	·03188			
		18.17	·1393	21.50	·03200			
		18.20	·1389	22. 0	·03192			
		18.24	·1393	22. 2	·03205			
		18.27	·1389	22. 4	·03203			
		18.35	·1390	22.10	·03202			
		18.44	·1397	22.37	·03210			
		18.48	·1394	22.47	·03220			
		18.59	·1400	22.57	·03209			
		19. 3	·1395	23. 8	·03217			
		19. 7	·1400	23.16	·03212			
		19.14	·1395	23.27	·03210			
		19.18	·1401	23.30	·03221			
		19.22	·1396	23.35	·03217			
		19.28	·1401	23.36	·03208			
		19.32	·1396	23.46	·03218			
		19.40	·1400	23.59	·03215			
		19.44	·1396					
		19.50	·1402					
		19.54	·1397					
		20. 2	·1404					
		20. 8	·1401					
		20.14	·1399					
		20.17	·1402					
		20.20	·1398					
		20.24	·1406					
		20.27	·1403					
		20.33	·1414					
		20.36	·1402					
		20.42	·1410					
		20.47	·1400					
		20.53	·1410					
		20.58	·1400					
		21. 4	·1409					
		21. 7	·1396					
		21.14	·1410					
		21.18	·1398					
		21.26	·1409					
		21.31	·1400					
		21.35	·1408					
		21.38	·1401					
		21.45	·1409					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
		May 13						
h m	° ′ ″	h m		h m		h m	°	°
		21. 51	·1402					
		21. 56	·1408					
		22. 1	·1412					
		22. 9	·1393					
		22. 15	·1399					
		22. 36	·1410					
		22. 40	·1397					
		22. 52	·1416					
		22. 57	·1410					
		23. 3	·1415					
		23. 13	·1411					
		23. 18	·1415					
		23. 24	·1410					
		23. 30	·1416					
		23. 36	·1409					
		23. 40	·1407					
		23. 44	·1410					
		23. 47	·1408					
		23. 55	·1414					
		23. 59	·1411					
June 6		June 6		June 6		June 6		
12. 0	20. 3. 15	12. 0	·1440	12. 0	·03430	9. 0	63·7	65·1
12. 22	4. 5	12. 20	·1443	13. 0	·03413	11. 0	64·5	65·1
12. 40	3. 5	12. 47	·1438	13. 21	·03402	21. 0	63·6	65·3
13. 5	2. 25	13. 15	·1444	13. 40	·03398	22. 0	63·3	64·9
13. 13	3. 45	13. 35	·1443	13. 47	·03420	23. 0	63·3	64·9
13. 39	4. 5	13. 50	·1453	14. 20	·03259			
13. 46	6. 0	13. 55	·1488	14. 27	·03243			
13. 48	14. 30	14. 5	·1485	14. 30	·03235			
13. 51	13. 25	14. 17	·1495	14. 37	·03241			
13. 57	14. 30	14. 31	·1480	14. 39	·03236			
14. 7	11. 50	14. 43	·1462	14. 42	·03235			
14. 17	20. 6. 20	15. 7	·1478	14. 49	·03218			
14. 31	19. 53. 45	15. 13	·1464	14. 56	·03213			
14. 40	47. 20	15. 21	·1470	14. 59	·03217			
14. 49	49. 35	15. 27	·1469	15. 7	·03202			
14. 53	46. 55	15. 30	·1456	15. 12	·03205			
15. 0	47. 20	15. 35	·1461	15. 18	·03200			
15. 6	49. 30	15. 41	·1438	15. 20	·03190			
15. 11	48. 30	15. 48	·1444	15. 27	·03192			
15. 20	51. 10	15. 56	·1440	15. 32	·03162			
15. 29	19. 58. 30	15. 57	·1423	15. 42	·03153			
15. 32	20. 8. 25	16. 15	·1405	15. 52	·03116			
15. 41	14. 15	16. 36	·1416	16. 0	·03132			
15. 45	13. 20	16. 55	·1406	16. 3	·03125			
15. 52	12. 25	17. 6	·1412	16. 10	·03133			
15. 53	6. 0	17. 12	·1408	16. 20	·03118			
16. 3	20. 8. 35	17. 21	·1419	16. 34	·03137			
16. 26	19. 44. 0	17. 30	·1403	16. 45	·03155			
16. 40	43. 0	17. 38	·1409	17. 7	·03163			
16. 54	55. 10	17. 45	·1404	17. 16	·03182			
17. 1	55. 30	17. 52	·1414	17. 24	·03168			
17. 3	58. 25	17. 56	·1411	17. 30	·03177			
17. 10	54. 50	18. 8	·1421	17. 41	·03150			
17. 13	58. 25	18. 16	·1411	17. 51	·03162			
17. 16	19. 57. 30	18. 25	·1420	18. 6	·03160			
17. 17	20. 1. 50	18. 39	·1410	18. 10	·03150			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
June 6		June 6		June 6				
h m	° ′ ″	h m		h m		h m	°	°
17. 20	20. 0. 50	18. 50	·1407	18. 16	·03158			
17. 23	20. 0. 30	19. 3	·1412	18. 26	·03142			
17. 25	19. 57. 10	19. 9	·1407	18. 33	·03144			
17. 33	20. 0. 55	19. 14	·1414	18. 42	·03158			
17. 46	19. 54. 30	19. 19	·1410	19. 3	·03197			
17. 52	19. 57. 0	19. 33	·1422	19. 9	·03223			
17. 54	20. 0. 45	19. 42	·1416	19. 13	·03225			
18. 0	1. 45	19. 52	·1418	19. 22	·03250			
18. 8	7. 0	20. 0	·1406	19. 29	·03258			
18. 13	6. 0	20. 4	·1420	19. 32	·03257			
18. 21	20. 6. 0	20. 9	·1402	19. 48	·03267			
18. 32	19. 57. 0	20. 14	·1413	19. 53	·03260			
18. 42	54. 30	20. 16	·1404	19. 59	·03278			
18. 43	55. 15	20. 26	·1412	20. 2	·03270			
18. 49	51. 5	20. 37	·1405	20. 8	·03283			
18. 53	50. 30	20. 41	·1410	20. 11	·03278			
18. 57	49. 20	20. 43	·1404	20. 22	·03293			
19. 4	48. 30	20. 46	·1413	20. 30	·03310			
19. 6	49. 20	20. 49	·1407	20. 39	·03321			
19. 13	55. 0	21. 3	·1402	21. 2	·03360			
19. 20	55. 40	21. 9	·1405	21. 22	·03375			
19. 23	19. 59. 35	21. 26	·1398	21. 52	·03375			
19. 29	20. 1. 35	21. 32	·1402	21. 54	·03382			
19. 36	2. 5	21. 36	·1398	22. 2	·03373			
19. 40	1. 0	21. 42	·1402	22. 22	·03390			
19. 49	20. 1. 10	21. 49	·1397	22. 38	·03380			
19. 55	19. 57. 10	21. 51	·1402	22. 46	·03386			
20. 2	55. 50	21. 56	·1398	23. 0	·03372			
20. 5	57. 20	22. 5	·1402	23. 18	·03378			
20. 17	53. 45	22. 10	·1398	23. 31	·03377			
20. 20	54. 25	22. 17	·1402	23. 59	·03400			
20. 23	53. 0	22. 22	·1398					
20. 33	59. 45	22. 29	·1403					
20. 42	53. 25	22. 52	·1405					
20. 45	55. 55	23. 0	·1405					
20. 48	55. 0	23. 5	·1395					
20. 53	56. 20	23. 14	·1398					
20. 55	55. 30	23. 29	·1394					
21. 0	56. 20	23. 34	·1395					
21. 5	55. 30	23. 43	·1404					
21. 14	57. 0	23. 59	·1410					
21. 20	56. 30							
21. 23	57. 25							
21. 32	58. 20							
21. 37	19. 57. 50							
22. 2	20. 1. 0							
22. 10	1. 0							
22. 38	6. 0							
22. 43	5. 30							
22. 57	7. 20							
23. 20	8. 10							
23. 30	8. 0							
23. 38	7. 35							
23. 59	10. 5							
June 7		June 7		June 7		June 7		
0. 0	20. 10. 5	0. 0	·1409	0. 0	·03402	0. 0	63·6	65·7
0. 10	8. 50	0. 5	·1402	0. 10	·03400	1. 0	64·0	66·6

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declina-tion.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
June 7		June 7		June 7		June 7		
h m	° ′ ″	h m		h m		h m	°	°
0. 19	20. 9. 0	0. 24	·1405	0. 27	·03420	2. 0	63·9	67·0
0. 24	10. 0	0. 33	·1399	0. 44	·03437	3. 0	64·0	67·2
0. 38	10. 5	0. 45	·1398	1. 2	·03460	6. 40	64·4	68·1
0. 43	9. 30	1. 0	·1408	1. 11	·03465	9. 0	65·0	68·7
1. 0	10. 45	1. 7	·1404	1. 17	·03478	10. 0	64·9	68·5
1. 10	10. 25	1. 14	·1410	1. 32	·03488	11. 0	65·1	68·0
1. 19	11. 55	1. 19	·1403	1. 42	·03530			
1. 31	11. 50	1. 24	·1409	2. 10	·03587			
1. 38	13. 30	1. 31	·1404	2. 17	·03583			
1. 43	17. 0	1. 40	·1421	2. 26	·03622			
1. 46	16. 40	1. 43	·1440	2. 40	·03647			
2. 7	18. 30	1. 55	·1451	2. 50	·03674			
2. 13	16. 20	2. 6	·1464	2. 57	·03697			
2. 35	17. 20	2. 12	·1453	3. 6	·03715			
2. 39	18. 0	2. 17	·1446	3. 7	·03727			
2. 47	17. 50	2. 27	·1453	3. 13	·03743			
2. 53	19. 30	2. 42	·1460	3. 19	·03750			
3. 0	18. 40	2. 49	·1454	3. 29	·03770			
3. 5	20. 0	2. 59	·1460	3. 40	·03806			
3. 20	15. 45	3. 3	·1472	3. 45	·03782			
3. 32	22. 0	3. 6	·1479	3. 47	·03803			
3. 38	18. 50	3. 15	·1474	3. 51	·03810			
3. 41	22. 15	3. 23	·1468	3. 59	·03863			
3. 50	18. 50	3. 30	·1481	4. 5	·03910			
3. 51	21. 55	3. 34	·1495	4. 10	·03925			
3. 53	21. 0	3. 40	·1464	4. 15	·03900			
3. 59	26. 0	3. 43	·1472	4. 21	·03893			
4. 10	13. 5	3. 47	·1462	4. 30	·03917			
4. 14	17. 55	3. 52	·1476	4. 31	·03936			
4. 28	21. 30	3. 57	·1485	4. 35	·03946			
4. 31	19. 40	3. 59	·1496	4. 44	·04010			
4. 33	20. 20	4. 4	·1493	4. 50	·04003			
4. 39	16. 25	4. 7	·1473	4. 53	·04010			
4. 43	16. 45	4. 11	·1480	5. 7	·04000			
4. 44	14. 20	4. 19	·1487	5. 17	·04063			
4. 47	14. 35	4. 26	·1503	5. 20	·04070			
4. 52	12. 0	4. 30	·1494	5. 22	·04033			
4. 59	12. 5	4. 34	·1504	5. 30	·03858			
5. 7	18. 0	4. 39	·1509	5. 43	·03880			
5. 11	14. 0	4. 45	·1491	5. 52	·03875			
5. 14	2. 30	4. 50	·1503	6. 10	·03817			
5. 26	19. 5	4. 59	·1498	6. 13	·03814			
5. 32	14. 25	5. 6	·1513	6. 24	·03785			
5. 36	7. 15	5. 9	·1534	6. 29	·03785			
5. 43	3. 40	5. 14	·1508	6. 47	·03745			
6. 0	5. 15	5. 17	·1535	6. 58	·03740			
6. 10	4. 10	5. 28	·1451	7. 2	·03726			
6. 22	6. 20	5. 33	·1431	7. 11	·03726			
6. 30	5. 40	5. 40	·1439	7. 14	·03718			
6. 36	6. 50	5. 54	·1447	7. 37	·03712			
6. 43	6. 5	6. 2	·1436	7. 57	·03697			
6. 49	5. 20	6. 10	·1440	8. 0	·03697			
6. 56	6. 0	6. 16	·1430					
7. 6	4. 55	6. 27	·1435					
7. 9	5. 40	6. 42	·1413					
7. 16	4. 50	6. 53	·1416					
7. 30	6. 0	6. 59	·1410					
7. 46	6. 10	7. 6	·1413					

Greenwich Mean Solar Time.	Western Declina-tion.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
June 7		June 7						
h m	° ′ ″	h m		h m		h m	°	°
7. 51	20. 7. 0	7. 10	·1406					
8. 29	6. 20	7. 22	·1410					
8. 37	6. 50	7. 42	·1404					
8. 47	6. 20	7. 48	·1406					
8. 56	6. 50	7. 54	·1401					
9. 0	7. 0	8. 0	·1403					
June 29		June 29		June 29		June 29		
6. 0	20. 5. 0	6. 0	·1448	6. 0	·03272	0. 0	61·9	63·8
6. 49	3. 45	6. 41	·1449	6. 21	·03280	1. 0	61·9	64·1
7. 6	2. 50	6. 49	·1447	6. 40	·03269	2. 0	61·9	64·2
7. 26	6. 20	6. 54	·1442	7. 3	·03274	3. 0	62·0	64·5
7. 38	4. 20	7. 4	·1446	7. 27	·03230	6. 20	62·4	64·8
7. 45	4. 55	7. 19	·1467	7. 37	·03238	6. 50	62·0	63·2
7. 52	4. 0	7. 37	·1452	7. 50	·03219	9. 0	61·3	62·0
8. 2	4. 40	7. 42	·1456	8. 0	·03220	21. 0	61·5	63·0
8. 8	6. 30	7. 48	·1469	8. 10	·03200	22. 40	61·8	63·2
8. 29	5. 45	7. 53	·1466	8. 24	·03192	23. 0	61·8	63·3
9. 1	0. 5	7. 58	·1472	8. 47	·03194			
9. 18	1. 45	8. 2	·1468	9. 9	·03173			
9. 22	0. 55	8. 8	·1471	9. 42	·03160			
9. 42	2. 10	8. 17	·1457	9. 53	·03158			
9. 53	20. 1. 45	8. 28	·1449	10. 7	·03140			
10. 3	19. 59. 0	8. 32	·1452	10. 20	·03150			
10. 19	19. 57. 10	8. 41	·1447	10. 27	·03140			
10. 40	20. 0. 15	8. 51	·1446	10. 32	·03147			
10. 53	19. 56. 10	8. 54	·1443	10. 39	·03130			
11. 0	56. 30	9. 0	·1447	10. 50	·03115			
11. 11	52. 45	9. 11	·1448	11. 0	·03117			
11. 12	53. 20	9. 18	·1442	11. 4	·03106			
11. 21	58. 25	9. 31	·1449	11. 20	·03109			
11. 39	51. 25	9. 35	·1442	11. 28	·03080			
11. 47	53. 0	9. 41	·1450	11. 38	·03092			
12. 15	45. 10	9. 44	·1443	11. 47	·03094			
12. 31	49. 20	9. 46	·1447	12. 1	·03050			
12. 40	45. 45	9. 49	·1444	12. 10	·03040			
12. 42	47. 5	9. 54	·1450	12. 23	·03042			
12. 50	44. 30	9. 59	·1444	12. 31	·03026			
13. 1	48. 10	10. 4	·1451	12. 40	·02983			
13. 3	47. 45	10. 14	·1438	12. 43	·02987			
13. 10	52. 45	10. 28	·1453	12. 58	·02963			
13. 19	51. 20	10. 34	·1445	13. 3	·02943			
13. 43	19. 40. 15	10. 39	·1463	13. 16	·02960			
14. 3	20. 5. 15	10. 43	·1455	13. 30	·02887			
14. 13	19. 55. 0	10. 49	·1461	13. 42	·02900			
14. 27	54. 0	10. 52	·1452	13. 50	·02918			
14. 36	52. 30	10. 55	·1456	13. 57	·02918			
14. 42	54. 20	11. 2	·1442	14. 7	·02840			
14. 50	53. 10	11. 5	·1446	14. 13	·02857			
14. 58	56. 55	11. 8	·1434	14. 30	·02880			
15. 10	52. 0	11. 14	·1442	14. 33	·02895			
15. 17	51. 0	11. 16	·1434	14. 42	·02900			
15. 28	51. 35	11. 25	·1444	14. 57	·02946			
15. 48	50. 25	11. 33	·1427	15. 8	·02930			
16. 13	55. 50	11. 36	·1427	15. 34	·02955			
16. 50	53. 55	11. 40	·1437	15. 43	·02952			
17. 5	55. 50	11. 51	·1444	16. 8	·02980			
17. 21	54. 55	12. 3	·1433	16. 17	·02983			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 29		June 29		June 29				
h m	° ′ ″	h m		h m		h m	°	°
17. 29	19. 56. 5	12. 7	·1438	16. 52	·03032			
17. 40	55. 0	12. 10	·1434	17. 12	·03047			
17. 48	55. 20	12. 19	·1442	17. 30	·03066			
17. 53	57. 15	12. 32	·1456	17. 59	·03087			
18. 2	55. 50	12. 39	·1450	18. 30	·03095			
18. 20	54. 45	12. 42	·1435	18. 42	·03103			
18. 23	55. 20	12. 46	·1442	18. 47	·03100			
18. 30	54. 55	12. 48	·1432	19. 30	·03115			
18. 38	58. 15	12. 51	·1436	19. 33	·03105			
18. 40	56. 20	12. 54	·1426	19. 42	·03117			
18. 51	56. 10	13. 1	·1432	19. 48	·03110			
19. 6	55. 20	13. 5	·1423	20. 11	·03110			
19. 13	56. 20	13. 12	·1433	20. 18	·03101			
19. 22	56. 45	13. 18	·1444	20. 23	·03105			
19. 28	57. 30	13. 24	·1449	21. 0	·03102			
19. 36	55. 5	13. 36	·1415		(†)			
19. 42	58. 10	13. 46	·1392	23. 13	·03123			
19. 48	57. 5	13. 58	·1378	23. 24	·03120			
19. 53	58. 55	14. 7	·1388	23. 59	·03130			
20. 3	19. 58. 45	14. 12	·1377					
20. 5	20. 0. 0	14. 28	·1396					
20. 10	19. 59. 20	14. 34	·1393					
20. 14	57. 15	14. 44	·1402					
20. 20	19. 59. 55	14. 47	·1397					
20. 28	20. 0. 0	14. 59	·1418					
20. 37	1. 20	15. 11	·1428					
20. 43	1. 0	15. 13	·1424					
21. 6	1. 20	15. 15	·1429					
	(†)	15. 19	·1424					
23. 5	6. 0	15. 33	·1438					
23. 39	9. 10	15. 36	·1449					
23. 50	10. 0	15. 39	·1439					
23. 57	10. 50	15. 42	·1447					
23. 59	10. 45	15. 46	·1442					
		16. 1	·1448					
		16. 12	·1445					
		16. 29	·1426					
		16. 38	·1429					
		16. 44	·1421					
		16. 55	·1432					
		17. 2	·1428					
		17. 19	·1420					
		17. 28	·1425					
		17. 41	·1417					
		17. 43	·1411					
		17. 48	·1418					
		17. 55	·1412					
		18. 22	·1402					
		18. 31	·1399					
		18. 40	·1405					
		18. 45	·1400					
		18. 59	·1399					
		19. 4	·1394					
		19. 9	·1397					
		19. 10	·1393					
		19. 14	·1397					
		19. 19	·1393					
		19. 32	·1399					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		June 29						
h m	° ′ ″	h m		h m		h m	°	°
		19. 37	·1392					
		19. 45	·1399					
		19. 50	·1393					
		19. 57	·1399					
		20. 2	·1393					
		20. 7	·1398					
		20. 9	·1392					
		20. 14	·1397					
		20. 16	·1390					
		20. 22	·1400					
		20. 26	·1392					
		20. 32	·1398					
		20. 38	·1391					
		20. 50	·1395					
		21. 1	·1390					
		21. 6	·1395					
			(†)					
		23. 9	·1394					
		23. 13	·1399					
		23. 18	·1393					
		23. 42	·1398					
		23. 44	·1401					
		23. 50	·1408					
		23. 59	·1403					
June 30		June 30		June 30		June 30		
0. 0	20. 10. 45	0. 0	·1403	0. 0	·03130	0. 0	62 ·1	63 ·9
0. 26	10. 30	0. 5	·1400	0. 12	·03127	1. 0	62 ·2	64 ·0
0. 33	10. 55	0. 16	·1401	0. 24	·03131	2. 0	62 ·2	64 ·2
0. 42	10. 20	0. 25	·1391	0. 30	·03142	3. 0	62 ·5	64 ·3
1. 3	12. 0	0. 30	·1396	0. 42	·03143	6. 20	62 ·6	63 ·4
1. 28	12. 20	0. 35	·1402	0. 47	·03157	9. 0	61 ·9	62 ·7
2. 3	13. 25	0. 44	·1397	1. 0	·03160	21. 0	61 ·8	62 ·2
2. 20	13. 5	0. 51	·1408	1. 11	·03157	22. 0	61 ·0	61 ·2
2. 29	13. 40	1. 0	·1416	1. 37	·03170	23. 0	61 ·7	61 ·7
2. 35	13. 20	1. 6	·1410	1. 42	·03180			
2. 53	13. 15	1. 23	·1416	2. 22	·03200			
3. 3	12. 20	1. 31	·1413	2. 26	·03207			
3. 23	13. 0	1. 48	·1422	2. 32	·03202			
3. 43	12. 0	1. 55	·1420	2. 36	·03210			
4. 19	12. 0	2. 14	·1424	2. 41	·03205			
4. 25	11. 0	2. 19	·1433	2. 58	·03219			
4. 31	12. 5	2. 23	·1428	3. 2	·03217			
4. 38	10. 10	2. 29	·1439	3. 13	·03239			
4. 47	12. 0	2. 35	·1434	4. 30	·03270			
4. 56	10. 5	2. 50	·1438	4. 38	·03264			
5. 1	10. 25	2. 59	·1444	4. 46	·03272			
5. 18	10. 0	3. 2	·1437	4. 50	·03264			
5. 24	8. 25	3. 19	·1460	5. 28	·03296			
5. 41	12. 20	3. 31	·1455	5. 33	·03306			
6. 4	6. 15	3. 44	·1445	6. 7	·03319			
6. 29	13. 20	3. 54	·1444	6. 12	·03322			
6. 43	10. 35	3. 56	·1441	6. 46	·03275			
6. 52	7. 10	4. 2	·1443	6. 52	·03290			
6. 59	6. 50	4. 5	·1438	7. 6	·03303			
7. 5	7. 40	4. 10	·1444	7. 14	·03295			
7. 17	4. 55	4. 12	·1436	7. 21	·03300			
7. 22	5. 35	4. 16	·1439	7. 51	·03283			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 30		June 30		June 30				
h m	° ′ ″	h m		h m		h m	°	°
7. 40	20. 5. 55	4. 21	·1433	8. 10	·03277			
7. 45	6. 30	4. 30	·1444	8. 20	·03258			
8. 0	6. 5	4. 38	·1437	8. 40	·03270			
	(†)	4. 48	·1450	8. 52	·03250			
8. 13	7. 55	4. 51	·1439	9. 2	·03253			
8. 20	6. 30	4. 54	·1437		***			
8. 26	6. 50	5. 0	·1443	9. 40	·03130			
8. 33	20. 2. 0	5. 6	·1446	10. 6	·03190			
8. 42	19. 59. 50	5. 11	·1443	10. 20	·03200			
8. 50	20. 3. 55	5. 16	·1448	10. 28	·03170			
8. 56	20. 3. 0	5. 20	·1443	10. 43	·03157			
9. 4	19. 58. 30	5. 25	·1447	10. 52	·03090			
9. 17	20. 4. 55	5. 29	·1442	11. 0	·03130			
9. 20	4. 0	5. 31	·1450	11. 7	·03150			
9. 30	3. 45	5. 43	·1463	11. 10	·03139			
9. 39	8. 10	5. 45	·1457	11. 18	·03160			
9. 52	3. 55	5. 59	·1473	11. 41	·03080			
10. 0	20. 6. 0	6. 5	·1479	11. 47	·03083			
10. 22	19. 57. 45	6. 13	·1489	11. 59	·02982			
10. 33	20. 2. 0	6. 16	·1493	12. 12	·02993			
10. 42	19. 58. 0	6. 20	·1479	12. 32	·03062			
	(†)	6. 25	·1482	12. 47	·03037			
11. 23	46. 30	6. 26	·1478	12. 52	·03033			
11. 38	54. 0	6. 30	·1480	13. 0	·03013			
11. 42	53. 55	6. 48	·1437	13. 7	·03020			
11. 50	59. 25	7. 0	·1454	13. 12	·03015			
12. 0	57. 10	7. 5	·1457	13. 23	·03042			
12. 2	57. 50	7. 13	·1443	13. 31	·03033			
12. 12	51. 40	7. 21	·1452	13. 37	·03035			
12. 23	19. 54. 20	7. 42	·1446	13. 47	·02994			
12. 37	20. 5. 35	7. 46	·1444	14. 0	·02979			
12. 49	1. 45	7. 51	·1446	14. 20	·03008			
12. 56	20. 0. 40	8. 0	·1442	14. 38	·03050			
13. 1	19. 57. 20	8. 5	·1443	14. 46	·03050			
13. 10	19. 56. 40	8. 10	·1442	15. 33	·03117			
13. 19	20. 0. 0	8. 18	·1426	16. 10	·03139			
13. 23	6. 35	8. 23	·1428	16. 51	·03140			
13. 40	8. 20	8. 27	·1425	17. 12	·03134			
13. 48	5. 0	8. 37	·1430	17. 20	·03140			
13. 50	20. 4. 35	8. 40	·1440	18. 57	·03125			
14. 8	19. 56. 20	8. 53	·1418	19. 42	·03117			
14. 16	56. 20	9. 4	·1438	20. 34	·03125			
14. 22	55. 30	9. 24	·1412	20. 46	·03125			
14. 32	55. 25	9. 27	·1417	21. 7	·03135			
14. 41	57. 40	9. 38	·1397	21. 43	·03138			
14. 48	56. 0	9. 51	·1408	21. 52	·03130			
14. 58	55. 55	9. 57	·1395	22. 0	·03133			
15. 0	56. 10	10. 8	·1396	23. 7	·03105			
		10. 21	·1417	23. 18	·03104			
		10. 33	·1397	23. 24	·03117			
		10. 39	·1402	23. 30	·03110			
		10. 42	·1394	23. 37	·03122			
		10. 49	·1410	23. 42	·03116			
		10. 54	·1391	23. 51	·03122			
		11. 3	·1408		(†)			
		11. 10	·1387					
		11. 20	·1407					
		11. 24	·1423					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		June 30						
h m	° ′ ″	h m		h m		h m	°	°
		11. 30	·1431					
		11. 40	·1408					
		11. 49	·1438					
		11. 56	·1418					
		11. 59	·1423					
		12. 12	·1397					
		12. 19	·1405					
		12. 26	·1417					
		12. 30	·1413					
		12. 36	·1420					
		12. 41	·1422					
		12. 43	·1415					
		12. 49	·1419					
		13. 15	·1396					
		13. 37	·1425					
		13. 46	·1433					
		14. 0	·1425					
		14. 8	·1430					
		14. 16	·1423					
		14. 21	·1428					
		14. 27	·1425					
		14. 34	·1432					
		14. 40	·1428					
		14. 44	·1433					
		14. 52	·1427					
		15. 0	·1432					
Aug. 6		Aug. 6		Aug. 6		Aug. 6		
0. 0	20. 10. 50	0. 0	·1390	0. 0	·03018	0. 0	64 ·9	66 ·1
1. 0	13. 20	0. 6	·1393	0. 40	·03027	1. 0	65 ·0	65 ·2
1. 17	12. 50	0. 21	·1379	0. 52	·03032	3. 0	64 ·9	65 ·4
1. 36	13. 10	0. 24	·1390	1. 10	·03030	9. 0	63 ·6	64 ·6
1. 41	12. 10	0. 29	·1380	1. 23	·03047	11. 30	64 ·9	65 ·2
1. 52	12. 20	0. 32	·1384	1. 33	·03043	21. 0	63 ·9	64 ·6
2. 0	10. 40	0. 37	·1382	1. 42	·03055	22. 0	64 ·2	65 ·2
2. 6	12. 20	0. 56	·1400	1. 49	·03052	23. 0	65 ·0	66 ·7
2. 20	9. 15	1. 12	·1390	2. 2	·03074			
2. 24	10. 10	1. 34	·1403	2. 9	·03065			
2. 30	8. 30	1. 41	·1396	2. 23	·03102			
2. 39	7. 25	1. 51	·1402	2. 47	·03120			
2. 42	8. 0	1. 59	·1393	2. 53	·03113			
2. 52	6. 30	2. 3	·1399	3. 6	·03114			
3. 0	6. 10	2. 5	·1410	3. 16	·03110			
3. 5	6. 30	2. 16	·1399	3. 33	·03103			
3. 8	7. 20	2. 24	·1415	4. 28	·03130			
3. 13	6. 20	2. 28	·1412	4. 37	·03140			
3. 19	7. 20	2. 32	·1419	4. 59	·03145			
3. 24	6. 25	2. 36	·1416	5. 2	·03143			
3. 37	4. 50	2. 40	·1421	5. 7	·03147			
3. 52	8. 10	2. 43	·1417	5. 23	·03162			
4. 8	9. 25	2. 47	·1421	5. 28	·03147			
4. 22	8. 0	2. 52	·1416	5. 38	·03157			
4. 28	7. 15	3. 5	·1420	5. 44	·03140			
4. 33	7. 15	3. 11	·1413	6. 0	·03147			
4. 52	5. 40	3. 18	·1417		***			
4. 58	5. 20	3. 21	·1414	6. 50	·03123			
5. 0	3. 55	3. 26	·1417	7. 2	·03130			
5. 7	4. 50	3. 32	·1414	7. 33	·03100			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug. 6		Aug. 6		Aug. 6				
h m	° ′ ″	h m		h m		h m	°	°
5. 11	20. 3. 50	3. 40	·1418	7. 53	·03102			
5. 19	3. 35	3. 56	·1421	7. 58	·03088			
5. 23	5. 0	4. 15	·1421	8. 10	·03075			
5. 28	3. 5	4. 22	·1427	8. 27	·03015			
5. 37	6. 20	4. 25	·1421	8. 38	·02980			
5. 49	2. 10	4. 34	·1429	9. 2	·02950			
6. 0	5. 10	4. 45	·1421	9. 7	·02922			
6. 3	5. 10	4. 49	·1425	9. 37	·02886			
6. 10	4. 10	4. 52	·1422	9. 42	·02870			
6. 16	4. 0	4. 55	·1426	9. 52	·02881			
6. 23	4. 20	4. 59	·1417	10. 2	·02877			
6. 49	1. 0	5. 3	·1422	10. 10	·02860			
7. 7	3. 25	5. 6	·1419	10. 18	·02860			
7. 22	20. 2. 0	5. 18	·1432	10. 33	·02814			
7. 43	19. 59. 25	5. 21	·1441	10. 48	·02822			
7. 50	59. 20	5. 25	·1426	11. 2	·02782			
7. 58	58. 30	5. 32	·1435	11. 12	·02796			
8. 8	19. 58. 50	5. 43	·1423	11. 17	·02793			
8. 12	20. 0. 0	5. 54	·1433	11. 25	·02804			
8. 18	19. 58. 20	5. 59	·1438	11. 33	·02800			
8. 23	51. 0	6. 5	·1430	11. 42	·02814			
8. 32	46. 30	6. 11	·1434	11. 44	·02807			
8. 38	48. 30	6. 32	·1418	11. 56	·02820			
8. 45	49. 20	6. 40	·1423	12. 16	·02822			
8. 58	57. 0	6. 45	·1415	12. 28	·02783			
9. 3	55. 20	6. 54	·1426	12. 37	·02696			
9. 10	49. 40	7. 6	·1436	12. 46	·02682			
9. 16	52. 30	7. 15	·1433	12. 52	·02660			
9. 20	51. 40	7. 21	·1427	13. 0	·02693			
9. 23	52. 55	7. 25	·1430	13. 7	·02750			
9. 28	52. 15	7. 29	·1426	13. 13	·02754			
9. 36	54. 55	7. 36	·1429	13. 23	·02726			
9. 40	54. 0	7. 42	·1425	13. 32	·02746			
9. 47	55. 55	7. 49	·1432	13. 40	·02772			
9. 52	55. 20	7. 53	·1428	14. 0	·02783			
9. 58	56. 50	8. 5	·1431	14. 7	·02808			
10. 7	19. 56. 0	8. 14	·1427	14. 17	·02817			
10. 18	20. 4. 55	8. 21	·1416	14. 31	·02788			
10. 38	19. 55. 10	8. 28	·1434	14. 50	·02786			
10. 43	53. 55	8. 33	·1420	14. 52	·02780			
10. 48	55. 0	8. 38	·1416	14. 58	·02790			
10. 53	55. 40	8. 48	·1419	15. 7	·02777			
11. 3	55. 5	9. 3	·1402	15. 17	·02726			
11. 13	55. 55	9. 12	·1406	15. 32	·02745			
11. 22	52. 50	9. 18	·1417	15. 40	·02730			
11. 52	48. 20	9. 21	·1408	15. 48	·02740			
11. 58	48. 30	9. 26	·1417	16. 2	·02770			
12. 10	46. 10	9. 31	·1411	16. 12	·02780			
12. 15	46. 10	9. 34	·1417	16. 20	·02762			
12. 23	51. 0	9. 42	·1391	16. 27	·02760			
12. 31	56. 50	9. 48	·1400	16. 32	·02750			
12. 36	19. 56. 0	9. 52	·1389	16. 46	·02780			
12. 46	20. 0. 0	9. 56	·1393	17. 7	·02810			
12. 52	19. 51. 5	10. 4	·1385	17. 13	·02807			
12. 58	49. 0	10. 19	·1401	17. 21	·02810			
13. 3	46. 5	10. 32	·1382	17. 57	·02793			
13. 9	45. 5	10. 38	·1371	19. 3	·02803			
13. 13	47. 0	10. 58	·1390	19. 58	·02834			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug. 6		Aug. 6		Aug. 6				
h m	° ′ ″	h m		h m		h m	°	°
13. 21	19. 44. 35	11. 7	·1372	20. 28	·02842			
13. 49	19. 59. 20	11. 15	·1378	20. 50	·02860			
14. 0	20. 0. 40	11. 22	·1374	21. 10	·02853			
14. 7	0. 50	11. 31	·1371	21. 24	·02860			
14. 10	0. 5	11. 38	·1360	21. 33	·02857			
14. 16	20. 1. 15	11. 45	·1365	22. 12	·02865			
14. 32	19. 54. 45	11. 48	·1360		(†)			
14. 42	51. 50	11. 59	·1365	23. 59	·02943			
14. 51	53. 30	12. 10	·1361					
15. 0	19. 57. 0	12. 15	·1364					
15. 9	20. 1. 0	12. 39	·1322					
15. 18	19. 57. 55	12. 46	·1334					
15. 30	55. 5	12. 50	·1329					
15. 40	48. 50	12. 53	·1335					
15. 49	47. 20	13. 2	·1367					
16. 9	49. 20	13. 10	·1383					
16. 19	45. 45	13. 14	·1388					
16. 23	46. 10	13. 22	·1368					
16. 28	45. 50	13. 28	·1363					
16. 40	42. 55	13. 30	·1367					
17. 3	48. 0	13. 34	·1363					
17. 11	51. 10	13. 42	·1376					
17. 19	50. 10	13. 47	·1382					
17. 24	52. 0	13. 58	·1379					
17. 30	51. 0	14. 7	·1383					
17. 33	51. 55	14. 12	·1374					
17. 38	51. 0	14. 19	·1396					
17. 43	51. 45	14. 30	·1397					
17. 50	50. 40	14. 34	·1390					
17. 54	50. 0	14. 39	·1393					
18. 12	49. 25	14. 49	·1387					
18. 18	50. 20	14. 54	·1378					
18. 32	49. 30	15. 2	·1386					
18. 51	50. 50	15. 10	·1393					
19. 10	49. 40	15. 20	·1385					
19. 41	52. 40	15. 33	·1397					
19. 50	55. 10	15. 44	·1387					
20. 22	56. 45	16. 14	·1412					
20. 27	57. 55	16. 23	·1413					
20. 29	57. 0	16. 37	·1395					
20. 38	58. 0	16. 52	·1390					
20. 48	58. 0	17. 10	·1395					
21. 0	59. 25	17. 15	·1386					
21. 11	19. 59. 0	17. 20	·1392					
21. 20	20. 0. 10	17. 30	·1387					
21. 33	1. 0	17. 46	·1399					
22. 0	1. 10	18. 0	·1394					
22. 18	2. 30	18. 13	·1396					
22. 45	2. 55	18. 18	·1388					
23. 11	6. 0	18. 23	·1384					
23. 30	5. 55	18. 29	·1388					
	(†)	18. 30	·1383					
		18. 39	·1386					
		18. 46	·1380					
		19. 0	·1381					
		19. 9	·1377					
		19. 16	·1381					
		19. 50	·1377					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
h m	° ′ ″	Aug. 6 h m		h m		h m	°	°
		20. 32	·1379					
		20. 48	·1387					
		21. 5	·1386					
		21. 16	·1382					
		21. 45	·1381					
		22. 20	·1381					
		22. 26	·1382					
		22. 46	·1382					
		23. 5	·1396					
		23. 12	·1392					
		23. 17	·1396					
		23. 28	·1391					
			(†)					
		23. 59	·1404					
Aug. 24		Aug. 24		Aug. 24		Aug. 24		
0. 0	20. 12. 50	0. 0	·1390	0. 0	·03120	0. 0	67 ·4	69 ·5
0. 22	14. 50	0. 17	·1400	0. 23	·03155	1. 0	67 ·6	69 ·8
0. 39	13. 45	0. 28	·1403	0. 33	·03161	2. 0	67 ·8	70 ·0
0. 50	14. 50	0. 40	·1400	0. 42	·03178	3. 0	67 ·8	70 ·1
0. 57	13. 20	0. 50	·1406	0. 51	·03180	7. 0	68 ·4	70 ·5
1. 10	13. 20	1. 0	·1396	1. 10	·03205	9. 0	68 ·0	69 ·0
1. 16	14. 30	1. 4	·1398	1. 22	·03214	21. 0	67 ·2	68 ·5
1. 28	11. 35	1. 7	·1393	1. 40	·03262	22. 0	67 ·6	68 ·9
1. 42	11. 0	1. 18	·1398	2. 11	·03290	23. 0	67 ·8	69 ·2
1. 52	8. 50	1. 28	·1389	2. 21	·03310			
2. 10	7. 45	1. 37	·1396	2. 42	·03330			
2. 19	8. 10	1. 47	·1408	3. 2	·03360			
2. 28	8. 0	2. 10	·1393	3. 17	·03360			
2. 37	8. 25	2. 21	·1400	3. 23	·03370			
2. 51	7. 30	2. 26	·1398	3. 38	·03363			
3. 2	11. 20	2. 36	·1403	4. 26	·03402			
3. 12	11. 30	2. 45	·1399	4. 32	·03400			
3. 19	10. 5	3. 5	·1414	4. 52	·03418			
3. 23	10. 10	3. 17	·1417	5. 17	·03446			
3. 32	8. 20	3. 22	·1412	5. 27	·03465			
3. 43	8. 0	3. 29	·1416	5. 40	·03468			
3. 50	9. 0	3. 46	·1391	5. 50	·03480			
4. 0	9. 45	3. 56	·1393	6. 0	·03474			
4. 10	11. 35	4. 3	·1402	6. 11	·03490			
4. 17	11. 20	4. 19	·1407	6. 19	·03483			
4. 23	12. 20	4. 27	·1414	6. 23	·03485			
4. 33	11. 55	4. 33	·1408	6. 30	·03475			
4. 40	12. 20	4. 44	·1405	6. 37	·03472			
4. 48	10. 45	4. 57	·1406	6. 44	·03478			
4. 58	9. 25	5. 3	·1410	6. 57	·03460			
5. 10	5. 20	5. 9	·1408	7. 3	·03455			
5. 17	4. 45	5. 17	·1413	7. 17	·03424			
5. 23	6. 15	5. 25	·1421	7. 33	·03445			
5. 33	2. 45	5. 43	·1409	7. 41	·03425			
5. 40	20. 2. 25	5. 50	·1405	7. 52	·03410			
5. 53	19. 57. 5	5. 54	·1408	7. 58	·03410			
6. 0	56. 50	6. 0	·1401	8. 2	·03403			
6. 7	58. 55	6. 6	·1410	8. 18	·03410			
6. 13	53. 30	6. 10	·1414	8. 28	·03390			
6. 19	54. 10	6. 14	·1408	8. 44	·03375			
6. 33	19. 50. 30	6. 21	·1413	9. 7	·03386			
6. 52	20. 2. 0	6. 32	·1399	9. 32	·03333			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug. 24 h m	° ′ ″	Aug. 24 h m		Aug. 24 h m		h m	°	°
6. 56	20. 1. 40	6. 44	·1414	9. 40	·03350			
7. 2	20. 2. 55	6. 55	·1404	9. 52	·03330			
7. 20	19. 51. 0	7. 2	·1412	10. 3	·03335			
7. 32	20. 1. 55	7. 15	·1388	10. 17	·03320			
7. 39	20. 2. 0	7. 31	·1426	10. 40	·03322			
7. 52	19. 58. 25	7. 45	·1402	11. 22	·03306			
8. 0	52. 25	7. 51	·1400	11. 27	·03299			
8. 20	49. 55	7. 58	·1391	11. 32	·03302			
8. 22	50. 55	8. 9	·1400	11. 56	·03290			
8. 30	49. 55	8. 15	·1405	12. 0	·03283			
8. 38	51. 40	8. 23	·1392	12. 6	·03290			
8. 47	49. 5	8. 30	·1385	12. 8	·03277			
8. 52	48. 15	8. 36	·1391	12. 12	·03278			
9. 13	58. 25	8. 47	·1382	12. 16	·03263			
9. 21	19. 57. 25	8. 51	·1386	12. 22	·03290			
9. 32	20. 0. 10	8. 58	·1412	12. 40	·03271			
9. 45	19. 57. 30	9. 4	·1419	12. 42	·03260			
9. 58	20. 0. 20	9. 21	·1399	12. 47	·03263			
10. 10	19. 57. 10	9. 33	·1415	13. 10	·03255			
10. 18	56. 45	9. 42	·1405	13. 31	·03218			
10. 28	19. 58. 30	9. 55	·1419	13. 37	·03190			
	(†)	10. 9	·1406	13. 50	·03190			
10. 53	20. 0. 10	10. 23	·1412	14. 16	·03117			
11. 26	1. 30	10. 25	·1421	14. 36	·03095			
11. 30	0. 20		(†)	14. 47	·03098			
11. 42	1. 35	10. 52	·1422	15. 6	·03060			
11. 59	1. 5	11. 0	·1418	15. 22	·03050			
12. 3	0. 20	11. 24	·1424	15. 33	·03013			
12. 7	20. 1. 15	11. 29	·1415	15. 47	·03021			
12. 9	19. 59. 20	11. 34	·1421	15. 59	·03023			
12. 12	20. 0. 30	11. 37	·1417	16. 10	·03009			
12. 19	19. 55. 45	11. 50	·1424	16. 26	·03032			
12. 23	20. 2. 5	11. 54	·1418	16. 38	·03037			
12. 32	2. 45	11. 59	·1424	16. 5c	·03010			
12. 37	1. 25	12. 1	·1416	16. 56	·03019			
12. 42	20. 1. 20	12. 7	·1423	17. 7	·03035			
12. 48	19. 59. 20	12. 11	·1413	17. 23	·03028			
12. 52	20. 1. 10	12. 13	·1415	17. 37	·03030			
13. 6	1. 35	12. 17	·1395	17. 50	·03000			
13. 12	3. 15	12. 24	·1414	18. 3	·03020			
13. 29	20. 3. 20	12. 28	·1409	18. 20	·03023			
13. 37	19. 57. 50	12. 33	·1417	18. 30	·03021			
13. 43	50. 45	12. 37	·1410	18. 57	·03039			
13. 49	19. 54. 30	12. 40	·1415	19. 17	·03057			
14. 9	20. 1. 20	12. 43	·1406	19. 23	·03070			
14. 27	19. 54. 45	12. 50	·1408	19. 36	·03064			
14. 32	54. 0	13. 3	·1401	19. 52	·03090			
14. 42	48. 45	13. 17	·1405	20. 12	·03099			
14. 50	48. 0	13. 33	·1400	20. 40	·03115			
15. 8	50. 25	13. 46	·1416	20. 53	·03117			
15. 12	52. 20	13. 51	·1412	21. 32	·03140			
15. 18	52. 5	13. 56	·1418	21. 37	·03140			
15. 21	54. 10	14. 5	·1414	21. 56	·03140			
15. 30	54. 0	14. 14	·1406	22. 26	·03145			
15. 39	52. 45	14. 22	·1402	22. 52	·03165			
15. 57	57. 25	14. 30	·1409	23. 10	·03172			
16. 8	58. 20	14. 35	·1406	23. 32	·03185			
16. 17	56. 5	14. 51	·1415	23. 59	·03210			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug. 24		Aug. 24							Sept. 3		Sept. 3		Sept. 3				
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
16. 30	19. 59. 20	14. 59	·1412						1. 19	20. 11. 45	0. 50	·1400	1. 26	·02709			
16. 32	19. 58. 50	15. 10	·1417						1. 22	10. 20	0. 54	·1406	1. 30	·02702			
16. 42	20. 1. 35	15. 20	·1408						1. 28	11. 20	0. 58	·1401	1. 41	·02716			
16. 53	20. 0. 55	15. 25	·1413						1. 32	10. 25	1. 7	·1410	1. 50	·02712			
17. 7	19. 57. 45	15. 42	·1387						1. 50	10. 0	1. 21	·1409	2. 3	·02729			
17. 22	20. 3. 0	15. 50	·1389						1. 59	8. 35	1. 40	·1415	2. 10	·02729			
17. 30	2. 25	16. 16	·1384						2. 7	8. 50	1. 53	·1406	2. 31	·02752			
17. 37	3. 35	16. 24	·1389						2. 22	7. 5	2. 3	·1411	2. 34	·02749			
17. 42	20. 8. 0	16. 32	·1386						2. 30	6. 55	2. 21	·1403	2. 42	·02773			
17. 57	19. 59. 0	16. 46	·1391						2. 39	4. 55	2. 27	·1409	2. 53	·02789			
18. 3	57. 50	16. 55	·1382						2. 42	1. 0	2. 30	·1403	2. 57	·02789			
18. 10	58. 45	17. 6	·1400						2. 52	2. 10	2. 35	·1408	3. 10	·02809			
18. 18	55. 35	17. 10	·1404						3. 3	20. 0. 10	2. 38	·1404	3. 20	·02811			
18. 23	56. 55	17. 19	·1407						3. 7	19. 58. 40	2. 46	·1421	3. 31	·02822			
18. 37	54. 20	17. 32	·1392						3. 20	20. 0. 20	2. 50	·1419	3. 42	·02812			
18. 50	53. 45	17. 39	·1395						3. 28	0. 30	3. 0	·1422	3. 50	·02819			
19. 3	54. 10	17. 49	·1377						3. 36	1. 55	3. 2	·1418	3. 52	·02814			
19. 13	55. 55	17. 55	·1381						3. 40	1. 20	3. 6	·1426	4. 2	·02819			
19. 18	55. 25	18. 2	·1379						3. 43	1. 50	3. 14	·1427	4. 16	·02809			
19. 27	59. 55	18. 22	·1406						3. 48	1. 0	3. 21	·1423	4. 30	·02814			
19. 33	57. 0	18. 31	·1400						3. 52	2. 0	3. 28	·1422	4. 35	·02809			
19. 41	54. 55	19. 2	·1391						4. 0	2. 0	3. 32	·1426	4. 43	·02816			
19. 52	57. 20	19. 11	·1393						4. 11	3. 25	3. 45	·1414	4. 48	·02810			
20. 0	57. 0	19. 17	·1387						4. 29	3. 55	3. 50	·1416	5. 2	·02829			
20. 15	57. 40	19. 25	·1394						4. 36	5. 0	3. 54	·1413	5. 6	·02829			
20. 22	57. 10	19. 39	·1377						4. 43	4. 25	4. 0	·1417	5. 11	·02836			
20. 29	58. 25	19. 53	·1385						4. 52	5. 25	4. 15	·1405	5. 12	·02827			
20. 38	58. 10	20. 15	·1383						5. 1	5. 0	4. 32	·1414	5. 20	·02836			
20. 46	59. 0	20. 23	·1379						5. 11	6. 0	4. 38	·1409	5. 40	·02851			
20. 58	19. 58. 45	20. 31	·1383						5. 22	4. 0	4. 46	·1414	5. 48	·02875			
21. 34	20. 1. 20	20. 39	·1379						5. 24	20. 3. 45	4. 51	·1408	5. 59	·02886			
21. 43	2. 35	20. 50	·1380						5. 41	19. 59. 20	4. 57	·1414	6. 4	·02864			
21. 45	2. 0	21. 7	·1376						5. 48	56. 30	5. 2	·1426	6. 12	·02856			
21. 49	3. 40	21. 25	·1374						5. 52	56. 25	5. 7	·1424	6. 30	·02825			
	***	21. 49	·1381						5. 57	54. 25	5. 11	·1430	6. 38	·02817			
22. 37	5. 30	22. 2	·1374						6. 4	57. 40	5. 16	·1422	6. 53	·02832			
23. 22	9. 40	22. 14	·1378						6. 10	19. 57. 10	5. 27	·1426	7. 10	·02811			
23. 52	11. 0	22. 21	·1375						6. 23	20. 2. 25	5. 36	·1419	7. 20	·02812			
23. 59	11. 0	22. 25	·1378						6. 36	20. 0. 5	5. 41	·1422	7. 56	·02792			
		22. 32	·1376						6. 43	19. 54. 55	5. 47	·1437	8. 11	·02792			
		22. 40	·1380						7. 0	59. 30	5. 49	·1435	8. 30	·02776			
		22. 47	·1379						7. 11	57. 10	5. 57	·1445	8. 40	·02779			
		23. 2	·1384						7. 18	55. 0	6. 3	·1429	8. 46	·02786			
		23. 22	·1384						7. 31	57. 5	6. 8	·1430	9. 42	·02765			
		23. 30	·1379						7. 44	59. 45	6. 21	·1410	9. 50	·02765			
		23. 55	·1385						7. 57	59. 30	6. 36	·1397	10. 30	·02745			
		23. 59	·1386						8. 10	57. 0	6. 56	·1425	10. 40	·02746			
									8. 20	59. 0	7. 10	·1415	11. 23	·02723			
Sept. 3		Sept. 3		Sept. 3		Sept. 3			8. 29	59. 20	7. 18	·1419	11. 32	·02725			
0. 0	20. 9. 50	0. 0	·1397	0. 0	·02662	0. 0	63·6	64·8	8. 35	55. 55	7. 25	·1416	11. 52	·02684			
0. 8	9. 30	0. 5	·1397		***	1. 0	63·8	65·0	8. 42	50. 10	7. 34	·1414	12. 10	·02692			
0. 13	10. 50	0. 8	·1402	0. 40	·02671	2. 0	63·8	65·3	8. 50	51. 10	7. 40	·1416	12. 23	·02630			
0. 20	11. 20	0. 11	·1398	0. 47	·02679	3. 0	64·8	65·3	8. 57	51. 0	7. 57	·1409	12. 37	·02610			
0. 38	10. 5	0. 15	·1402	0. 51	·02675	9. 0	63·8	65·1	9. 0	52. 10	8. 11	·1417	12. 57	·02599			
0. 43	10. 35	0. 21	·1398	0. 57	·02679	21. 0	63·5	64·8	9. 9	51. 50	8. 19	·1412	13. 7	·02580			
0. 50	12. 0	0. 32	·1397	1. 3	·02683	22. 0	63·7	65·3	9. 20	54. 30	8. 34	·1390	13. 11	·02592			
0. 57	11. 10	0. 41	·1402	1. 10	·02699	23. 0	63·5	64·4	9. 27	54. 55	8. 44	·1406	13. 17	·02565			
1. 7	10. 45	0. 45	·1408	1. 20	·02699				9. 43	58. 5	8. 51	·1407	13. 22	·02570			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 3 h m	° ′ ″	Sept. 3 h m		Sept. 3 h m		h m	°	°
9. 51	20. 0. 10	9. 0	·1414	13. 30	·02547			
10. 1	0. 20	9. 8	·1414	13. 52	·02558			
10. 8	0. 50	9. 16	·1420	14. 2	·02550			
10. 16	0. 45	9. 28	·1420	14. 11	·02560			
10. 20	1. 20	9. 41	·1414	14. 33	·02533			
10. 31	0. 20	9. 47	·1419	14. 40	·02540			
	(†)	9. 52	·1413	15. 6	·02543			
11. 7	20. 0. 20	9. 59	·1410	15. 13	·02536			
11. 12	19. 59. 40	10. 8	·1412	15. 23	·02541			
11. 27	19. 59. 45	10. 16	·1415	15. 50	·02482			
11. 33	20. 2. 0	10. 27	·1410	15. 57	·02452			
11. 47	1. 25	10. 36	·1411	16. 7	·02442			
11. 52	0. 5	10. 41	·1415	16. 18	·02455			
12. 4	8. 20	10. 50	·1412	16. 32	·02465			
12. 11	9. 0	11. 0	·1416	16. 43	·02459			
12. 13	12. 5	11. 7	·1411	16. 50	·02450			
12. 22	10. 5	11. 19	·1417	16. 57	·02458			
	(†)	11. 32	·1432	17. 7	·02435			
12. 33	7. 10	11. 40	·1428	17. 27	·02438			
12. 55	6. 0	11. 45	·1418	17. 59	·02466			
13. 6	7. 25	12. 0	·1437	18. 2	·02462			
13. 14	7. 25	12. 7	·1439	18. 21	·02483			
13. 20	6. 15	12. 12	·1427	18. 23	·02484			
13. 23	9. 20	12. 21	·1418	18. 53	·02507			
13. 30	8. 15		(†)	19. 2	·02502			
13. 37	8. 0	12. 51	·1418	19. 11	·02510			
13. 46	4. 25	13. 5	·1432	19. 17	·02503			
14. 0	2. 0	13. 12	·1430	19. 23	·02519			
14. 4	20. 1. 55	13. 20	·1424	19. 30	·02507			
14. 13	19. 59. 0	13. 24	·1440	19. 38	·02523			
14. 20	19. 57. 55	13. 29	·1430	19. 42	·02523			
14. 23	20. 1. 25	13. 32	·1434	20. 0	·02569			
14. 33	20. 1. 35	13. 38	·1420	20. 19	·02562			
14. 43	19. 58. 0	13. 54	·1407	20. 27	·02563			
14. 56	57. 35	14. 12	·1414	20. 37	·02560			
15. 2	57. 0	14. 20	·1428	21. 0	·02570			
15. 10	57. 55	14. 32	·1440		***			
15. 12	59. 30	14. 41	·1438	21. 57	·02622			
15. 29	19. 57. 0	14. 44	·1434	22. 19	·02637			
15. 57	20. 15. 35	14. 48	·1440		(†)			
16. 2	14. 30	14. 52	·1438	23. 8	·02690			
16. 10	6. 20	15. 3	·1436	23. 32	·02688			
16. 22	2. 30	15. 13	·1436		(†)			
16. 33	5. 25	15. 18	·1426					
16. 41	8. 0	15. 21	·1429					
16. 52	10. 0	15. 25	·1420					
17. 1	13. 25	15. 29	·1422					
17. 10	15. 5	15. 39	·1409					
17. 16	14. 40	15. 52	·1391					
17. 22	11. 20	16. 2	·1407					
17. 37	12. 20	16. 13	·1421					
17. 43	9. 0	16. 20	·1416					
17. 49	8. 15	16. 33	·1428					
18. 2	11. 10	16. 40	·1436					
18. 12	5. 45	16. 47	·1434					
18. 21	7. 55	16. 53	·1439					
18. 30	8. 10	16. 57	·1430					
18. 36	5. 20	17. 7	·1427					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 3 h m	° ′ ″	Sept. 3 h m		h m		h m	°	°
18. 42	20. 5. 20	17. 18	·1398					
18. 47	6. 30	17. 22	·1402					
18. 50	6. 30	17. 39	·1377					
18. 56	8. 30	17. 46	·1378					
19. 6	11. 0	17. 52	·1385					
19. 12	9. 0	17. 58	·1381					
19. 19	10. 0	18. 2	·1385					
19. 29	6. 10	18. 6	·1381					
19. 32	6. 45	18. 17	·1393					
19. 41	1. 0	18. 26	·1396					
19. 44	20. 2. 45	18. 32	·1388					
19. 51	19. 59. 5	18. 43	·1400					
19. 53	20. 0. 45	18. 59	·1393					
19. 56	0. 15	19. 9	·1373					
20. 0	3. 0	19. 20	·1370					
20. 2	2. 40	19. 23	·1364					
20. 4	8. 20	19. 32	·1369					
20. 10	10. 40	19. 36	·1366					
20. 22	13. 5	19. 46	·1370					
20. 29	13. 0	19. 50	·1358					
20. 38	14. 20	19. 55	·1351					
20. 47	12. 25	20. 9	·1365					
20. 50	13. 0	20. 21	·1358					
20. 57	10. 0	20. 30	·1357					
20. 59	10. 55	20. 36	·1360					
21. 2	9. 0	20. 39	·1354					
21. 8	10. 5	20. 45	·1350					
21. 12	8. 10	20. 49	·1356					
21. 20	9. 20	20. 55	·1350					
21. 29	9. 0	21. 4	·1346					
21. 32	10. 20	21. 22	·1350					
21. 43	9. 30	21. 29	·1347					
21. 52	7. 0	21. 49	·1356					
22. 0	7. 10	21. 59	·1368					
22. 7	4. 0	22. 7	·1349					
22. 13	6. 55	22. 17	·1358					
22. 22	7. 25	22. 20	·1346					
22. 28	4. 45	22. 23	·1351					
	(†)	22. 25	·1332					
23. 16	11. 30		(†)					
23. 19	13. 20	23. 18	·1376					
23. 27	12. 22	23. 24	·1372					
23. 30	13. 55	23. 30	·1377					
23. 36	10. 50	23. 33	·1370					
23. 42	11. 20	23. 36	·1363					
23. 59	12. 10	23. 40	·1363					
		23. 49	·1369					
		23. 59	·1380					
Sept. 11		Sept. 11		Sept. 11		Sept. 11		
0. 0	20. 12. 15	0. 0	·1406	0. 0	·02716	0. 0	66 ·0	67 ·1
0. 5	11. 40	0. 5	·1400	0. 42	·02762	1. 0	66 ·2	67 ·8
0. 20	13. 0	0. 9	·1406	0. 54	·02782	2. 0	66 ·3	68 ·0
0. 29	14. 50	0. 19	·1404	0. 57	·02777	3. 0	66 ·4	67 ·7
0. 37	14. 10	0. 30	·1419	1. 17	·02808	9. 0	66 ·0	66 ·6
0. 41	14. 55	0. 35	·1416	1. 33	·02813	9. 30	66 ·0	66 ·4
0. 50	13. 55	0. 42	·1419	1. 40	·02836	10. 0	64 ·8	65 ·8
0. 54	15. 55	0. 49	·1411	1. 45	·02828	21. 20	63 ·6	64 ·9

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 11 h m	° ′ ″	Sept. 11 h m		Sept. 11 h m		h m	°	°
1. 0	20. 13. 45	0. 55	·1425	1. 56	·02842			
1. 10	15. 45	1. 0	·1410	2. 0	·02830			
1. 17	17. 30	1. 5	·1418	2. 7	·02842			
1. 30	16. 5	1. 14	·1422	2. 16	·02838			
1. 38	16. 30	1. 17	·1428	2. 20	·02850			
1. 43	18. 0	1. 25	·1422	2. 23	·02840			
1. 49	17. 0	1. 29	·1418	3. 7	·02921			
1. 56	18. 20	1. 32	·1421	3. 38	·02938			
2. 0	17. 0	1. 35	·1417	3. 47	·02937			
2. 7	16. 45	1. 40	·1420	3. 56	·02947			
2. 16	16. 0	1. 45	·1432	4. 7	·02943			
2. 21	14. 10	1. 50	·1426	4. 17	·02930			
2. 29	16. 20	1. 54	·1431	4. 27	·02940			
2. 38	14. 55	2. 0	·1434	4. 37	·02934			
2. 42	15. 20	2. 4	·1421	4. 46	·02952			
2. 59	15. 20	2. 8	·1425	4. 52	·02938			
3. 4	16. 10	2. 16	·1415	5. 2	·02940			
3. 13	15. 50	2. 20	·1420	5. 7	·02950			
3. 20	14. 30	2. 24	·1410	5. 17	·02942			
3. 29	14. 0	2. 29	·1420	5. 26	·02950			
3. 33	14. 45	2. 33	·1428	5. 33	·02949			
3. 47	13. 0	2. 39	·1420	5. 56	·02976			
3. 52	13. 20	2. 50	·1430	6. 8	·02953			
4. 5	12. 45	3. 9	·1434	6. 17	·02957			
4. 7	12. 50	3. 24	·1421	6. 27	·02948			
4. 15	10. 50	3. 30	·1416	6. 32	·02933			
4. 26	11. 20	3. 38	·1420	6. 47	·02943			
4. 35	10. 20	3. 50	·1416	7. 9	·02942			
4. 42	11. 45	3. 59	·1423	7. 14	·02930			
4. 50	9. 30	4. 3	·1416	7. 22	·02932			
4. 56	9. 25	4. 7	·1420	7. 37	·02919			
5. 0	8. 25	4. 15	·1410	7. 52	·02920			
5. 8	9. 0	4. 25	·1417	8. 8	·02900			
5. 15	7. 25	4. 34	·1413	8. 22	·02912			
5. 22	7. 20	4. 37	·1407	8. 26	·02903			
5. 30	3. 20	4. 46	·1426	8. 32	·02906			
5. 37	3. 0	4. 55	·1414	8. 52	·02905			
5. 44	1. 0	5. 0	·1418		(†)			
5. 53	3. 10	5. 3	·1414	10. 11	·02763			
6. 2	0. 50	5. 11	·1423	10. 36	·02823			
6. 17	5. 25	5. 20	·1412	10. 52	·02782			
6. 23	20. 1. 55	5. 23	·1415	11. 2	·02797			
6. 46	19. 56. 40	5. 27	·1409	11. 22	·02781			
7. 7	19. 58. 55	5. 33	·1406	11. 42	·02795			
7. 23	20. 2. 10	5. 44	·1422	11. 51	·02758			
7. 34	1. 0	5. 50	·1439	12. 1	·02738			
7. 42	3. 20	5. 55	·1435	12. 12	·02750			
7. 48	3. 0	6. 0	·1421	12. 42	·02716			
7. 51	4. 5	6. 11	·1432	13. 8	·02750			
7. 54	3. 30	6. 18	·1426	13. 20	·02740			
8. 14	3. 5	6. 26	·1407	13. 42	·02745			
8. 19	3. 40	6. 37	·1409	14. 7	·02738			
8. 27	3. 0	6. 42	·1416	14. 17	·02696			
8. 35	3. 20	6. 46	·1413	14. 57	·02750			
8. 50	2. 25	6. 51	·1419	15. 12	·02759			
8. 53	1. 30	6. 55	·1416	15. 23	·02750			
8. 59	20. 2. 5	7. 3	·1422	15. 32	·02763			
9. 12	19. 51. 0	7. 10	·1417	15. 37	·02760			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 11 h m	° ′ ″	Sept. 11 h m		Sept. 11 h m		h m	°	°
9. 19	19. 45. 55	7. 20	·1422	15. 47	·02764			
9. 30	55. 20	7. 28	·1422	15. 50	·02760			
9. 36	54. 0	7. 30	·1417	15. 59	·02775			
9. 46	59. 25	7. 35	·1424	16. 7	·02750			
10. 7	46. 55	7. 42	·1436	16. 13	·02760			
10. 23	54. 25	7. 47	·1422	16. 32	·02766			
10. 31	55. 25	7. 53	·1424	16. 39	·02765			
10. 41	50. 20	7. 57	·1414	17. 17	·02778			
10. 50	47. 35	8. 2	·1414	18. 2	·02782			
10. 52	48. 0	8. 11	·1423	18. 26	·02778			
11. 0	45. 30	8. 14	·1416	19. 11	·02786			
11. 12	44. 45	8. 22	·1423	19. 32	·02781			
11. 20	47. 45	8. 27	·1420	19. 51	·02784			
	(†)	8. 39	·1426	21. 23	·02740			
11. 45	56. 30	8. 49	·1417	22. 20	·02716			
12. 3	48. 10	8. 52	·1421	23. 59	·02680			
12. 20	53. 0	8. 58	·1416					
12. 37	39. 20	9. 2	·1427					
12. 42	38. 30	9. 15	·1412					
13. 3	47. 40	9. 20	·1432					
13. 12	46. 45	9. 26	·1442					
13. 30	50. 0	9. 29	·1433					
13. 32	48. 35	9. 32	·1437					
13. 40	47. 0	9. 38	·1421					
13. 50	49. 50	9. 42	·1431					
14. 4	52. 0	9. 45	·1443					
14. 18	44. 20	9. 46	·1421					
14. 32	43. 20	9. 51	·1426					
14. 40	43. 30	9. 52	·1416					
15. 5	53. 35	9. 53	·1400					
15. 11	52. 55	9. 57	·1409					
15. 12	54. 0	10. 0	·1396					
15. 17	53. 0	10. 3	·1402					
15. 23	56. 0	10. 7	·1397					
15. 32	53. 0	10. 26	·1427					
15. 38	54. 20	10. 41	·1398					
15. 46	52. 20	10. 47	·1402					
15. 52	55. 45	10. 50	·1398					
16. 2	49. 45	10. 54	·1402					
16. 8	50. 50	10. 59	·1395					
16. 19	50. 45	11. 4	·1396					
16. 24	52. 10	11. 10	·1398					
16. 28	51. 50	11. 16	·1393					
16. 33	52. 30	11. 22	·1392					
16. 42	51. 55	11. 25	·1387					
17. 0	51. 0	11. 32	·1402					
17. 20	55. 20	11. 40	·1395					
17. 33	55. 20	11. 50	·1400					
17. 40	58. 0	12. 7	·1426					
17. 43	57. 40	12. 29	·1384					
17. 50	58. 50	12. 43	·1408					
17. 57	58. 25	13. 0	·1420					
18. 4	59. 5	13. 7	·1411					
18. 12	58. 10	13. 15	·1411					
18. 18	56. 30	13. 35	·1401					
18. 32	56. 0	13. 40	·1403					
18. 38	56. 10	13. 49	·1400					
18. 48	55. 20	14. 0	·1407					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Reading of Thermometers. Of H. F. Magnet.	Reading of Thermometers. Of V. F. Magnet.
Sept. 11		Sept. 11						
h m	° ′ ″	h m		h m		h m	°	°
19. 4	19. 56. 30	14. 7	·1395					
19. 13	56. 20	14. 13	·1403					
19. 20	57. 0	14. 28	·1404					
19. 30	56. 20	14. 43	·1414					
19. 46	58. 30	14. 53	·1415					
20. 8	58. 50	14. 58	·1419					
20. 19	59. 25	15. 2	·1412					
20. 31	19. 59. 0	15. 7	·1415					
20. 48	20. 0. 20	15. 14	·1407					
20. 57	0. 5	15. 21	·1412					
21. 5	1. 0	15. 27	·1407					
21. 10	0. 50	15. 33	·1413					
21. 16	1. 30	15. 39	·1407					
21. 30	1. 0	15. 47	·1421					
22. 2	2. 50	15. 54	·1412					
22. 8	2. 45	16. 3	·1422					
22. 33	5. 0	16. 7	·1418					
23. 0	5. 55	16. 11	·1422					
23. 59	9. 35	16. 15	·1416					
		16. 21	·1421					
		16. 24	·1415					
		16. 30	·1418					
		16. 45	·1414					
		16. 55	·1409					
		17. 11	·1408					
		17. 19	·1399					
		17. 22	·1402					
		17. 26	·1398					
		17. 37	·1402					
		17. 40	·1397					
		17. 45	·1403					
		17. 49	·1400					
		17. 59	·1406					
		18. 13	·1401					
		18. 21	·1404					
		18. 35	·1406					
		18. 46	·1402					
		19. 3	·1400					
		19. 10	·1397					
		19. 26	·1394					
		19. 37	·1395					
		19. 57	·1390					
		20. 21	·1390					
		20. 25	·1387					
		20. 35	·1389					
		20. 52	·1383					
		21. 0	·1387					
		21. 8	·1381					
		21. 14	·1383					
		21. 23	·1379					
		21. 49	·1378					
		22. 22	·1380					
		22. 48	·1379					
		23. 20	·1382					
		23. 40	·1387					
		23. 59	·1390					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 13		Sept. 13		Sept. 13		Sept. 13		
h m	° ′ ″	h m		h m		h m	°	°
11. 0	20. 2. 0	11. 0	·1420	11. 0	·02700	9. 0	64·6	64·3
11. 22	1. 35	11. 19	·1419	11. 38	·02698	21. 0	64·2	64·8
11. 26	6. 0	11. 20	·1414	12. 27	·02700	22. 0	64·4	65·0
11. 36	20. 1. 0	11. 23	·1453	12. 36	·02704	23. 0	64·6	65·3
11. 42	19. 58. 50	11. 25	·1436	12. 43	·02700			
11. 44	59. 25	11. 32	·1433	13. 2	·02700			
11. 51	58. 10	11. 34	·1426	13. 7	·02706			
12. 2	58. 0	11. 38	·1428	13. 12	·02698			
12. 7	58. 55	11. 41	·1421	13. 18	·02710			
12. 15	58. 20	11. 46	·1426	13. 27	·02690			
12. 20	57. 20	11. 48	·1421	13. 30	·02660			
12. 22	58. 5	11. 54	·1427	13. 32	·02704			
12. 36	19. 58. 45	12. 2	·1421	13. 36	·02687			
12. 43	20. 1. 0	12. 7	·1415	13. 48	·02690			
12. 55	19. 59. 45	12. 12	·1419	13. 53	·02702			
13. 0	59. 15	12. 16	·1415	13. 56	·02688			
13. 5	19. 58. 25	12. 29	·1430	14. 7	·02680			
13. 8	20. 0. 5	12. 36	·1420	14. 16	·02692			
13. 15	19. 58. 30	12. 43	·1416	14. 20	·02680			
13. 20	51. 45	12. 50	·1417	14. 25	·02703			
13. 23	57. 40	12. 55	·1428	14. 33	·02673			
13. 30	58. 30	12. 59	·1424	14. 40	·02672			
13. 34	57. 0	13. 2	·1431	14. 50	·02629			
13. 39	19. 56. 15	13. 5	·1452	15. 4	·02654			
13. 42	20. 0. 0	13. 7	·1442	15. 17	·02640			
13. 44	19. 58. 10	13. 10	·1449	15. 23	·02648			
13. 51	57. 40	13. 13	·1440	15. 40	·02620			
13. 58	54. 25	13. 15	·1443	15. 49	·02572			
14. 3	56. 35	13. 17	·1408	15. 56	·02567			
14. 7	19. 53. 20	13. 20	·1443	16. 6	·02583			
14. 11	20. 1. 50	13. 22	·1428	16. 16	·02577			
14. 16	19. 58. 0	13. 28	·1424	16. 26	·02553			
14. 18	58. 45	13. 31	·1418	16. 40	·02550			
14. 23	57. 0	13. 34	·1419	16. 50	·02534			
14. 28	59. 50	13. 37	·1430	16. 56	·02541			
14. 32	59. 5	13. 38	·1446	17. 7	·02567			
14. 40	54. 50	13. 42	·1431	17. 11	·02552			
14. 47	54. 30	13. 46	·1435	17. 15	·02560			
14. 48	52. 25	13. 53	·1429	17. 22	·02535			
14. 52	55. 40	14. 0	·1437	17. 37	·02521			
14. 58	56. 0	14. 3	·1420	18. 2	·02520			
15. 4	53. 0	14. 9	·1449	18. 23	·02470			
15. 16	55. 0	14. 12	·1440	19. 7	·02530			
15. 23	52. 5	14. 13	·1433	19. 34	·02532			
15. 35	51. 5	14. 15	·1438	20. 0	·02560			
15. 41	52. 55	14. 19	·1430	20. 26	·02580			
15. 52	56. 20	14. 24	·1446		(†)			
15. 56	58. 10	14. 28	·1440	23. 59	·02723			
16. 2	58. 15	14. 30	·1444					
16. 10	55. 5	14. 34	·1419					
16. 12	55. 45	14. 41	·1426					
16. 20	53. 25	14. 44	·1417					
16. 23	55. 0	14. 48	·1428					
16. 41	19. 57. 30	14. 53	·1425					
16. 50	20. 7. 20	15. 0	·1418					
16. 52	8. 0	15. 4	·1420					
17. 0	22. 15	15. 8	·1430					
17. 1	21. 40	15. 12	·1424					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ; attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 13		Sept. 13							Sept. 13		Sept. 13						
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
17. 6	20. 33. 20	15. 17	·1418						23. 52	20. 7. 10	20. 50	·1366					
17. 22	10. 0	15. 23	·1419							(†)	20. 55	·1370					
17. 30	19. 55	15. 30	·1412								20. 56	·1366					
17. 32	20. 20	15. 33	·1404								21. 2	·1374					
17. 42	31. 20	15. 37	·1410								21. 4	·1385					
17. 53	20. 14. 20	15. 42	·1406								21. 10	·1337					
18. 18	19. 50. 15	15. 59	·1431								21. 13	·1358					
18. 23	47. 35	16. 5	·1434								21. 19	·1364					
18. 27	48. 35	16. 10	·1430								21. 22	·1359					
18. 30	46. 50	16. 15	·1432								21. 25	·1365					
18. 32	51. 15	16. 21	·1423								21. 30	·1368					
18. 36	49. 30	16. 27	·1420								21. 39	·1361					
18. 38	54. 25	16. 40	·1382								21. 47	·1371					
18. 42	52. 45	16. 43	·1377								21. 48	·1353					
18. 50	57. 0	16. 48	·1368								21. 51	·1358					
18. 54	19. 55. 10	16. 51	·1374								21. 53	·1344					
19. 0	20. 2. 20	17. 0	·1389								21. 58	·1351					
19. 3	1. 5	17. 10	·1380								22. 0	·1344					
19. 13	3. 20	17. 13	·1356								22. 3	·1331					
19. 18	1. 50	17. 19	·1329								22. 9	·1353					
19. 29	5. 25	17. 25	·1356								22. 11	·1347					
19. 43	6. 20	17. 29	·1370								22. 14	·1360					
19. 51	8. 40	17. 33	·1387								22. 17	·1363					
19. 57	7. 50	17. 39	·1390								22. 20	·1369					
20. 3	8. 20	17. 51	·1350								22. 22	·1363					
20. 12	5. 45	18. 0	·1312								22. 25	·1371					
20. 18	4. 45		(†)								22. 29	·1366					
20. 22	3. 5	18. 16	·1312								22. 33	·1364					
20. 27	3. 35	18. 23	·1330								22. 40	·1376					
20. 38	3. 55	18. 28	·1353								22. 48	·1367					
20. 41	2. 25	18. 31	·1341								22. 50	·1370					
20. 49	1. 40	18. 33	·1351								22. 53	·1367					
21. 1	2. 40	18. 38	·1335								23. 4	·1370					
21. 5	20. 3. 10	18. 43	·1349								23. 20	·1365					
21. 12	19. 51. 5	18. 50	·1339								23. 25	·1367					
21. 13	20. 7. 55	18. 57	·1356								23. 36	·1362					
21. 22	3. 55	19. 2	·1350								23. 44	·1374					
21. 28	5. 0	19. 9	·1364								23. 48	·1368					
21. 33	6. 15	19. 11	·1367									(†)					
21. 49	1. 0	19. 13	·1363														
21. 51	5. 20	19. 19	·1369						Sept. 27		Sept. 27		Sept. 27		Sept. 27		
21. 54	3. 20	19. 23	·1363						0. 0	20. 6. 10	0. 0	·1408	0. 0	·02555	0. 0	64·6	64·8
22. 0	20. 6. 10	19. 30	·1362						0. 5	6. 55	0. 15	·1404	0. 13	·02556	1. 0	64·8	65·3
22. 6	19. 59. 45	19. 36	·1368						0. 44	6. 55	0. 25	·1402	1. 32	·02598	3. 0	64·8	65·1
22. 9	20. 5. 45	19. 39	·1363						1. 7	7. 10	0. 41	·1402	2. 40	·02622	9. 0	64·0	64·3
22. 14	3. 25	19. 42	·1368						1. 40	8. 10	0. 55	·1404	4. 22	·02650	10. 0	63·9	63·6
22. 18	4. 5	19. 47	·1361						2. 30	6. 55	1. 22	·1400	4. 45	·02679	21. 0	64·0	64·5
22. 22	6. 0	19. 55	·1365						2. 45	7. 55	1. 36	·1402	4. 52	·02672	22. 0	64·0	63·7
22. 28	5. 25	20. 5	·1357						2. 57	7. 0	1. 50	·1401	5. 1	·02682	23. 0	64·2	64·0
22. 32	6. 55	20. 10	·1366						3. 9	7. 20	2. 22	·1406	5. 7	·02666			
22. 40	4. 55	20. 17	·1360						3. 47	6. 15	2. 35	·1410	5. 12	·02685			
22. 46	7. 25	20. 27	·1368						3. 55	6. 35	2. 41	·1414	5. 32	·02725			
22. 51	6. 0	20. 30	·1365						4. 7	5. 55	2. 47	·1416	5. 36	·02724			
23. 19	6. 35	20. 35	·1370						4. 19	5. 45	2. 53	·1411	5. 48	·02730			
23. 23	6. 0	20. 38	·1364						4. 36	4. 5	3. 13	·1419	5. 54	·02750			
23. 32	6. 30	20. 41	·1368						4. 52	6. 10	3. 21	·1416	5. 57	·02770			
23. 38	6. 0	20. 44	·1364						5. 1	8. 45	3. 28	·1418	6. 1	·02780			
23. 48	7. 30	20. 47	·1369						5. 10	7. 20	3. 37	·1417	6. 4	·02764			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

September 13. The photographic trace for Horizontal Force was off the sheet in the direction of *diminishing* force from $18^h. 0^m.$ to $18^h. 16^m.$

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 27		Sept. 27		Sept. 27				
h m	° ′ ″	h m		h m		h m	°	°
5. 12	20. 7. 50	3. 45	·1421	6. 7	·02770			
5. 26	4. 10	3. 49	·1420	6. 12	·02757			
5. 33	3. 5	3. 58	·1426	6. 13	·02762			
5. 40	4. 10	4. 5	·1424	6. 20	·02803			
5. 51	3. 0	4. 17	·1432	6. 27	·02803			
6. 1	7. 35	4. 19	·1429	6. 43	·02745			
6. 7	20. 6. 45	4. 31	·1438	6. 52	·02742			
6. 17	19. 49. 20	4. 40	·1446	7. 9	·02718			
6. 28	43. 15	4. 50	·1451	7. 15	·02720			
6. 41	47. 25	4. 55	·1442	7. 20	·02703			
6. 42	47. 20	5. 2	·1443	7. 29	·02703			
7. 5	56. 35	5. 5	·1440	7. 47	·02698			
7. 16	50. 30	5. 11	·1421	8. 3	·02710			
7. 22	49. 20	5. 16	·1428	8. 20	·02680			
7. 26	48. 5	5. 32	·1434	8. 40	·02620			
7. 37	51. 15	5. 37	·1416	9. 3	·02616			
7. 43	48. 20	5. 42	·1411	9. 22	·02594			
7. 47	48. 0	5. 47	·1404	9. 30	·02600			
7. 58	53. 10	5. 52	·1416	10. 17	·02515			
8. 13	56. 0	5. 54	·1409	10. 47	·02572			
8. 28	43. 20	5. 56	·1415	11. 28	·02414			
	(†)	6. 0	·1409		(†)			
9. 0	49. 10	6. 5	·1396	12. 12	·02415			
9. 12	54. 5	6. 13	·1385	12. 13	·02413			
9. 30	55. 35	6. 19	·1402	12. 20	·02430			
9. 34	55. 0	6. 22	·1399	12. 28	·02415			
9. 56	54. 30	6. 27	·1407	12. 57	·02420			
10. 20	46. 30	6. 32	·1412	13. 9	·02404			
10. 32	45. 10	6. 34	·1409	13. 27	·02440			
10. 47	50. 0	6. 38	·1414	14. 8	·02477			
10. 54	50. 20	6. 45	·1404	14. 12	·02465			
11. 7	46. 40	6. 56	·1411	14. 18	·02478			
11. 17	51. 20	7. 5	·1405	14. 33	·02510			
11. 20	52. 45	7. 11	·1382	14. 43	·02500			
11. 24	55. 10	7. 15	·1384	15. 1	·02503			
11. 30	55. 15	7. 22	·1378	15. 22	·02543			
11. 36	55. 0	7. 28	·1384	15. 42	·02560			
11. 46	49. 50	7. 35	·1387	16. 7	·02545			
11. 52	52. 15	7. 37	·1384	16. 17	·02544			
12. 10	54. 20	7. 39	·1387	16. 37	·02530			
12. 13	54. 0	7. 43	·1382	16. 41	·02523			
12. 14	53. 55	7. 56	·1392	17. 0	·02530			
12. 25	44. 10	8. 3	·1402	17. 11	·02510			
12. 32	50. 5	8. 6	·1398	17. 23	·02510			
12. 52	54. 55	8. 15	·1402	17. 33	·02500			
12. 58	53. 45	8. 23	·1392	17. 42	·02503			
13. 7	55. 10	8. 30	·1399	18. 2	·02482			
13. 21	46. 40	8. 33	·1395	18. 10	·02484			
13. 31	43. 25		(†)	18. 16	·02473			
13. 38	43. 55	8. 58	·1399	18. 22	·02476			
13. 53	41. 10	9. 5	·1405	18. 43	·02430			
14. 4	42. 0	9. 10	·1408	19. 5	·02442			
14. 12	43. 30	9. 14	·1404		***			
14. 19	47. 5	9. 34	·1412	20. 59	·02521			
14. 26	46. 50	9. 44	·1403	21. 30	·02553			
14. 42	54. 0	10. 1	·1400	22. 13	·02550			
14. 57	57. 0	10. 10	·1388	22. 34	·02554			
15. 5	55. 50	10. 17	·1383	22. 41	·02540			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 27		Sept. 27		Sept. 27				
h m	° ′ ″	h m		h m		h m	°	°
15. 11	19. 55. 45	10. 32	·1396	22. 50	·02550			
15. 18	58. 0	10. 44	·1413	22. 53	·02562			
15. 26	19. 58. 25	10. 49	·1409	23. 2	·02542			
15. 30	20. 0. 20	10. 58	·1428	23. 7	·02546			
15. 33	0. 0	11. 8	·1447	23. 13	·02558			
15. 39	1. 45	11. 12	·1449	23. 20	·02560			
15. 42	1. 20	11. 21	·1441	23. 23	·02550			
15. 49	2. 45	11. 35	·1390	23. 42	·02566			
15. 52	2. 15	11. 41	·1375	23. 59	·02585			
15. 57	3. 15	11. 57	·1387					
16. 11	0. 50	12. 5	·1382					
16. 20	2. 0	12. 8	·1385					
16. 22	1. 15	12. 16	·1374					
16. 27	2. 15	12. 22	·1400					
16. 37	0. 45	12. 30	·1409					
16. 43	1. 40	12. 38	·1400					
16. 50	0. 0	12. 44	·1384					
16. 52	0. 55	12. 50	·1376					
17. 0	1. 0	13. 0	·1384					
17. 18	4. 55	13. 4	·1380					
17. 22	4. 10	13. 15	·1395					
17. 41	8. 10	13. 22	·1389					
17. 47	12. 50	13. 30	·1394					
17. 53	14. 5	13. 37	·1388					
17. 57	16. 30	13. 45	·1391					
18. 2	17. 0	13. 53	·1400					
18. 12	24. 25	14. 0	·1402					
18. 18	24. 0	14. 5	·1399					
18. 27	26. 50	14. 12	·1404					
18. 40	21. 20	14. 16	·1394					
18. 54	17. 0	14. 20	·1397					
19. 4	17. 25	14. 23	·1393					
19. 17	13. 25	14. 37	·1400					
19. 20	15. 5	14. 50	·1392					
19. 29	10. 50	14. 56	·1386					
19. 50	20. 4. 0	15. 1	·1391					
19. 57	19. 57. 30	15. 4	·1386					
20. 0	57. 20	15. 10	·1392					
20. 7	57. 55	15. 13	·1387					
20. 12	59. 0	15. 23	·1395					
20. 18	56. 55	15. 26	·1392					
20. 22	19. 57. 35	15. 31	·1398					
20. 26	20. 0. 10	15. 34	·1394					
20. 35	19. 59. 25	15. 40	·1403					
20. 40	58. 20	15. 45	·1400					
20. 51	59. 50	15. 49	·1405					
20. 56	58. 50	15. 52	·1401					
21. 1	59. 55	16. 0	·1407					
21. 12	19. 59. 20	16. 5	·1409					
21. 17	20. 1. 30	16. 9	·1403					
21. 22	1. 40	16. 13	·1409					
21. 30	3. 10	16. 15	·1402					
21. 43	1. 45	16. 19	·1409					
21. 51	2. 35	16. 25	·1402					
21. 59	3. 0	16. 33	·1402					
22. 7	1. 40	16. 36	·1398					
22. 13	3. 0	16. 40	·1402					
22. 30	1. 10	16. 44	·1396					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept.27		Sept.27						
h m	° ′ ″	h m		h m		h m	°	°
22.36	20. 3. 0	16.57	·1400					
22.44	3. 0	17. 8	·1398					
22.51	2. 0	17.12	·1393					
22.57	2. 5	17.32	·1392					
23. 3	5. 5	17.38	·1390					
23.17	3.30	17.47	·1380					
23.28	6.20	17.51	·1383					
23.43	3.20	17.57	·1380					
23.47	5. 0	18. 5	·1383					
23.50	2.25	18. 8	·1392					
23.51	4.40	18.13	·1395					
23.59	1.40	18.21	·1407					
		18.34	·1418					
		18.41	·1404					
		18.44	·1407					
		18.46	·1398					
		18.50	·1405					
		18.59	·1413					
		19. 2	·1407					
		19. 6	·1411					
		19. 8	·1402					
		19.14	·1404					
		19.16	·1409					
		19.22	·1398					
		19.29	·1405					
		19.32	·1397					
		19.34	·1402					
		19.37	·1395					
		19.41	·1400					
		19.45	·1393					
		19.49	·1397					
		19.52	·1388					
		19.59	·1392					
		20. 8	·1396					
		20.12	·1388					
		20.20	·1395					
		20.25	·1389					
		20.30	·1394					
		20.33	·1384					
		20.42	·1391					
		20.48	·1392					
		20.51	·1388					
		20.56	·1398					
		21.16	·1395					
		21.21	·1384					
		21.25	·1388					
		21.30	·1378					
		21.36	·1383					
		21.41	·1379					
		21.45	·1385					
		21.50	·1379					
		21.56	·1383					
		22. 0	·1379					
		22. 3	·1382					
		22. 8	·1375					
		22.12	·1379					
		22.16	·1373					
		22.23	·1375					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Sept.27						
h m	° ′ ″	h m		h m		h m	°	°
		22.34	·1381					
		22.39	·1376					
		22.50	·1360					
		22.55	·1376					
		23. 1	·1369					
		23. 7	·1354					
		23.15	·1370					
		23.23	·1367					
		23.26	·1360					
		23.37	·1361					
		23.40	·1365					
		23.43	·1359					
		23.46	·1366					
		23.49	·1362					
		23.55	·1365					
		23.59	·1368					
Sept.29		Sept.29		Sept.29		Sept.29		
	(†)		(†)	0. 0	·02640	0. 0	64·9	66·8
0.37	20.12.50	0.26	·1395	0. 7	·02662	1. 0	65·2	67·3
0.42	12.45	0.33	·1403	0.22	·02695	2. 0	65·2	67·4
0.47	13.40	0.38	·1402	0.30	·02694	3. 0	65·3	67·7
1. 1	13.10	0.41	·1395	0.57	·02745	6. 0	65·7	68·3
1.16	15. 5	1. 0	·1405	1. 6	·02742	9. 0	65·8	67·0
1.26	12.55	1. 4	·1401	1.22	·02812	10.45	65·8	67·0
1.29	14.20	1.10	·1413	1.37	·02840	21. 0	66·0	67·2
1.33	13. 5	1.18	·1403	1.48	·02918	22. 0	66·7	67·2
1.42	22.30	1.23	·1410	1.52	·02922	23. 0	66·3	67·4
1.49	24.40	1.27	·1405	1.57	·02953			
1.58	22.40	1.31	·1410	2. 2	·02972			
2. 4	19.15	1.34	·1428	2.12	·03021			
2.12	13. 0		***	2.20	·03023			
2.19	13.10	1.49	·1427	2.24	·03068			
2.23	16. 5	1.53	·1436	2.32	·03114			
2.34	10.55	1.58	·1446	2.38	·03090			
2.40	12. 0	2. 2	·1430	2.49	·03138			
2.42	17.35	2. 9	·1412	2.54	·03050			
2.50	4.40	2.21	·1422	3. 0	·03080			
3. 0	22.50	2.24	·1433	3. 7	·03099			
3. 8	10.50	2.30	·1440	3.13	·03138			
3.12	16.55	2.34	·1460		(†)			
3.17	15. 0	2.39	·1413	3.32	·03060			
3.20	19.55	2.46	·1444	3.52	·03057			
3.37	8. 5	2.50	·1450	4. 2	·03039			
3.41	9.20	2.55	·1415	4.22	·03108			
3.46	8. 5	2.59	·1424	4.40	·03070			
3.53	11. 0	3. 2	·1399	4.43	·03067			
4. 0	8.30	3.10	·1437	4.50	·03045			
4. 5	7.50	3.22	·1405	5. 2	·03058			
4.10	9. 0	3.28	·1414	5. 9	·03038			
4.15	8. 0	3.33	·1399	5.17	·03044			
4.22	10.40	3.36	·1403	5.20	·03030			
4.26	3. 0	3.40	·1392	5.37	·03023			
4.29	6. 0	3.47	·1410	5.39	·03007			
4.39	20. 0.20	3.52	·1401	5.47	·03010			
4.43	19.59.25	3.57	·1406	5.52	·02980			
4.51	20. 0.50	4. 3	·1413	6. 5	·02998			
4.54	0.10	4. 6	·1406	6. 8	·02982			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 29 h m	° ′ ″	Sept. 29 h m		Sept. 29 h m		h m	°	°
5. 7	20. 2. 20	4. 13	·1423	6. 17	·02980			
5. 12	9. 25	4. 16	·1427	6. 24	·02998			
5. 18	0. 40	4. 18	·1416	6. 27	·02976			
5. 23	2. 10	4. 22	·1433	6. 36	·02979			
5. 29	1. 40	4. 27	·1424	6. 43	·03000			
5. 33	3. 0	4. 31	·1423	6. 45	·02995			
5. 50	5. 25	4. 35	·1415	6. 55	·03018			
5. 57	0. 40	4. 44	·1421	6. 57	·02986			
6. 9	7. 0	4. 51	·1410	7. 2	·03000			
6. 20	10. 40	4. 55	·1417	7. 9	·03027			
6. 33	3. 10	5. 2	·1430	7. 14	·03030			
6. 43	7. 15	5. 8	·1393	7. 22	·03003			
6. 49	7. 20	5. 15	·1412	7. 32	·03016			
6. 58	10. 0	5. 19	·1404	7. 37	·03000			
7. 5	8. 20	5. 23	·1408	7. 50	·02988			
7. 10	10. 45	5. 27	·1404	8. 0	·02976			
7. 19	17. 55	5. 35	·1413	8. 23	·02964			
7. 29	12. 0	5. 37	·1409	8. 37	·02947			
7. 36	11. 10	5. 42	·1418	9. 0	·02941			
7. 43	8. 45	5. 49	·1401	9. 7	·02907			
7. 49	7. 50	5. 56	·1413	9. 20	·02880			
7. 57	8. 30	6. 3	·1415	9. 36	·02867			
8. 15	5. 45	6. 9	·1410	9. 39	·02882			
8. 22	20. 5. 40	6. 11	·1417	9. 44	·02843			
8. 40	19. 57. 0	6. 12	·1403	10. 5	·02856			
8. 41	56. 0	6. 16	·1406	10. 9	·02842			
8. 49	50. 0	6. 20	·1421	10. 18	·02850			
9. 0	55. 50	6. 27	·1394	10. 22	·02835			
9. 12	55. 20	6. 31	·1397	10. 24	·02843			
9. 22	59. 10	6. 34	·1392	10. 47	·02860			
9. 28	19. 59. 10	6. 39	·1408	11. 2	·02844			
9. 37	20. 2. 25	6. 43	·1393	11. 30	·02863			
9. 50	1. 5	6. 47	·1404	11. 40	·02838			
10. 7	3. 30	6. 50	·1428	11. 42	·02820			
10. 15	1. 15	6. 52	·1403	11. 47	·02832			
10. 30	1. 0	6. 55	·1413	11. 59	·02838			
10. 40	2. 5	7. 0	·1397	12. 8	·02808			
10. 51	1. 20	7. 4	·1409	12. 18	·02807			
11. 3	1. 20	7. 12	·1416	12. 30	·02822			
11. 9	2. 10	7. 15	·1408	13. 12	·02843			
11. 17	2. 15	7. 22	·1381	13. 18	·02854			
11. 28	7. 20	7. 30	·1391	13. 22	·02840			
11. 42	3. 20	7. 36	·1389	13. 30	·02857			
11. 54	7. 20	7. 53	·1403	13. 33	·02840			
12. 22	20. 1. 45	7. 59	·1396	13. 40	·02844			
12. 33	19. 59. 5	8. 6	·1400	13. 42	·02839			
12. 58	57. 50	8. 10	·1396	14. 2	·02853			
13. 2	57. 20	8. 16	·1400	14. 7	·02842			
13. 8	57. 35	8. 20	·1410	14. 22	·02847			
13. 16	57. 10	8. 29	·1410	14. 50	·02838			
13. 18	58. 40	8. 35	·1404	15. 32	·02783			
13. 25	56. 40	8. 43	·1409	15. 43	·02795			
13. 28	58. 10	8. 54	·1442	16. 13	·02802			
13. 37	57. 20	9. 0	·1425	16. 52	·02835			
13. 43	55. 25	9. 3	·1429	17. 7	·02830			
14. 2	58. 10	9. 6	·1419	17. 29	·02852			
14. 7	19. 57. 10	9. 17	·1424	18. 7	·02854			
14. 21	20. 2. 20	9. 22	·1414	18. 11	·02842			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 29 h m	° ′ ″	Sept. 29 h m		Sept. 29 h m		h m	°	°
14. 35	20. 1. 45	9. 24	·1420	18. 27	·02862			
14. 51	4. 35	9. 29	·1419	19. 2	·02853			
14. 58	3. 45	9. 32	·1438	19. 9	·02861			
15. 3	4. 5	9. 35	·1419	19. 12	·02855			
15. 30	20. 1. 30	9. 39	·1402	19. 21	·02860			
15. 37	19. 59. 50	9. 42	·1406	20. 16	·02860			
15. 52	59. 55	9. 47	·1391	20. 30	·02854			
16. 18	55. 25	9. 54	·1399	20. 40	·02858			
16. 48	58. 20	10. 2	·1407	20. 50	·02847			
17. 12	58. 55	10. 5	·1398	20. 57	·02850			
17. 16	58. 10	10. 10	·1400	21. 40	·02847			
17. 23	19. 58. 30	10. 15	·1384	22. 22	·02853			
17. 30	20. 0. 15	10. 22	·1393	22. 28	·02857			
17. 41	2. 5	10. 24	·1388	23. 32	·02870			
18. 0	20. 0. 25	10. 35	·1395	23. 59	·02873			
18. 7	19. 58. 15	10. 40	·1402					
18. 10	20. 0. 55	10. 47	·1394					
18. 18	19. 56. 10	10. 52	·1399					
18. 34	20. 0. 15	10. 57	·1391					
18. 54	20. 0. 0	11. 0	·1397					
19. 8	19. 57. 20	11. 3	·1391					
19. 13	59. 30	11. 6	·1397					
19. 18	57. 0	11. 8	·1392					
19. 23	59. 0	11. 16	·1398					
19. 28	59. 20	11. 24	·1419					
19. 33	57. 55	11. 31	·1427					
19. 38	58. 30	11. 34	·1417					
19. 42	58. 35	11. 37	·1430					
19. 44	59. 40	11. 40	·1408					
19. 50	58. 5	11. 43	·1427					
20. 12	57. 55	11. 52	·1440					
20. 17	57. 10	11. 57	·1428					
20. 20	57. 40	12. 4	·1404					
20. 31	57. 25	12. 12	·1395					
20. 37	56. 45	12. 18	·1393					
20. 42	58. 10	12. 25	·1397					
20. 52	57. 0	12. 31	·1391					
21. 3	58. 20	12. 33	·1399					
21. 17	57. 20	12. 35	·1395					
21. 19	59. 0	12. 38	·1398					
21. 22	57. 10	12. 41	·1394					
21. 25	59. 5	12. 49	·1399					
21. 30	56. 55	12. 55	·1394					
21. 36	59. 25	13. 2	·1400					
21. 40	58. 0	13. 6	·1397					
21. 42	59. 0	13. 12	·1410					
22. 7	19. 59. 50	13. 17	·1395					
22. 13	20. 1. 20	13. 23	·1411					
22. 18	0. 0	13. 28	·1400					
22. 29	0. 55	13. 31	·1405					
22. 33	0. 0	13. 35	·1395					
22. 37	1. 10	13. 52	·1398					
22. 49	1. 30	13. 57	·1406					
22. 53	1. 20	14. 1	·1395					
23. 7	2. 35	14. 4	·1400					
23. 28	2. 0	14. 10	·1390					
23. 42	3. 0	14. 14	·1393					
23. 59	3. 25	14. 19	·1389					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ⁏ attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Sept. 29						
h m	° ′ ″	h m		h m		h m	°	°
		14.40	·1407					
		14.44	·1404					
		14.50	·1412					
		14.53	·1407					
		15. 3	·1412					
		15.12	·1409					
		15.19	·1413					
		15.30	·1408					
		15.38	·1412					
		15.55	·1406					
		16.13	·1400					
		17. 2	·1400					
		17. 8	·1392					
		17.24	·1399					
		17.43	·1398					
		18. 6	·1407					
		18.18	·1388					
		18.19	·1409					
		18.25	·1416					
		18.53	·1406					
		19. 2	·1393					
		19. 8	·1407					
		19.15	·1394					
		19.17	·1410					
		19.21	·1402					
		19.26	·1405					
		19.31	·1400					
		19.35	·1405					
		19.41	·1400					
		19.54	·1397					
		20. 7	·1396					
		20.15	·1393					
		20.21	·1395					
		20.33	·1390					
		20.40	·1396					
		20.49	·1387					
		20.56	·1392					
		21.16	·1390					
		21.22	·1394					
		21.29	·1383					
		21.34	·1394					
		21.41	·1382					
		21.52	·1393					
		22. 5	·1387					
		22.15	·1392					
		22.20	·1389					
		22.31	·1387					
		22.49	·1388					
		22.59	·1384					
		23.14	·1388					
		23.27	·1381					
		23.50	·1384					
		23.59	·1385					
Oct. 6		Oct. 6		Oct. 6		Oct. 6		
0. 0	20.11.30		(†)	0. 0	·03860	0. 0	63·5	64·5
0. 4	12.50	0. 5	·1397	0.51	·03900	1. 0	63·6	64·7

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 6		Oct. 6		Oct. 6		Oct. 6		
h m	° ′ ″	h m		h m		h m	°	°
0.15	20.11.25	0.16	·1395	1. 2	·03939	2. 0	63·7	65·0
0.32	10.45	0.22	·1397	1. 7	·03925	3. 0	63·7	64·8
0.40	11.15	0.30	·1394	1. 9	·03941	6. 0	63·7	64·8
0.53	10.35	0.37	·1400	1.14	·03930	9. 0	62·5	62·5
1.16	10.35	0.52	·1404	1.24	·03970	21. 0	62·8	63·3
1.23	13. 5	0.55	·1401	1.33	·03946	22. 0	62·9	63·4
1.33	9.10	1. 1	·1405	1.37	·03955	23. 0	63·2	64·0
1.46	17.20	1.14	·1403	1.42	·03938			
2. 0	6. 0	1.24	·1422	1.52	·03962			
2. 6	4. 5	1.28	·1420		***			
2.16	4.45	1.31	·1429	3.11	·03978			
2.30	6.40	1.34	·1423	3.38	·03998			
2.52	7.45	1.37	·1430	4. 1	·03987			
3.20	6.20	1.44	·1434	4.33	·04002			
3.35	6.25	1.51	·1400	4.54	·04003			
4.43	3. 0	2. 1	·1376	5.14	·04017			
5. 7	3. 0	2.15	·1390	6.28	·04021			
5.17	3.25	2.21	·1394	6.35	·04028			
5.36	2.30	2.34	·1392	6.38	·04021			
6.18	3.55	2.38	·1388	6.44	·04026			
6.26	4.45	2.56	·1399	7. 2	·03998			
6.42	5.20	3.15	·1399	7.10	·04003			
6.43	6.35	3.52	·1405	7.15	·03992			
6.48	4.55	4.17	·1407	7.20	·04002			
6.57	5.10	4.32	·1410	7.28	·03990			
7. 3	6. 5	4.39	·1409	7.46	·04000			
7.19	20. 2. 5	4.52	·1415	8. 6	·04010			
7.24	19.57.20	5. 7	·1415	8.14	·03998			
7.40	20. 3.40	5.22	·1424	8.27	·04000			
7.50	2. 5	5.38	·1423	8.42	·04016			
7.52	20. 1.50	6.14	·1413	8.50	·04025			
8.10	19.58.10	6.20	·1419	9. 2	·04023			
8.17	58.35	6.45	·1416	9.10	·03977			
8.24	57.10	6.55	·1425	9.19	·03974			
8.32	57.10	7. 2	·1423	9.26	·03934			
8.42	55.55	7.13	·1413	9.35	·03920			
8.50	56.15	7.19	·1419	9.43	·03917			
8.56	54.45	7.23	·1409	10. 2	·03839			
9. 3	53.40	7.33	·1421	10. 7	·03767			
9.13	50.40	7.45	·1400	10.17	·03748			
9.23	49.20	7.57	·1396	10.27	·03812			
9.34	52. 0	8. 5	·1400	10.38	·03865			
9.55	36.40	8. 8	·1398	10.46	·03782			
10.16	42.25	8.21	·1412	10.51	·03798			
10.23	47. 0	8.27	·1403	11. 5	·03730			
10.30	46. 0	8.35	·1397	11.18	·03784			
10.39	48.45	8.56	·1387	11.30	·03822			
10.52	43.30	9. 0	·1392	11.45	·03837			
10.57	45. 5	9. 7	·1405	12. 2	·03863			
11. 2	19.43.45	9.24	·1392	12.22	·03890			
11.17	20. 5. 5	9.35	·1397	12.32	·03883			
11.20	19.55. 5	9.39	·1378	12.47	·03846			
11.27	49. 0	9.53	·1381	12.57	·03860			
11.37	48.30	10. 1	·1397	13.18	·03894			
11.41	50. 0	10. 5	·1393	13.27	·03896			
12. 8	52.25	10.11	·1398	13.37	·03910			
12.19	55. 5	10.16	·1395	13.47	·03906			
12.29	54.55	10.32	·1363	14. 0	·03922			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

October 5. VERTICAL FORCE.—The adjustments were altered, so that the readings were increased by 27[div]·64 or by 0·0145 parts of the whole Vertical Force. It will be necessary therefore to diminish the indications on October 6 by 0·0145 to connect them with the indications preceding October 5.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Oct. 6		Oct. 6		Oct. 6				
h m	° ′ ″	h m		h m		h m	°	°
12. 44	20. 2. 10	10. 39	·1376	14. 17	·03918			
13. 10	19. 51. 55	10. 47	·1406	14. 23	·03922			
13. 20	52. 45	10. 54	·1421	14. 36	·03916			
13. 23	54. 35	11. 0	·1425	14. 45	·03922			
13. 40	55. 20	11. 7	·1444	14. 51	·03913			
13. 50	56. 25	11. 22	·1386	15. 0	·03917			
13. 56	56. 0	11. 40	·1402	15. 28	·03910			
14. 10	59. 5	11. 49	·1402	15. 57	·03910			
14. 27	58. 10	11. 54	·1396	16. 2	·03904			
14. 32	58. 30	11. 59	·1400	16. 27	·03910			
14. 43	56. 45	12. 7	·1396	16. 40	·03902			
14. 50	57. 0	12. 18	·1393	16. 59	·03913			
14. 58	56. 0	12. 27	·1395	18. 4	·03893			
15. 5	57. 15	12. 32	·1402	18. 27	·03876			
15. 13	56. 40	12. 37	·1398	18. 56	·03867			
15. 22	57. 0	12. 46	·1403	19. 10	·03873			
15. 33	55. 15	12. 57	·1397	19. 24	·03863			
15. 49	55. 20	13. 17	·1408	19. 35	·03865			
16. 1	56. 50	13. 35	·1400	20. 43	·03833			
16. 10	55. 30	13. 44	·1404	21. 27	·03830			
16. 15	56. 40	13. 51	·1399	22. 3	·03816			
16. 20	56. 0	14. 0	·1404	22. 46	·03822			
16. 30	57. 40	14. 10	·1399	23. 59	·03862			
16. 40	55. 20	14. 28	·1404					
16. 50	55. 45	14. 35	·1400					
17. 0	58. 25	14: 45	·1406					
17. 14	58. 50	14. 51	·1401					
17. 18	58. 30	15. 0	·1407					
17. 23	59. 5	15. 7	·1403					
17. 34	58. 55	15. 18	·1404					
17. 42	58. 30	15. 24	·1400					
18. 8	59. 0	15. 36	·1405					
18. 27	56. 0	15. 52	·1403					
18. 52	57. 40	16. 0	·1399					
19. 4	57. 0	16. 8	·1403					
19. 12	58. 20	16. 14	·1400					
19. 22	56. 40	16. 20	·1404					
19. 30	57. 35	16. 29	·1400					
19. 32	57. 0	16. 39	·1404					
20. 12	56. 25	16. 45	·1400					
20. 21	56. 0	16. 51	·1404					
20. 29	57. 0	17. 0	·1401					
20. 50	56. 10	17. 12	·1398					
20. 56	57. 5	17. 28	·1402					
21. 11	57. 0	17. 35	·1399					
21. 20	19. 59. 0	17. 44	·1405					
21. 28	20. 0. 45	17. 49	·1402					
21. 31	19. 59. 5	18. 3	·1406					
21. 46	20. 0. 45	18. 15	·1402					
21. 57	0. 10	18. 28	·1403					
22. 37	4. 0	18. 56	·1396					
22. 57	7. 0	19. 5	·1400					
23. 13	6. 0	19. 16	·1396					
23. 23	7. 50	19. 23	·1400					
23. 30	8. 10	19. 28	·1398					
23. 42	8. 50	19. 39	·1400					
23. 59	7. 45	20. 15	·1400					
		20. 24	·1402					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
		Oct. 6						
h m	° ′ ″	h m		h m		h m	°	°
		20. 37	·1399					
		20. 45	·1395					
		20. 52	·1399					
		20. 57	·1396					
		21. 1	·1400					
		21. 7	·1398					
		21. 15	·1400					
		21. 28	·1394					
		21. 45	·1400					
		21. 49	·1397					
		22. 2	·1397					
		22. 15	·1399					
		22. 21	·1395					
		22. 30	·1400					
		22. 35	·1398					
		22. 44	·1404					
		22. 49	·1401					
		22. 58	·1405					
		23. 5	·1399					
		23. 16	·1397					
		23. 27	·1402					
		23. 32	·1401					
		23. 37	·1403					
		23. 45	·1400					
		23. 50	·1403					
		23. 53	·1400					
		23. 57	·1403					
		23. 59	·1399					
Oct. 25		Oct. 25		Oct. 25		Oct. 25		
0. 0	20. 6. 30	0. 0	·1416	0. 0	·03328	0. 0	63·0	63·0
0. 18	8. 10	0. 7	·1419	0. 12	·03330	1. 0	62·6	62·8
0. 22	9. 5	0. 12	·1420	1. 0	·03360	2. 0	62·8	62·8
0. 26	7. 55	0. 20	·1415	1. 18	·03386	3. 0	62·8	62·7
0. 31	9. 0	0. 28	·1418	1. 31	·03380	9. 0	62·9	63·0
0. 38	7. 10	0. 32	·1411	1. 43	·03402	21. 0	62·4	62·4
0. 42	7. 55	0. 37	·1412	1. 52	·03378	22. 0	62·1	62·1
0. 52	7. 5	0. 42	·1407	2. 7	·03402	23. 0	62·1	62·1
1. 0	8. 0	0. 53	·1408	2. 30	·03442			
1. 9	5. 40	1. 0	·1403	2. 32	·03433			
1. 17	8. 20	1. 4	·1402	2. 38	·03450			
1. 30	9. 40	1. 11	·1409	2. 42	·03437			
1. 42	8. 0	1. 31	·1415		(†)			
1. 51	10. 15	1. 35	·1412	3. 0	·03429*			
1. 58	9. 40	1. 44	·1419	4. 23	·03415			
2. 3	11. 0	1. 54	·1411	5. 52	·03418			
2. 10	11. 30	1. 57	·1415	6. 22	·03438			
2. 12	10. 55	2. 3	·1408	6. 38	·03466			
2. 23	13. 50	2. 19	·1417	6. 46	·03479			
2. 30	13. 45	2. 32	·1412	6. 58	·03466			
2. 34	14. 30	2. 42	·1416	7. 2	·03448			
2. 39	13. 15	2. 58	·1399	7. 15	·03436			
2. 45	13. 55	3. 7	·1398	7. 21	·03438			
3. 0	11. 20	3. 14	·1391	7. 28	·03399			
3. 4	6. 45	3. 20	·1391	7. 33	·03400			
3. 17	7. 0	3. 32	·1401	7. 39	·03397			
3. 32	4. 45	3. 48	·1408	7. 52	·03420			
3. 43	5. 20	4. 7	·1410	8. 3	·03412			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

October 13. VERTICAL FORCE.—The adjustments were again altered, causing the position of the trace to differ from the position held in the series ending October 5 by 0·0102 parts of the whole Vertical Force. It will be necessary therefore to diminish the indications on October 25 by 0·0102 to connect them with the indications preceding October 5.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 25		Oct. 25		Oct. 25				
h m	° ′ ″	h m		h m		h m	°	°
3. 51	20. 6. 40	4. 20	·1419	8. 14	·03421			
4. 12	5. 20	4. 28	·1419	8. 29	·03440			
4. 30	6. 55	4. 38	·1425	8. 42	·03443			
4. 34	6. 30	4. 53	·1414	9. 2	·03427			
4. 50	8. 10	5. 3	·1415	9. 20	·03418			
5. 6	7. 25	5. 15	·1412	9. 52	·03403			
5. 21	5. 0	5. 30	·1418	10. 9	·03385			
5. 53	3. 45	5. 42	·1418	10. 33	·03298			
5. 59	4. 0	5. 55	·1422	10. 42	·03306			
6. 8	20. 1. 20	6. 0	·1426	11. 3	·03223			
6. 19	19. 58. 20	6. 3	·1419	11. 12	·03240			
6. 28	55. 10	6. 6	·1421	11. 36	·03250			
6. 34	54. 25	6. 12	·1416	11. 57	·03315			
6. 42	48. 50	6. 23	·1411	12. 5	·03320			
6. 47	47. 10	6. 37	·1399	12. 46	·03273			
6. 57	41. 25	6. 46	·1405	13. 2	·03283			
7. 5	45. 0	6. 57	·1433	13. 22	·03261			
7. 10	44. 55	7. 4	·1436	14. 9	·03302			
7. 21	19. 50. 15	7. 11	·1447	14. 19	·03294			
7. 30	20. 3. 40	7. 19	·1442	14. 30	·03307			
7. 40	19. 50. 30	7. 24	·1449	14. 42	·03292			
7. 43	49. 20	7. 35	·1389	14. 47	·03295			
7. 57	43. 40	7. 40	·1392	15. 2	·03275			
8. 7	48. 10	7. 46	·1384	15. 17	·03270			
8. 12	47. 55	8. 0	·1406	15. 27	·03266			
8. 22	49. 40	8. 9	·1396	15. 51	·03297			
8. 32	50. 0	8. 17	·1394	16. 22	·03287			
8. 41	53. 5	8. 26	·1386	16. 37	·03303			
8. 52	54. 50	8. 35	·1393	17. 18	·03304			
8. 57	54. 50	8. 42	·1394	17. 33	·03320			
9. 7	57. 0	9. 1	·1410	18. 12	·03335			
9. 20	56. 35	9. 8	·1407	18. 27	·03343			
9. 46	54. 0	9. 24	·1407	18. 32	·03340			
9. 53	54. 5	9. 31	·1406	18. 49	·03347			
10. 2	54. 0	9. 36	·1410	18. 54	·03343			
10. 7	55. 20	9. 44	·1408	19. 0	·03354			
10. 14	55. 25	9. 51	·1411	19. 6	·03342			
10. 30	19. 56. 40	10. 0	·1409	19. 14	·03353			
10. 38	20. 1. 0	10. 5	·1423	20. 24	·03346			
10. 49	19. 57. 30	10. 23	·1433	21. 40	·03318			
11. 1	20. 8. 10	10. 34	·1411	22. 16	·03300			
11. 10	11. 0	10. 43	·1424	23. 0	·03282			
11. 21	20. 5. 0	10. 58	·1441	23. 59	·03296			
11. 33	19. 59. 55	11. 12	·1413					
11. 41	55. 55	11. 23	·1417					
12. 12	42. 10	11. 37	·1396					
12. 33	46. 55	11. 45	·1396					
12. 47	48. 15	11. 58	·1403					
13. 0	45. 5	12. 8	·1413					
13. 10	45. 50	12. 19	·1419					
13. 18	44. 25	12. 36	·1409					
13. 23	45. 0	12. 43	·1402					
13. 39	42. 45	12. 47	·1406					
14. 11	50. 15	12. 50	·1403					
14. 22	49. 55	12. 57	·1412					
14. 41	19. 59. 0	13. 0	·1407					
14. 52	20. 1. 0	13. 3	·1419					
15. 18	19. 57. 20	13. 13	·1424					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 25		Oct. 25						
h m	° ′ ″	h m		h m		h m	°	°
15. 37	20. 3. 30	13. 27	·1415					
15. 41	4. 0	13. 32	·1419					
15. 57	7. 55	13. 35	·1414					
16. 1	7. 25	13. 39	·1417					
16. 6	7. 45	13. 47	·1402					
16. 29	1. 10	13. 51	·1406					
16. 39	0. 45	13. 57	·1397					
16. 43	1. 15	14. 1	·1400					
17. 7	0. 25	14. 7	·1397					
17. 12	0. 50	14. 10	·1400					
17. 22	0. 30	14. 17	·1394					
17. 39	2. 0	14. 26	·1403					
17. 58	0. 40	14. 37	·1408					
18. 7	20. 1. 10	14. 46	·1418					
18. 13	19. 59. 20	14. 52	·1415					
18. 18	19. 59. 5	15. 1	·1420					
18. 29	20. 1. 10	15. 13	·1419					
18. 38	19. 58. 50	15. 27	·1402					
18. 44	58. 35	15. 43	·1418					
18. 53	59. 5	15. 50	·1420					
19. 0	57. 0	15. 55	·1417					
19. 5	59. 0	16. 2	·1422					
19. 13	57. 0	16. 11	·1416					
19. 28	58. 10	16. 28	·1424					
19. 39	57. 0	16. 44	·1436					
19. 42	57. 45	16. 57	·1439					
19. 48	57. 0	17. 44	·1423					
20. 0	57. 45	18. 1	·1423					
20. 7	57. 5	18. 7	·1420					
20. 26	57. 10	18. 13	·1423					
20. 40	56. 10	18. 17	·1428					
21. 2	57. 10	18. 19	·1422					
21. 12	56. 45	18. 24	·1426					
21. 19	58. 35	18. 29	·1419					
21. 31	57. 20	18. 32	·1423					
21. 53	57. 40	18. 36	·1420					
21. 59	57. 20	18. 37	·1424					
22. 3	58. 55	18. 40	·1420					
22. 7	58. 30	18. 46	·1424					
22. 20	59. 10	18. 54	·1415					
22. 23	19. 58. 45	18. 59	·1424					
22. 29	20. 1. 30	19. 5	·1414					
22. 45	3. 10	19. 14	·1422					
23. 15	4. 10	19. 17	·1417					
23. 21	3. 30	19. 21	·1420					
23. 32	4. 25	19. 32	·1412					
23. 40	4. 10	19. 36	·1416					
23. 59	5. 0	19. 42	·1412					
		19. 47	·1415					
		19. 57	·1413					
		20. 1	·1409					
		20. 9	·1411					
		20. 23	·1410					
		20. 29	·1406					
		20. 45	·1407					
		20. 48	·1410					
		20. 55	·1407					
		21. 0	·1411					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Oct. 25									Oct. 25						
h m	° ′ ″	h m		h m		h m	°	°	h m	′ ″	h m		h m		h m	°	°
		21. 10	·1405								22. 46	·1396					
		21. 15	·1408								22. 55	·1394					
		21. 29	·1398								23. 1	·1397					
		21. 45	·1398								23. 17	·1392					
		21. 52	·1396								23. 25	·1394					
		22. 2	·1401								23. 38	·1378					
		22. 8	·1397								23. 59	·1392					
		22. 20	·1399 (†)														

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

OBSERVATIONS

OF THE

MAGNETIC DIP.

1869.

RESULTS of OBSERVATIONS of MAGNETIC DIP, on each Day of Observation.

Day and Approximate Hour, 1869.		Needle.	Length of Needle.	Magnetic Dip.	Observer.
	d h			° ′ ″	
January	6. 2	C 1	6 inches	67. 55. 49	N
	11. 2	B 2	9 ,,	67. 55. 58	N
	21. 0	B 1	9 ,,	67. 58. 23	N
	21. 2	D 1	3 ,,	68. 2. 1	N
	22. 1	C 2	6 ,,	67. 55. 52	N
	28. 0	D 2	3 ,,	67. 57. 45	N
	28. 1	B 1	9 ,,	67. 54. 41	N
	28. 2	D 1	3 ,,	67. 58. 43	N
February	4. 23	C 1	6 ,,	67. 57. 10	N
	5. 1	C 2	6 ,,	67. 55. 32	N
	5. 2	D 2	3 ,,	67. 58. 16	N
	13. 2	D 1	3 ,,	67. 56. 2	N
	17. 2	C 1	6 ,,	67. 54. 15	N
	20. 2	B 1	9 ,,	67. 53. 0	N
	26. 1	B 2	9 ,,	67. 54. 0	N
	26. 2	C 2	6 ,,	67. 59. 52	N
	27. 2	D 2	3 ,,	67. 58. 27	N
March	6. 3	D 1	3 ,,	67. 59. 36	N
	12. 2	C 1	6 ,,	67. 57. 52	N
	16. 2	D 1	3 ,,	67. 55. 52	N
	24. 2	C 2	6 ,,	67. 56. 43	N
	25. 0	B 1	9 ,,	67. 52. 50	N
	25. 1	D 2	3 ,,	67. 53. 54	N
	25. 2	B 2	9 ,,	67. 49. 20	N
	31. 23	B 2	9 ,,	67. 53. 43	N
April	7. 2	B 1	9 ,,	67. 52. 51	N
	10. 2	C 1	6 ,,	67. 55. 56	N
	15. 1	C 2	6 ,,	67. 54. 8	N
	20. 2	D 1	3 ,,	67. 57. 17	N
	21. 2	B 2	9 ,,	67. 56. 52	N
	22. 1	B 1	9 ,,	67. 55. 9	N
	26. 1	C 1	6 ,,	67. 56. 7	N
	26. 2	D 2	3 ,,	67. 59. 9	N
	28. 23	B 1	9 ,,	67. 53. 7	N
	29. 0	B 2	9 ,,	67. 50. 5	N
	29. 1	C 1	6 ,,	67. 52. 49	N
	29. 2	C 2	6 ,,	67. 54. 38	N
	29. 2	D 2	3 ,,	67. 56. 22	N
May	5. 1	D 1	3 ,,	67. 57. 36	N
	10. 2	D 2	3 ,,	67. 55. 38	N
	13. 1	C 1	6 ,,	67. 50. 59	N
	13. 2	C 2	6 ,,	67. 49. 25	N
	20. 2	C 1	6 ,,	67. 53. 22	N
	21. 2	B 1	9 ,,	67. 51. 37	N
	25. 2	D 1	3 ,,	67. 54. 42	N
	26. 1	B 2	9 ,,	67. 52. 7	N
June	5. 6	C 2	6 ,,	67. 53. 39	N
	10. 2	D 1	3 ,,	67. 54. 35	N
	11. 2	D 2	3 ,,	67. 55. 56	N
	14. 2	C 1	6 ,,	67. 53. 50	N
	16. 2	B 1	9 ,,	67. 52. 46	N
	19. 2	D 1	3 ,,	67. 50. 6	N
June	22. 22	B 2	9 inches	67. 48. 54	N
	22. 23	C 1	6 ,,	67. 53. 26	N
	23. 0	D 1	3 ,,	67. 57. 51	N
	23. 1	D 2	3 ,,	67. 54. 44	N
	23. 2	C 2	6 ,,	67. 51. 32	N
	26. 2	B 2	9 ,,	67. 50. 43	N
	30. 3	D 1	3 ,,	67. 55. 18	N
July	3. 1	B 1	9 ,,	67. 47. 45	N
	3. 2	C 1	6 ,,	67. 49. 54	N
	10. 2	D 1	3 ,,	67. 57. 25	N
	13. 2	B 2	9 ,,	67. 47. 1	N
	17. 1	C 2	6 ,,	67. 50. 32	N
	21. 2	B 1	9 ,,	67. 54. 32	N
	22. 1	C 1	6 ,,	67. 57. 58	N
	22. 2	D 2	3 ,,	67. 56. 26	N
	22. 22	D 1	3 ,,	67. 56. 19	N
	22. 23	B 2	9 ,,	67. 50. 35	N
	23. 0	C 1	6 ,,	67. 55. 6	N
	23. 2	C 2	6 ,,	67. 52. 25	N
	29. 2	B 1	9 ,,	67. 50. 29	N
August	7. 1	C 1	6 ,,	67. 56. 31	N
	7. 2	C 2	6 ,,	67. 56. 23	N
	13. 22	C 1	6 ,,	67. 55. 5	N
	13. 23	D 2	3 ,,	67. 55. 11	N
	14. 1	B 1	9 ,,	67. 53. 38	N
	14. 3	C 1	6 ,,	67. 54. 9	N
	21. 2	B 2	9 ,,	67. 51. 8	N
	28. 2	D 1	3 ,,	67. 59. 49	N
	31. 2	D 1	3 ,,	67. 54. 28	N
September	4. 0	D 2	3 ,,	67. 58. 27	N
	4. 1	C 2	6 ,,	67. 59. 5	N
	11. 2	D 1	3 ,,	67. 54. 27	N
	18. 2	B 1	9 ,,	67. 53. 39	N
	21. 1	D 1	3 ,,	67. 55. 48	N
	21. 22	C 2	6 ,,	67. 57. 28	N
	21. 23	C 1	6 ,,	67. 54. 29	N
	28. 0	B 2	9 ,,	67. 58. 44	N
	29. 1	D 1	3 ,,	68. 0. 2	N
	29. 2	D 2	3 ,,	67. 57. 24	N
	30. 0	B 2	9 ,,	67. 56. 46	N
October	5. 2	C 1	6 ,,	67. 54. 57	N
	9. 1	B 1	9 ,,	67. 51. 56	N
	9. 2	D 1	3 ,,	67. 53. 58	N
	12. 1	D 2	3 ,,	67. 58. 49	N
	12. 2	B 2	9 ,,	67. 50. 4	N
	23. 1	C 2	6 ,,	67. 51. 41	N
	23. 2	D 2	3 ,,	67. 58. 9	N
	25. 1	C 1	6 ,,	67. 55. 58	N
	25. 2	B 1	9 ,,	67. 55. 8	N
	29. 1	B 2	9 ,,	67. 51. 46	N
	29. 2	C 2	6 ,,	67. 55. 25	N

The initial N is that of Mr. W. C. Nash.

RESULTS of OBSERVATIONS of MAGNETIC DIP, on each Day of Observation—*continued.*

Day and Approximate Hour, 1869.	Needle.	Length of Needle.	Magnetic Dip.	Observer.	Day and Approximate Hour, 1869.	Needle.	Length of Needle.	Magnetic Dip.	Observer.
d h			° ′ ″		d h			° ′ ″	
November 6. 1	C 1	6 inches	67. 52. 28	N	December 1. 2	D 1	3 inches	67. 54. 59	N
6. 2	D 1	3 "	67. 57. 14	N	7. 2	D 2	3 "	67. 55. 28	N
12. 2	C 2	6 "	67. 54. 8	N	13. 2	C 1	6 "	67. 53. 39	N
13. 2	D 2	3 "	67. 54. 11	N	13. 23	B 1	9 "	67. 57. 28	N
16. 0	B 1	9 "	67. 52. 52	N	14. 2	C 2	6 "	67. 57. 7	N
16. 1	C 1	6 "	67. 53. 16	N	17. 0	D 1	3 "	67. 55. 22	N
16. 2	C 2	6 "	67. 55. 0	N	17. 1	C 1	6 "	67. 54. 21	N
16. 3	D 2	3 "	67. 54. 27	N	17. 1	C 2	6 "	67. 53. 16	N
20. 1	B 2	9 "	67. 48. 2	N	17. 2	B 2	9 "	67. 51. 53	N
20. 2	D 1	3 "	67. 54. 6	N	24. 2	D 2	3 "	67. 56. 43	N
30. 2	B 2	9 "	67. 48. 13	N					

The initial N is that of Mr. W. C. Nash.

MONTHLY MEANS of MAGNETIC DIPS.

Month, 1869.	B 1, 9-inch Needle.	Number of Observations.	B 2, 9-inch Needle.	Number of Observations.	C 1, 6-inch Needle.	Number of Observations.
	° ′ ″		° ′ ″		° ′ ″	
January	67. 56. 32	2	67. 55. 58	1	67. 55. 49	1
February	67. 53. 0	1	67. 54. 0	1	67. 55. 43	2
March	67. 52. 50	1	67. 51. 32	2	67. 57. 52	1
April	67. 53. 42	3	67. 53. 28	2	67. 54. 57	3
May	67. 51. 37	1	67. 52. 7	1	67. 52. 10	2
June	67. 52. 46	1	67. 49. 48	2	67. 53. 38	2
July	67. 50. 55	3	67. 48. 48	2	67. 54. 19	3
August	67. 53. 38	1	67. 51. 8	1	67. 55. 15	3
September	67. 53. 39	1	67. 57. 45	2	67. 54. 29	1
October	67. 53. 32	2	67. 50. 55	2	67. 55. 28	2
November	67. 52. 52	1	67. 48. 7	2	67. 52. 52	2
December	67. 57. 28	1	67. 51. 53	1	67. 54. 0	2
Means	67. 53. 26	Sum 18	67. 51. 53	Sum 19	67. 54. 34	Sum 24

Month, 1869.	C 2, 6-inch Needle.	Number of Observations.	D 1, 3-inch Needle.	Number of Observations.	D 2, 3-inch Needle.	Number of Observations.
	° ′ ″		° ′ ″		° ′ ″	
January	67. 55. 52	1	68. 0. 22	2	67. 57. 45	1
February	67. 57. 42	2	67. 56. 2	1	67. 58. 22	2
March	67. 56. 43	1	67. 57. 44	2	67. 53. 54	1
April	67. 54. 23	2	67. 57. 17	1	67. 57. 46	2
May	67. 49. 25	1	67. 56. 9	2	67. 55. 38	1
June	67. 52. 36	2	67. 54. 28	4	67. 55. 20	2
July	67. 51. 28	2	67. 56. 52	2	67. 56. 26	1
August	67. 56. 23	1	67. 57. 8	2	67. 55. 11	1
September	67. 58. 16	2	67. 56. 46	3	67. 57. 56	2
October	67. 53. 33	2	67. 53. 58	1	67. 58. 29	2
November	67. 54. 34	2	67. 55. 40	2	67. 54. 19	2
December	67. 55. 12	2	67. 55. 11	2	67. 56. 5	2
Means	67. 54. 41	Sum 20	67. 56. 24	Sum 24	67. 56. 36	Sum 19

For this table the monthly means have been formed without reference to the hour at which the observation was made on each day, as in preceding years no certain difference was found between observations taken at 21^h and at 3^h.

In combining the monthly results, to form the annual means, weights have been given proportional to the number of observations.

YEARLY MEANS of MAGNETIC DIPS for each of the NEEDLES, and GENERAL MEAN for the Year 1869.

Lengths of the several Sets of Needles.	Needles.	Number of Observations with each Needle.	Mean Yearly Dip from Observations with each Needle.	Mean Yearly Dip from each Set of Needles.	Mean Yearly Dip from all the Sets of Needles.
			° ′ ″	° ′ ″	° ′ ″
9-inch Needles	B 1	18	67. 53. 26	67. 52. 40	
	B 2	19	67. 51. 53		
6-inch Needles	C 1	24	67. 54. 34	67. 54. 37	67. 54. 36
	C 2	20	67. 54. 41		
3-inch Needles	D 1	24	67. 56. 24	67. 56. 30	
	D 2	19	67. 56. 36		

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS

OF

DEFLEXION OF A MAGNET

FOR

ABSOLUTE MEASURE

OF

HORIZONTAL FORCE.

1869.

ABSTRACT of the OBSERVATIONS of DEFLEXION of a MAGNET for ABSOLUTE MEASURE of HORIZONTAL FORCE.

Month and Day, 1869.		Distances of Centers of Magnets.	Temperature.	Observed Deflexion.	Mean of the Times of Vibration of Deflecting Magnet.	Number of Vibrations.	Temperature.	Observer.
		ft.	°	° ′ ″	s		°	
January	26	1·0 1·3	43·9	12. 9. 52 5. 30. 46	5·389 5·392	100 100	48·5 49·1	N
February	19	1·0 1·3	51·7	12. 9. 20 5. 30. 20	5·400 5·400	100 100	56·1 59·1	N
March	31	1·0 1·3	47·8	12. 9. 55 5. 30. 49	5·386 5·388	100 100	54·0 54·1	N
April	28	1·0 1·3	73·6	12. 5. 8 5. 28. 26	5·384 5·402	100 100	77·7 76·8	N
May	27	1·0 1·3	61·0	12. 6. 12 5. 28. 53	5·402 5·403	100 100	64·5 63·6	N
June	24	1·0 1·3	62·4	12. 5. 51 5. 28. 51	5·392 5·391	100 100	64·3 69·6	N
July	27	1·0 1·3	73·8	12. 2. 37 5. 27. 24	5·409 5·414	100 100	77·5 78·2	N
August	25	1·0 1·3	83·4	11. 59. 50 5. 26. 14	5·415 5·420	100 100	84·2 85·5	N
September	22	1·0 1·3	64·3	12. 1. 10 5. 26. 47	5·408 5·416	100 100	66·7 65·6	N
October	27	1·0 1·3	42·8	12. 4. 30 5. 28. 18	5·412 5·420	100 100	41·2 50·0	N
November	19	1·0 1·3	53·8	12. 0. 15 5. 26. 22	5·420 5·419	100 100	57·3 58·3	N
December	14	1·0 1·3	49·9	12. 1. 24 5. 26. 56	5·416 5·420	100 100	53·5 54·2	N
December	23	1·0 1·3	44·5	12. 0. 38 5. 26. 22	5·412 5·411	100 100	47·9 47·5	N

The position of the Deflecting Magnet with regard to the suspended Magnet is always that which was formerly termed "Lateral." The Deflecting Magnet is placed on the East side of the suspended Magnet, with its marked pole alternately E. and W., and it is placed on the West side with its pole alternately E. and W.; and the deflexion in the table above is the mean of the four deflexions observed in those positions of the magnets.

The lengths of 1 foot and 1·3 foot answer to 304·8 and 396·2 millimètres respectively.

The initial N is that of Mr. W. C. Nash.

In the following calculations every observation is reduced to the temperature 35°.

COMPUTATION of the VALUES of ABSOLUTE MEASURE of HORIZONTAL FORCE in the Year 1869.

Month and Day, 1869.		In English Measure.									Value of X in Metric Measure.
		Apparent Value of A^1.	Apparent Value of A^2.	Apparent Value of P.	Mean Value of P.	Log. A corrected by the Application of Mean Value of P. = Log. $\frac{m}{X}$	Adopted Time of Vibration of Deflecting Magnet.	Log. *m* X.	Value of X.	Value of *m*.	
January	26	+0·10550	0·10566	−0·00372	−0·00291	9·02460	5·3905	0·19716	3·857	0·4082	1·779
February	19	+0·10557	0·10567	−0·00232		9·02474	5·4000	0·19627	3·853	0·4079	1·776
March	31	+0·10558	0·10575	−0·00395		9·02493	5·3870	0·19812	3·860	0·4088	1·780
April	28	+0·10537	0·10546	−0·00209		9·02391	5·3930	0·19879	3·868	0·4087	1·783
May	27	+0·10529	0·10537	−0·00186		9·02356	5·4025	0·19634	3·858	0·4073	1·779
June	24	+0·10526	0·10539	−0·00303		9·02354	5·3915	0·19825	3·867	0·4082	1·783
July	27	+0·10501	0·10514	−0·00304		9·02250	5·4115	0·19586	3·861	0·4066	1·780
August	25	+0·10480	0·10494	−0·00328		9·02166	5·4175	0·19540	3·863	0·4060	1·781
September	22	+0·10463	0·10476	−0·00305		9·02092	5·4120	0·19482	3·863	0·4054	1·781
October	27	+0·10472	0·10486	−0·00328		9·02132	5·4160	0·19263	3·852	0·4046	1·776
November	19	+0·10431	0·10444	−0·00306		9·01959	5·4195	0·19276	3·860	0·4038	1·780
December	14	+0·10440	0·10455	−0·00353		9·02003	5·4180	0·19278	3·858	0·4040	1·779
,,	23	+0·10420	0·10427	−0·00165		9·01902	5·4115	0·19339	3·865	0·4038	1·782
Means........		..	..	..	..	..	..	..	3·860	..	1·780

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS.

1869.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Jan. 1	..	29·906	42·2	28·7	36·1	33·7	51·5	25·7	39·9	38·4	2·4	5·3	0·0	− 1·2	Calm	S by E	6·5	0·0	0·2	226	0·05
2	..	29·774	46·2	40·1	43·2	39·6	66·3	36·9	39·4	38·4	3·6	5·7	2·1	+ 6·2	S : WSW	SW : SSW	18·0	0·0	1·0	437	0·13
3	..	29·496	51·9	39·2	46·0	44·2	52·5	34·2	38·4	36·4	1·8	5·1	0·0	+ 9·3	SSW	SW	30+	0·0	3·1	596	0·44
4	In Equator.	29·845	47·8	38·8	43·2	38·6	72·3	34·2	39·4	37·4	4·6	7·3	2·9	+ 6·8	SW	SW	5·2	0·0	0·4	375	0·00
5	Last Qr.	29·573	53·8	39·5	47·2	45·7	54·5	36·3	40·4	38·4	1·5	5·2	0·0	+11·0	SSW	SW : WSW	30·0	0·0	3·7	623	0·23
6	..	30·133	48·2	37·3	42·7	39·4	69·4	30·8	40·9	39·9	3·3	8·2	0·0	+ 6·7	SW	SW : SSE	0·7	0·0	0·0	198	0·12
7	..	30·195	50·5	41·9	43·9	43·6	50·5	41·9	42·4	40·4	0·3	0·8	0·0	+ 8·1	SW : NE	Calm : SW	3·6	0·0	0·2	153	0·36
8	..	30·285	52·2	46·2	49·3	47·7	74·1	37·5	42·9	41·4	1·6	2·8	0·6	+13·6	SW	WSW : SW	1·1	0·0	0·1	274	0·00
9	..	30·358	50·0	46·8	47·9	45·1	54·0	42·1	43·9	42·4	2·8	4·6	1·0	+12·1	Calm	Calm : S	0·0	0·0	0·0	114	0·00
10	..	30·145	46·0	38·6	41·4	38·3	46·3	36·0	44·8	42·9	3·1	4·0	2·3	+ 5·5	SE	SE	1·0	0·0	0·1	191	0·00
11	Greatest Declination S.	30·050	39·7	36·7	37·9	37·1	42·3	36·7	44·6	43·4	0·8	1·8	0·0	+ 1·9	SE	SE	0·1	0·0	0·0	135	0·00
12	New	29·992	41·2	37·0	39·3	37·9	44·3	37·0	44·4	42·4	1·4	2·8	0·0	+ 3·2	SE	SE	0·0	0·0	0·0	123	0·00
13	..	29·864	39·9	34·8	37·1	36·4	43·1	34·8	43·4	41·4	0·7	1·2	0·2	+ 0·9	ESE	E by S	0·3	0·0	0·0	151	0·00
14	..	29·642	42·7	33·1	37·4	36·2	42·8	33·0	44·0	41·7	0·8	2·0	0·0	+ 1·1	SE	SSE	2·6	0·0	0·1	184	0·00
15	..	29·551	50·9	41·7	45·9	42·8	69·0	40·2	42·7	41·5	3·1	5·7	1·5	+ 9·5	S : SSW	SW : WSW	7·3	0·0	1·2	464	0·23
16	Apogee	30·014	48·7	37·1	44·1	42·8	54·7	32·1	42·4	41·4	1·3	3·9	0·0	+ 7·6	WSW : SW	SSW	1·5	0·0	0·1	271	0·00
17	..	30·026	50·5	39·5	45·7	45·0	54·5	35·0	43·4	42·4	0·7	2·0	0·0	+ 9·1	SSW	SW : WSW	2·9	0·0	0·4	292	0·12
18	..	30·255	46·7	35·1	40·2	39·8	68·6	34·7	43·4	42·4	0·4	3·6	0·0	+ 3·5	WSW	Calm : SSE	0·0	0·0	0·0	74	0·01
19	In Equator.	30·338	41·6	30·0	36·1	35·7	43·7	28·0	42·9	42·2	0·4	3·1	0·0	− 0·8	SSE	SSE	0·3	0·0	0·0	141	0·00
20	..	30·205	42·6	29·3	35·5	31·5	66·7	26·6	42·4	40·7	4·0	7·9	1·5	− 1·5	Calm	S	0·1	0·0	0·0	108	0·00
21	First Qr.	30·057	39·0	30·8	35·0	33·6	42·8	26·2	43·4	42·4	1·4	3·6	0·0	− 2·2	S	ESE	0·0	0·0	0·0	101	0·00
22	..	30·189	38·8	29·7	33·6	27·8	67·7	25·7	41·9	41·4	5·8	8·3	3·6	− 3·8	ESE	E : SE	0·4	0·0	0·0	131	0·00
23	..	30·009	32·0	28·1	29·8	16·9	37·6	26·2	41·1	39·3	12·9	17·1	4·3	− 7·9	SE	SE	0·4	0·0	0·0	181	0·00
24	..	29·999	36·7	26·3	30·0	15·0	75·1	22·7	38·9	37·9	15·0	19·5	7·7	− 7·9	SE	SSE	0·1	0·0	0·0	136	0·00
25	..	29·878	40·8	27·1	34·7	25·9	76·5	20·2	37·4	35·4	8·8	12·0	7·9	− 3·4	S : SSW	SSW	1·4	0·0	0·2	265	0·00
26	Greatest Declination N.	29·721	45·2	35·1	40·0	34·3	53·3	28·0	37·4	35·4	5·7	7·0	2·6	+ 1·7	SW	SW : SSW	1·2	0·0	0·1	251	0·00
27	..	29·486	46·0	36·7	40·7	34·7	65·0	31·2	37·9	35·9	6·0	11·4	0·0	+ 2·3	SSW	SSE : S	1·8	0·0	0·2	259	0·03
28	Full	29·183	54·0	40·9	47·6	44·8	84·7	39·0	37·9	35·9	2·8	8·0	0·0	+ 9·2	S : SSW	SW : S	15·6	0·0	0·4	308	0·23
29	Perigee	28·968	51·6	40·0	46·2	42·4	75·5	37·8	39·9	37·4	3·8	9·4	0·0	+ 7·9	S : SSW	SW : SSW	30+	0·0	3·1	552	0·70
30	..	29·438	51·7	39·1	45·8	40·9	81·5	36·0	40·7	38·4	4·9	10·2	2·4	+ 7·7	SSW	SW : SSW	19·4	0·1	1·5	527	0·06
31	..	29·132	55·9	45·2	52·0	46·7	70·7	42·7	44·4	42·1	5·3	12·0	0·0	+14·1	SSW	SW : SSW	30+	0·5	4·3	716	0·21
Means	..	29·861	46·0	36·5	41·1	37·6	59·7	33·2	41·5	39·9	3·6	6·5	1·3	+ 4·2	...	...	..	..	..	Sum 8557	Sum 2·92

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·976 on the 1st; the first minimum in the month was 29in·416 on the 3rd.
The second maximum ,, was 29in·902 on the 4th; the second minimum ,, was 29in·463 on the 5th.
The absolute maximum ,, was 30in·381 on the 9th; the third minimum ,, was 29in·468 on the 15th.
The fourth maximum ,, was 30in·354 on the 19th; the fourth minimum ,, was 30in·040 on the 21st.
The fifth maximum ,, was 30in·202 on the 22nd; the fifth minimum ,, was 29in·931 on the 23rd.
The sixth maximum ,, was 30in·020 on the 24th; the absolute minimum ,, was 28in·920 on the 29th.
The seventh maximum ,, was 29in·496 on the 30th; the seventh minimum ,, was 29in·094 on the 31st.
The eighth maximum ,, was 29in·184 on the 31st.
The range in the month was 1in·461.
The mean for the month was 29in·861, being 0in·115 *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 55°·9 on the 31st; the lowest was 26°·3 on the 24th.
The range ,, was 29°·6.
The mean ,, of all the highest daily readings was 46°·0, being 2°·9 *higher* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 36°·5, being 3°·1 *higher* than the average of the preceding 28 years.
The mean daily range was 9°·5, being 0°·2 *less* than the average of the preceding 28 years.
The mean for the month was 41°·1, being 3°·0 *higher* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Jan. 1			0, h.-fr	0 : 2, ci, ci.-s : 10, ci.-s, s, r
2	0	0	10, r : 0	1, ci : 7, ci.-s, s : 10, th.-cl
3	0	0	10, cu.-s, sc, th.-r, h.-g	10, cu.-s, sc, h.-r, st.-w : 0
4	0		0	0 : 6, li.-cl, ci.-cu, ci.-s : 0, h, d
5			10, h.-r, h.-g	10, sc, st.-w : 3, ci, ci.-cu, ci.-s : 10, r, st.-w : 0
6			2, ci, h.-fr	0, h : 6, ci, ci.-s : 10, th.-r
7			10, h.-r : 10, ci.-s, h, sl.-f, glm	10, sl.-f : 10, sl.-f, th.-r : 10, th.-r
8			9, ci.-s, cu.-s	10, ci.-s : 10, v : 10, vv
9		0	10, th.-cl, sl.-f	10, sl.-f : 10, ci.-s : 10
10	0	0	10, d : 9, th.-cl	10, ci.-s : 10
11	0	0	10, th.-r	10, oc.-th.-r : 10, cu.-s : 10, th.-r
12	0	0	10	10, th.-r : 10, oc.-th.-r : 10
13	0	0 : w	10	10 : 8, ci.-s : 10, f
14	0	0	10, sl.-f	10 : 10 : 10
15	0	0	9, ci, ci.-s, cu.-s, fr.-shs	9, ci, ci.-cu, ci.-s : 7, ci, ci.-cu, ci.-s : 10, h.-r
16	0	0	8, ci, ci.-cu, ci.-s, cu.-s	10, m.-r : 10, m.-r : 10, th.-cl
17	0	0	10, r	10, oc.-r : 0
18	0	0	7, ci, f	0, th.-f : 10, ci.-s, th.-f : 3, ci.-s, v
19	0	0	10, li.-cl	10 : 9, ci.-cu, ci.-s, s : 4, ci, h.-fr
20	0	0	8, ci, ci.-cu, ci.-s	8, ci.-cu : 6, ci.-cu, ci.-s : 2, ci, ci.-s, h, lu.-ha
21	0	0 : w	10, th.-cl, h.-fr	10 : v : 0, h
22	0	0	1, ci, d, h. fr	8, ci, ci.-s : 9, ci, ci.-s, v : 10, th.-cl
23	0	0	10	10 : 10, ci.-cu, ci.-s, cu.-s : 9, cu.-s
24	0	0	4, ci	0 : 10, ci.-s : 0
25	0	0	0 : ci	0 : 10 : 10
26	0	0	10 : 0	10 : 10 : 4, h, lu.-co, lu.-ha
27	0	0	0, h.-fr	5, ci : 6, ci : 10, r
28	0		4, ci, ci.-s : 10, th.-r	0 : 3, ci.-cu, ci.-s : 10, h.-r, st.-w
29			10, h.-r, st.-w : 10, oc.-r	5, ci.-cu, vv : 10, r, h.-sqs : 10, fr.-h.-shs, fr.-h.-sqs
30			10, h.-r, hl : v	4, ci.-cu, ci.-s, w : 10 : 10, st.-w
31			10, r, h.-g : 9, ci.-cu, ci.-s, cu.-s, th.-r, h.-g	6, ci.-cu, ci.-s, cu.-s, st.-w : 10, cu.-s, h.-r, st.-w

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 50°·2 on the 31st; and the lowest was 12°·1 on the 23rd.

The mean ,, was 37°·6, being 2°·7 *higher* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·225, being 0in·023 *greater* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 2grs·6, being 0gr·2 *greater* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 88 (that of Saturation being represented by 100), being *the same as* the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 553 grains, being 1 grain *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·2.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·1.

WIND.

The proportions were of N. 0, S. 17, W. 7, E. 5, and Calm 2. The greatest pressure in the month was more than 30lbs·0 on the square foot on the 3rd, 29th, and 31st.

RAIN.

Fell on 14 days in the month, amounting to 2in·92, as measured in the simple cylinder gauge partly sunk below the ground; being 1in·07 *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning on January 1, from 4 to 9, and 28 to 31.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Feb. 1	In Equator.	28·901	54·9	46·2	49·4	44·4	61·7	44·1	44·9	42·9	5·0	8·0	1·7	+11·6	SW	SW	30·+	0·5	4·7	728	0·32
2	..	29·571	48·5	36·0	41·5	36·4	53·1	31·2	45·4	43·4	5·1	9·9	2·2	+ 3·8	WSW : NW	NW : SSW	15·0	0·0	1·1	382	0·01
3	Last Qr.	29·662	55·5	35·1	47·2	46·6	84·0	30·6	46·9	44·4	0·6	4·1	0·0	+ 9·4	SSW : SW	SW : WSW	13·2	0·0	0·8	415	0·07
4	..	30·031	56·3	47·8	51·6	48·1	78·0	43·1	46·4	44·4	3·5	6·3	1·2	+13·6	SW	WSW : SW	5·6	0·1	0·6	399	0·04
5	..	30·103	61·6	46·5	52·1	45·5	94·3	38·0	46·9	44·7	6·6	12·8	2·9	+13·8	SW	SSW	2·2	0·0	0·3	288	0·00
6	..	29·948	59·9	43·9	50·3	46·3	98·7	36·7	47·4	45·4	4·0	10·7	0·4	+11·7	SSW	SW	0·9	0·0	0·1	230	0·00
7	..	29·773	54·6	43·5	50·0	44·1	90·6	40·1	47·4	45·4	5·9	9·6	1·1	+11·2	SW : WSW	SW	30·+	0·2	3·0	648	0·00
8	Greatest Declination S.	29·460	55·3	44·5	50·8	49·2	59·7	43·2	47·9	45·4	1·6	3·6	0·0	+11·9	SW	SW	30·+	1·1	6·1	786	0·02
9	..	29·598	51·1	45·5	47·2	40·0	63·0	39·8	48·4	46·4	7·2	11·2	5·0	+ 8·3	WSW	W : WSW	30·+	0·5	3·5	753	0·09
10	..	29·771	54·8	46·4	50·4	45·5	93·8	40·1	47·9	46·4	4·9	8·2	1·6	+11·6	WSW	WSW	26·5	0·4	2·7	637	0·00
11	New	29·912	56·2	45·5	50·6	47·6	64·2	44·0	48·4	46·9	3·0	6·4	0·8	+12·0	WSW	WSW	2·4	0·0	0·5	338	0·10
12	..	29·563	50·9	36·5	43·1	42·5	55·0	34·2	47·9	45·9	0·6	2·9	0·0	+ 4·7	SW : ENE	SW : NW	14·0	0·0	1·1	371	0·77
13	Apogee	30·189	48·2	31·7	40·1	34·9	84·7	27·1	47·9	45·4	5·2	13·0	0·0	+ 1·8	WSW : N	NW : WSW	1·1	0·0	0·2	261	0·00
14	..	30·126	50·1	37·9	45·9	41·1	61·0	35·3	44·9	43·4	4·8	7·6	0·0	+ 7·7	WSW	WSW	18·4	0·2	2·2	630	0·00
15	In Equator.	30·199	53·9	45·0	46·7	41·1	55·0	43·5	45·4	43·4	5·6	13·6	2·9	+ 8·6	WSW	WSW	3·4	0·0	0·4	358	0·00
16	..	29·902	52·9	44·2	48·2	42·2	94·3	42·9	45·9	43·9	6·0	9·4	3·3	+10·1	SW	SSW	3·3	0·0	0·8	418	0·00
17	..	29·622	53·9	45·1	48·6	44·0	72·5	43·7	46·4	44·6	4·6	9·4	0·0	+10·4	SSW	SW : SSW	12·1	0·0	1·4	445	0·03
18	..	29·582	51·0	38·5	44·1	40·4	77·7	34·0	46·4	44·4	3·7	8·0	0·9	+ 5·8	SW : WSW	WSW : SW	1·2	0·0	0·1	243	0·14
19	First Qr.	29·823	52·8	33·2	42·3	38·8	81·5	28·2	47·3	45·4	3·5	10·6	0·0	+ 3·8	WSW	WSW	0·1	0·0	0·0	160	0·00
20	..	29·763	51·9	35·4	42·8	37·2	94·5	30·0	45·4	43·4	5·6	12·4	0·0	+ 4·1	SW : SSW	SW : S	0·3	0·0	0·0	155	0·00
21	..	29·844	48·6	33·6	39·9	38·2	92·6	28·7	45·4	44·4	1·7	6·3	0·0	+ 1·1	SSE : ENE	ENE : NE	0·8	0·0	0·1	196	0·00
22	Greatest Declination N.	29·831	40·5	32·2	33·5	32·5	42·0	31·0	44·4	43·4	1·0	3·7	0·0	− 5·5	NE : NNE	NNE	3·1	0·0	0·6	388	0·57
23	..	30·086	42·2	32·6	37·0	30·1	72·9	31·0	43·4	41·4	6·9	9·9	4·1	− 2·2	N	NNW : WSW	0·6	0·0	0·1	214	0·00
24	..	29·950	49·8	32·0	41·5	39·8	62·6	27·2	43·7	41·4	1·7	6·1	0·0	+ 2·1	SW	SW : W	21·5	0·0	0·7	376	0·13
25	..	29·843	47·9	36·0	41·5	37·5	52·5	30·2	44·4	42·4	4·0	7·0	1·5	+ 1·9	WNW : WSW	WSW	15·2	0·0	1·8	439	0·00
26	Full : Perigee	29·991	52·2	44·1	47·4	36·8	89·6	37·7	44·4	42·4	10·6	13·6	5·9	+ 7·6	WSW : NW	W : SW	3·2	0·0	0·7	396	0·00
27	..	29·924	52·4	38·4	45·2	34·1	97·7	32·0	43·9	42·4	11·1	16·2	6·2	+ 5·3	WSW : NW	NW : WSW	13·3	0·0	1·7	554	0·00
28	In Equator.	29·653	43·8	35·3	39·5	31·4	81·5	27·8	43·4	41·4	8·1	12·3	4·1	− 0·6	WSW : WNW	WNW : WSW	21·4	0·1	1·5	580	0·05
Means	..	29·808	51·8	39·7	45·3	40·6	75·3	35·6	46·0	44·1	4·7	9·0	1·6	+ 6·6	...	...	..	..	..	Sum 11788	Sum 2·34

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·752 on the 2nd; the absolute minimum in the month was 28in·833 on the 1st.
The second maximum ,, was 30in·117 on the 5th; the second minimum ,, was 29in·623 on the 3rd.
The third maximum ,, was 29in·946 on the 11th; the third minimum ,, was 29in·376 on the 8th.
The fourth maximum ,, was 30in·241 on the 13th; the fourth minimum ,, was 29in·262 on the 12th.
The absolute maximum ,, was 30in·241 on the 15th; the fifth minimum ,, was 30in·109 on the 14th.
The sixth maximum ,, was 29in·842 on the 19th; the sixth minimum ,, was 29in·521 on the 18th.
The seventh maximum ,, was 30in·184 on the 23rd; the seventh minimum ,, was 29in·735 on the 20th.
The eighth maximum ,, was 29in·925 on the 25th; the eighth minimum ,, was 29in·746 on the 24th.
The ninth maximum ,, was 30in·021 on the 26th; the ninth minimum ,, was 29in·721 on the 25th.
The range in the month was 1in·408.
The mean for the month was 29in·808, being 0in·009 *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 61°·6 on the 5th; the lowest was 31°·7 on the 13th.
The range ,, was 29°·9.
The mean ,, of all the highest daily readings was 51°·8, being 6°·5 *higher* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 39°·7, being 5°·8 *higher* than the average of the preceding 28 years.
The mean daily range was 12°·1, being 0°·7 *greater* than the average of the preceding 28 years.
The mean for the month was 45°·3, being 6°·2 *higher* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Feb. 1			10, r, st.-w : 10, st.-w	10, v, r, g : 10, h.-r, st.-w : 2, w
2			9, ci.-cu, ci.-s, cu.-s, f : 9,ci.-cu,ci.-s,cu.-s,glm,th.-r	10, ci.-s, cu.-s, cu : 7, ci, ci.-cu, cu, f : 0
3			0 : 10, ci.-s, cu.-s, r	9, ci.-cu, ci.-s, cu.-s : 9, ci.-cu, ci.-s, cu.-s : 10, li.-cl, a
4			10, r : 10, ci.-s, cu.-s, th.-r	8, ci.-cu, ci.-s, cu.-s : 5,ci,ci.-s,ci.-cu,cu.-s : 1, ci.-s
5			8, ci, ci.-cu, ci.-s, cu.-s, h.-d	4, ci, ci.-s : 7, ci : 0
6		0 : w : 0	1, ci, h.-d :	1, ci : 8, ci : 0
7	0	w	3, ci, ci.-s, st.-w	4, ci, ci.-cu, ci.-s : 10, oc.-th.-r, st.-w
8			10, ci.-s, cu.-s, c.-r, h.-g	10,ci.-s,cu.-s,sc,oc.-r,h.-g : 10,ci.-s,cu.-s,sc,oc.-r,g : 10,oc.-r,st.-w
9			10, r, st.-w : 8, ci.-cu, ci.-s, cu.-s, w	10,ci.-cu,cu.-s,r,w : 9, ci.-s, cu.-s, st.-w : 0, a, h, w
10			10, st.-w	10, vv, st.-w : 10, glm, sqs : 10, oc.-r
11			10, ci.-s, cu.-s, sl.-r	10, ci.-s, cu.-s : 10,ci.-cu,ci.-s,cu.-s,r : 10, r
12			10, h.-r	10, c.-h.-r, w : 10, c.-r, st.-w : 0, h
13		0	0, fr : 9,ci.-cu,ci.-s,cu.-s,sl.-f	0, sl.-f : 10 : 0
14	0	0	10, ci.-cu, ci.-s, cu.-s, sqs	10, ci.-s, cu.-s, fr.-sqs : 10
15	0	0	10, ci.-s	10, ci.-s, cu.-s : 10, ci.-s, cu.-s : 10, ci.-s, cu.-s
16	0	0	10	9 : 10 : 9
17	0	0	10, ci.-s, cu.-s, sqs	8,ci,ci.-s,cu.-s,cu : 10, r : 10, c.-r
18			10, c.-r : 10, cu.-s, th.-r	9, ci.-cu, ci.-s, cu : 7, ci, ci.-cu, cu.-s, cu : 0
19			0, d	0, h : 8, ci.-s, cu.-s : 10, ci.-s, v
20		0 : 0 : m	8, ci.-cu, ci.-s, s	6, ci, ci.-cu, ci.-s : 3, ci, ci.-cu, ci.-s : 4, ci.-cu
21	w	0	0, mt, h.-fr, h.-d	2, cu.-s, cu, h : 10, th.-r
22	0	0	10, r : 10, r, sn	10, sn : 10, sn : 10, sn
23	0	0	9, ci.-cu, ci.-s, s	9, ci, ci.-cu, ci.-s : 6, ci, ci.-cu, ci.-s : 9, f
24	0	0	10, s, m.-r	10, ci.-s, cu.-s : 10, ci.-s, cu.-s, r, sq : 4, ci
25	0	0	10	10 : 10, th.-r, sqs : 10, oc.-th.-r
26	0	0	7, ci, ci.-s, cu.-s	9, ci, ci.-cu, ci.-s : 7, ci, ci.-s : 4, ci
27	0		3, ci.-cu, ci.-s, st.-w	4, ci, ci.-s, w : ci.-cu, ci.-s, cu.-s, w : 2, ci
28			10, r : 1, ci, st.-w	8,ci.-s,cu.-s,sl.-sn,vv : vv, fr.-h.-sqs, sn : 10, oc.-th.-r

HUMIDITY OF THE AIR.

Temperature of the Dew Point.
The highest in the month was $51^{\circ}\cdot0$ on the 4th; and the lowest was $28^{\circ}\cdot5$ on the 23rd.
The mean ,, was $40^{\circ}\cdot6$, being $5^{\circ}\cdot7$ *higher* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot253$, being $0^{in}\cdot048$ *greater* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $2^{grs}\cdot9$, being $0^{gr}\cdot5$ *greater* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 84 (that of Saturation being represented by 100), being 1 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 547 grains, being 6 grains *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·2.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·0.

WIND.

The proportions were of N. 2, S. 10, W. 15, E. 1, and Calm 0. The greatest pressure in the month was more than $30^{lbs}\cdot0$ on the square foot on the 1st, 7th, 8th, and 9th.

RAIN.

Fell on 13 days in the month, amounting to $2^{in}\cdot34$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot78$ *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from February 1 to 6, 8 to 13, 18 to 20, and on 27 and 28.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Mar. 1	..	29·473	48·1	38·7	40·9	34·1	68·4	34·6	43·4	41·9	6·8	11·2	0·7	+ 0·7	WSW : NW	NNW : SW	13·4	0·0	0·8	363	0·18
2	..	29·089	50·2	36·0	39·5	32·9	80·6	32·4	43·4	41·4	6·6	11·7	0·0	− 0·7	WNW	NW : N	30·0	0·1	3·1	653	0·24
3	..	29·932	41·8	30·3	35·0	24·8	72·1	24·7	42·4	39·4	10·2	14·3	6·0	− 5·2	N : N by W	N : S	10·7	0·0	0·8	316	0·00
4	..	30·025	44·7	28·8	36·9	31·5	58·1	21·2	43·0	41·3	5·4	11·3	3·1	− 3·2	SSW : SW	NNW : SW	0·2	0·0	0·0	159	0·00
5	Last Qr.	29·711	53·6	34·8	43·7	37·1	78·4	33·9	43·4	42·4	6·6	15·2	0·0	+ 3·6	WSW	NW	20·0	0·0	1·9	491	0·00
6	..	30·059	46·8	31·0	38·0	31·6	84·5	24·0	42·4	41·4	6·4	12·3	0·0	− 2·1	NNW : N	NNE : NE	15·7	0·0	1·6	445	0·00
7	Greatest Declination S.	30·037	45·9	28·0	35·8	25·9	100·0	20·4	42·4	41·4	9·9	17·0	0·5	− 4·4	NE : SE	SE : SSW	0·4	0·0	0·0	136	0·00
8	..	29·672	43·9	27·3	35·3	34·8	68·9	22·8	42·5	41·3	0·5	6·2	0·0	− 5·0	SW	WSW : WNW	0·2	0·0	0·0	196	0·01
9	..	29·351	44·8	31·4	37·3	34·3	102·0	25·0	42·4	41·9	3·0	6·6	0·0	− 3·1	NW : NE	SE	0·1	0·0	0·0	147	0·00
10	..	29·259	40·2	32·6	35·0	26·5	67·4	31·5	41·4	41·4	8·5	12·0	4·4	− 5·6	ESE	NE	1·6	0·0	0·2	289	0·00
11	..	29·277	43·4	30·8	34·7	30·6	78·6	29·0	41·4	39·4	4·1	10·1	1·9	− 6·2	N by E	NNE	3·7	0·0	0·5	375	0·02
12	Apogee	29·492	44·5	30·7	36·8	31·1	92·5	25·9	40·9	38·4	5·7	10·1	0·0	− 4·4	N by E	NbyE: NE: ENE	1·3	0·0	0·2	248	0·00
13	New	29·450	43·1	28·3	34·5	29·4	92·4	23·5	39·4	37·4	5·1	10·1	0·0	− 6·9	ENE	ENE	2·3	0·0	0·2	295	0·01
14	In Equator	29·589	39·7	28·2	33·9	26·3	84·6	26·7	39·4	37·4	7·6	13·1	3·5	− 7·6	NE	NE	3·3	0·0	0·7	427	0·05
15	..	29·680	39·7	32·4	35·1	28·1	52·2	31·3	39·9	37·6	7·0	9·4	2·6	− 6·6	NE	NE	0·7	0·0	0·1	212	0·00
16	..	29·549	39·0	30·9	34·3	25·2	53·4	26·8	39·4	37·4	9·1	12·2	5·1	− 7·6	N	N by W : WSW : S by E	0·5	0·0	0·0	178	0·00
17	..	29·288	39·7	34·4	36·5	34·1	50·8	25·0	39·7	38·4	2·4	5·3	1·4	− 5·5	SSE	SE : E	2·4	0·0	0·3	286	0·01
18	..	29·739	50·6	29·6	39·7	37·6	80·3	22·7	38·9	37·4	2·1	11·6	0·0	− 2·4	Variable	SW : W	1·2	0·0	0·1	208	0·04
19	..	29·357	49·1	37·7	43·0	40·9	57·7	31·7	39·9	38·4	2·1	4·2	0·0	+ 0·8	WSW : S	S : SSW : NE	9·0	0·0	0·3	264	0·09
20	..	29·414	39·2	33·1	35·6	33·9	45·3	31·9	40·9	39·4	1·7	4·6	0·0	− 6·6	N by W	N by E	13·0	0·1	2·1	541	0·38
21	Greatest Dec. N. First Quarter.	29·643	41·7	36·1	39·2	36·7	49·8	34·5	41·1	41·1	2·5	3·7	0·0	− 3·1	NNE	NNE	11·5	0·2	1·3	526	0·20
22	..	29·930	47·2	34·4	39·6	32·7	89·4	31·7	40·9	38·9	6·9	11·8	1·9	− 2·6	NE	NE	13·0	0·0	1·1	474	0·00
23	..	30·106	42·0	32·9	36·6	30·8	56·7	28·6	41·2	39·4	5·8	8·5	0·3	− 5·6	NNE : NE	NE	2·5	0·0	0·4	354	0·00
24	..	29·983	44·9	30·9	37·8	35·3	78·3	24·3	42·4	40·4	2·5	5·3	0·0	− 4·4	NNE	NE	1·9	0·0	0·2	297	0·00
25	..	29·909	50·4	36·7	42·4	36·5	107·3	32·9	43·3	41·9	5·9	10·9	1·7	+ 0·1	NNE : NE	NE : NNE	2·7	0·0	0·3	338	0·01
26	..	29·714	48·2	35·5	40·7	35·6	61·1	32·4	41·9	40·4	5·1	8·8	1·0	− 1·8	NNW : W	NW : WNW	4·6	0·0	0·1	207	0·03
27	Perigee : Full	29·464	42·4	29·2	34·5	30·6	93·5	24·7	41·4	40·4	3·9	7·6	0·0	− 8·4	N : N by W	N : NNW : W	8·6	0·0	1·1	364	0·03
28	In Equator	29·424	45·0	31·8	35·9	31·9	105·1	27·6	41·4	39·4	4·0	7·0	0·0	− 7·3	NW : N : NE	SE : ENE : NNE	6·0	0·0	0·5	320	0·03
29	..	29·603	42·4	32·5	36·2	32·3	85·3	30·2	41·9	40·4	3·9	7·9	0·0	− 7·4	NNE	ENE	30·+	0·0	3·6	551	0·06
30	..	29·711	45·3	32·0	37·7	33·2	78·6	27·6	41·4	39·4	4·5	11·4	0·0	− 6·3	NE	NNE	19·7	0·0	1·4	504	0·00
31	..	29·665	52·7	34·2	41·1	36·7	71·5	31·5	41·4	39·4	4·4	13·4	0·0	− 3·3	NNE	NNE	2·8	0·0	0·7	406	0·02
Means	..	29·632	44·8	32·3	37·5	32·4	75·6	28·1	41·4	39·9	5·2	9·8	1·1	− 4·1	...	...	..	..	..	Sum 10570	Sum 1·41

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·588 on the 1st; the first minimum in the month was 29in·487 on the 1st.
The second maximum ,, was 30in·039 on the 4th; the absolute minimum ,, was 28in·986 on the 2nd.
The absolute maximum ,, was 30in·145 on the 6th; the third minimum ,, was 29in·672 on the 5th.
The fourth maximum ,, was 29in·695 on the 15th; the fourth minimum ,, was 29in·242 on the 10th.
The fifth maximum ,, was 29in·763 on the 18th; the fifth minimum ,, was 29in·177 on the 17th.
The sixth maximum ,, was 30in·123 on the 23rd; the sixth minimum ,, was 29in·105 on the 19th.
The seventh maximum ,, was 29in·761 on the 30th; the seventh minimum ,, was 29in·327 on the 28th.
the eighth minimum ,, was 29in·643 on the 31st.
The range in the month was 1in·159.
The mean for the month was 29in·632, being 0in·114 *lower* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 53°·6 on the 5th; the lowest was 27°·3 on the 8th.
The range ,, was 26°·3.
The mean ,, of all the highest daily readings was 44°·8, being 5°·0 *lower* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 32°·3, being 2°·9 *lower* than the average of the preceding 28 years.
The mean daily range was 12°·5, being 2°·1 *less* than the average of the preceding 28 years.
The mean for the month was 37°·5, being 4°·1 *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
March 1			10, r : 4, ci, ci.-s, cu.-s, sl.-f, r, hl, sqs	9,ci,ci.-s,ci.-cu,cu.-s: 10, r : 10, r, sqs
2			10, cu.-s, sc, r, sn, fr.-sqs	ci.-s,cu.-s,cu,oc.-r,fr.-sqs,v: vv,h.-r,fr.-h.-sqs: 1,st.-w
3			3, ci, fr	7, ci, ci.-s, cu.-s : ci.-cu,ci.-s,cu.-s,v : v, h
4			9, ci.-cu, ci.-s, s, f, fr : 10, th.-r	10, ci.-cu, ci.-s, s: 10, f : 0, h
5			10, ci.-s, cu.-s	9, ci.-cu, ci.-s, s: 4, ci.-cu, ci.-s,w: 0, st.-w
6			8, ci, ci.-cu, ci.-s, sqs	vv, sl.-r : 9,ci,ci.-cu,ci.-s,cu.-s,sl.-r: 0
7			2, ci, sl.-f, fr, h.-fr	1, ci : 0
8			10, sn, sl : 10, th.-r	10, ci.-s, cu : 9,ci.-cu,cu.-s,ci.-s,h,f: 10, th.-cl, th.-r
9		o	9, li.-cl, f, d	9, ci, ci.-s, cu.-s : 8,ci,ci.-cu,ci.-s,cu.-s: 10, th.-r
10	o	w : w : m	10, sn	10, ci.-cu, ci.-s, s: 10, ci.-cu, ci.-s, s: 10
11	w	o	10, ci.-cu, ci.-s, s, sn, sl	9,ci,ci.-cu,ci.-s,cu,n: 10,ci.-s,cu.-s,s,sn,sl,r: 0
12	o	o	9, ci, ci.-cu, ci.-s, sl	ci.-s,cu.-s,v,sl,hl : 6,ci,ci.-cu,ci.-s,cu.-s: 9, sl
13	o	m	0, f, h.-fr	9,ci,ci.-s,ci.-cu,cu.-s,sn: 6,ci,ci.-s,ci.-cu,cu.-s,cu: v, sn
14			3, ci, ci.-cu, ci.-s, sn	5, ci.-cu, ci.-s, cu.-s : 10, glm, sl.-sn
15			10, glm, sl	10 : 10, ci.-s, cu.-s : 10
16			10, f	10, ci.-cu, ci.-s, cu.-s: 10, ci.-s, cu.-s : 0
17			10, th.-r	10, ci.-cu, ci.-s, cu.-s: 10, ci.-s, cu.-s : 10
18		o	10	10 : 9, ci.-cu, ci.-s, r: 0
19	o	o	10, oc.-th. r	10,ci.-cu,cu,cu.-s,s,oc.-r: 10,ci.-s,cu.-s,oc.-r: 9, ci.-s, th.-cl
20	o		10, r, sqs	10, oc.-r, sqs : 10, oc.-r, oc.-sn, sl : 10, sqs
21			10, r	10, oc.-h.-shs : 10
22			6, ci, ci.-s, ci.-cu, cu.-s	9,ci,ci.-cu,ci.-s,cu.-s,s: 7,ci,ci.-cu,ci.-s,cu.-s:4,ci,ci.-cu,h,lu.-ha
23			10, th.-r	10, oc.-th.-r : 10 : 3, ci, ci.-s
24			4, ci, ci.-cu, th.-r	10,ci.-cu,ci.-s,cu.-s:10,ci.-s,cu.-s,oc.-th.-r: 9, ci.-cu, ci.-s
25			10, ci.-s, cu.-s, r	7, ci, ci.-cu, ci.-s : 10, ci.-s, cu.-s : 10
26			10, th.-f, glm	10, f, glm : v, sl.-f, r, sqs
27			9, ci.-cu	9,ci.-cu,ci.-s,cu.-s,cu,sn: v, th.-sn :10,th.-cl,lu.-ha,h.-sn
28			10, ci.-s, cu.-s, sn	10 : 6, ci, ci.-cu, ci.-s, sn
29			10, r, sn : 3,ci,ci.-cu,h.-g: 10, r, h.-g	10, r, st.-w : 7, ci, ci.-cu, cu.-s, cu: 0
30			10, ci.-s, cu.-s, w	10,ci.-cu,ci.-s,cu.-s,st.-w: 5,ci,ci.-cu,cu.-s,sqs: 10, w
31			10, r	10, oc.-r : ci,ci.-s,cu.-s,v : 0

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 44°·5 on the 19th; and the lowest was 23°·2 on the 7th.

The mean „ was 32°·4, being 4°·0 *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·184, being 0in·032 *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 2grs·1, being 0gr·4 *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 83 (that of Saturation being represented by 100), being 1 *greater* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 553 grains, being 3 grains *greater* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·7.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·7.

WIND.

The proportions were of N. 14, S. 4, W. 5, E. 8, and Calm 0. The greatest pressure in the month was 30lbs·0 on the square foot on the 2nd and 29th.

RAIN.

Fell on 17 days in the month, amounting to 1in·41, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·19 *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from March 1 to 9, 14 to 18, and 20 to 31.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
April 1	..	29·760	50·4	33·6	39·4	33·4	86·3	27·3	41·4	39·4	6·0	13·4	0·3	− 5·2	NE	NE : SE	1·0	0·0	0·2	252	0·00
2	..	29·572	51·9	29·3	41·4	37·3	94·3	24·2	41·9	39·9	4·1	13·0	0·0	− 3·4	SSW : SW	SW	3·1	0·0	0·7	352	0·01
3	Greatest Dec. S.: Last Quarter.	29·284	48·3	37·4	41·0	35·1	78·1	34·3	42·0	40·4	5·9	12·2	1·2	− 4·0	SW : WSW	Variable	7·5	0·0	0·7	309	0·12
4	..	29·553	47·4	34·4	39·9	32·4	84·5	30·0	42·4	40·4	7·5	10·7	5·9	− 5·3	N	N by E : NW	3·5	0·0	0·8	339	0·00
5	..	29·967	54·5	34·3	44·6	39·7	93·6	29·7	43·4	40·9	4·9	12·4	0·0	− 0·8	WSW	WSW : SW	1·1	0·0	0·1	255	0·00
6	..	29·899	50·7	41·9	46·0	43·1	64·5	41·0	43·9	40·9	2·9	9·5	0·4	+ 0·6	SW	SW	6·1	0·0	0·7	417	0·13
7	..	29·817	63·8	47·2	52·8	48·2	108·8	46·0	44·4	41·4	4·6	10·8	0·0	+ 7·4	SW	SW	2·7	0·0	0·5	352	0·01
8	Apogee	29·827	61·1	46·6	51·1	50·3	87·7	41·0	46·4	43·4	0·8	5·7	0·0	+ 5·7	SW	NE : ESE	0·2	0·0	0·0	123	0·03
9	..	29·968	48·0	42·9	44·3	41·8	61·9	42·3	46·9	44·4	2·5	3·6	0·9	− 1·0	ENE	E by N	1·5	0·0	0·1	262	0·00
10	..	29·916	68·3	41·9	51·2	49·5	109·5	41·3	49·4	44·4	1·7	12·6	0·0	+ 6·0	ESE : NE	SE : E	0·0	0·0	0·0	63	0·00
11	In Equator	29·982	77·9	37·9	58·8	52·3	125·2	32·1	..	..	6·5	23·1	0·0	+13·7	ENE : ESE	SSE : SSW	0·3	0·0	0·0	142	0·00
12	New	30·092	75·5	51·1	61·8	51·1	125·7	46·7	53·4	51·4	10·7	21·2	0·0	+16·8	S : SW	WSW	1·3	0·0	0·1	234	0·00
13	..	30·092	74·9	48·2	59·2	50·7	124·6	44·1	52·9	50·4	8·5	20·2	1·5	+14·3	WSW : SW	SW : S : SSE	0·0	0·0	0·0	142	0·00
14	..	29·770	79·1	46·9	62·0	53·5	124·9	40·0	53·4	51·4	8·5	25·2	0·0	+17·0	ENE	S : SW	3·0	0·0	0·2	195	0·00
15	..	29·510	63·5	48·5	52·6	49·5	89·3	43·5	54·4	52·4	3·1	11·7	0·0	+ 7·3	SW	SW : SSW	3·0	0·0	0·5	333	0·00
16	..	29·064	56·7	42·7	46·9	44·7	88·5	37·5	55·4	53·4	2·2	9·9	0·0	+ 1·4	SW : SSW	SW	11·2	0·1	1·1	474	0·13
17	..	29·235	49·5	43·1	45·3	42·7	62·4	42·6	53·4	51·4	2·6	6·0	0·0	− 0·4	WNW : NW	NNW : N	6·0	0·0	1·0	460	0·33
18	Greatest Declination N.	29·815	52·6	39·4	45·2	41·2	84·0	35·0	54·4	53·4	4·0	6·8	0·9	− 0·8	N by E	NNE	23·0	0·0	1·3	436	0·02
19	First Qr.	29·954	57·9	32·9	44·4	39·0	106·5	..	53·4	52·4	5·4	13·7	0·0	− 2·0	NNW : SW	SW : SSW	1·3	0·0	0·1	199	0·00
20	..	29·720	59·1	43·6	48·9	46·8	99·3	36·0	53·4	51·4	2·1	9·7	0·0	+ 2·2	SSW	SSW	5·1	0·0	0·7	382	0·00
21	..	29·875	64·2	43·2	52·4	46·7	120·9	39·8	53·6	51·4	5·7	16·0	0·0	+ 5·4	SW	WSW	1·5	0·0	0·2	281	0·00
22	..	29·901	66·3	40·2	52·9	45·5	123·8	38·3	54·4	52·4	7·4	17·6	0·0	+ 5·7	SW : SSW	SSW	0·7	0·0	0·0	193	0·00
23	..	29·916	64·1	45·6	54·2	51·1	90·0	36·0	53·9	51·4	3·1	11·7	0·0	+ 6·8	WSW : NE	E : NE	0·0	0·0	0·0	102	0·20
24	Perigee: In Equator.	29·932	63·8	48·8	54·3	46·2	109·6	48·4	53·4	52·4	8·1	18·6	0·0	+ 6·7	N	N : W	0·5	0·0	0·0	161	0·03
25	..	30·091	68·8	46·9	54·4	48·4	118·5	43·1	54·9	52·4	6·0	15·8	0·0	+ 6·7	WSW : NW	NE : ESE	0·3	0·0	0·0	149	0·00
26	Full	30·102	61·8	41·6	51·3	46·1	122·2	33·8	55·4	52·4	5·2	13·6	0·0	+ 3·4	ESE : ENE	E	6·5	0·0	0·2	205	0·00
27	..	30·012	70·0	42·2	56·5	47·1	127·8	33·8	56·4	53·4	9·4	20·0	1·8	+ 8·4	NE	ENE	4·7	0·0	0·4	281	0·00
28	..	30·088	73·3	45·9	58·2	46·2	122·5	38·2	56·4	53·4	12·0	24·7	3·8	+ 9·8	NE	E : NE	7·5	0·0	0·5	333	0·00
29	..	30·112	61·2	39·2	49·1	40·1	126·9	36·0	56·4	54·4	9·0	15·0	3·9	+ 0·3	NE	NE : ENE	15·0	0·1	0·6	396	0·00
30	Greatest Declination S.	30·012	62·8	37·6	48·6	39·7	126·3	33·0	56·9	54·9	8·9	17·6	3·4	− 0·7	ENE	E : ENE	3·3	0·0	0·3	322	0·00
Means	..	29·828	61·6	41·8	50·3	44·6	102·9	37·8	51·0	48·7	5·6	14·1	0·8	+ 4·1	...	...	..	..	..	Sum 8144	Sum 1·01

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29$^{\text{in}}$·771 on the 1st; the first minimum in the month was 29$^{\text{in}}$·209 on the 3rd.
The second maximum ,, was 30$^{\text{in}}$·015 on the 5th; the second minimum ,, was 29$^{\text{in}}$·805 on the 7th.
The third maximum ,, was 30$^{\text{in}}$·163 on the 13th; the absolute minimum ,, was 29$^{\text{in}}$·003 on the 16th.
The fourth maximum ,, was 30$^{\text{in}}$·004 on the 19th; the fourth minimum ,, was 29$^{\text{in}}$·673 on the 20th.
The fifth maximum ,, was 30$^{\text{in}}$·150 on the 26th; the fifth minimum ,, was 30$^{\text{in}}$·005 on the 27th.
The absolute maximum ,, was 30$^{\text{in}}$·175 on the 29th.
The range in the month was 1$^{\text{in}}$·172.
The mean for the month was 29$^{\text{in}}$·828, being 0$^{\text{in}}$·064 *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 79°·1 on the 14th; the lowest was 29°·3 on the 2nd.
The range ,, was 49°·8.
The mean ,, of all the highest daily readings was 61°·6, being 4°·1 *higher* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 41°·8, being 2°·7 *higher* than the average of the preceding 28 years.
The mean daily range was 19°·8, being 1°·4 *greater* than the average of the preceding 28 years.
The mean for the month was 50°·3, being 3°·4 *higher* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
April 1			10	9,ci,ci.-cu,ci.-s,cu.-s : 5, ci, ci.-cu, ci.-s : 4, li.-cl
2			1, ci	6, ci, ci.-cu, ci.-s : ci.-s, v, w : 10, th.-r
3			10, r, sqs : 5, ci, ci.-cu, ci.-s	10 : 10, th.-r : 10, oc.-th.-r
4			10	10 : v : 0, h
5			7, ci.-cu, ci.-s, sl.-f	10, ci.-cu, ci.-s, cu.-s : 10, ci, ci.-cu, ci.-s : 9
6			10, ci.-s, s : 10, r	10, ci.-s, s, r : 10, ci.-s, cu.-s, sc, r : 10, c.-r, sqs
7			10, r : 9	v : 10, ci.-s, cu.-s : ci.-s, v, h
8			10, r, f : 10, th.-r, th.-f	10,ci,ci.-cu,ci.-s,s,mt : 7, ci, ci.-cu, ci.-s, h : 0, d
9			10, h.-d	10 : 10, ci.-s : 10
10		0 : m : 0	10, f, d	0, h : 7, ci, ci.-s, h : 0, h
11	m	m : w	2, ci, d, l.-f	4, ci : v : 0
12	w	w : w : w	0, h	0 : 3, ci : 0
13	m	m : w : 0	10, th.-cl, d, sl.-f	0, h : 0 : 0
14	sN	w	8, ci, ci.-cu, ci.-s, th.-r	2, ci, ci.-s : 0 : v : 10
15	w	w : 0 : 0	9, ci.-cu, ci.-s	10, th.-r : 4, ci.-cu, h : 9, li.-cl, oc.-r, a
16	w		9, ci, ci-cu, ci.-s, cu.-s, oc. r, sqs	10, r, sqs : cu.-s, v, h.-r : 10, r, a
17			10, r	10,ci.-cu,cu.-s,s,oc.-r : 10, r, sqs : 10, c.-r, sqs
18			8, cu.-s, sc, st.-w	9,ci.-cu,ci.-s,cu.-s,w : vv, th.-r : 5, ci, ci.-cu, cu.-s
19		0 : 0 : m	10	9, ci.-cu, ci.-s, cu.-s : 7, ci, ci.-cu, ci.-s : 10
20	0	0 : w : 0	10, th.-r	10 : ci, ci.-cu, ci.-s, v : v, oc.-th.-r
21	0	0	6, ci, ci.-cu, ci.-s, d	7,ci,ci.-cu,ci.-s,cu.-s : 7, ci, ci.-cu, cu.-s : v, ms
22	0	0	3, ci, ci.-s	ci.-s,cu.-s,v : 5,ci,ci.-cu,ci.-s : 4,ci,ci.-s,lu.-ha : 10, h.-r
23	0	0	10, r : 10, th.-cl, h	10, ci, ci.-cu, ci.-s, r : 10, ci.-cu, ci.-s, cu.-s : 10, r
24	0		10, r : 10, ci.-cu, ci.-s, cu.-s	6, ci, ci.-cu, ci.-s, h : 5, ci, ci.-cu, cu.-s, cu : 10, ci.-s, cu.-s
25			10, ci.-s, cu.-s	ci.-s, cu.-s, cu, h. v : 5, ci.-cu, ci.-s, cu.-s
26			0, h.-d	2, ci : 0 : 10
27			0, h.-d	0 : 0 : 0, d
28			3, ci	0 : 0 : 0
29			4, ci.-s	0 : 0 : 0
30			0	0 : 0 : 0

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $57^{\circ}\cdot 1$ on the 14th; and the lowest was $32^{\circ}\cdot 4$ on the 4th.

The mean „ was $44^{\circ}\cdot 6$, being $4^{\circ}\cdot 1$ *higher* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot 295$, being $0^{in}\cdot 042$ *greater* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $3^{grs}\cdot 4$, being $0^{gr}\cdot 5$ *greater* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 81 (that of Saturation being represented by 100), being 2 *greater* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 542 grains, being 1 grain *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was $6\cdot 1$.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was $3\cdot 3$.

WIND.

The proportions were of N. 6, S. 8, W. 8, E. 8, and Calm 0. The greatest pressure in the month was $23^{lbs}\cdot 0$ on the square foot on the 18th.

RAIN.

Fell on 10 days in the month, amounting to $1^{in}\cdot 01$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot 73$ *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from April 1 to 10, 16 to 19, and 24 to 30.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	Thames Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference Greatest.	Difference Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure Least.	Pressure Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
May 1	..	29·980	55·6	40·6	45·1	38·9	110·5	36·0	55·4	53·4	6·2	13·5	2·4	− 4·7	NE	NE : SE	1·2	0·0	0·1	189	0·00
2	..	29·879	65·2	33·3	48·5	44·8	127·1	26·4	56·4	54·4	3·7	18·7	0·0	− 1·8	WSW	ESE	1·3	0·0	0·0	160	0·00
3	Last Qr.	29·727	64·3	43·5	51·3	46·8	117·5	39·5	55·4	53·4	4·5	13·1	0·0	+ 0·5	ESE	SW : SE : E	1·3	0·0	0·0	155	0·37
4	..	29·739	47·0	40·2	42·5	40·7	58·7	39·2	55·4	52·9	1·8	4·2	0·0	− 8·7	ENE	ENE	2·2	0·0	0·5	332	0·63
5	..	29·689	57·6	38·0	48·2	43·9	117·6	36·0	54·4	52·4	4·3	11·8	0·0	− 3·3	ENE : E : ESE	E	2·6	0·0	0·4	263	0·00
6	Apogee	29·067	67·5	46·4	53·8	52·1	103·9	44·2	54·9	53·4	1·7	8·6	0·0	+ 2·1	E : ESE	SW	2·2	0·0	0·2	238	0·08
7	..	29·062	65·2	52·1	57·2	50·5	120·5	48·5	55·4	53·7	6·7	12·0	1·4	+ 5·5	SSW	SW	4·9	0·0	0·6	349	0·03
8	In Equator	29·196	60·8	47·4	52·2	49·5	94·4	42·3	55·9	54·4	2·7	8·7	0·0	+ 0·5	SSE : SE	SW : SSW	5·9	0·0	0·4	262	0·17
9	..	29·543	58·0	44·6	49·7	47·0	82·3	41·0	56·4	52·4	2·7	8·2	0·0	− 1·8	N by E	E : ESE : SSE	0·7	0·0	0·0	179	0·03
10	..	29·373	68·3	50·6	57·2	52·0	131·5	50·0	56·1	53·1	5·2	12·1	0·0	+ 5·9	SSE : SW	SW	2·3	0·0	0·3	262	0·11
11	New	29·657	60·7	48·0	51·5	48·0	103·5	40·0	55·9	53·4	3·5	10·1	0·0	+ 0·3	SW : N	NE : SE	0·2	0·0	0·0	260	0·21
12	..	29·928	62·1	43·0	51·4	43·0	128·5	39·2	55·4	53·4	8·4	16·9	0·0	+ 0·2	NNE : NE	NNE : E	0·5	0·0	0·0	186	0·00
13	..	30·063	61·8	37·3	49·2	40·2	125·7	27·2	54·9	52·9	9·0	17·6	0·0	− 2·2	NNE : NE	ESE : ENE	2·7	0·0	0·4	280	0·00
14	..	29·932	57·8	42·1	48·9	40·4	111·2	37·6	54·4	52·4	8·5	13·3	6·1	− 2·8	ENE : E	ENE	30·0	0·1	2·5	497	0·00
15	Greatest Declination N.	29·702	60·0	44·7	50·8	43·2	121·7	43·7	54·9	52·4	7·6	13·3	4·2	− 1·2	ENE	ENE	30·0	0·0	1·7	442	0·00
16	..	29·571	54·6	45·5	49·0	47·2	64·5	42·0	52·9	51·7	1·8	7·0	0·0	− 3·3	NE	NE	0·1	0·0	0·0	180	0·05
17	..	29·466	66·5	47·4	53·7	48·8	120·2	46·8	53·4	52·4	4·9	13·7	0·0	+ 1·1	N : SE	SSW	1·8	0·0	0·2	193	0·01
18	First Qr.	29·340	62·1	46·9	52·1	49·2	112·8	41·0	53·9	52·9	2·9	6·5	0·0	− 0·8	SW : SSW	SW	3·8	0·9	0·5	347	0·24
19	..	29·323	56·6	43·1	47·4	44·9	117·4	42·7	53·4	52·4	2·5	8·4	0·0	− 5·8	SW	WSW : W	19·0	0·0	(0·7)	384	0·33
20	..	29·548	60·6	38·5	49·0	41·1	123·5	30·9	53·4	52·7	7·9	15·0	0·0	− 4·5	W : WSW	W : WSW	4·9	0·0	0·4	292	0·01
21	In Equator: Perigee.	29·593	59·6	37·6	48·8	45·7	118·6	30·7	53·9	53·4	3·1	12·7	0·0	− 5·0	WSW : NE	NE : SE : N	0·2	0·0	0·0	130	0·03
22	..	29·869	59·1	46·2	49·9	45·4	87·8	43·2	55·4	54·4	4·5	10·3	0·6	− 4·2	N : NE : SW	S : SW	0·0	0·0	0·0	105	0·01
23	..	29·915	63·2	43·2	51·6	44·8	101·5	42·2	53·4	52·4	6·8	15·8	0·0	− 2·7	WSW : NNE	NW : WSW	0·1	0·0	0·0	132	0·00
24	..	29·758	68·1	45·3	55·1	45·8	133·6	40·6	55·4	53·4	9·3	17·6	1·3	+ 0·5	SW	S : SSW : ESE	0·3	0·0	0·0	130	0·02
25	Full	29·577	68·1	50·7	57·6	47·1	125·6	48·6	55·9	54·0	10·5	18·7	3·0	+ 2·7	E : SE	ESE : E by N	7·7	0·0	0·4	271	0·01
26	..	29·397	70·5	51·3	58·3	52·1	135·6	47·2	55·4	53·4	6·2	14·6	2·6	+ 3·1	E	SW : N	3·5	0·0	0·2	204	0·12
27	..	29·603	62·6	45·6	51·1	49·3	107·4	44·1	55·1	52·0	1·8	9·6	0·0	− 4·3	NE	NE : ENE	3·2	0·0	0·4	286	0·11
28	Greatest Declination S.	29·776	45·8	43·0	43·7	41·0	58·4	41·0	54·4	51·7	2·7	4·4	0·0	−12·0	ENE	ENE	20·0	0·1	1·1	465	0·85
29	..	29·969	51·9	41·8	44·6	37·2	76·7	37·1	53·4	52·4	7·4	10·2	4·0	−11·4	NE	NE	3·0	0·0	0·8	360	0·01
30	..	29·965	60·3	33·5	46·9	43·3	99·7	28·2	..	..	3·6	13·3	0·0	− 9·4	WSW : NW	WSW : NW : NNW	0·2	0·0	0·0	137	0·00
31	..	29·981	59·2	43·3	47·8	41·8	100·5	34·2	54·4	50·9	6·0	11·6	0·0	− 8·8	W : NW	NE	8·5	0·0	0·1	207	0·00
Means	..	29·651	60·7	43·7	50·5	45·3	107·7	39·7	54·8	52·9	5·1	12·0	0·8	− 2·5	...	...	..	..	..	Sum 7877	Sum 3·43

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·843 on the 4th; the first minimum in the month was 29in·573 on the 3rd.
The second maximum „ was 29in·566 on the 9th; the absolute minimum „ was 29in·012 on the 6th.
The absolute maximum „ was 30in·084 on the 13th; the third minimum „ was 29in·352 on the 10th.
The fourth maximum „ was 29in·935 on the 23rd; the fourth minimum „ was 29in·286 on the 19th.
The fifth maximum „ was 30in·012 on the 29th; the fifth minimum „ was 29in·382 on the 26th.
the sixth minimum „ was 29in·928 on the 31st.
The range in the month was 1in·072.
The mean for the month was 29in·651, being 0in·126 *lower* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 70°·5 on the 26th; the lowest was 33°·3 on the 2nd.
The range „ was 37°·2.
The mean „ of all the highest daily readings was 60°·7, being 4°·0 *lower* than the average of the preceding 28 years.
The mean „ of all the lowest daily readings was 43°·7, being 0°·6 *lower* than the average of the preceding 28 years.
The mean daily range was 17°·0, being 3°·4 *less* than the average of the preceding 28 years.
The mean for the month was 50°·5, being 2°·6 *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
May 1		o	10	10 : v : 1, cu : 1, ci.-s
2	o	o	4, ci, sl.-f, d	1, ci : 10
3	o	o	ci : 10, ci.-s, cu.-s	10, ci, ci.-cu, h : 10, ci.-cu, ci.-s : 10, r
4	o	o	10, c.-r	10, c.-r : 10, c.-r : 10
5	o	o	4, ci, ci.-cu	4, ci : 5, ci, ci.-cu : v, h
6	o	o	10, r	9, ci, ci.-cu, ci.-s, r : 10,ci.-cu,ci.-s,cu.-s,s : 10, ci, cu.-s
7	o	o	6, ci, ci.-cu, ci.-s, cu.-s : 10, r	vv, ci.-cu, ci.-s, cu, r : vv,ci.-cu,ci.-s,oc.-r : vv, ci, s, l
8			10, r	10, th.-r : 6,ci,ci.-cu,ci.-s,cu.-s : v,ci,ci.-cu,cu.-s,m
9			10, ci.-s, cu.-s	10 : 10, ci.-s, cu.-s, r
10			10, c.-r : 10	9 : 2, ci, ci.-cu, cu.-s, cu : vv,ci,ci.-s,cu.-s
11			10 : 10, r	10 : 8, ci, ci.-cu, h : 10, l, r
12		o	2, ci, h	2, ci : 7, ci.-cu, ci.-s, cu.-s : 3, ci, ci.-cu, cu.-s
13	o	o	o, d, h	3, ci.-cu, ci.-s : 2, ci, ci.-cu : 3, ci.-s, s, h, a
14	o		10, ci.-s, s, st.-w	7,ci,ci.-cu,ci.-s,h. g : 6, ci, ci.-cu, g : 8, ci, s, w
15			4, ci, ci.-cu, sc, st.-w	5, ci, ci.-cu : 5, ci, ci.-cu : 3,ci,ci.-cu,ci.-s
16			10, r	10, glm, oc.-th.-r : 10, oc.-th.-r
17	o	o	10, oc.-th.-r	10, ci.-cu,ci.-s,cu.-s : v, ci, ci.-cu, cu.-s, r : v, s
18	o	o	10, cu.-s, r	10,ci.-cu,ci.-s,cu.-s,r : 6,ci.-cu,ci.-s,cu.-s,cu,r : 9, ci.-s, cu, s, r
19	o	o : sP, sN : o	10, cu.-s, fr.-h.-sqs	v, h.-shs, h, t.-s, l : vv,oc.-h.-sqs,oc.-h.-shs : 10, cu.-s, oc.-th.-r
20			v, ci, ci.-cu, ci.-s, s, th.-r	v,ci,ci.-cu,ci.-s,oc.-r : 3, ci, ci.-cu, h : 2, ci, s, d, lu.-ha
21			6, ci, ci.-cu, d, h	v,ci,ci.-cu,ci.-s,cu.-s : 10, ci.-s, cu.-s : 10, r
22		o	10, oc.-th.-r	10, gt.-glm : 10, r :4,ci,s,d,sl.-f,lu.-co
23	o	o	7, ci, ci.-cu, d, h, th.-r	8,ci,ci.-cu,cu.-s,h,gt.-glm : 10, s, cu.-s
24	o	o	4, ci, h	6, ci, ci.-cu, ci.-s : 8,ci,ci.-cu,cu,cu.-s : 10, r
25	o	o	9, ci.-cu, ci.-s, cu.-s, oc.-th.-r	ci,ci.-cu,ci.-s,v : v, ci.-s : 10, ci.-s,cu.-s,r
26	o	o	10, h.-r : 5, ci.-cu, ci.-s	v,ci,ci.-cu,ci.-s,cu.-s,s : 5,ci,ci.-cu,ci.-s,cu.-s : 3, s, d
27	o	o : w	10, glm	10,ci.-cu,ci.-s,cu.-s,s : 10, r : 10, r
28	o	o	10, r : 10, h.-r	10, r : 10, c.-r, sqs : 10
29	o		10, r	10, ci.-s, cu.-s, s : 10, ci.-s, cu.-s, s : 2, s
30			8, ci.-s, cu.-s, f, glm	10, gt.-glm : 3, ci.-s, s, h
31			10, ci.-s, cu.-s, s, oc.-r	10, oc.-r : v,ci.-cu,ci.-s,cu.-s : o, h, ms

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $55^{\circ}\cdot8$ on the 6th ; and the lowest was $36^{\circ}\cdot5$ on the 13th.

The mean ,, was $45^{\circ}\cdot3$, being $0^{\circ}\cdot3$ *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot303$, being $0^{in}\cdot001$ *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $3^{grs}\cdot4$, being $0^{gr}\cdot1$ *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 83 (that of Saturation being represented by 100), being 7 *greater* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 538 grains, being 4 grains *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 4·1.

WIND.

The proportions were of N. 7, S. 7, W. 6, E. 11, and Calm 0. The greatest pressure in the month was $30^{lbs}\cdot0$ on the square foot on the 14th and 15th.

RAIN.

Fell on 21 days in the month, amounting to $3^{in}\cdot43$, as measured in the simple cylinder gauge partly sunk below the ground; being $1^{in}\cdot28$ *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning on May 1, 8 to 12, 14 to 16, 20 to 22, and 29 to 31.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
June 1	..	30·098	65·5	35·6	50·5	43·5	133·0	25·7	53·4	50·4	7·0	17·5	0·0	− 6·5	WSW	SW	2·2	0·0	0·2	189	0·00
2	Last Qr.	30·014	71·1	47·8	57·6	49·2	134·8	46·0	54·4	51·4	8·4	17·8	1·9	+ 0·3	WSW	WSW : SW	2·5	0·0	0·2	276	0·00
3	Apogee.	29·850	69·9	51·0	58·4	54·4	128·2	43·2	54·9	51·9	4·0	14·4	0·0	+ 1·0	SW : WSW	NW : W : SW	1·5	0·0	0·1	218	0·10
4	In Equator.	29·791	62·5	48·3	53·0	48·9	105·5	38·3	56·4	53·4	4·1	13·7	0·0	− 4·3	WSW	SW : SSW	1·3	0·0	0·1	225	0·00
5	..	29·984	71·9	50·1	59·1	54·8	145·8	50·0	56·9	53·9	4·3	13·5	1·0	+ 1·9	SW : SSW	SSW : SW	1·2	0·0	0·1	212	0·00
6	..	30·116	83·2	47·0	64·6	58·6	141·6	44·0	57·4	54·4	6·0	20·7	0·0	+ 7·6	SW	SSW : SSE	0·7	0·0	0·0	133	0·00
7	..	30·008	87·5	56·4	71·8	61·8	143·3	53·5	58·5	55·4	10·0	22·2	0·8	+14·8	Calm : SW	SW : WSW	2·6	0·0	0·2	222	0·00
8	..	30·039	74·1	49·5	60·5	51·8	132·3	43·0	59·4	56·4	8·7	21·8	0·2	+ 3·2	NW:WSW:NNW	N : NE : E	1·2	0·0	0·1	235	0·00
9	..	29·946	71·1	45·8	57·7	46·3	131·1	39·5	59·9	56·9	11·4	21·1	3·4	0·0	Calm : SW	NW : NNW	1·5	0·0	0·2	222	0·00
10	New	29·990	61·0	45·3	51·9	41·8	124·5	38·5	58·9	55·9	10·1	17·1	3·2	− 6·1	NNE : N	N : ENE	1·1	0·0	0·1	222	0·00
11	Greatest Declination N.	29·951	63·8	40·7	51·6	43·4	125·6	35·1	..	..	8·2	15·5	2·3	− 6·7	NE	NE : SE	0·7	0·0	0·0	137	0·00
12	..	29·683	66·8	44·1	54·8	46·9	128·3	41·0	..	..	7·9	15·7	1·1	− 3·8	S : SW	SSW : SSE	0·7	0·0	0·0	172	0·00
13	..	29·396	73·0	48·3	58·2	49·1	140·2	41·1	58·4	56·4	9·1	22·1	0·0	− 0·6	Calm : SW	SW : SSW	2·0	0·0	0·2	193	0·00
14	..	29·383	61·7	44·0	50·8	45·7	102·0	35·0	..	..	5·1	13·7	0·2	− 8·2	SSE : NE : NNW	NW : WSW	3·3	0·0	0·3	267	0·55
15	..	29·502	64·8	43·7	51·9	45·6	133·6	33·0	56·4	55·4	6·3	12·2	0·6	− 7·1	SSW : SW	W : WSW	22·0	0·0	1·7	536	0·09
16	Perigee.	29·976	58·5	43·6	48·8	41·0	88·7	39·8	55·4	54·4	7·8	15·6	3·8	−10·2	WNW : NW	NNW : N : SW	15·0	0·0	1·2	430	0·04
17	First Quarter.	30·102	56·8	39·4	47·4	46·0	86·5	30·3	56·9	55·4	1·4	11·4	0·0	−11·6	SW	SW : WSW	1·1	0·0	0·0	183	0·15
18	In Equator	29·872	60·3	46·2	50·7	45·5	104·9	43·2	57·1	55·6	5·2	12·0	0·0	− 8·4	NNW : W	W : N by W	1·0	0·0	0·1	168	0·00
19	..	29·811	63·3	42·5	51·4	44·4	121·2	40·9	57·4	55·4	7·0	15·4	1·1	− 7·8	N	N	0·3	0·0	0·0	158	0·02
20	..	29·865	62·1	41·4	50·5	44·3	101·0	40·5	56·0	53·9	6·2	13·1	0·0	− 9·0	NE	NNE	1·6	0·0	0·1	246	0·03
21	..	29·877	54·9	46·0	49·2	46·9	66·5	41·8	56·4	54·4	2·3	5·2	0·0	−10·7	N : WSW : NW	NW : N	0·6	0·0	0·0	146	0·12
22	..	30·028	62·8	49·1	53·6	49·5	92·1	48·0	57·4	55·4	4·1	11·3	0·0	− 6·7	W : N	Calm : N	0·2	0·0	0·0	91	0·00
23	..	30·056	67·8	47·4	55·7	49·2	117·1	46·9	57·4	55·9	6·5	14·4	1·0	− 5·0	Variable	NW : N	0·7	0·0	0·0	146	0·00
24	Full : Greatest Declination S.	29·989	68·9	44·4	54·9	53·1	99·5	40·0	57·4	54·4	1·8	11·9	0·0	− 6·3	WSW	N : NNE	0·3	0·0	0·0	135	0·05
25	..	29·984	70·9	49·9	58·1	52·1	122·3	45·3	57·7	55·4	6·0	16·9	0·4	− 3·5	NNE	ENE : E	0·7	0·0	0·0	164	0·00
26	..	29·967	73·4	47·2	58·3	49·4	132·0	38·5	58·4	56·4	8·9	19·6	0·4	− 3·4	NE	ESE	2·0	0·0	0·1	192	0·00
27	..	30·074	75·0	45·1	60·7	49·7	133·4	40·7	59·4	57·4	11·0	22·1	1·1	− 0·9	NE	E : NE	0·7	0·0	0·1	140	0·00
28	..	30·121	67·6	49·7	57·1	46·7	123·0	48·1	59·9	57·4	10·4	17·8	1·7	− 4·4	NE	NNE : ESE	2·2	0·0	0·3	264	0·00
29	..	30·066	68·5	42·6	54·6	45·8	129·6	36·8	60·4	58·4	8·8	17·8	2·0	− 6·8	NNE	NNE	2·7	0·0	0·3	269	0·00
30	Apogee.	30·061	63·8	48·5	55·1	46·6	95·7	42·9	60·9	58·4	8·5	14·1	1·7	− 6·0	NE	NNE : NE	1·6	0·0	0·3	281	0·00
Means	..	29·920	67·4	46·0	55·3	48·4	118·1	41·0	57·5	55·2	6·9	15·9	0·9	− 3·8	...	...	..	..	..	Sum 6472	Sum 1·15

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $30^{\text{in}}\cdot128$ on the 1st; the first minimum in the month was $29^{\text{in}}\cdot773$ on the 4th.
The second maximum ,, was $30^{\text{in}}\cdot129$ on the 6th; the second minimum ,, was $29^{\text{in}}\cdot950$ on the 7th.
The third maximum ,, was $30^{\text{in}}\cdot093$ on the 8th; the third minimum ,, was $29^{\text{in}}\cdot887$ on the 9th.
The fourth maximum ,, was $30^{\text{in}}\cdot005$ on the 10th; the absolute minimum ,, was $29^{\text{in}}\cdot240$ on the 14th.
The fifth maximum ,, was $30^{\text{in}}\cdot144$ on the 17th; the fifth minimum ,, was $29^{\text{in}}\cdot808$ on the 19th.
The sixth maximum ,, was $30^{\text{in}}\cdot077$ on the 23rd; the sixth minimum ,, was $29^{\text{in}}\cdot951$ on the 26th.
The absolute maximum ,, was $30^{\text{in}}\cdot145$ on the 28th.
The range in the month was $0^{\text{in}}\cdot905$.
The mean for the month was $29^{\text{in}}\cdot920$, being $0^{\text{in}}\cdot113$ *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was $87^{\circ}\cdot5$ on the 7th; the lowest was $35^{\circ}\cdot6$ on the 1st.
The range ,, was $51^{\circ}\cdot9$.
The mean ,, of all the highest daily readings was $67^{\circ}\cdot4$, being $3^{\circ}\cdot8$ *lower* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was $46^{\circ}\cdot0$, being $4^{\circ}\cdot2$ *lower* than the average of the preceding 28 years.
The mean daily range was $21^{\circ}\cdot4$, being $0^{\circ}\cdot4$ *greater* than the average of the preceding 28 years.
The mean for the month was $55^{\circ}\cdot3$, being $3^{\circ}\cdot9$ *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
June 1			1, h, h.-d	7, ci, ci.-cu,ci.-s: 4, ci, ci.-cu : v, ci.-cu, cu.-s
2			7, ci, ci.-cu	7, ci, ci.-cu : 10, ci.-cu,ci.-s,cu.-s: 10, li.-cl
3			10, r : 10, ci.-s, cu.-s, glm	9, ci.-s, cu.-s, glm: 7, ci,ci.-cu,ci.-s,cu.-s,glm: 10 : o
4			9, ci, ci.-cu, ci.-s, oc.-th.-r	10,ci.-cu,ci.-s,cu.-s: v, ci.-s, cu.-s, th.-r : 2, s, h.-d
5	o	o	6, ci, ci.-cu, ci.-s	6, ci.-cu, ci.-s : 1, ci, ci.-cu,ci.-s: o, m
6	o	o	o	3, ci, ci.-cu : o, m
7	o	o	1, ci	1, ci : 4, ci : s, d, m
8	wN : o	w : o	ci, ci.-cu, ci.-s, h, f, d	6, ci, ci.-cu : 1, ci : 4, ci.-cu
9	o	o : w : o	o	6, ci,ci.-cu,ci.-s: 4, ci, ci.-cu : 4,ci,ci.-cu,ci.-s
10	o	o : w	7, ci, ci.-cu, ci.-s	9, ci,ci.-cu,ci.-s: v, ci.-s, cu.-s, s : v, ci,ci.-cu, s
11	o	o	7, ci, ci.-cu, ci.-s	7, ci,ci.-cu,ci.-s: 4, ci,ci.-cu,ci.-s: 8, ci.-cu
12	o		4, ci, ci.-cu, ci.-s	3, ci : v, ci, so.-ha : 10, ci.-s, cu.-s
13			10, ci.-s, cu.-s, s, d	7,ci,ci.-cu,ci.-s,cu.-s: v, ci, ci.-cu : 9, ci.-cu,ci.-s, s
14			10, h.-r	10 : 8, ci,ci.-cu,ci.-s: 1, ci.-cu, f
15		sN, sp, w : o	10, r : vv, r, sqs	v, r, hl, t, l, sqs : vv, ci, ci.-cu, r, sqs: vv, s, w
16			10, ci.-s, cu.-s, r, fr.-sqs	10, ci.-s, cu.-s : v,ci,ci.-cu,ci.-s,cu.-s,h,r: vv,ci,ci.-cu,s,h,d
17			10, th.-r	10, r : vv, c.-r : 9,ci.-cu,ci.-s,cu.-s
18			10, gt.-glm : 10, th.-f, th.-r	10, th.-r : v,ci,ci.-cu,ci.-s: v,ci.-cu,ci.-s,cu.-s,s,d,lu.-co
19		o	2, ci : v	10, th.-r : 10, oc.-r : 7,ci,ci.-cu,ci.-s,cu.-s,s,sl.-f,lu.-co
20	o	o	10, ci.-cu, ci.-s, cu.-s	10, ci.-cu, ci.-s, oc.-r : vv, s
21	o	o : w	10, h.-d : 10, oc.-r	10, r : 10, oc.-r : 10, oc.-r
22	o	o	10, f : 10, f	10 : 10 : 10
23			7, h	8, ci.-cu,cu.-s,h: 8,ci,ci.-cu,ci.-s,h: o,h,h.-d,th.-f
24		o	10, oc.-th.-r, f : 10, th.-r, th.-f	10, f, oc.-r : 10, f, oc.-r : 1, s
25	o	o	10, ci.-s, h.-d	7,ci,ci.-cu,ci.-s,cu.-s: 8, ci.-cu, ci.-s, s : 2, s, d
26	o		o, h, h.-d : ci, s	4, ci, ci.-s : 1, ci, ci.-cu : 1, s, d
27			o, d	1, ci : 1, s, d
28			8, ci, ci.-cu, ci.-s, cu.-s, d : ci, ci.-cu	6, ci.-cu : 8, ci.-cu, ci.-s : o, d
29			7, ci, ci.-cu, ci.-s, d	5, ci,ci.-cu,ci.-s: 4,ci,ci.-cu,ci.-s,h: o, d : 10, a
30			9, ci.-s	10 : 10 : 10

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 65°·8 on the 7th; and the lowest was 38°·8 on the 15th.

The mean ,, was 48°·4, being 2°·4 *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·340, being 0in·033 *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 3grs·8, being 0gr·4 *less* than the average of the preceding 28 years.

Degree of Humidity—The mean for the month was 78 (that of Saturation being represented by 100), being 4 *greater* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 538 grains, being 7 grains *greater* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·3.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·5.

WIND.

The proportions were of N. 10, S. 5, W. 9, E. 5, and Calm 1. The greatest pressure in the month was 22lbs·0 on the square foot on the 15th.

RAIN.

Fell on 9 days in the month, amounting to 1in·15, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·81 *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from June 1 to 4, 12 to 15, 16 to 19, 23 and 24, and 26 to 30.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
July 1	..	30·031	66·9	52·5	57·1	48·8	107·6	50·7	59·9	58·1	8·3	15·7	4·9	− 3·8	NE	NNE	1·8	0·0	0·3	321	0·00
2	Last Quarter: In Equator.	30·014	67·8	52·1	56·7	50·4	117·8	50·3	59·4	57·4	6·3	12·6	2·2	− 4·4	NNE: NE	NE	1·1	0·0	0·2	306	0·00
3	..	30·016	69·4	52·3	57·1	50·9	124·8	52·0	60·4	58·1	6·2	14·8	1·8	− 4·2	NE : ENE	NE : ESE	0·9	0·0	0·0	196	0·00
4	..	29·932	76·2	52·1	62·5	52·8	132·7	50·3	61·4	58·4	9·7	22·8	0·0	+ 1·0	ESE	SE	0·7	0·0	0·0	165	0·00
5	..	29·761	80·0	49·1	64·4	57·7	125·0	48·0	61·9	59·4	6·7	20·1	0·8	+ 2·7	Calm	SW	2·0	0·0	0·3	205	0·00
6	..	29·786	76·6	58·9	64·5	58·8	124·2	55·0	62·4	60·4	5·7	12·8	0·0	+ 2·7	WSW	WSW	3·6	0·0	0·6	355	0·00
7	..	29·967	72·9	58·0	63·7	56·9	113·6	52·5	63·0	61·4	6·8	15·1	1·5	+ 1·8	WSW : SW	SW	2·3	0·0	0·2	285	0·00
8	..	29·876	78·1	58·3	66·6	59·6	126·7	54·5	63·4	61·7	7·0	16·8	0·0	+ 4·9	SW	SW	2·4	0·0	0·3	310	0·00
9	Greatest Dec. N. New	30·103	77·6	53·2	63·7	49·4	139·7	45·2	64·0	62·4	14·3	23·6	1·6	+ 2·0	WSW : W	W	2·1	0·0	0·2	301	0·00
10	..	30·235	77·6	53·8	63·9	51·7	130·3	52·5	65·4	63·4	12·2	25·3	2·6	+ 2·1	WSW	WSW: NNE: SSE	0·2	0·0	0·0	128	0·00
11	..	30·180	78·1	49·4	63·9	53·8	139·5	42·2	64·4	62·4	10·1	20·4	4·8	+ 2·1	ESE	ESE: E	2·2	0·0	0·1	180	0·00
12	Perigee	29·929	86·7	50·9	70·4	59·9	139·5	45·0	63·4	62·4	10·5	24·5	0·4	+ 8·4	Calm : SW	SW	1·3	0·0	0·1	159	0·00
13	..	30·035	71·1	53·4	59·9	51·4	125·0	50·0	65·4	63·4	8·5	18·4	0·8	− 2·4	NNE : NE	N : NNE	1·2	0·0	0·3	262	0·14
14	..	30·102	76·3	50·3	62·9	53·2	131·0	43·8	65·4	63·4	9·7	21·4	0·0	+ 0·4	N : NNW	W	1·2	0·0	0·1	186	0·00
15	In Equator	30·081	79·0	57·2	66·5	58·4	119·5	55·3	66·4	64·4	8·1	18·0	0·0	+ 4·0	WSW : WNW	NW : NNW	0·9	0·0	0·1	220	0·00
16	First Qr.	30·010	84·0	58·9	71·1	64·4	119·2	57·3	66·9	63·4	6·7	19·9	0·0	+ 8·7	WSW : NW	N : Calm	0·0	0·0	0·0	104	0·00
17	..	29·919	89·0	60·4	73·5	62·5	141·8	53·7	66·9	63·9	11·0	24·0	0·9	+11·3	Calm : NE	NE : E by S	0·7	0·0	0·0	105	0·00
18	..	29·869	88·8	58·0	73·3	64·7	139·1	57·8	..	..	8·6	23·0	0·2	+11·4	Calm : SE : SW	SW	0·3	0·0	0·0	141	0·00
19	..	29·932	74·5	55·8	63·1	58·3	120·0	50·5	..	..	4·8	11·9	1·0	+ 1·5	N by W : N	NNE : NE	1·5	0·0	0·2	260	0·00
20	..	29·989	68·2	54·2	59·0	52·3	108·0	52·0	67·9	65·4	6·7	12·4	0·0	− 2·4	NE	ENE : ESE	0·5	0·0	0·0	167	0·00
21	..	29·892	78·0	54·5	63·9	55·4	140·5	52·0	68·2	66·4	8·5	20·2	0·0	+ 2·4	SE : S	E : ESE	0·5	0·0	0·0	109	0·00
22	Greatest Declination S.	29·777	90·9	51·1	72·9	61·9	143·5	49·8	68·4	64·4	11·0	25·4	0·8	+11·4	ESE : NE : S	SSW : WSW	2·1	0·0	0·2	189	0·00
23	Full	29·915	78·7	59·3	66·6	59·5	107·2	55·3	69·9	67·3	7·1	17·0	2·1	+ 5·0	WSW	WSW : SW	0·2	0·0	0·0	165	0·00
24	..	29·826	78·9	52·6	63·4	55·5	118·2	44·0	68·9	67·4	7·9	24·1	0·0	+ 1·7	WSW	Variable	0·0	0·0	0·0	109	0·00
25	..	29·730	79·8	52·8	65·3	55·8	106·5	44·3	68·4	66·4	9·5	25·2	0·0	+ 3·5	WSW : W : NW	SW	0·1	0·0	0·0	148	0·00
26	..	29·649	77·9	51·7	64·9	55·4	136·7	48·3	68·4	66·4	9·5	21·2	0·0	+ 3·0	SW : SSW	SW : WSW	2·1	0·0	0·3	250	0·00
27	..	29·741	77·7	55·9	64·9	50·2	136·6	49·3	67·4	65·4	14·7	26·5	4·2	+ 2·9	WSW	WSW	2·7	0·0	0·3	275	0·00
28	Apogee	29·801	62·1	50·9	59·0	58·2	81·5	44·6	67·4	65·4	0·8	4·0	0·0	− 3·2	SW : NE	N : NE : NNE	0·6	0·0	0·0	118	0·41
29	In Equator	29·817	75·7	49·7	62·2	54·0	131·8	43·9	66·6	64·7	8·2	19·9	2·1	− 0·1	SW	SW	3·3	0·0	0·4	244	0·00
30	..	29·902	76·9	59·2	65·8	60·3	115·4	54·9	67·4	65·4	5·5	15·0	0·0	+ 3·4	SW	SW	3·2	0·0	0·6	381	0·00
31	Last Qr.	29·847	70·5	62·6	66·1	60·8	117·7	52·8	66·9	64·9	5·3	9·4	1·8	+ 3·7	WSW : SW	SW	3·0	0·0	0·3	324	0·00
Means	..	29·925	77·0	54·5	64·5	56·2	124·5	50·3	65·4	63·2	8·3	18·8	1·1	+ 2·6	...	...	..	..	..	Sum 6668	Sum 0·55

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·979 on the 7th; the first minimum in the month was 29in·723 on the 6th.
The absolute maximum ,, was 30in·244 on the 11th; the second minimum ,, was 29in·846 on the 8th.
The third maximum ,, was 30in·133 on the 14th; the third minimum ,, was 29in·895 on the 12th.
The fourth maximum ,, was 30in·023 on the 20th; the fourth minimum ,, was 29in·824 on the 18th.
The fifth maximum ,, was 29in·923 on the 23rd; the fifth minimum ,, was 29in·754 on the 22nd.
The sixth maximum ,, was 29in·940 on the 30th; the absolute minimnm ,, was 29in·635 on the 26th.
The range in the month was 0in·609.
The mean for the month was 29in·925, being 0in·123 *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 90°·9 on the 22nd; the lowest was 49°·1 on the 5th.
The range ,, was 41°·8.
The mean ,, of all the highest daily readings was 77°·0, being 3°·1 *higher* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 54°·5 being 1°·6 *higher* than the average of the preceding 28 years.
The mean daily range was 22°·5, being 1°·5 *greater* than the average of the preceding 28 years.
The mean for the month was 64°·5, being 2°·7 *higher* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
July 1			10	10, li.-cl : 7,ci,ci.-cu,ci.-s: 10,ci.-s,cu.-s,s
2			10, ci.-s	10 : 7,ci,ci.-cu,ci.-s: 10, li.-cl
3			10	9 : 1 : 10, li.-cl
4			2, ci., ci.-s	o : 1, ci, s, d
5			10, ci.-cu, ci.-s, th.-r	v, cu, th.-r : v : 10
6			10	10, li.-cl, oc.-th.-r: 10, ci.-s, cu.-s : 10, li.-cl
7			10	7,ci,ci.-cu,ci.-s,h : 10, ci.-cu, ci.-s : 8, ci.-cu,ci.-s : o
8			6, ci, ci.-cu, h : 5, ci,ci.-cu,ci.-s,cu.-s,h	6,ci,ci.-cu,ci.-s,cu: 4, ci, ci.-s : 9,ci.-s,cu.-s,s,th.-r
9			4, ci, ci.-cu, h, d	4,ci,ci.-cu,ci.-s,cu: 3, ci, ci.-cu, h : 1, ci, s, h
10		o	o, h, sl.-f	o, h, sl.-f : 1, ci.-s : 2, s, h, d
11	o	o	o	o : o, m
12	o	o : sP	o, h	o : v, ci.-s : 8, ci.-cu, th.-r
13	o	o	10, ci.-s, ci.-cu, cu, r	1, ci : 2, ci, ci.-cu : v,ci.-cu,ci.-s,cu.-s
14	w	o	2, ci, ci.-cu, h	3, ci, h : 2, ci, h : o, h
15	o	o	10 : 10, th.-r, f	v, ci, ci.-s : o, h : o, h
16	o	o	o, h, mt	8,ci,ci.-s,mt : 7,ci,ci.-cu,ci.-s,cu.-s,h : v,ci.-cu,ci.-s,s,h : o,d,m
17	o	o	o, h, h.-d : o, h, gt.-glm, f	4, ci.-cu, h : 7, ci, ci.-s : o
18	o	o	o	4, ci,ci.-cu,ci.-s,h : v, : 2, s
19	o	o	10	v, ci, ci.-cu : v, ci.-cu, ci : 10, ci.-cu,ci.-s,s
20	o	o	10 : 10	v, ci.-cu, ci.-s : 5, ci.-cu, ci.-s : 9, cu.-s
21	o	o : wN	2, ci.-cu, ci.-s	o : o : 2, s, h.-d, m
22	o	o : w	o, h, mt, h.-d	o : o : v, ci, ci.-cu,ci.-s,s
23	o	o	8, ci, ci.-cu, ci.-s, h	9,ci.-cu,ci.-s,li.-cl : v, ci.-cu, li.-cl : o
24	o	o	10, mt	10, mt : v, ci.-s,cu.-s,h,mt: 2, ci, h
25	o	o	10, th.-cl, h	v, th.-cl, h : o, h
26	o	o	6, ci, ci.-cu	8, ci, ci.-cu : 9, th.-r : v : 10
27	o	o	7, ci, ci.-cu, ci.-s : v, th.-r	v,ci,ci.-cu,ci.-s,cu.-s,cu: v,ci,ci.-cu,ci.-s: vv,ci.-cu,ci.-s,s,cu
28	o	o	10 : 10, r	10, c.-h.-r : 10 : 10
29	o	o	2, ci, ci.-cu, h	4, ci, ci.-cu : v, ci, ci.-cu : 10
30	o	o	10	10 : 10, ci.-cu,ci.-s,cu.-s: 10
31	o	o	10	10 : 9, ci, ci.-cu : 10, th.-r

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 67°·3 on the 18th; and the lowest was 45°·6 on the 9th.

The mean ,, was 56°·2, being 2°·6 *higher* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·453, being 0in·040 *greater* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 5grs·0, being 0gr·4 *greater* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 75 (that of Saturation being represented by 100), being *the same as* the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 527 grains, being 1 grain *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 5·7.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·9.

WIND.

The proportions were of N. 6, S. 8, W. 10, E. 5, and Calm 2. The greatest pressure in the month was 3lbs·6 on the square foot on the 6th.

RAIN.

Fell on 2 days in the month, amounting to 0in·55, as measured in the simple cylinder gauge partly sunk below the ground; being 2in·05 *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from July 1 to 10.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry.			Dew Point.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M.		Difference between the Dew Point Temperature and Air Temperature.			Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction.		Pressure in lbs. on the square foot.			Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
			Highest.	Lowest.	Mean Daily Value.	Mean Daily Value.			Highest.	Lowest.	Mean Daily Value.	Greatest.	Least.		A.M.	P.M.	Greatest.	Least.	Mean of 24 Obs.		
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Aug. 1	..	29·656	76·3	54·9	61·5	52·6	128·4	48·5	67·4	65·4	8·9	22·3	0·0	− 0·9	W : WSW	WSW : SW	7·8	0·0	0·1	233	0·03
2	..	29·690	72·7	50·7	58·5	48·4	123·3	..	64·4	63·4	10·1	19·4	3·0	− 3·9	WSW : W	WSW : WNW	2·4	0·0	0·3	328	0·00
3	..	29·711	66·9	49·5	56·6	56·0	81·7	40·5	64·4	63·4	0·6	5·4	0·0	− 5·8	SW : SSW : S	SSW : SW	7·8	0·0	0·5	333	0·33
4	..	29·813	76·5	58·5	64·4	55·5	131·4	51·3	64·4	63·4	8·9	15·0	3·8	+ 2·1	SW	SW : WSW	2·2	0·0	0·2	298	0·02
5	Greatest Declination N.	30·018	71·6	57·9	62·7	52·0	114·4	51·8	64·4	62·4	10·7	14·9	4·9	+ 0·5	WSW : NW : N	N : NNW	0·7	0·0	0·1	223	0·00
6	..	30·146	69·0	51·1	56·9	52·7	116·0	43·0	64·7	62·4	4·2	12·8	0·8	− 5·2	N : NE	E: ESE	0·8	0·0	0·0	136	0·09
7	New	30·044	70·8	45·4	57·7	49·9	124·7	37·3	64·8	61·4	7·8	16·9	2·0	− 4·3	Calm : SW	SW	1·5	0·0	0·1	207	0·00
8	..	29·708	64·5	55·8	58·7	58·1	79·7	50·4	63·4	62·4	0·6	2·3	0·0	− 3·3	SW : WSW	WSW : W	1·9	0·0	0·2	327	0·23
9	Perigee	29·439	73·9	60·0	64·2	54·8	112·3	57·8	63·4	61·4	9·4	18·9	2·5	+ 2·1	WSW : W	W : NW : WNW	7·2	0·1	0·7	440	0·01
10	..	29·587	65·5	50·7	56·6	43·0	106·3	42·4	63·7	62·4	13·6	19·1	9·2	− 5·5	WNW : NW	NW	10·1	0·0	1·0	497	0·02
11	In Equator	29·753	65·0	49·3	56·0	45·5	95·3	41·1	62·4	60·4	10·5	15·2	4·8	− 6·1	WNW : NW	NW	2·2	0·0	0·3	311	0·01
12	..	29·894	72·0	47·4	57·3	46·2	132·2	..	62·3	60·4	11·1	23·4	2·1	− 4·7	WNW : WSW	WSW : SW	2·6	0·0	0·1	241	0·00
13	..	29·730	70·5	51·9	59·4	57·6	100·2	43·8	61·4	60·4	1·8	8·0	0·0	− 2·5	SSW : SW	SW : NW	2·4	0·0	0·3	316	0·39
14	First Qr.	29·959	68·0	52·6	57·3	51·0	116·4	42·1	61·4	59·7	6·3	11·9	0·0	− 4·4	W :WSW:NW	N	1·0	0·0	0·1	203	0·07
15	..	30·159	68·7	48·9	59·1	53·0	104·8	42·1	61·4	60·4	6·1	10·6	2·5	− 2·4	NW : SW : NE	Variable	0·3	0·0	0·0	77	0·00
16	..	30·149	70·6	54·0	61·7	54·4	100·4	46·0	61·9	60·9	7·3	15·1	0·0	+ 0·4	WSW : W	NNW : NE	0·2	0·0	0·0	129	0·01
17	..	30·197	65·8	53·2	58·1	47·5	119·9	45·8	61·4	59·4	10·6	14·9	3·6	− 3·0	NE : NNE	NNE : NE	1·8	0·0	0·1	237	0·00
18	Greatest Declination S.	30·178	68·9	46·2	57·4	49·8	120·3	37·7	61·4	59·4	7·6	16·0	2·7	− 3·6	NNE: NW: WSW	NNE : WSW : ESE	0·3	0·0	0·0	117	0·00
19	..	30·173	62·2	51·9	57·2	47·7	108·5	44·3	61·1	59·9	9·5	12·7	4·6	− 3·7	ENE	NE	0·6	0·0	0·0	167	0·00
20	..	30·165	69·6	50·2	57·9	49·1	121·0	42·2	60·4	59·2	8·8	17·8	0·0	− 2·9	Calm : NNE	NE : E : Calm	0·2	0·0	0·0	87	0·00
21	..	30·122	75·1	46·3	59·6	51·6	125·0	38·0	61·6	59·4	8·0	20·6	0·0	− 1·1	WSW : ENE	N : S : SSW	0·1	0·0	0·0	107	0·00
22	Full	30·148	77·9	50·3	62·9	56·4	129·3	42·2	62·4	62·4	6·5	20·6	0·0	+ 2·2	Calm : N	NE : ESE	0·5	0·0	0·0	112	0·00
23	..	30·107	75·2	57·9	63·7	56·6	120·2	55·7	62·9	61·4	7·1	14·4	3·0	+ 3·1	Calm: SSW: SW	SW	0·3	0·0	0·0	143	0·00
24	..	30·047	82·9	54·8	67·6	56·5	134·1	45·4	63·4	62·4	11·1	23·6	2·0	+ 7·1	WSW	WSW : SW	0·3	0·0	0·0	184	0·00
25	In Equator : Apogee.	30·074	84·0	59·5	70·0	56·9	129·5	47·2	63·7	62·7	13·1	25·8	3·6	+ 9·5	WSW : NE	ESE : Calm	0·2	0·0	0·0	104	0·00
26	..	30·099	86·8	57·5	71·3	59·8	138·6	48·6	63·4	62·4	11·5	23·5	0·6	+ 11·0	Calm : NE : E	ESE : E	1·3	0·0	0·1	153	0·00
27	..	30·130	84·2	58·9	71·5	61·6	141·7	50·3	64·4	62·7	9·9	20·7	1·9	+ 11·4	Calm : ENE	ESE : E	1·6	0·0	0·1	186	0·00
28	..	29·941	89·0	58·2	71·9	55·6	142·5	48·0	65·4	63·4	16·3	33·0	0·0	+ 12·0	ESE : Calm	ESE : Calm	0·6	0·0	0·0	120	0·00
29	..	29·865	64·6	53·2	58·1	52·6	79·4	43·8	66·4	64·4	5·5	10·3	0·0	− 1·6	Calm : NNE	NNE : NE	4·9	0·0	0·7	349	0·00
30	Last Qr.	30·089	65·8	47·0	55·2	41·2	129·2	39·5	65·4	63·4	14·0	21·1	8·0	− 4·2	NE	NE : NNE	7·2	0·0	0·5	382	0·00
31	..	30·186	68·1	42·1	55·1	41·4	131·5	29·5	63·4	61·4	13·7	23·6	3·7	− 4·1	NNE : NE	NE : ESE : ENE	1·5	0·0	0·1	218	0·00
Means	..	29·967	72·3	52·4	60·8	52·1	117·4	44·7	63·3	61·7	8·7	17·1	2·2	− 0·4	...	...	..	..	..	Sum 6965	Sum 1·21

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $29^{\text{in}}\cdot805$ on the 3rd; the first minimum in the month was $29^{\text{in}}\cdot613$ on the 1st.
The second maximum ,, was $30^{\text{in}}\cdot176$ on the 6th; the second minimum ,, was $29^{\text{in}}\cdot653$ on the 3rd.
The third maximum ,, was $29^{\text{in}}\cdot924$ on the 12th; the absolute minimum ,, was $29^{\text{in}}\cdot388$ on the 9th.
The absolute maximum ,, was $30^{\text{in}}\cdot224$ on the 18th; the fourth minimum ,, was $29^{\text{in}}\cdot697$ on the 13th.
The fifth maximum ,, was $30^{\text{in}}\cdot167$ on the 22nd; the fifth minimum ,, was $30^{\text{in}}\cdot105$ on the 21st.
The sixth maximum ,, was $30^{\text{in}}\cdot161$ on the 27th; the sixth minimum ,, was $30^{\text{in}}\cdot026$ on the 24th.
the seventh minimum ,, was $29^{\text{in}}\cdot805$ on the 29th.
The range in the month was $0^{\text{in}}\cdot836$.
The mean for the month was $29^{\text{in}}\cdot967$, being $0^{\text{in}}\cdot182$ *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was $89^{\circ}\cdot0$ on the 28th; the lowest was $42^{\circ}\cdot1$ on the 31st.
The range ,, was $46^{\circ}\cdot9$.
The mean ,, of all the highest daily readings was $72^{\circ}\cdot3$, being $0^{\circ}\cdot5$ *lower* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was $52^{\circ}\cdot4$, being $0^{\circ}\cdot7$ *lower* than the average of the preceding 28 years.
The mean daily range was $19^{\circ}\cdot9$, being $0^{\circ}\cdot3$ *greater* than the average of the preceding 28 years.
The mean for the month was $60^{\circ}\cdot8$, being $0^{\circ}\cdot5$ *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Aug. 1			7, ci, ci.-cu, ci.-s	10, shs.-r, l : v, ci, ci.-cu, ci.-s, oc.-r
2			4, ci, ci.-cu	7,ci.-cu,ci.-s,cu.-s,cu: 7, ci, ci.-cu : 1, s
3			10 : 10, r	10, fr.-shs : v, oc.-shs, sqs : v, ci.-s, cu.-s
4			6, ci, ci.-cu, ci.-s, h	10 : 10, li.-shs : 7, ci.-cu, li.-shs, l
5			4, ci, h	5,ci,ci.-cu,ci.-s,h,glm: 5,ci,ci.-cu,ci.-s,h,glm: 7, ci.-s, s, h, d, l
6			7, ci, ci.-cu, ci.-s, cu : 10, th.-r	10,ci.-s,cu.-s,oc.-h.-shs : v,ci,ci.-s,cu.-s: 0 : 5, th.-cl
7		0	0 : v	8, ci, ci.-cu : v, ci, ci.-cu, ci.-s : 7, li.-cl, s
8	0	0	10, sc, h.-r	10, th.-r : 10,ci.-cu,ci.-s,cu.-s,oc.-th.-r
9	0	0	10, m.-r	9,ci,ci.-cu,w : vv,ci,ci.-cu,cu,w: vv, r : 0, ms
10	0	0 : w	8, ci, ci.-cu, ci.-s	10, sl.-r, sqs : 4,ci,ci.-cu,ci.-s,cu.-s: v, ci.-cu, ci.-s, s, ms
11	0	w : 0 : w	9, ci, ci.-cu, ci.-s	9, ci,ci.-cu, ci.-s : 10, th.-r : 7
12	0	0 : w	0, h	7, ci.-cu, h : 5, ci.-cu : 2, s, ms
13	0	0	0 : 10, r	10, r : vv, h.-r : 4, s : 0, d, ms
14	0	0	10, ci.-s, cu.-s, h, r	10, ci.-cu, ci.-s, cu.-s: v, ci.-cu, ci.-s, cu.-s : 0
15	0	0	9, ci.-cu, ci.-s	10 : 10, glm : 10
16	0	0	9, ci, ci.-cu, ci.-s, f, h, d	9, h : v,ci.-cu,ci.-s,cu.-s,h: 10, r
17	0	0	0	10, li.-cl : 10, ci.-cu, ci.-s : 8, ci.-cu, m
18	0	0	9, ci, ci.-cu, ci.-s, h, f, d	8, ci, ci.-cu, ci.-s: 9, ci.-cu, ci.-s : 5, ci, ci.-cu, ci.-s
19	0	0	8, ci, ci.-cu, ci.-s, h	10 : 9,ci,ci.-cu,ci.-s,cu.-s: 10
20	0	0	8, ci, ci.-cu	6, ci, ci.-cu : 4, ci.-cu : 0, d
21	0	0	0, h.-d, h, mt	5, ci.-cu, h : 2, ci.-cu : 0, d
22	0	w : 0	0, h	4, ci.-cu, h : v, ci.-s, s, d
23	0	0	10, li.-cl	8 ci, ci.-cu, ci.-s, h : 1, ci : 2, ci, ci.-s
24	0	0 : wN : wN	0, h, mt	3, ci : 7, ci, h, glm : 0, h, m
25	0	0	0, h, d, mt	0, h : 0, h : 0
26	0	0 : w	0, h, d	0 : 0 : 1, s
27	0	0	0, d	0 : 0 : 0, ms
28	0	0	0, h.-d	0 : 0 : 0, d, m
29	0	0	v : 10	10, w : 10, sc, w
30	0	0	6, ci, ci.-cu, cu	8, ci, ci.-cu, ci.-s : v, ci, ci.-cu, ci.-s : vv, ci.-s, cu.-s, m
31	0	0 : wN : 0	2, ci	1, ci, ci.-cu : 0 : 0

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 63°·8 on the 27th; and the lowest was 39°·5 on the 30th.

The mean „ was 52°·1, being 1°·7 *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·389, being 0in·029 *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 4grs·4, being 0gr·2 *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 73 (that of Saturation being represented by 100), being 4 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 532 grains, being 3 grains *greater* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 5·9.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·8.

WIND.

The proportions were of N. 8, S. 6, W. 9, E. 6, and Calm 2. The greatest pressure in the month was 10lbs·1 on the square foot on the 10th.

RAIN.

Fell on 11 days in the month, amounting to 1in·21, as measured in the simple cylinder gauge partly sunk below the ground; being 1in·20 *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from August 1 to 7.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Sept. 1	Greatest Declination N.	30·247	68·6	41·2	54·9	42·4	136·3	30·4	62·4	60·4	12·5	23·9	3·1	− 4·1	NNE	NE : NNE	1·6	0·0	0·2	201	0·00
2	..	30·195	61·4	48·3	54·6	43·7	84·4	37·8	63·4	61·4	10·9	16·5	5·5	− 4·1	NNE	N : NE	1·1	0·0	0·1	192	0·00
3	..	29·999	62·8	49·6	53·8	45·2	79·9	46·6	62·4	60·4	8·6	18·2	0·0	− 4·6	Calm	SSE : SE	0·0	0·0	0·0	84	0·00
4	..	29·717	74·7	44·4	60·8	47·1	131·3	34·0	60·4	58·4	13·7	22·9	1·5	+ 2·6	SE : ESE : E	E : SE : SSW	2·0	0·0	0·2	194	0·00
5	..	29·614	80·0	59·0	66·4	57·2	141·7	53·0	59·4	58·4	9·2	22·1	0·0	+ 8·4	SSW : SSE	SSE : SSW : S	0·4	0·0	0·0	163	0·04
6	New: Perigee.	29·576	71·0	58·9	62·0	55·2	124·3	52·8	59·4	58·4	6·8	11·1	0·0	+ 4·1	SSW	WSW : SW	6·4	0·0	0·7	372	0·13
7	..	29·722	74·0	58·6	64·8	56·7	132·3	55·0	62·4	60·4	8·1	17·3	2·9	+ 7·0	SW : WSW	WSW : SW	1·8	0·0	0·4	316	0·12
8	In Equator.	29·648	75·7	61·5	66·7	57·8	123·3	54·6	62·4	60·4	8·9	15·0	3·4	+ 8·9	SW	SSW	3·5	0·0	0·4	271	0·00
9	..	29·629	75·9	58·1	64·5	53·8	132·8	51·2	61·4	59·4	10·7	18·0	1·5	+ 6·8	SW : SSW	SSW : SE	2·4	0·0	0·3	219	0·00
10	..	29·240	69·2	53·0	59·6	55·2	85·3	47·0	..	..	4·4	12·1	0·0	+ 1·9	Variable	SSW : SW	30·+	0·0	2·3	392	0·40
11	..	29·320	70·4	51·6	60·7	51·1	125·3	43·6	62·4	60·4	9·6	18·9	0·0	+ 3·1	SW : WSW	SW : SSE	3·3	0·0	0·5	314	0·00
12	First Qr.	29·194	62·8	52·0	53·8	45·4	87·4	51·0	..	..	8·4	12·7	2·8	− 3·7	Variable	W : SW	18·9	0·1	2·7	607	0·42
13	..	29·276	63·1	52·7	55·5	47·4	101·3	45·0	59·4	57·4	8·1	15·2	2·0	− 1·8	SW	WSW	30·+	0·1	4·1	690	0·32
14	Greatest Declination S.	29·660	68·8	52·9	59·5	59·0	88·5	46·3	59·6	57·4	0·5	5·8	0·0	+ 2·3	SW	SW	13·2	0·1	1·3	452	0·09
15	..	29·425	66·1	54·9	57·6	50·0	112·3	54·7	59·4	56·9	7·6	13·9	3·8	+ 0·5	SW : WSW	WSW : SW	13·2	0·1	2·0	539	0·18
16	..	29·567	67·8	54·2	58·5	49·4	109·1	47·2	58·4	56·4	9·1	16·6	2·8	+ 1·6	WSW : W	W : WSW	15·9	0·1	2·1	573	0·00
17	..	29·624	65·8	54·5	60·0	59·3	81·3	50·2	58·9	57·4	0·7	4·7	0·0	+ 3·3	SW	SW	3·8	0·0	1·0	410	0·10
18	..	29·354	68·2	57·4	61·6	56·9	98·2	53·8	59·4	57·4	4·7	8·1	0·0	+ 5·1	SW	SW : SSW	30·0	0·1	2·5	515	0·74
19	..	29·310	61·7	50·2	54·0	46·1	111·0	43·0	57·4	55·4	7·9	11·2	5·3	− 2·2	WSW	WSW	21·6	0·2	2·4	585	0·11
20	Full	29·380	60·3	48·0	51·9	43·4	86·5	40·7	56·9	54·4	8·5	13·9	2·5	− 4·1	WSW	WSW : N : NNW	2·4	0·0	0·2	254	0·00
21	Apogee: In Equator.	29·691	64·8	42·5	52·4	46·1	76·8	34·9	56·4	54·4	6·3	16·4	0·9	− 3·4	WSW : W	W : WSW	2·2	0·0	0·2	327	0·01
22	..	30·028	64·2	47·1	55·2	48·0	103·5	40·1	56·9	54·9	7·2	14·4	2·1	− 0·3	WSW	W : WSW	3·5	0·0	0·5	317	0·00
23	..	30·048	67·8	53·5	58·9	53·4	110·0	46·5	56·4	54·4	5·5	12·8	0·0	+ 3·7	WSW	WSW : SW	11·0	0·1	1·6	469	0·00
24	..	29·958	72·2	59·0	63·6	60·3	110·2	56·5	56·7	54·7	3·3	10·1	0·0	+ 8·6	SW	SW : WSW	3·6	0·0	0·5	344	0·00
25	..	29·749	73·5	51·8	61·9	52·7	124·2	43·8	57·6	55·4	9·2	19·4	0·0	+ 7·1	WSW : SW	SW	20·8	0·0	0·9	400	0·00
26	..	29·792	68·5	54·5	59·0	49·5	115·5	46·1	..	..	9·5	20·7	3·0	+ 4·4	SW : WSW	W : WSW	6·6	0·0	0·8	374	0·00
27	..	29·847	65·5	46·6	55·7	50·7	108·1	37·0	56·4	55·4	5·0	13·3	0·0	+ 1·3	WSW	SW : SSW	1·0	0·0	0·1	196	0·00
28	Last Qr.	29·608	67·0	50·2	57·2	50·6	109·8	42·0	56·4	55·4	6·6	15·8	0·0	+ 3·0	SSW	SSW : S by E	2·4	0·0	0·4	274	0·00
29	Greatest Declination N.	29·394	75·1	51·2	64·0	57·5	117·2	43·7	57·4	56·4	6·5	17·7	0·0	+ 9·9	SE : SSE	SSE : E	3·0	0·0	0·4	224	0·00
30	..	29·445	70·5	55·1	61·3	56·2	100·4	53·6	58·8	56·9	5·1	11·8	0·0	+ 7·3	SSE	E : S	3·7	0·0	0·1	170	0·42
Means	..	29·642	68·6	52·4	59·0	51·6	108·3	46·1	59·2	57·4	7·4	15·0	1·4	+ 2·4	...	...	..	..	..	Sum 10438	Sum 3·08

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The absolute maximum in the month was $30^{\text{in}}\cdot 259$ on the 1st; the first minimum in the month was $29^{\text{in}}\cdot 501$ on the 6th.
The second maximum ,, was $29^{\text{in}}\cdot 758$ on the 7th; the second minimum ,, was $29^{\text{in}}\cdot 196$ on the 10th.
The third maximum ,, was $29^{\text{in}}\cdot 396$ on the 11th; the absolute minimum ,, was $28^{\text{in}}\cdot 580$ on the 12th.
The fourth maximum ,, was $29^{\text{in}}\cdot 465$ on the 12th; the fourth minimum ,, was $29^{\text{in}}\cdot 160$ on the 13th.
The fifth maximum ,, was $29^{\text{in}}\cdot 716$ on the 14th; the fifth minimum ,, was $29^{\text{in}}\cdot 385$ on the 15th.
The sixth maximum ,, was $29^{\text{in}}\cdot 714$ on the 16th; the sixth minimum ,, was $29^{\text{in}}\cdot 169$ on the 18th.
The seventh maximum ,, was $29^{\text{in}}\cdot 421$ on the 20th; the seventh minimum ,, was $29^{\text{in}}\cdot 327$ on the 20th.
The eighth maximum ,, was $30^{\text{in}}\cdot 081$ on the 23rd; the eighth minimum ,, was $29^{\text{in}}\cdot 699$ on the 25th.
The ninth maximum ,, was $29^{\text{in}}\cdot 885$ on the 27th; the ninth minimum ,, was $29^{\text{in}}\cdot 375$ on the 29th.
The range in the month was $1^{\text{in}}\cdot 679$.
The mean for the month was $29^{\text{in}}\cdot 642$, being $0^{\text{in}}\cdot 175$ *lower* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was $80^{\circ}\cdot 0$ on the 5th; the lowest was $41^{\circ}\cdot 2$ on the 1st.
The range ,, was $38^{\circ}\cdot 8$.
The mean ,, of all the highest daily readings was $68^{\circ}\cdot 6$, being $0^{\circ}\cdot 9$ *higher* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was $52^{\circ}\cdot 4$, being $3^{\circ}\cdot 2$ *higher* than the average of the preceding 28 years.
The mean daily range was $16^{\circ}\cdot 2$, being $2^{\circ}\cdot 3$ *less* than the average of the preceding 28 years.
The mean for the month was $59^{\circ}\cdot 0$, being $1^{\circ}\cdot 7$ *higher* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Sept. 1	o	o : w	6, ci.-cu, d, f	7, ci.-cu : v : o, h.-d
2	o	o	9, ci.-cu	10 : v : 9, li.-cl
3	o	o	10, f	10, ci.-cu,ci.-s,f : 5,ci.-cu,ci.-s,h : o, a
4	o	o	o, d	o : 3, ci : v : 10
5	o	o	9, ci, ci.-s, cu.-s	8,ci,ci.-cu,ci.-s : 10, h.-shs, t : v, ci.-s, l, ms
6	o	o	9, ci.-cu, ci.-s, cu.-s, cu, r	v,ci,ci.-cu,oc.-r,sqs : v, shs.-r : v
7	o	o	10, r : 7, ci, ci.-cu, ci.-s	4, ci, ci.-cu : v, ci : 10
8	o	o : wN	9, ci, ci.-cu, cu.-s	v, ci, ci.-cu : vv, ci, ci.-cu : v, ci, ci.-cu
9	o	o	7, ci, ci.-cu	vv, ci, ci.-cu, cu : v, ci,ci.-cu,ci.-s : o, h, l, m
10	wN	o	10, t.-s, l	v,oc.-shs,fr.-h.-sqs : 6,ci,ci.-cu,ci.-s,cu,h.-g : 9, w
11			2, ci.-cu, cu, d	7, ci, ci.-cu, cu : v, ci, ci.-cu, cu : 10, shs.-r
12			10, r : 10, h.-r, st.-w	7, ci,ci.-cu,ci.-s,cu.-s,cu,st.-w : v, s, h
13			10, h.-r, st.-w : v, ci.-s, cu.-s, g	10,ci,ci.-cu,r,h.-g : v, fr.-h.-sqs : 4, ci, ci.-cu,cu.-s
14			10 : 10, r	10, st.-w : 10, cu.-s, st.-w : 10, oc.-th.-r,st.-w
15			10, r, w : 4, ci, ci.-cu, cu, h	v, sl.-r, sqs : v,ci.-cu,cu,oc.-r,st.-w : o, st.-w
16			9, ci.-cu, ci.-s, cu.-s, st.-w	v,ci,ci.-cu,cu,w : v, ci, ci.-cu, cu : 6,s,th.-cl,lu.-ha
17			10, r, w	10, w : 9, ci.-s,cu.-s,oc.-r : 10
18			v, ci.-s, cu.-s, st.-w	10,ci,ci.-cu,ci.-s,w : 10,ci.-cu,ci.-s,oc.-r,w. 10,fr.-h.-shs,fr.-h.-sqs
19			10, r, sqs : v,ci,ci.-cu,ci.-s,cu.-s,r,w	v, th.-r, w : o, w : o, w
20			10	10, ci, ci.-cu : v : o, h, f
21			6, ci, ci.-cu, d	v,ci.-cu,ci.-s,cu.-s,cu:v,ci,ci.-cu,ci.-s,r:vv,ci.-cu,ci.-s,cu.-s,lu.-co
22			o, f, h.-d : v	7, ci,ci.-cu,ci.-s : v, ci, ci.-cu, cu : 10, ci.-s, cu.-s
23			10, ci.-s, s	7,ci,ci.-cu,cu,w : 10, ci.-s, cu.-s : 10
24			10, th.-r	v : v,ci,ci.-cu,cu.-s,cu,h : 10
25			o, d	o, st.-w : 2, li.-cl, w : 2, ci, cu.-s
26			v, ci.-s, w	v, ci, ci.-s, w : 10, th.-r
27			4, ci, ci.-s	10, ci,ci.-cu,ci.-s : 10,ci,ci.-cu,cu.-s : 10
28			2, ci, ci.-cu, h.-d	6, ci, ci.-cu, cu : 5, ci, ci.-cu, cu : 3, ci, ci.-s, m
29			5, c, h.-d	v,ci,ci.-cu,ci.-s : 1, ci, ci.-s, l : 2, ci, cu.-s, l
30	o	o	9, ci, ci.-cu, ci.-s, d	7,ci,ci.-cu,ci.-s : 8,ci.-s,cu.-s,h.-r : 2, ci.-s, s

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 63°·5 on the 14th; and the lowest was 42°·0 on the 20th.

The mean ,, was 51°·6, being 0°·4 *higher* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot382$, being $0^{in}\cdot001$ *greater* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $4^{grs}\cdot3$, being $0^{gr}\cdot1$ *greater* than the average of the preceding 28 years.

Degree of Humidity—The mean for the month was 77 (that of Saturation being represented by 100), being 4 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 528 grains, being 6 grains *less* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·6.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 4·0.

WIND.

The proportions were of N. 1, S. 11, W. 14, E. 3, and Calm 1. The greatest pressure in the month was $30^{lbs}\cdot0+$ on the square foot on the 10th and 13th.

RAIN.

Fell on 13 days in the month, amounting to $3^{in}\cdot08$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot66$ *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from September 11 to 29.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Oct. 1	..	29·652	67·5	51·8	58·0	52·9	106·5	45·4	59·4	57·4	5·1	11·5	0·0	+ 4·1	SSW	SSW : SE	1·5	0·0	0·2	226	0·11
2	..	29·556	62·5	53·5	56·2	52·8	78·0	47·2	58·9	56·9	3·4	8·3	0·0	+ 2·4	SSE : SE	SE : ENE	1·6	0·0	0·2	206	0·28
3	..	29·754	66·9	50·2	56·0	53·9	96·4	48·2	58·4	57·4	2·1	10·1	0·0	+ 2·3	NNW : NW	N	0·6	0·0	0·0	141	0·02
4	..	30·023	62·0	49·4	54·7	53·7	78·5	40·6	58·4	56·4	1·0	7·8	0·0	+ 1·2	WSW : SW	SSE : SW	0·0	0·0	0·0	77	0·00
5	Perigee : In Equator : New.	30·030	60·9	45·9	52·5	51·7	94·1	38·5	58·8	56·8	0·8	4·9	0·0	— 0·8	Variable	NE : SE	0·0	0·0	0·0	81	0·00
6	..	30·079	64·4	44·9	54·5	47·7	115·5	38·0	57·4	54·4	6·8	14·8	0·0	+ 1·6	SE	SE : E	1·3	0·0	0·1	139	0·00
7	..	30·044	67·4	45·7	56·3	47·4	113·5	35·1	57·4	55·4	8·9	19·4	0·0	+ 3·8	ESE : SE	SE	0·5	0·0	0·0	135	0·00
8	..	29·976	73·1	52·8	61·5	56·4	118·2	45·2	57·4	55·4	5·1	12·6	0·6	+ 9·4	SE: WSW	WSW : SW	0·3	0·0	0·0	139	0·00
9	..	30·054	73·9	51·0	61·3	56·9	111·4	45·4	58·1	56·1	4·4	11·4	0·0	+ 9·5	Calm	SSE : SE	0·1	0·0	0·0	84	0·00
10	..	30·049	73·1	53·2	59·9	57·0	107·6	45·1	58·6	57·4	2·9	12·6	0·0	+ 8·3	SSE	SE	0·1	0·0	0·0	120	0·00
11	Greatest Declination S.	30·032	70·6	50·0	59·9	52·5	113·6	41·4	59·4	58·4	7·4	14·4	0·0	+ 8·5	SE: SSE	S	0·1	0·0	0·0	100	0·00
12	First Qr.	30·014	71·0	46·7	57·8	54·6	107·9	39·2	58·9	57·9	3·2	13·2	0·0	+ 6·6	SW	WSW : SW	1·0	0·0	0·0	171	0·00
13	..	29·903	67·5	45·0	54·5	49·3	104·3	40·0	58·4	58·4	5·2	11·1	0·0	+ 3·6	SW	WSW : NW	6·9	0·0	0·5	351	0·12
14	..	29·976	53·6	39·6	46·8	40·1	84·6	33·4	57·4	56·4	6·7	12·6	0·9	— 3·8	W : W by S	WNW: WSW: SW	1·2	0·0	0·3	297	0·00
15	..	29·604	59·5	46·3	52·2	49·5	80·1	42·8	56·4	55·4	2·7	9·3	0·0	+ 1·9	WSW	WSW	3·5	0·1	1·0	442	0·01
16	..	29·186	57·2	43·8	50·2	47·7	67·2	39·0	56·3	55·4	2·5	5·9	1·0	+ 0·2	WSW	SW : WSW	30·+	0·2	1·8	519	0·12
17	..	29·639	46·8	35·3	39·5	29·7	84·1	29·9	54·4	54·4	9·8	14·7	4·4	—10·3	NW	NW : W	5·8	0·0	1·0	408	0·00
18	Apogee	29·289	48·9	36·0	42·2	42·0	52·3	28·7	52·4	52·4	0·2	2·5	0·0	— 7·4	WSW : SSW	SSW : SW	7·3	0·0	0·4	307	0·89
19	In Equator	29·455	45·3	34·2	39·5	33·0	61·6	29·2	51·4	51·4	6·5	10·8	0·0	— 9·8	WSW: W: NNW	NNW	30+	0·0	2·5	521	0·01
20	Full	30·004	46·4	32·0	39·5	33·7	69·7	25·1	49·4	48·9	5·8	11·7	3·5	— 9·6	NNW	WNW : WSW	3·4	0·0	0·8	367	0·00
21	..	30·105	55·5	38·0	46·0	42·0	85·0	30·1	48·9	47·7	4·0	10·5	0·0	— 2·9	WSW: WNW: N	NNE : N	1·1	0·0	0·1	220	0·00
22	..	30·305	49·4	37·3	43·3	40·1	56·5	28·2	47·4	46·4	3·2	8·2	0·7	— 5·4	NNW : SW	NNW : WSW	0·2	0·0	0·0	137	0·00
23	..	30·128	54·8	44·8	49·0	45·6	78·8	43·2	47·9	47·1	3·4	7·4	1·9	+ 0·5	NW : WSW	WSW	0·7	0·0	0·1	241	0·00
24	..	30·041	55·4	36·0	45·3	40·5	80·6	28·3	48·4	46·9	4·8	9·2	0·0	— 2·9	W : NNW	N : W	2·2	0·0	0·2	209	0·09
25	..	30·022	50·5	35·5	42·6	40·0	61·4	29·8	48·4	47·4	2·6	9·9	0·0	— 5·3	WSW	WSW	1·6	0·0	0·1	196	0·00
26	Greatest Declination N.	29·751	46·7	31·5	38·5	31·0	85·7	24·2	47·4	46·4	7·5	12·1	5·2	— 9·1	WSW : NW	NNW : WNW	6·5	0·0	1·4	424	0·05
27	..	29·624	39·8	31·3	34·7	22·9	64·3	23·0	46·4	45·4	11·8	15·6	6·1	—12·6	WNW : NNW	NNW : NW	7·4	0·0	1·1	424	0·00
28	Last Qr.	29·636	43·6	27·9	35·1	27·3	51·8	18·8	45·9	41·5	7·8	13·0	2·6	—11·9	W : NW	NNW	8·1	0·0	1·0	432	0·00
29	..	30·043	49·3	36·1	41·3	35·2	90·7	29·9	45·4	43·4	6·1	10·1	3·2	— 5·5	N : NNE	N : WSW	2·6	0·0	0·5	287	0·00
30	..	29·833	49·1	36·7	42·5	40·7	58·0	30·1	44·4	43·4	1·8	5·5	0·0	— 4·1	WSW : N	NNE : N	1·7	0·0	0·2	268	0·07
31	..	30·065	48·4	38·3	43·4	42·2	54·7	37·3	..	..	1·2	2·9	0·0	— 3·1	WSW	WSW	0·5	0·0	0·0	203	0·00
Means	..	29·867	57·5	42·0	48·9	44·2	84·3	35·5	53·6	52·3	4·7	10·5	1·0	— 1·3	...	...	..	..	..	Sum 7872	Sum 1·77

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·698 on the 1st; the first minimum in the month was 29in·520 on the 2nd.
The second maximum ,, was 30in·098 on the 6th; the second minimum ,, was 29in·967 on the 8th.
The third maximum ,, was 30in·072 on the 9th; the third minimum ,, was 29in·860 on the 13th.
The fourth maximum ,, was 30in·032 on the 14th; the absolute minimum ,, was 29in·132 on the 16th.
The fifth maximum ,, was 29in·739 on the 17th; the fifth minimum ,, was 29in·199 on the 18th.
The absolute maximum ,, was 30in·328 on the 22nd; the sixth minimum ,, was 30in·021 on the 24th.
The seventh maximum ,, was 30in·110 on the 25th; the seventh minimum ,, was 29in·596 on the 27th.
The eighth maximum ,, was 30in·093 on the 29th; the eighth minimum ,, was 29in·743 on the 30th.
The range in the month was 1in·196.
The mean for the month was 29in·867, being 0in·166 *higher* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 73°·9 on the 9th; the lowest was 27°·9 on the 28th.
The range ,, was 46°·0.
The mean ,, of all the highest daily readings was 57°·5, being 1°·1 *lower* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 42°·0, being 1°·9 *lower* than the average of the preceding 28 years.
The mean daily range was 15°·5, being 0°·8 *greater* than the average of the preceding 28 years.
The mean for the month was 48°·9, being 1°·5 *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Oct. 1	o	wN : wN : o	10, r : v, ci.-cu, ci.-s, cu.-s, r	v, ci, ci.-cu, cu : v, ci, ci.-cu : 6,ci.-cu,cu.-s,ci.-s,r
2	o	o	10, r	v, ci, ci.-cu,ci.-s:8, ci,ci.-s,cu.-s,cu,h.-r: 10, th.-cl, r
3	o	w : o	10, r, f : v, glm	v, ci, ci.-cu, cu, sh.-r : o, h.-d, m
4	o	o	10, ci.-s, cu.-s, f, glm	10, ci.-s, cu.-s, glm: 10 : 10, h
5	o	o	o, th.-f	3, ci, ci.-cu, ci.-s: v, ci, ci.-cu : o, f, h.-d, ms
6	o	o	o, f, h.-d	1, ci, ci-cu : 3, ci, ci.-cu, ci.-s: o, a, ms
7	o	o : w : o	1, ci, h.-d	3, ci : v : 10, m
8	o	o	7, ci, d	8, ci, ci.-cu : ci.-cu : 1, ci
9	o	o : wN	o, h.-d, th.-f	o : o : o, h.-d, ms
10	o	o	1, ci, h, h.-d	o : o, th.-f
11	o	o	o, f, h.-d	o : o, h : o, sl.-f, ms
12	o	o	o, f, h.-d	3, ci : v, ci, h : 10, m
13	o	o	10, r	v, ci, ci.-cu : 9, ci.-cu, cu.-s, sl.-r : 10
14	o	o	o, d : v	8, ci, ci.-cu, cu : 6, ci, ci.-cu, cu.-s: 10
15	o	o	10, th.-r	10 : 10, ci.-s, cu.-s : 7, ci.-s, cu.-s, s, sl.-r
16	o	o	10, th.-r, sqs	10, oc.-r, sqs : vv, ci.-s, cu.-s, th.-r: o
17	o	o	o, h	ci.-s, h : v, th.-cl, lu.-ha
18	o	o	10, r	10, h.-r, hl : v : o, f, ms
19	o	o	10, oc.-th.-r, g	10,ci,ci.-cu,ci.-s,cu,st.-w:vv,ci.-cu,ci.-s,cu.-s,st-w:vv,th.-cl,st.-w
20			1, ci, fr, w	2, ci, h : v, ci, ci.-cu : 9, ci.-cu, sl.-r
21			10, ci.-cu, ci.-s, cu.-s, d, sl.-f	6, ci.-cu, ci.-s, cu.-s: v, ci.-cu, ci.-s, cu.-s : v, ms
22			7, ci, ci.-cu, ci.-s, f	10, f : 10, f : 10, f
23			10, f	6, ci, ci.-cu, h : v : v, ci.-cu, f
24			10, r, f : 9, ci.-cu, ci.-s, sl.-f	v, ci.-cu, ci.-s, cu.-s : o, h.-d, f, m
25			10, f, gt.-glm	9,ci,ci.-cu,ci.-s,f,glm: 10,ci.-cu,ci.-s, cu.-s, glm : 10
26			r : o, w	vv,ci,ci.-cu, ci.-s, w: vv, ci, ci.-s : o, sl.-f, h.-fr, ms
27			7, ci, ci.-cu, ci.-s, sl.-f, h.-fr	3, ci, ci.-cu, h, w : 6,ci,ci.-cu,ci.-s,cu.-s,s,sl.-sn: o
28			o, sl.-f : 10, sl.-sn	v, sl.-sn, w : v, li.-cl, w : 10, w
29			5, ci, ci.-cu, ci.-s	v, ci, ci.-cu : ci, ci.-cu : o, f, d
30			10, f, r, mt	10 : 10,ci.-cu,ci.-s,th.-r : 9, ci.-s, cu.-s
31			10, f, glm	10, f, glm : o, f, mt

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $63^{\circ}\cdot 0$ on the 9th; and the lowest was $20^{\circ}\cdot 6$ on the 27th.

The mean " was $44^{\circ}\cdot 2$, being $2^{\circ}\cdot 1$ *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot 290$, being $0^{in}\cdot 026$ *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $3^{grs}\cdot 2$, being $0^{gr}\cdot 5$ *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 84 (that of Saturation being represented by 100), being 3 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 544 grains, being 5 grains *greater* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was $5\cdot 5$.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was $1\cdot 7$.

WIND.

The proportions were of N. 7, S. 8, W. 11, E. 4, and Calm 1. The greatest pressure in the month was $30^{lbs}\cdot 0$ + on the square foot on the 16th and 19th.

RAIN.

Fell on 11 days in the month, amounting to $1^{in}\cdot 77$, as measured in the simple cylinder gauge partly sunk below the ground; being $1^{in}\cdot 03$ *less* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from October 20 to 31.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Nov. 1	In Equator	30·133	53·6	42·4	48·2	44·0	62·2	34·2	44·4	43·4	4·2	8·0	0·0	+ 1·8	WNW : W	WSW : WNW	2·3	0·0	0·1	279	0·00
2	Perigee	29·993	56·6	46·3	51·7	46·5	84·8	36·0	44·9	43·4	5·2	7·8	2·5	+ 5·4	W : WSW	WSW	30·0	0·0	1·4	488	0·00
3	New	29·696	53·2	44·4	48·6	39·7	74·9	40·0	46·4	44·4	8·9	11·3	6·1	+ 2·5	W : NNW	NW : SW	9·8	0·0	0·6	385	0·04
4	..	29·383	54·1	41·4	47·3	38·2	69·7	35·2	46·9	44·9	9·1	12·8	3·1	+ 1·4	W by S : WNW	WNW : W	30·0	0·0	0·7	552	0·05
5	..	29·492	51·5	38·9	44·3	40·3	69·7	31·1	46·4	44·4	4·0	8·2	0·9	− 1·4	W : W by S	SSW : WSW	17·0	0·0	0·7	436	0·19
6	..	29·495	54·9	35·7	42·5	34·2	62·9	29·0	46·2	44·4	8·3	11·3	4·8	− 3·0	WSW : NW	NW : W by S	8·6	0·0	1·5	483	0·00
7	..	29·781	47·3	32·9	40·1	34·3	66·2	25·0	46·4	44·4	5·8	10·5	2·7	− 5·2	WSW	W by N : WSW	3·2	0·0	0·2	290	0·00
8	Greatest Declination S.	29·631	56·0	37·3	46·4	39·8	73·4	29·0	45·9	44·4	6·6	13·5	0·0	+ 1·4	WSW	NW : WSW	17·2	0·0	2·0	499	0·00
9	..	29·613	54·1	34·0	43·6	39·7	57·5	29·6	45·4	43·4	3·9	7·2	1·2	− 1·1	WSW	NNW : NW : WSW	6·4	0·0	0·5	323	0·07
10	..	29·823	40·9	31·5	35·8	29·7	52·9	24·8	44·4	43·4	6·1	12·4	2 2	− 8·6	WSW : WNW	W : NW	15·0	0·0	0·5	342	0·01
11	First Qr.	30·152	41·3	28·8	34·7	28·9	60·5	21·2	44·4	42·4	5·8	10·3	0·0	− 9·4	NW : NNW	NNW : WSW	1·5	0·0	0·2	239	0·00
12	..	30·223	46·0	27·3	38·3	31·4	62·7	19·3	43·4	42·4	6·9	10·5	2·7	− 5·5	SW	SW	2·6	0·0	0·2	261	0·00
13	..	29·935	52·9	42·8	48·6	41·0	57·7	36·7	43·4	42·4	7·6	10·0	6·0	+ 5·1	SW	WSW	20·8	0·2	2·3	636	0·00
14	Apogee	29·779	57·6	51·3	54·2	49·5	59·7	46·3	..	..	4·7	5·8	3·8	+ 11·0	WSW	WSW	14·0	0·1	1·8	581	0·00
15	In Equator	29·817	58·8	49·1	53·6	51·2	60·9	44·7	44·7	42·4	2·4	5·6	1·6	+ 10·7	WSW : SW	WSW	2·5	0·0	0·5	366	0·10
16	..	29·867	56·7	47·3	51·2	47·3	85·9	40·8	44·9	43·4	3·9	7·4	1·1	+ 8·6	SW : SSW	SSW : SW	1·6	0·0	0·2	303	0·00
17	..	30·185	48·0	31·2	37·9	37·8	49·2	30·0	44·9	43·5	0·1	1·3	0·0	− 4·4	N : WSW	SW	0·0	0·0	0·0	76	0·00
18	..	30·336	49·8	28·9	39·0	37·2	73·9	28·7	45·4	44·4	1·8	7·2	0·0	− 3·0	SW : SSW	SSW : SW	1·0	0·0	0·1	194	0·00
19	Full	30·152	55·6	40·3	47·4	44·7	66·9	29·7	45·4	44·4	2·7	5·1	1·8	+ 5·6	WSW	WSW : NW	2·3	0·0	0·4	333	0·00
20	..	30·146	43·8	32·0	37·2	28·0	67·5	26·0	45·4	44·2	9·2	13·2	1·4	− 4·4	WSW : NNW	N : N by W	2·2	0·0	0·3	278	0·00
21	..	29·928	43·7	26·8	36·9	32·9	65·7	22·0	..	..	4·0	8·6	0·0	− 4·5	WSW : SW	WSW : SSW	1·8	0·0	0·1	261	0·00
22	Greatest Declination N.	29·085	47·3	40·0	43·3	41·7	54·1	39·0	43·5	42·6	1·6	2·5	0·9	+ 2·1	SSW : S	SW : NE	4·9	0·0	0·7	307	0·51
23	..	29·177	40·7	38·7	39·8	36·8	44·4	37·0	43·4	42·4	3·0	4·0	1·8	− 1·3	N : NNW	WSW : NW : N	0·3	0·0	0·0	149	0·00
24	..	29·562	41·5	35·7	39·3	35·4	45·7	30·0	43·4	42·4	3·9	5·3	1·5	− 1·7	E : NNE	N : N by E	0·2	0·0	0·0	138	0·00
25	..	29·739	44·6	32·5	37·5	33·8	47·7	26·8	43·5	42·1	3·7	8·6	0·3	− 3·4	N : NW : WSW	WSW : SW	1·5	0·0	0·1	210	0·00
26	Last Qr.	29·622	49·9	44·0	46·5	40·4	52·6	39·4	43·7	41·6	6·1	7·1	3·4	+ 5·6	SW : W	WSW	2·5	0·0	0·6	374	0·00
27	..	29·476	45·8	41·0	43·5	41·9	49·0	36·7	44·4	43·4	1·6	5·3	0·0	+ 2·4	WSW	ESE : ENE	1·8	0·0	0·2	232	0·65
28	..	29·467	46·6	35·0	41·4	37·3	49·8	27·0	43·7	42·4	4·1	6·7	0·4	+ 0·1	Calm : NW	WNW	7·9	0·0	0·7	359	0·42
29	In Equator	29·703	39·7	32·5	36·4	32·4	42·7	24·4	42·4	41·4	4·0	7·6	1·4	− 5·2	WNW : WSW	SW : SE	2·7	0·0	0·2	274	0·15
30	Perigee	29·570	39·2	30·5	34·8	29·3	42·2	26·0	42·1	40·7	5·5	10·6	2·2	− 7·1	ENE : NNE	N : NNW	7·3	0·0	1·0	379	0·19
Means	..	29·765	49·1	37·4	43·0	38·2	60·4	31·5	44·6	43·2	4·8	8·2	1·8	−0·2	...	...	..	..	..	Sum 10027	Sum 2·38

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $30^{\text{in}}\cdot155$ on the 1st; the first minimum in the month was $29^{\text{in}}\cdot324$ on the 4th.
The second maximum ,, was $29^{\text{in}}\cdot630$ on the 5th; the second minimum ,, was $29^{\text{in}}\cdot285$ on the 5th.
The third maximum ,, was $29^{\text{in}}\cdot812$ on the 7th; the third minimum ,, was $29^{\text{in}}\cdot533$ on the 8th.
The fourth maximum ,, was $29^{\text{in}}\cdot782$ on the 8th; the fourth minimum ,, was $29^{\text{in}}\cdot524$ on the 9th.
The fifth maximum ,, was $30^{\text{in}}\cdot268$ on the 12th; the fifth minimum ,, was $29^{\text{in}}\cdot757$ on the 14th.
The absolute maximum ,, was $30^{\text{in}}\cdot350$ on the 18th; the absolute minimum ,, was $29^{\text{in}}\cdot033$ on the 22nd.
The seventh maximum ,, was $29^{\text{in}}\cdot765$ on the 25th; the seventh minimum ,, was $29^{\text{in}}\cdot340$ on the 27th.
The eighth maximum ,, was $29^{\text{in}}\cdot895$ on the 29th; the eighth minimum ,, was $29^{\text{in}}\cdot357$ on the 29th.
The range in the month was $1^{\text{in}}\cdot317$.
The mean for the month was $29^{\text{in}}\cdot765$, being $0^{\text{in}}\cdot001$ *lower* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 58°·8 on the 15th; the lowest was 26°·8 on the 21st.
The range ,, was 32°·0.
The mean ,, of all the highest daily readings was 49°·1, being *the same as* the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 37°·4, being *the same as* the average of the preceding 28 years.
The mean daily range was 11°·7, being *the same as* the average of the preceding 28 years.
The mean for the month was 43°·0, being 0°·9 *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Nov. 1			v, ci, ci-cu, sl-f, h, d	10, h, f, th.-r : 10, ci.-s, cu.-s : 10
2			10	9, ci, ci.-cu, ci.-s, w: v,ci.-cu,ci.-s,cu.-s, st.-w: 10, st.-w
3			10, w, r : v, ci	v, ci, ci.-cu, ci.-s :8,ci,ci.-cu,ci.-s,cu.-s,f: 10
4			10, ci.-cu, ci.-s, r, fr-h-sqs, glm	v,ci.-cu,ci.-s,r,fr.-sqs: v,ci.-cu,ci.-s,cu.-s,sqs: 0, ms
5			4, ci, ci.-cu, sl.-f	10, r : 10, c.-r : 10, w
6			3, ci, ci.-cu, ci.-s, h, w	v, ci, ci.-cu, ci.-s : 2, ci, ci.-cu : 0, h, h.-fr
7			10, ci.-s, cu.-s	v, h, sl.-f : 0, mt
8			10, ci.-s, cu.-s, oc.-th.-r, fr.-sqs.	v,ci,ci.-cu,ci.-s,h,w: 4,ci,ci.-cu,ci.-s,h,f,: 0, h
9			10, ci.-s, cu.-s, sc.-w	10,ci.-cu,ci.-s,n,r: v, ci.-s, cu.-s : 0, f, d
10			10, ci.-s, cu.-s, sl.-f, h.-fr	1, ci, h : v,ci,ci.-cu,r,sn: 0, fr, m
11	0	0	0, h.-fr, sl.-f, h	0 : 0 : 0, f, h
12	0	0	10, h.-fr, f	10, ci.-cu, ci.-s, f :8,ci.-cu,ci.-s,cu.-s,f, : 10
13	0	0	vv, ms : 10, w : 10, w	10, st.-w : 10, st.-w : 10, st.-w
14	0	0	10, th.-r, sqs : 10, w : 10, th. r, w	10, th.-r : v, th.-cl, th.-r, lu.-ha, ms
15	0	0	10, th.-r : 10 : 10, th.-r	10, r, ci, ci.-s, cu.-s: 10 : 10 : v : 0, ms
16	0	0	4, ci, ci.-cu	v, ci, ci.-cu : v,ci, ci.-cu, ci.-s : v, ci, ci.-cu, m
17	0	0	10, th.-f	10, th.-f : 10, th.-f : 10, th.-f
18	0	0	0, th.-f, h.-d	1, ci, sl.-f : 3, ci 2,ci, h.-d, lu.-co, ms
19	0	0	10	10 v,ci.-cu,ci.-s,cu.-s: 0
20	0	0	0, d, h.-fr, h	1, ci.-cu : 1, ci.-s, h : 0
21	0	0	0, h, sl.-f	4, ci.-cu : 10
22	0	0	10, r, w	10, h.-r : 10, r : 10, th.-r
23	0	0	10, glm	v,ci,ci.-cu,ci.-s,cu.-s: 10, sl.-f : 10
24	0	0	10, f	10, sl.-f : 10, sl.-f : 10
25	0	0	0, th.-f	0, th.-f : 1, ci, h : 10, th.-cl, th.-r, m
26	0	0	1, ci, ci.-cu, h	10, li.-cl, h : 0, h
27	0	0	10, r	10, h.-r : 10, c.-h.-r : 10, c.-r
28	0	0	10, c.-r : 7, ci.-s, cu.-s, sl.-f	1, ci.-s, h, sl.-f, w : 0, w, ms
29			7, ci, h.-fr, so.-ha	10, f, r : 10, r : 10, c.-r
30			10, r : 10, th.-r	v, sqs : 0, w : 0, w, m

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 55°·4 on the 15th; and the lowest was 21°·4 on the 30th.

The mean ,, was 38°·2, being 1°·6 *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was 0in·231, being 0in·019 *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 2grs·7, being 0gr·1 *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 83 (that of Saturation being represented by 100), being 5 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 549 grains, being 1 grain *greater* than the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·1.

WIND.

The proportions were N. 6, S. 8, W. 15, E. 1, and Calm 0. The greatest pressure in the month was 30lbs·0 on the square foot on the 2nd and 4th.

RAIN.

Fell on 13 days in the month, amounting to 2in·38, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·02 *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from November 1 to 10, and on 29 and 30.

MONTH and DAY, 1869.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Dec. 1	..	29·882	36·5	29·0	32·3	24·6	57·1	22·0	40·6	39·4	7·7	11·2	4·1	− 9·8	NNW : N	N by W : N	2·9	0·0	0·5	378	0·00
2	..	29·837	33·7	28·8	31·2	29·2	35·9	23·1	39·4	37·4	2·0	4·2	0·0	−11·0	N	NE	1·1	0·0	0·0	146	0·00
3	New	29·814	35·5	24·0	30·4	27·2	58·3	24·0	38·4	36·4	3·2	7·0	0·0	−11·9	NNW : W : N	N	3·2	0·0	0·3	238	0·00
4	..	29·759	36·7	29·0	32·6	27·5	38·9	23·5	36·4	35·4	5·1	11·2	0·0	− 9·6	NNW: NNE: NE	E by N : E	16·7	0·1	1·2	416	0·04
5	Greatest Declination S.	30·313	37·7	28·6	34·6	30·2	45·4	23·0	37·4	35·4	4·4	6·5	4·0	− 7·6	NE	NE : ENE	0·7	0·0	0·1	206	0·00
6	..	30·328	38·5	35·2	37·0	35·5	41·1	34·0	36·9	35·4	1·5	4·4	0·0	− 5·1	ENE	ENE	4·5	0·0	0·7	384	0·00
7	..	30·029	38·0	32·8	36·0	34·8	38·9	30·4	36·4	35·4	1·2	1·9	0·0	− 6·0	ENE	E : ENE	2·8	0·0	0·6	357	0·00
8	..	29·777	43·3	37·6	40·0	37·8	46·9	37·1	37·4	35·9	2·2	5·5	0·0	− 1·7	ENE	E : ENE	2·0	0·0	0·2	191	0·00
9	..	29·775	42·0	38·3	39·8	39·2	44·6	38·3	37·6	35·1	0·6	2·9	0·0	− 1·5	ENE	E : ESE	0·0	0·0	0·2	89	0·00
10	First Qr.	29·705	43·5	38·0	41·2	41·2	47·1	38·0	37·9	35·4	0·0	0·7	0·0	+ 0·2	Variable	SW : SSW	0·3	0·0	0·0	97	0·12
11	..	29·278	49·8	40·7	46·0	42·8	52·8	40·1	37·4	35·4	3·2	5·9	0·4	+ 5·3	SSW	SSW : NNW	5·5	0·0	0·6	350	0·31
12	Apogee In Equator.	29·369	47·4	33·8	40·5	35·7	67·9	30·2	40·4	38·4	4·8	8·2	0·8	− 0·1	WSW : SSW	SW : SSW	6·1	0·0	0·3	299	0·01
13	..	29·203	50·8	39·0	46·8	45·0	56·5	30·8	40·4	38·4	1·8	5·0	0·0	+ 6·3	SSW	SSW : SW	30 +	0·1	4·4	627	0·08
14	..	29·327	47·0	38·0	42·2	36·7	59·7	33·2	40·5	38·6	5·5	7·8	3·2	+ 1·8	WSW	WSW	8·6	0·2	1·5	537	0·06
15	..	29·347	47·9	37·4	42·4	34·9	62·7	31·3	40·9	38·9	7·5	13·4	0·0	+ 2·2	SW	WSW	24·0	0·1	2·4	650	0·34
16	..	29·338	55·8	36·4	46·0	42·8	55·8	30·8	41·4	39·4	3·2	5·6	1·5	+ 6·0	WSW	SW: SSW: WSW	30 +	0·1	4·3	603	0·59
17	..	29·602	48·0	40·0	43·2	35·4	60·7	31·7	41·4	40·4	7·8	9·9	5·1	+ 3·4	WNW : W	W : WSW	30 +	0·0	2·4	557	0·00
18	Full.	29·331	55·8	42·4	51·6	50·4	57·0	38·1	41·9	39·4	1·2	3·0	0·0	+12·0	SSW : SW	SW	30·0	0·0	2·9	614	0·15
19	..	29·235	52·5	40·8	45·4	38·3	69·7	36·0	43·6	41·4	7·1	9·0	2·4	+ 6·0	SW : WSW	WSW	30·0	0·1	2·8	606	0·09
20	Greatest Declination N.	29·444	44·9	36·0	40·0	36·1	64·7	29·2	44·4	42·4	3·9	5·9	0·7	+ 0·9	WSW	SW : SSW	6·4	0·0	0·5	329	0·00
21	..	29·206	42·7	34·7	38·4	37·4	56·9	30·1	44·5	42·4	1·0	2·3	0·0	− 0·4	SSE	NNW	1·9	0·0	0·2	213	0·77
22	..	29·399	40·5	35·3	37·4	35·0	40·9	34·3	44·2	41·4	2·4	3·5	0·2	− 1·1	NNW : N	NE : NNE	3·8	0·0	0·3	261	0·00
23	..	29·656	43·6	38·0	39·9	34·1	51·5	32·0	41·4	39·4	5·8	9·0	3·7	+ 1·8	NNE	NNE	9·0	0·0	2·3	521	0·00
24	..	29·837	39·9	30·8	35·4	32·0	48·7	25·0	40·7	38·4	3·4	5·5	2·2	− 2·4	NNE	NNE : N	4·8	0·0	0·5	397	0·00
25	..	29·640	33·6	29·0	30·9	24·4	64·6	19·8	40·4	38·4	6·5	7·7	5·0	− 6·7	N : NE	NNE : NW : W	1·5	0·0	0·2	270	0·00
26	Last Quarter: In Equator.	29·372	30·0	24·0	27·0	21·5	33·3	17·0	..	..	5·5	8·3	2·9	−10·4	NW : N : NE	NE	0·4	0·0	0·0	164	0·00
27	Perigee.	29·559	32·8	23·6	28·5	24·6	39·6	16·7	35·4	33·4	3·9	8·1	0·7	− 8·8	NNE : N	NNE : N	1·3	0·0	0·2	260	0·01
28	..	29·812	31·9	21·3	26·3	20·2	33·5	14·3	34·4	32·4	6·1	10·8	4·1	−10·9	NNW : WSW	NW : WSW	2·0	0·0	0·1	248	0·00
29	..	29·965	40·5	22·3	34·6	30·8	45·3	15·9	33·7	32·1	3·8	9·7	0·0	− 2·7	SW	SSW	3·6	0·0	0·3	300	0·00
30	..	29·713	39·7	35·2	37·4	26·2	43·4	31·8	33·8	32·4	11·2	12·2	7·5	0·0	SSW	S	30 +	0·1	2·4	536	0·00
31	..	29·338	42·7	35·0	39·9	39·7	43·3	34·2	34·4	32·4	0·2	0·9	0·0	+ 2·4	S : SSW	SSW : S	3·0	0·0	0·5	353	0·20
Means	..	29·619	42·0	33·4	37·9	33·9	50·4	28·9	39·1	37·2	4·0	6·7	1·6	− 1·9	...	...	..	..	..	Sum 11197	Sum 2·77

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $29^{\text{in}}\cdot917$ on the 1st; the first minimum in the month was $29^{\text{in}}\cdot597$ on the 4th.
The absolute maximum ,, was $30^{\text{in}}\cdot401$ on the 6th; the second minimum ,, was $29^{\text{in}}\cdot254$ on the 11th.
The third maximum ,, was $29^{\text{in}}\cdot436$ on the 12th; the third minimum ,, was $29^{\text{in}}\cdot018$ on the 13th.
The fourth maximum ,, was $29^{\text{in}}\cdot526$ on the 14th; the fourth minimum ,, was $29^{\text{in}}\cdot261$ on the 15th.
The fifth maximum ,, was $29^{\text{in}}\cdot636$ on the 16th; the absolute minimum ,, was $28^{\text{in}}\cdot782$ on the 16th.
The sixth maximum ,, was $29^{\text{in}}\cdot750$ on the 17th; the sixth minimum ,, was $29^{\text{in}}\cdot204$ on the 19th.
The seventh maximum ,, was $29^{\text{in}}\cdot473$ on the 20th; the seventh minimum ,, was $29^{\text{in}}\cdot176$ on the 21st.
The eighth maximum ,, was $29^{\text{in}}\cdot847$ on the 24th; the eighth minimum ,, was $29^{\text{in}}\cdot361$ on the 26th.
The ninth maximum ,, was $29^{\text{in}}\cdot978$ on the 29th.
The range in the month was $1^{\text{in}}\cdot619$.
The mean for the month was $29^{\text{in}}\cdot619$, being $0^{\text{in}}\cdot196$ *lower* than the average of the preceding 28 years.

TEMPERATURE OF THE AIR.

The highest in the month was 55°·8 on the 16th and 18th; the lowest was 21°·3 on the 28th.
The range ,, was 34°·5.
The mean ,, of all the highest daily readings was 42°·0, being 3°·4 *lower* than the average of the preceding 28 years.
The mean ,, of all the lowest daily readings was 33°·4, being 2°·4 *lower* than the average of the preceding 28 years.
The mean daily range was 8°·6, being 1°·0 *less* than the average of the preceding 28 years.
The mean for the month was 37°·9, being 2°·7 *lower* than the average of the preceding 28 years.

MONTH and DAY, 1869.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Dec. 1			4, ci, ci.-s, sl.-sn	o : o : o
2			10, sl.-f, glm	10, glm : 9, ci.-s, cu.-s : 10
3			7, ci, ci.-cu, sn, sl.-f, h.-fr	v, ci, ci.-cu, ci.-s, sn : v,ci,ci.-cu,ci.-s,cu.-s,sn : o, h
4			10, ci.-s, cu.-s, oc.-r, w	10, ci.-s, cu.-s, w : o, fr
5			8, ci.-cu, ci.-s, cu.-s	9, ci.-cu, ci.-s : 10
6			10	10 : 10 : 10
7	o	o	10	10 : 10 : 10
8	o	o	10	10 : 10, f : 10, sl.-f
9	o	o	10, f	10, f : 10, sl.-f : 10, f, mt
10	o	o	10, r : 10, f, mt	10, th.-f : 10, th.-f : 10, f
11	o	o	8, ci, ci.-cu, sc	10, ci.-s, ci.-cu : 10, h.-r : 10, r
12	o	o	2, ci, f	7, ci.-cu, ci.-s, s, th.-r : 3, ci.-s, lu.-ha, ms
13	o	o	9, ci.-s, cu.-s, sc, w	10, g : 10, th.-r, g : 10, th.-r, st.-w
14			v, ci, r	v, ci, ci.-cu, mt : v, mt : o, d, lu.-ha
15			r, st.-w 4, ci, ci.-cu, ci.-s	vv, ci, ci.-cu, oc.-th.-r : o
16			9, ci, so.-ha	10, r : 10, h.-r, g : 10, h.-g
17			1, ci, w	v, ci.-s : 8, ci.-s, f : 10, s, mt
18			10, sc, r, sqs	10, sqs : 10, sc, fr.-h.-sqs : 10, r, fr.-h.-sqs
19			10, r, w : o, w	vv, fr.-h.-sqs, th.-r : vv, st.-w, th.-r, l
20	o	o	o, h.-fr	6, ci, ci.-s : 6, ci, ci.-cu, ci.-s : 2, ci.-cu, ci.-s
21	o	o	10, h.-r : 10, h.-r, gt.-glm	10, glm, c.-r, f, sn : 10, r, gt.-glm : 10
22	o	o	10, sl.-f, glm	10, mt : 10, mt : 10
23	o	o	3, ci, ci.-cu, cu.-s, w	3, ci, ci.-cu, ci.-s, w : 4, ci, ci.-cu, ci.-s, cu : 10, sl
24	o	o	10	5, ci, ci.-cu, ci.-s, cu : 1, ci, ci.-cu : o
25	o	o	10, cu.-s, cu, sn	7, ci, ci.-cu, ci.-s, cu.-s : o : o, sl.-f
26	o	o	5, ci.-cu, sl.-sn	3, ci.-cu, ci.-s, cu : o, h
27	o	o	10, sn	v, ci, cu.-s, sn : 4, ci, ci.-cu, cu.-s : 2, li.-cl, h.-fr
28	w	o	o, h, sl.-f	1, ci, , f : 2, ci, ci.-cu, h, sl.-f : o
29	o	o	1, ci	o : 3, ci, ci.-cu, ci.-s : 2, ci.-s
30	o	o	1, ci, st.-w	10, w : v, ci, ci.-s, st.-w : 10, th.-cl
31	o	o	10, r	10, r : 10, r : 10, th.-r

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $53^{\circ}\cdot 1$ on the 18th; and the lowest was $17^{\circ}\cdot 4$ on the 28th.

The mean ,, was $33^{\circ}\cdot 9$, being $3^{\circ}\cdot 4$ *lower* than the average of the preceding 28 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot 195$, being $0^{in}\cdot 030$ *less* than the average of the preceding 28 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $2^{grs}\cdot 3$, being $0^{gr}\cdot 3$ *less* than the average of the preceding 28 years.

Degree of Humidity.—The mean for the month was 86 (that of Saturation being represented by 100), being 2 *less* than the average of the preceding 28 years.

Weight of a Cubic Foot of Air.—The mean for the month was 552 grains, being *the same as* the average of the preceding 28 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·5.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·8.

WIND.

The proportions were of N. 9, S. 7, W. 9, E. 5, and Calm 1. The greatest pressure in the month was $30^{lbs}\cdot 0$ on the square foot on the 13th, 16th, 17th, 18th, 19th, and 30th.

RAIN.

Fell on 13 days in the month, amounting to $2^{in}\cdot 77$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot 83$ *greater* than the average fall of the preceding 54 years.

ELECTRICITY.—The insulating lamp was not burning from December 1 to 6 and 14 to 19.

The following table contains the highest and lowest readings of the Barometer, reduced to 32° Fahrenheit, extracted from the photographic records. The readings are accurate; but the times are liable to great uncertainty, as the barometer frequently remains at its highest or lowest point through several hours. The time given is the middle of the stationary period. Where the symbol : follows the time, it denotes that the mercury has been sensibly stationary through a period of more than one hour.

MAXIMA.		
Approximate Mean Solar Time, 1869.		Reading.
	d h m	in.
January	0. 22. 40	29·992
	2. 3. 15	29·881
	4. 8. 55	29·922
	6. 4. 35	30·167
	8. 22. 30:	30·390
	18. 22. 30:	30·360
	21. 23. 25	30·239
	24. 6. 35	30·022
	30. 4. 30	29·496
	31. 3. 35	29·202
February	2. 12. 40	29·810
	4. 23. 30:	30·120
	11. 8. 25:	29·960
	13. 6. 56	30·278
	14. 23. 30:	30·260
	18. 21. 10	29·860
	23. 12. 0:	30·210
	24. 20. 15	29·945
	26. 1. 0	30·035
	27. 6. 5	29·990
March	1. 2. 5	29·595
	4. 8. 0:	30·045
	6. 10. 25:	30·160
	14. 23. 40	29·697
	18. 12. 35	29·815
	23. 9. 30:	30·135
	29. 13. 40:	29·770
April	1. 10. 30:	29·780

MINIMA.		
Approximate Mean Solar Time, 1869.		Reading.
	d h m	in.
January	1. 15. 5	29·496
	2. 23. 35	29·389
	5. 2. 35	29·452
	6. 13. 10	29·960
	14. 15. 35	29·416
	21. 2. 10	30·030
	23. 9. 30:	29·930
	28. 16. 40	28·825
	30. 18. 15	29·030
February	1. 1. 55	28·810
	3. 1. 35	29·602
	8. 15. 50	29·345
	12. 4. 47	29·122
	13. 18. 59	30·075
	17. 18. 55	29·505
	20. 4. 30	29·725
	24. 7. 45	29·710
	25. 11. 30	29·680
	26. 16. 45	29·784
	28. 16. 5	29·380
March	1. 23. 20	28·965
	5. 3. 20	29·668
	10. 15. 0	29·215
	16. 19. 40	29·158
	19. 9. 5	29·095
	27. 16. 45	29·260
	31. 4. 35	29·642
April	3. 12. 30	29·202

MAXIMA.		
Approximate Mean Solar Time, 1869.		Reading.
	d h m	in.
April	5. 13. 20:	30·032
	12. 11. 30	30·170
	18. 19. 0:	30·030
	25. 19. 0:	30·160
	28. 11. 20	30·200
May	4. 10. 55	29·890
	8. 22. 58	29·578
	12. 19. 40	30·085
	22. 19. 0:	29·950
	29. 10. 30:	30·025
June	0. 21. 30:	30·130
	5. 22. 15	30·149
	8. 10. 30	30·110
	10. 9. 0	30·008
	16. 14. 15:	30·170
	22. 20. 0:	30·090
	27. 20. 20	30·145
July	6. 23. 50	29·985
	10. 15. 20	30·250
	13. 19. 35	30·143
	19. 22. 55	30·023
	22. 21. 20	29·943
	30. 10. 30	29·961
August	2. 13. 20	29·817
	6. 9. 35:	30·181
	11. 21. 15	29·937
	17. 11. 50:	30·224
	22. 10. 20	30·180

MINIMA.		
Approximate Mean Solar Time, 1869.		Reading.
	d h m	in.
April	7. 3. 15	29·801
	16. 5. 10	28·978
	20. 10. 28	29·655
	27. 4. 30	29·991
May	3. 12. 15	29·530
	6. 16. 5:	28·975
	9. 22. 4	29·333
	19. 5. 15	29·270
	26. 4. 10:	29·381
	30. 22. 58	29·910
June	4. 0. 30	29·761
	7. 7. 45	29·946
	9. 6. 25	29·870
	13. 18. 57	29·214
	19. 14. 20:	29·805
	26. 0. 30	29·942
July	6. 0. 0	29·723
	8. 3. 45	29·840
	12. 8. 5	29·885
	18. 5. 35	29·813
	22. 4. 35	29·740
	26. 6. 30	29·621
August	1. 14. 30:	29·595
	3. 5. 10	29·628
	9. 5. 45	29·388
	13. 3. 45	29·680
	21. 5. 50	30·092
	24. 5. 0	30·020

MAXIMA.		MINIMA.		MAXIMA.		MINIMA.	
Approximate Mean Solar Time, 1869.	Reading.	Approximate Mean Solar Time, 1869.	Reading.	Approximate Mean Solar Time, 1869.	Reading.	Approximate Mean Solar Time, 1869.	Reading.
d h m	in.	d h m	in.	d h m	in.	d h m	in.
August 26. 21. 30	30·165	August 28. 18. 0	29·761	November 1. 11. 50	30·172	November 3. 18. 0	29·285
September 0. 21. 10	30·259	September 5. 21. 0	29·500	4. 20. 50	29·645	5. 15. 15	29·135
7. 10. 10	29·770	10. 6. 50	29·160	6. 22. 20	29·823	7. 21. 55	29·509
10. 21. 10	29·398	11. 17. 30	28·580	8. 10. 10	29·800	9. 0. 35	29·513
12. 9. 35:	29·491	12. 18. 10	29·135	11. 22. 0:	30·270	14. 2. 15	29·745
13. 18. 30:	29·739	15. 16. 15	29·295	17. 22. 40	30·378	22. 13. 30:	29·031
16. 11. 30:	29·738	18. 12. 18	29·020	24. 22. 25	29·790	27. 16. 5	29·232
19. 14. 50	29·440	20. 3. 10	29·318	28. 18. 0	29·915	29. 15. 35	29·225
22. 20. 55	30·084	25. 16. 5	29·679	December 1. 8. 50	29·930	December 3. 17. 0:	29·580
26. 20. 58	29·892	29. 10. 45	29·352	5. 11. 25:	30·410	11 6. 55	29·226
October 1. 8. 5	29·708	October 2. 7. 15	29·510	12. 14. 5	29·461	13. 9. 30	29·018
5. 23. 10	30·105	7. 17. 30	29·920	14. 11. 50	29·570	14. 18. 48	29·177
8. 22. 0:	30·088	13. 2. 15	29·850	15. 14. 30	29·650	16. 9. 58	28·755
13. 21. 10	30·045	16. 7. 50	29·098	17. 10. 20:	29·770	19. 0. 59	29·152
17. 9. 21	29·756	18. 15. 20:	29·180	19. 22. 15	29·495	20. 23. 55	29·170
21. 23. 40	30·343	23. 18. 15	29·982	24. 7. 0	29·861	25. 19. 0:	29·345
24. 21. 30:	30·115	27. 0. 45	29·592	29. 8. 30	29·981	31. 18. 15	29·091
29. 6. 45	30·110	29. 21. 50	29·724				

ABSOLUTE MAXIMA AND MINIMA READINGS OF THE BAROMETER for each Month in the YEAR 1869.

[Extracted from the preceding Table.]

1869, MONTH.	Readings of the Barometer.		Range of Reading in each Month.
	Maxima.	Minima.	
	in.	in.	in.
January	30·390	28·825	1·565
February	30·278	28·810	1·468
March	30·160	28·965	1·195
April	30·200	28·978	1·222
May	30·085	28·975	1·110
June	30·170	29·214	0·956
July	30·250	29·621	0·629
August	30·224	29·388	0·836
September	30·259	28·580	1·679
October	30·343	29·098	1·245
November	30·378	29·031	1·347
December	30·410	28·755	1·655

The highest reading in the year was $30^{in}\cdot410$ on December 5. The lowest reading in the year was $28^{in}\cdot580$ on September 12.

The range of reading in the year was $1^{in}\cdot830$.

MONTHLY MEANS of RESULTS for METEOROLOGICAL ELEMENTS.

1869, MONTH.	Mean Reading of the Barometer.	Temperature of the Air. Highest.	Lowest.	Range in the Month.	Mean of all the Highest.	Mean of all the Lowest.	Mean Daily Range.	Mean Temperature.	Mean Temperature of Dew Point.	Mean Elastic Force of Vapour.	Mean Weight of Vapour in a Cubic Foot of Air.	Mean additional Weight required to saturate a Cubic Foot of Air.
	in.	°	°	°	°	°	°	°	°	in.	grs.	grs.
January ..	29·861	55·9	26·3	29·6	46·0	36·5	9·5	41·1	37·6	0·225	2·6	0·4
February..	29·808	61·6	31·7	29·9	51·8	39·7	12·1	45·3	40·6	0·253	2·9	0·6
March	29·632	53·6	27·3	26·3	44·8	32·3	12·5	37·5	32·4	0·184	2·1	0·5
April	29·828	79·1	29·3	49·8	61·6	41·8	19·8	50·3	44·6	0·295	3·4	0·8
May	29·651	70·5	33·3	37·2	60·7	43·7	17·0	50·5	45·3	0·303	3·4	0·7
June	29·920	87·5	35·6	51·9	67·4	46·0	21·4	55·3	48·4	0·340	3·8	1·1
July......	29·925	90·9	49·1	41·8	77·0	54·5	22·5	64·5	56·2	0·453	5·0	1·7
August ...	29·967	89·0	42·1	46·9	72·3	52·4	19·9	60·8	52·1	0·389	4·4	1·6
September.	29·642	80·0	41·2	38·8	68·6	52·4	16·2	59·0	51·6	0·382	4·3	1·3
October ...	29·867	73·9	27·9	46·0	57·5	42·0	15·5	48·9	44·2	0·290	3·2	0·7
November .	29·765	58·8	26·8	32·0	49·1	37·4	11·7	43·0	38·2	0·231	2·7	0·5
December .	29·619	55·8	21·3	34·5	42·0	33·4	8·6	37·9	33·9	0·195	2·3	0·4
Means	29·790	71·4	32·7	38·7	58·2	42·7	15·6	49·5	43·8	0·295	3·3	0·9

1869, MONTH.	Mean Degree of Humidity. (Sat. = 100.)	Mean Weight of a Cubic Foot of Air.	Mean Amount of Cloud. 0–10	Rain. Number of Rainy Days.	Amount collected on the Ground. Gauge read Daily.	Gauge read Monthly.	Wind. From Osler's Anemometer. Number of Days for Mean Direction of the Wind referred to different Points of Azimuth. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Number of Calm Days and Days on which the Pressure of the Wind was less than ½ lb. on the Sq. Foot.	Mean Daily Pressure in lbs. on the Square Foot.	From Robinson's Anemometer. Mean Daily Horizontal Movement of Air in Miles.
		grs.			in.	in.											
January.........	88	553	7·2	14	2·92	..	0	0	2	7	8	10	2	0	2	0·66	276
February........	84	547	7·2	13	2·34	2·50	1	1	0	0	2	15	7	2	0	1·31	421
March	83	553	7·7	17	1·41	1·51	7	11	2	2	1	3	2	3	0	0·76	341
April...........	81	542	6·1	10	1·01	0·95	3	6	4	2	2	10	2	1	0	0·37	271
May............	83	538	7·4	21	3·43	3·48	2	8	6	3	2	7	2	1	0	0·38	254
June............	78	538	6·3	9	1·15	1·20	6	6	1	1	1	8	3	3	1	0·20	216
July............	75	527	5·7	2	0·55	0·51	2	5	2	2	1	11	4	2	2	0·16	215
August	73	532	5·9	11	1·21	1·22	3	6	2	2	1	7	5	3	2	0·18	225
September.......	77	528	6·6	13	3·08	3·10	1	1	1	2	3	14	7	0	1	0·96	348
October.........	84	544	5·5	11	1·77	1·81	4	1	1	4	2	8	5	5	1	0·44	254
November	83	549	6·4	13	2·38	2·40	3	1	1	1	1	11	8	4	0	0·62	334
December	86	552	6·5	13	2·77	2·80	6	5	2	0	3	8	3	3	1	1·05	361
Means	81	542	6·5	Sum 147	Sum 24·02	..	Sum 38	Sum 51	Sum 24	Sum 26	Sum 27	Sum 112	Sum 50	Sum 27	Sum 10	...	...

(I.)—Reading of a Thermometer whose bulb is sunk to the depth of 25·6 feet (24 French feet) below the surface of the soil, at Noon on every Day, except Sundays, Good Friday, and Christmas Day.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	53·02	52·25	51·54	50·89	50·33	50·06	50·24	S	51·56	52·34	52·93	53·07
2	52·87	52·21	51·54	50·88	S	50·07	50·27	50·76	51·57	52·35	52·96	53·07
3	S	52·21	51·50	50·87	50·31	50·06	50·28	50·76	51·57	S	52·92	53·07
4	52·83	52·21	51·47	S	50·25	50·05	S	50·80	51·68	52·41	52·96	53·07
5	52·81	52·18	51·47	50·84	50·27	50·07	50·33	50·83	S	52·42	52·98	S
6	52·80	52·16	51·45	50·81	50·25	S	50·33	50·80	51·68	52·46	52·98	53·06
7	52·77	S	S	50·83	50·25	50·12	50·35	50·87	51·72	52·48	S	53·04
8	52·77	52·11	51·36	50·78	50·21	50·07	50·37	S	51·75	52·53	53·03	53·05
9	52·75	52·16	51·37	50·75	S	50·08	50·38	50·92	51·78	52·54	52·98	53·05
10	S	52·07	51·32	50·76	50·22	50·08	50·40	50·93	51·78	S	53·02	53·03
11	52·67	52·03	51·30	S	50·17	50·08	S	50·95	51·82	52·58	53·02	53·04
12	52·66	52·00	51·30	50·75	50·17	50·09	50·44	50·98	S	52·61	53·03	S
13	52·62	51·96	51·27	50·73	50·17	S	50·42	51·01	51·86	52·62	53·07	53·05
14	52·60	S	S	50·71	50·13	50·07	50·46	51·04	51·91	52·61	S	53·01
15	52·60	51·91	51·22	50·65	50·13	50·10	50·47	S	51·92	52·63	53·11	52·99
16	52·60	51·92	51·19	50·62	S	50·07	50·50	51·11	51·95	52·66	53·12	53·01
17	S	51·87	51·17	50·58	50·11	50·09	50·57	51·11	51·98	S	53·10	52·99
18	52·55	51·83	51·18	S	50·08	50·11	S	51·15	52·02	52·67	53·08	53·00
19	52·50	51·83	51·15	50·56	50·07	50·13	50·54	51·17	S	52·68	53·13	S
20	52·47	51·78	51·12	50·53	50·07	S	50·54	51·21	52·04	52·71	53·09	52·93
21	52·39	S	S	50·53	50·07	50·13	50·57	51·23	52·08	52·76	S	52·92
22	52·43	51·71	51·09	50·53	50·07	50·14	50·59	S	52·11	52·75	53·11	52·88
23	52·39	51·69	51·07	50·50	S	50·17	50·59	51·29	52·13	52·78	53·10	52·90
24	S	51·68	51·05	50·47	50·07	50·17	50·60	51·34	52·17	S	53·10	52·86
25	52·36	51·65	51·05	S	50·07	50·20	S	51·37	52·21	52·80	53·08	Christmas Day
26	52·36	51·64	Good Friday.	50·44	50·06	50·22	50·64	51·41	S	52·83	53·13	S
27	52·33	51·62	50·98	50·43	50·05	S	50·64	51·44	52·23	52·81	53·12	52·79
28	52·33	S	S	50·43	50·03	50·24	50·65	51·47	52·26	52·82	S	52·75
29	52·31		50·93	50·38	50·03	50·24	50·67	S	52·32	52·87	53·08	52·67
30	52·28		50·93	50·36	S	50·24	50·70	51·49	52·33	52·88	53·04	52·75
31	S		50·93		50·03		50·72	51·53		S		52·73
Means.	52·58	51·95	51·23	50·64	50·14	50·12	50·49	51·11	51·94	52·64	53·05	52·95

(II.)—Reading of a Thermometer whose bulb is sunk to the depth of 12·8 feet (12 French feet) below the surface of the soil, at the same times.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	51·37	49·72	48·88	47·69	48·00	50·03	51·81	S	55·92	56·56	55·76	53·06
2	51·37	49·58	48·87	47·66	S	50·11	51·87	54·47	55·91	56·52	55·72	52·98
3	S	49·53	48·84	47·60	48·16	50·14	51·94	54·53	55·92	S	55·62	52·87
4	51·25	49·48	48·83	S	48·17	50·18	S	54·68	56·06	56·52	55·52	52·80
5	51·22	49·41	48·84	47·54	48·30	50·27	52·09	54·76	S	56·51	55·41	S
6	51·12	49·36	48·80	47·51	48·36	S	52·11	54·82	56·12	56·51	55·32	52·65
7	51·05	S	S	47·50	48·43	50·43	52·19	54·91	56·17	56·53	S	52·55
8	51·02	49·26	48·71	47·45	48·50	50·40	52·26	S	56·23	56·57	55·18	52·47
9	50·93	49·17	48·69	47·40	S	50·42	52·32	55·04	56·26	56·55	55·07	52·42
10	S	49·20	48·65	47·38	48·65	50·47	52·41	55·07	56·24	S	54·90	52·29
11	50·80	49·16	48·62	S	48·73	50·50	S	55·14	56·29	56·53	54·82	52·23
12	50·74	49·11	48·58	47·37	48·81	50·56	52·59	55·24	S	56·55	54·76	S

(II.)—Reading of a Thermometer whose bulb is sunk to the depth of 12·8 feet (12 French feet) below the surface of the soil, at the same times—*concluded.*

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
13	50·65	49·04	48·56	47·36	48·87	S	52·56	55·26	56·31	56·47	54·71	52·05
14	50·61	S	S	47·37	48·94	50·65	52·69	55·32	56·37	56·39	S	51·88
15	50·61	49·02	48·45	47·34	49·02	50·74	52·77	S	56·41	56·39	54·58	51·78
16	50·55	49·03	48·42	47·32	S	50·76	52·91	55·44	56·43	56·41	54·48	51·71
17	S	49·02	48·38	47·32	49·15	50·86	53·02	55·46	56·44	S	54·34	51·52
18	50·45	49·02	48·34	S	49·19	50·89	S	55·52	56·51	56·30	54·24	51·44
19	50·40	49·00	48·32	47·37	49·24	51·09	53·22	55·53	S	56·28	54·19	S
20	50·33	49·01	48·24	47·42	49·35	S	53·17	55·57	56·49	56·27	54·04	51·20
21	50·30	S	S	47·47	49·43	51·20	53·31	55·64	56·56	56·33	S	51·12
22	50·24	48·95	48·16	47·53	49·44	51·32	53·52	S	56·54	56·24	53·88	50·94
23	50·16	48·95	48·10	47·62	S	51·38	53·61	55·70	56·60	56·27	53·80	50·90
24	S	48·97	48·06	47·74	49·61	51·46	53·65	55·76	56·62	S	53·68	50·83
25	50·12	48·95	48·03	S	49·69	51·57	S	55·81	56·63	56·14	53·59	Christmas Day
26	50·08	48·96	Good Friday.	47·77	49·72	51·61	53·87	55·84	S	56·12	53·57	S
27	50·02	48·95	47·86	47·83	49·77	S	53·93	55·86	56·58	56·04	53·51	50·65
28	50·00	S	S	47·88	49·75	51·72	53·98	55·88	56·57	55·94	S	50·57
29	49·95		47·81	47·92	49·85	51·74	54·12	S	56·65	55·94	53·25	50·58
30	49·86		47·77	47·98	S	51·78	54·23	55·82	56·63	55·87	53·17	50·53
31	S		47·74		49·94		54·32	55·87		S		50·49
Means .	50·58	49·16	48·41	47·55	49·04	50·86	52·98	55·34	56·36	56·34	54·50	51·71

(III.)—Reading of a Thermometer whose bulb is sunk to the depth of 6·4 feet (6 French feet) below the surface of the soil, at the same times.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	49·01	46·63	47·48	45·50	49·88	52·61	55·13	S	60·14	58·84	54·42	50·15
2	49·00	46·53	47·45	45·48	S	52·60	55·33	59·80	60·14	58·80	54·21	50·10
3	S	46·71	47·36	45·47	50·24	52·53	55·48	59·84	60·11	S	53·98	49·93
4	48·40	46·89	47·33	S	50·32	52·52	S	59·99	60·18	58·80	53·82	49·77
5	48·41	46·97	47·24	45·53	50·53	52·62	55·83	59·98	S	58·76	53·74	S
6	48·30	47·10	47·15	45·54	50·65	S	55·93	59·91	60·00	58·73	53·63	49·33
7	48·20	S	S	45·59	50·78	52·94	56·12	59·92	59·97	58·68	S	49·10
8	48·16	47·38	46·96	45·64	50·86	53·01	56·33	S	59·97	58·62	53·52	48·91
9	48·20	47·48	46·89	45·70	S	53·25	56·50	59·89	59·97	58·53	53·36	48·79
10	S	47·62	46·79	45·80	51·20	53·53	56·70	59·89	59·94	S	53·15	48·62
11	48·38	47·74	46·71	S	51·28	53·81	S	59·76	60·02	58·41	53·01	48·50
12	48·44	47·82	46·62	46·27	51·53	54·07	57·17	59·78	S	58·43	52·88	S
13	48·41	47·88	46·53	46·50	51·61	S	57·25	59·68	60·07	58·34	52·69	48·40
14	48·45	S	S	46·75	51·65	54·37	57·47	59·61	60·10	58·28	S	48·30
15	48·43	48·02	46·31	47·04	51·70	54·57	57·68	S	60·04	58·29	52·25	47·97
16	48·37	48·05	46·23	47·38	S	54·65	57·92	59·54	59·90	58·28	52·10	48·14
17	S	48·04	46·13	47·71	51·77	54·77	58·09	59·44	59·81	S	52·00	47·69
18	48·26	48·05	46·02	S	51·77	54·80	S	59·42	59·77	57·99	51·95	47·84
19	48·25	48·09	45·93	48·22	51·82	54·86	58·34	59·36	S	57·67	51·98	S
20	48·22	48·10	45·80	48·38	51·93	S	58·49	59·33	59·59	57·49	51·89	47·88
21	48·20	S	S	48·46	52·02	54·71	58·73	59·32	59·60	57·30	S	47·78
22	48·13	48·11	45·72	48·55	52·00	54·71	59·03	S	59·46	56·91	51·73	47·69
23	48·01	47·97	45·68	48·64	S	54·69	59·13	59·27	59·41	56·66	51·60	47·83
24	S	47·91	45·64	48·73	52·03	54·63	59·24	59·32	59·25	S	51·38	47·87
25	47·72	47·79	45·62	S	52·10	54·63	S	59·41	59·15	56·06	51·22	Christmas Day
26	47·53	47·78	Good Friday.	49·01	52·10	54·69	59·62	59·49	S	55·90	51·12	S

(III.)—Reading of a Thermometer whose bulb is sunk to the depth of 6·4 feet (6 French feet) below the surface of the soil, at the same times—*concluded.*

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
27	47·33	47·57	45·56	49·17	52·16	*S*	59·67	59·58	58·97	55·66	51·03	47·72
28	47·12	*S*	*S*	49·37	52·22	54·77	59·68	59·69	58·96	55·45	*S*	47·56
29	46·96		45·59	49·51	52·60	54·87	59·83	*S*	59·00	55·28	50·38	47·42
30	46·73		45·59	49·72	*S*	55·00	59·88	59·87	58·94	54·99	50·28	47·21
31	*S*		45·53		52·62		59·89	60·05		*S*		47·05
Means.	48·10	47·59	46·38	47·29	51·51	54·01	57·79	59·66	59·71	57·58	52·44	48·37

(IV.)—Reading of a Thermometer whose bulb is sunk to the depth of 3·2 feet (3 French feet) below the surface of the soil, at the same times.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	44·69	44·07	44·72	42·24	51·72	52·35	57·78	*S*	62·52	59·36	49·70	45·78
2	44·25	44·75	44·52	42·44	*S*	52·37	57·95	63·02	62·00	59·27	49·88	45·20
3	*S*	44·79	44·35	42·55	51·74	52·82	58·09	62·62	61·58	*S*	50·17	44·58
4	44·48	44·85	44·02	*S*	51·80	53·39	*S*	62·46	61·37	58·93	50·46	44·12
5	44·62	45·25	43·63	42·90	51·68	53·82	58·94	62·29	*S*	58·72	50·51	*S*
6	44·78	45·64	43·50	43·00	51·40	*S*	59·30	62·22	61·29	58·48	50·22	43·42
7	44·78	*S*	*S*	43·38	51·57	55·15	59·73	62·18	61·46	58·18	*S*	43·30
8	44·94	46·11	43·41	44·08	51·96	56·19	60·10	*S*	61·62	58·02	49·81	43·37
9	45·33	46·38	43·18	44·75	*S*	57·05	60·48	61·64	61·95	58·17	49·58	43·53
10	*S*	46·59	43·08	45·23	52·40	57·42	60·77	61·52	62·12	*S*	49·28	43·67
11	45·81	46·62	43·01	*S*	52·61	57·38	*S*	61·32	62·21	58·68	48·87	43·91
12	45·65	46·79	42·75	46·49	52·94	57·20	61·30	61·02	*S*	58·80	48·17	*S*
13	45·38	46·85	42·59	47·45	52·85	*S*	61·46	60·73	61·29	58·63	47·57	44·49
14	45·19	*S*	*S*	48·38	52·69	57·26	61·76	60·78	60·71	58·51	*S*	44·51
15	44·97	46·07	42·14	49·15	52·62	57·35	61·78	*S*	60·32	58·02	48·06	44·60
16	45·04	46·12	41·98	49·68	*S*	56·93	62·09	60·56	60·30	57·54	48·67	44·62
17	*S*	46·21	41·84	49·63	52·62	56·40	62·41	60·52	60·13	*S*	49·01	44·31
18	45·50	46·40	41·73	*S*	52·60	55·85	*S*	60·56	60·10	56·29	49·01	44·52
19	45·38	46·45	41·84	48·91	52·61	55·61	63·26	60·27	*S*	54·79	48·70	*S*
20	45·14	46·22	42·05	48·59	52·67	*S*	63·50	60·27	59·98	54·22	48·46	45·30
21	44·64	*S*	*S*	48·58	52·53	55·18	63·52	60·32	59·57	53·50	*S*	45·00
22	44·12	45·68	42·19	48·72	52·27	55·06	63·74	*S*	59·00	53·01	47·52	44·45
23	43·67	45·21	42·27	49·03	*S*	54·98	63·87	60·71	58·76	52·78	47·33	44·25
24	*S*	44·71	42·27	49·42	52·33	55·15	64·08	61·28	58·68	*S*	47·19	44·09
25	42·76	44·38	42·18	*S*	52·63	55·42	*S*	61·71	59·00	52·73	47·01	Christmas Day
26	42·20	44·32	Good Friday.	50·22	53·13	55·80	63·98	62·10	*S*	52·55	46·82	*S*
27	42·00	44·57	42·52	50·56	53·70	*S*	63·70	62·60	59·29	52·15	46·86	42·85
28	42·10	*S*	*S*	51·03	53·93	56·77	63·40	63·18	59·18	51·28	*S*	42·20
29	42·51		42·23	51·46	53·53	57·31	63·25	*S*	59·17	50·46	46·60	41·72
30	43·18		42·11	51·80	*S*	57·59	62·89	63·46	59·16	49·90	46·18	41·25
31	*S*		42·04		52·40		62·87	63·02		*S*		41·04
Means.	44·35	45·63	42·78	47·30	52·50	55·68	61·70	61·63	60·49	55·88	48·52	43·66

(V.)—Reading of a Thermometer whose bulb is sunk to the depth of 1 inch below the surface of the soil, within the case which covers the tops of the deep-sunk Thermometers, at the same times.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	38·1	49·8	43·5	41·9	51·2	52·9	60·2	S	60·3	60·2	47·6	38·0
2	42·7	46·2	42·0	43·0	S	58·2	60·5	63·4	60·5	58·5	51·3	36·8
3	S	47·2	38·2	44·4	55·6	57·4	61·0	60·5	59·2	S	50·3	36·0
4	43·7	49·6	39·4	S	50·3	57·5	S	65·0	61·5	57·7	51·2	38·2
5	47·1	49·6	43·7	44·3	51·7	60·2	66·5	64·2	S	56·5	46·2	S
6	43·3	49·7	42·8	47·1	54·8	S	66·0	63·8	63·5	56·5	48·0	39·0
7	45·0	S	S	49·9	56·3	67·0	65·5	61·5	63·8	56·5	S	39·0
8	48·3	51·7	38·8	49·8	55·7	65·0	67·4	S	66·0	59·7	48·2	41·2
9	47·8	48·8	40·8	47·8	S	62·6	65·9	63·8	66·3	60·3	48·7	42·0
10	S	49·3	39·7	49·3	57·2	59·9	64·3	60·5	64·4	S	42·5	42·0
11	42·8	51·4	39·6	S	55·4	58·5	S	59·8	61·8	60·7	40·5	46·0
12	42·7	47·8	39·5	57·3	54·7	59·8	68·8	60·2	S	59·1	39·8	S
13	42·2	42·9	39·0	55·8	53·5	S	64·5	62·3	58·6	60·0	45·6	45·4
14	40·4	S	S	58·8	54·1	57·5	64·7	61·3	58·8	53·4	S	44·7
15	46·0	47·0	38·0	57·2	55·1	57·5	66·3	S	60·9	55·5	51·4	44·0
16	44·0	47·2	38·8	52·0	S	54·1	70·2	62·8	60·0	56·6	51·5	43·3
17	S	49·9	40·2	50·1	54·9	54·5	70·7	61·5	60·8	S	46·9	43·7
18	43·5	46·8	42·8	S	54·8	54·5	S	60·3	62·7	48·8	42·5	48·4
19	43·0	44·1	43·5	47·3	52·7	55·9	69·3	60·5	S	46·8	48·0	S
20	38·7	45·9	40·2	50·1	52·4	S	65·6	61·3	56·2	44·3	43·5	43·0
21	39·0	S	S	51·9	53·7	54·8	65·1	60·4	56·5	49·2	S	40·0
22	38·6	40·1	42·3	52·3	53·0	55·2	69·7	S	56·3	46·8	45·8	40·0
23	35·9	40·2	40·1	56·4	S	58·0	71·7	64·3	59·6	49·5	44·1	41·3
24	S	42·2	41·3	54·0	56·0	57·7	66·7	66·3	61·3	S	42·5	40·7
25	46·7	41·2	42·8	S	58·0	59·9	S	66·8	61·9	47·0	41·0	Christmas Day
26	39·4	46·4	Good Friday.	54·3	58·8	61·3	69·5	68·5	S	47·2	46·0	S
27	40·9	47·2	39·9	56·8	58·0	S	66·2	70·3	58·6	42·7	45·6	34·5
28	45·1	S	S	58·3	51·2	62·6	62·8	70·5	59·0	40·2	S	33·0
29	47·4		39·9	54·2	50·0	60·5	63·6	S	61·8	44·0	40·7	35·9
30	45·2		41·2	54·0	S	61·3	66·5	63·5	63·0	45·0	41·3	37·0
31	S		42·0		52·0		67·8	60·5		S		40·0
Means.	43·0	46·8	40·8	51·5	54·3	58·6	66·2	63·2	60·9	52·4	45·8	40·5

(VI.)—Reading of a Thermometer within the case covering the deep-sunk Thermometers, whose bulb is placed on a level with their scales, at the same times.

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	37·8	51·0	42·2	44·8	51·3	62·0	61·2	S	67·2	64·8	50·5	36·0
2	45·2	44·5	43·0	48·7	S	69·9	63·4	67·2	61·8	58·7	56·5	33·2
3	S	51·6	38·6	48·0	61·3	64·5	63·9	58·0	58·0	S	51·5	35·5
4	46·6	53·0	42·1	S	46·1	61·9	S	72·5	72·5	58·8	50·8	36·5
5	49·7	55·6	49·6	51·9	58·0	70·4	76·5	68·7	S	59·6	47·7	S
6	45·7	56·4	44·1	49·9	60·1	S	70·1	65·6	67·7	62·5	47·0	37·5
7	43·5	S	S	57·4	62·1	83·5	69·6	68·4	70·0	63·9	S	37·5
8	50·6	53·9	38·8	53·9	56·1	71·0	74·0	S	71·7	67·8	53·8	41·5
9	48·5	47·2	44·0	46·7	S	68·5	72·5	69·0	72·8	70·3	53·0	41·6
10	S	53·0	39·5	57·3	64·0	62·0	70·5	61·5	65·0	S	39·5	42·5
11	39·5	54·2	40·0	S	56·2	63·1	S	61·5	67·8	70·0	41·5	48·5
12	40·9	48·7	42·1	70·8	60·5	64·5	82·4	67·3	S	68·3	40·3	S
13	39·2	42·5	40·9	66·7	61·2	S	66·3	64·7	61·3	62·5	50·0	48·7
14	37·3	S	S	73·0	57·4	55·9	70·3	64·8	63·1	53·3	S	46·0
15	47·0	47·1	37·8	57·2	60·0	61·7	71·5	S	63·3	57·0	55·4	46·0

(VI.)—Reading of a Thermometer within the case covering the deep-sunk Thermometers, whose bulb is placed on a level with their scales, at the same times—*concluded.*

Days of the Month, 1869.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
16	45·7	51·5	38·8	50·3	*S*	53·0	80·8	69·0	64·0	57·7	57·0	45·9
17	*S*	52·3	39·9	48·4	59·0	54·0	82·3	64·8	63·7	*S*	43·3	45·2
18	44·6	47·2	38·8	*S*	53·9	54·0	*S*	67·0	67·0	48·3	43·0	54·0
19	40·2	47·8	45·7	52·8	51·0	62·7	70·5	62·3	*S*	44·3	53·5	*S*
20	37·2	47·6	38·2	51·6	57·2	*S*	66·8	66·5	57·6	45·8	43·0	44·0
21	38·4	*S*	*S*	58·6	60·9	54·1	67·9	69·8	62·0	53·1	*S*	42·2
22	38·8	34·9	43·8	60·2	56·1	57·8	83·4	*S*	60·6	46·0	46·5	37·0
23	31·4	40·2	40·1	64·5	*S*	64·1	75·8	68·7	65·0	53·5	41·0	41·2
24	*S*	45·8	43·2	58·1	63·9	63·6	69·7	76·5	65·0	*S*	40·5	37·5
25	40·3	41·8	49·6	*S*	67·5	67·7	*S*	79·1	71·0	45·2	37·5	Christmas Day
26	42·8	49·5.	Good Friday.	63·0	64·0	72·0	76·8	82·5	*S*	46·2	47·2	*S*
27	44·2	49·8	40·5	68·4	60·1	*S*	70·9	83·5	63·3	39·6	46·5	31·8
28	49·6	*S*	*S*	71·0	46·2	67·8	61·0	82·8	64·0	37·7	*S*	28·0
29	50·5		38·3	59·6	50·3	66·5	71·5	*S*	72·1	48·7	38·0	39·9
30	48·0		43·1	61·7	*S*	64·5	72·0	66·3	67·9	46·6	38·2	37·2
31	*S*		45·8		53·0		71·5	67·7		*S*		41·9
Means.	43·2	48·6	41·9	57·5	57·6	63·9	71·6	69·1	65·6	55·0	46·6	40·6

WEEKLY MEANS of READINGS of THERMOMETERS.

1869. Period.	Thermometers sunk in the ground. Bulb 24 French Feet deep.	Bulb 12 French Feet deep.	Bulb 6 French Feet deep.	Bulb 3 French Feet deep.	Bulb 1 Inch deep.	Thermometer inclosed in the box which covers the scales of the deep-sunk Thermometers, and placed on a level with their scales.
d d	°	°	°	°	°	°
January 1 to January 7	52·85	51·23	48·55	44·60	43·3	44·7
8 to 14	52·68	50·79	48·34	45·38	44·0	42·7
15 to 21	52·52	50·44	48·29	45·11	42·4	42·2
22 to 28	52·37	50·10	47·64	42·81	41·1	41·2
29 to February 4	52·24	49·69	46·74	44·02	47·6	49·8
February 5 to 11	52·12	49·26	47·38	46·10	50·1	53·4
12 to 18	51·91	49·04	47·98	46·41	46·9	48·2
19 to 25	51·72	48·97	47·99	45·44	42·3	43·0
26 to March 4	51·55	48·89	47·49	44·42	42·8	44·2
March 5 to 11	51·38	48·72	46·96	43·30	40·9	42·7
12 to 18	51·22	48·46	46·31	42·17	39·7	39·7
19 to 25	51·09	48·15	45·73	42·13	41·7	43·4
26 to April 1	50·93	47·77	45·55	42·23	41·0	42·5
April 2 to 8	50·83	47·54	45·54	43·06	46·4	51·6
9 to 15	50·72	47·37	46·34	46·91	54·4	61·9
16 to 22	50·56	47·41	48·12	49·02	50·6	53·6
23 to 29	50·44	47·79	49·07	50·29	55·7	64·1
30 to May 6	50·29	48·16	50·22	51·69	52·9	56·4
May 7 to 13	50·20	48·66	51·21	52·39	55·5	60·0
14 to 20	50·10	49·15	51·77	52·63	54·0	56·4
21 to 27	50·06	49·61	52·07	52·76	56·2	62·1
28 to June 3	50·05	49·97	52·53	52·90	53·6	57·6
June 4 to 10	50·08	50·36	52·98	55·50	62·0	69·5
11 to 17	50·08	50·68	54·37	57·09	57·0	58·7
18 to 24	50·14	51·22	54·73	55·31	56·0	59·4
25 to July 1	50·23	51·71	54·85	56·78	61·0	66·6
July 2 to 8	50·32	52·08	55·84	59·02	64·5	69·6
9 to 15	50·43	52·56	57·13	61·26	65·7	72·2
16 to 22	50·55	53·19	58·43	63·09	68·4	75·3
23 to 29	50·63	53·86	59·53	63·71	66·7	70·9
30 to August 5	50·76	54·50	59·90	62·69	64·6	68·3
August 6 to 12	50·91	55·04	59·86	61·65	61·6	65·5
13 to 19	51·10	55·42	59·51	60·57	61·4	65·4
20 to 26	51·31	55·72	59·36	61·06	64·6	73·8
27 to September 2	51·51	55·88	59·91	62·80	64·3	71·5
September 3 to 9	51·70	56·13	60·03	61·54	63·4	68·8
10 to 16	51·87	56·34	60·01	61·16	60·7	64·1
17 to 23	52·06	56·52	59·61	59·59	58·7	62·6
24 to 30	52·25	56·61	59·05	59·08	60·9	67·2
October 1 to October 7	52·41	56·52	58·77	58·82	57·6	61·4
8 to 14	52·58	56·51	58·43	58·47	58·9	65·4
15 to 21	52·68	56·33	57·84	55·73	50·2	51·0
22 to 28	52·80	56·12	56· 1	52·42	45·6	44·7
29 to November 4	52·92	55·74	54·45	50·09	48·2	50·8
November 5 to 11	53·00	55·12	53·40	49·71	45·7	47·1
12 to 18	53·08	54·52	52·31	48·41	46·3	48·2
19 to 25	53·10	53·86	51·63	47·70	44·1	43·7
26 to December 2	53·08	53·16	50·51	46·24	41·4	39·8
December 3 to 9	53·06	52·63	49·30	43·72	39·2	38·3
10 to 16	53·02	51·99	48·32	44·30	44·2	46·3
17 to 23	52·94	51·19	47·78	44·64	42·7	43·9
24 to 31	52·76	50·61	47·47	42·19	36·8	36·0

ABSTRACT OF THE CHANGES OF THE DIRECTION OF THE WIND, AS DERIVED FROM OSLER'S ANEMOMETER.

By *direct* motion, in the following statements, is meant that the change of the direction of the wind was in the order N., E., S., W., N., &c. by *retrograde* is meant in the order N., W., S., E., N., &c.

1868. Dec. 31^{d}. 12^{h}. The direction of the wind was W.S.W.
1869. Jan. 31. 12. ,, ,, S.W., which implies a retrograde motion of 22½°.
On Jan. 7. 8. 45^{m}, the trace was shifted to the next set of lines downwards, implying direct motion of 360°.
Therefore the whole excess of direct motion in the month of January was 337½°.

1869. Jan. 31^{d}. 12^{h}. The direction of the wind was S.W.
Feb. 28. 12. ,, ,, S.W., which implies no change.
On Feb. 20. 22, 21^{d}. 22^{h}, the trace was shifted to the next set of lines upwards; on Feb. 2^{d}. 8^{h}. 30^{m}, 12^{d}. 2^{h}. 45^{m}, the trace was shifted to the next set of lines downwards, implying retrograde motion of 720°, and direct motion of 720°.
Therefore there was no change in the month of February.

1869. Feb. 28^{d}. 12^{h}. The direction of the wind was S.W.
March 31. 12. ,, ,, N.N.E., which implies a direct motion of 157½°.
On March 3. 22, 4^{d}. 22^{h}, 7^{d}. 22^{h}, the trace was shifted to the next set of lines downwards; on March 16^{d}. 22^{h}, 19^{d}. 22^{h}, 24^{d}. 9^{h}. 15^{m}, the trace was shifted to the next set of lines upwards, implying direct motion of 1080°, and retrograde motion of 1080°.
Therefore the whole excess of direct motion in the month of March was 157½°.

1869. March 31^{d}. 12^{h}. The direction of the wind was N.N.E.
April 30. 12. ,, ,, N.E., which implies a retrograde motion of 337½°.
On April 1. 22, 14^{d}. 22^{h}, 24^{d}. 9^{h}. 15^{m}, the trace was shifted to the next set of lines downwards; on April 26^{d}. 22^{h}, the trace was shifted to the second set of lines upwards; and on April 3^{d}. 9^{h}. 15^{m}, 11^{d}. 9^{h}. 30^{m}, 22^{d}. 20^{h}. 45^{m}, 26^{d}. 1^{h}. 45^{m}, 29^{d}. 2^{h}. 45^{m}, to the next set of lines upwards, implying direct motion of 1080°, and retrograde motion of 2520°.
Therefore the whole excess of retrograde motion in the month of April was 1777½°.

1869. April 30^{d}. 12^{h}. The direction of the wind was N.E.
May 31. 12. ,, ,, N.E., which implies a direct motion of 360°.
On May 0. 22, 1^{d}. 21^{h}. 15^{m}, 3^{d}. 22^{h}, 24^{d}. 2^{h}. 40^{m}, 25^{d}. 22^{h}, the trace was shifted to the next set of lines upwards; on May 2^{d}. 22^{h}, 6^{d}. 2^{h}. 45^{m}, the trace was shifted to the second set of lines downwards; and on May 2^{d}. 1^{h}, 2^{d}. 4^{h}, 3^{d}. 0^{h}, 9^{d}. 22^{h}, 17^{d}. 1^{h}. 30^{m}, 21^{d}. 22^{h}, 23^{d}. 4^{h}. 30^{m}, 23^{d}. 22^{h}, 29^{d}. 22^{h}, to the next set of lines downwards, implying retrograde motion of 1800°, and direct motion of 4680°.
Therefore the whole excess of direct motion in the month of May was 3240°.

1869. May 31^{d}. 12^{h}. The direction of the wind was N.E.
June 30. 12. ,, ,, N.E., which implies no change.
On June 5. 22, 6^{d}. 0^{h}, 8^{d}. 22^{h}, 11^{d}. 22^{h}, 16^{d}. 9^{h}. 45^{m}, 22^{d}. 6^{h}. 30^{m}, 22^{d}. 20^{h}. 45^{m}, the trace was shifted to the next set of lines downwards; on June 27^{d}. 0^{h}. 40^{m}, the trace was shifted to the second set of lines upwards; and on June 9^{d}. 2^{h}. 45^{m}, 13^{d}. 21^{h}, 17^{d}. 22^{h}, 26^{d}. 6^{h}. 30^{m}, 27^{d}. 5^{h}. 20^{m}, 28^{d}. 22^{h}, 30^{d}. 2^{h}. 45^{m}, to the next set of lines upwards, implying direct motion of 2520°, and retrograde motion of 3240°.
Therefore the whole excess of retrograde motion in the month of June was 720°.

1869. June 30^{d}. 12^{h}. The direction of the wind was N.E.
July 31. 12. ,, ,, W.S.W., which implies a retrograde motion of 157½°.
On July 2. 2. 45^{m}, 7^{d}. 2^{h}. 45^{m}, 21^{d}. 2^{h}. 45^{m}, the trace was shifted to the second set of lines upwards; and on July 3^{d}. 7^{h}. 30^{m}, 3^{d}. 22^{h}, 4^{d}. 0^{h}, 9^{d}. 3^{h}. 30^{m}, 19^{d}. 22^{h}, 28^{d}. 2^{h}. 45^{m}, to the next set of lines upwards; on July 4^{d}. 22^{h}, 11^{d}. 8^{h}. 30^{m}, 20^{d}. 22^{h}, the trace was shifted to the second set of lines downwards; and on July 4^{d}. 8^{h}, 5^{d}. 0^{h}, 8^{d}. 2^{h}. 45^{m}, 11^{d}. 0^{h}, 12^{d}. 0^{h}, 16^{d}. 21^{h}, 17^{d}. 2^{h}. 45^{m}, 17^{d}. 8^{h}. 45^{m}, 22^{d}. 10^{h}. 40^{m}, 24^{d}. 2^{h}. 45^{m}, 24^{d}. 9^{h}, to the next set of lines downwards, implying retrograde motion of 4320°, and direct motion of 6120°.
Therefore the whole excess of direct motion in the month of July was 1642½°.

1869. July $31^d. 12^h$. The direction of the wind was W.S.W.
Aug. 31. 12. ,, ,, E.N.E., which implies a direct motion of 180°.
On Aug. 6. 22, $10^d. 1^h. 15^m$, $12^d. 2^h. 45^m$, $15^d. 9^h. 30^m$, $21^d. 8^h. 45^m$, $22^d. 6^h. 15^m$, $22^d. 20^h. 45^m$, $30^d. 2^h. 45^m$, $31^d. 9^h. 30^m$, the trace was shifted to the next set of lines downwards; on Aug. $25^d. 2^h. 45^m$, $29^d. 22^h$, the trace was shifted to the second set of lines upwards; and on Aug. $9^d. 2^h. 30^m$, $14^d. 22^h$, $31^d. 2^h. 45^m$, to the next set of lines upwards, implying direct motion of 3240°, and retrograde motion of 2520°.
Therefore the whole excess of direct motion in the month of August was 900°.

1869. Aug. $31^d. 12^h$. The direction of the wind was E.N.E.
Sept. 30. 12. ,, ,, S.S.W., which implies a retrograde motion of 225°.
On Sept. 2. 22, $3^d. 22^h$, $8^d. 2^h. 45^m$, $11^d. 22^h$, $28^d. 22^h$, $30^d. 2^h. 45^m$, the trace was shifted to the next set of lines upwards; and on $5^d. 0^h$, to the second set of lines upwards; on Sept. $5^d. 22^h$, $18^d. 2^h. 45^m$, $30^d. 6^h. 15^m$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 2880°, and direct motion of 1080°.
Therefore the whole excess of retrograde motion in the month of September was 2025°.

1869. Sept. $30^d. 12^h$. The direction of the wind was S.S.W.
Oct. 31. 12. ,, ,, W.N.W., which implies a direct motion of 90°.
On Oct. 2. 9. 15^m, $4^d. 22^h$, $7^d. 2^h. 45^m$, $8^d. 22^h$, $10^d. 22^h$, $31^d. 0^h. 15^m$, the trace was shifted to the next set of lines upwards; on Oct. $9^d. 23^h. 45^m$, the trace was shifted to the second set of lines downwards; and on Oct. $7^d. 9^h. 30^m$, $7^d. 22^h$, $11^d. 20^h. 45^m$, to the next set of lines downwards, implying retrograde motion of 2160°, and direct motion of 1800°.
Therefore the whole excess of retrograde motion in the month of October was 270°.

1869. Oct. $31^d. 12^h$. The direction of the wind was W.N.W.
Nov. 30. 12. ,, ,, N.N.W., which implies a direct motion of 45°.
On Nov. 17. 9. 20^m, $17^d. 21^h. 0^m$, the trace was shifted to the next set of lines downwards; on Nov. $27^d. 2^h. 45^m$, $29^d. 22^h$, the trace was shifted to the next set of lines upwards, implying direct motion of 720°, and retrograde motion of 720°.
Therefore the whole excess of direct motion in the month of November was 45°.

1869. Nov. $30^d. 12^h$. The direction of the wind was N.N.W.
Dec. 31. 12. ,, ,, S., which implies a retrograde motion of 157½°.
On Dec. 10. 2. 30^m, the trace was shifted to the next set of lines downwards, implying a direct motion of 360°.
Therefore the whole excess of direct motion in the month of December was 202½°.

The whole excess of direct motion to the end of the year was 1732½°.

The revolution-counter which is attached to the vertical spindle of the vane, whose readings increase with change of direction of the wind in the order N., E., S., W., &c., or in *direct* motion, and decrease with change of direction in the order N., W., S., E., &c., or in *retrograde* motion, gave the following readings:—

	revs.
On 1868, December $31^d. 12^h$	3·35
On 1869, December $31^d. 12^h$	8·25

Implying an excess of direct motion, during the year, of 4·90 revolutions, or 1764°.

AMOUNT OF RAIN COLLECTED IN EACH MONTH OF THE YEAR 1869.

1869, MONTH.	Monthly Amount of Rain collected in each Gauge.							
	Self-registering Gauge of Osler's Anemometer.	Second Gauge at Osler's Anemometer.	On the Roof of the Octagon Room.	On the Roof of the Library.	On the Roof of the Photographic Thermometer Shed.	Crosley's.	Cylinder partly sunk in the Ground read daily.	Cylinder partly sunk in the Ground read Monthly.
	in.	in.	in.	in.	in.	in.	in.	in.
January	1·36	1·25	1·69	1·31	2·32	2·38	2·92	..
February	1·25	1·22	1·76	1·76	2·24	2·33	2·34	2·50
March	0·30	0·31	0·74	1·12	1·35	1·36	1·41	1·51
April	0·57	0·54	0·81	0·80	0·98	1·03	1·01	0·95
May	2·38	2·47	2·80	3·15	3·39	3·27	3·43	3·48
June	0·80	0·78	0·99	1·06	1·13	1·14	1·15	1·20
July	0·43	0·47	0·53	0·57	0·60	0·56	0·55	0·51
August	0·83	0·79	1·05	0·86	1·16	1·21	1·21	1·22
September	2·07	2·01	2·49	2·20	3·02	2·97	3·08	3·10
October	1·23	1·22	1·66	1·38	1·72	1·70	1·77	1·81
November	1·75	1·84	2·12	2·09	2·30	2·14	2·38	2·40
December	1·74	1·75	2·17	2·01	2·65	2·53	2·77	2·80
Sums	14·71	14·65	18·81	18·31	22·86	22·62	24·02	..

The heights of the receiving surfaces are as follows:

	Above the Mean Level of the Sea. Ft.	In.	Above the Ground. Ft.	In.
The Two Gauges at Osler's Anemometer	205	6	50	8
Gauge on the Roof of the Octagon Room	193	2½	38	4½
Gauge on the Roof of the Library	177	2	22	4
Gauge on the Roof of the Photographic Thermometer Shed	164	10	10	0
Crosley's Gauge	156	6	1	8
The Two Cylinder Gauges partly sunk in the Ground	155	3	0	5

The Monthly Cylinder Gauge was under repair in the month of January.

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS

OF

LUMINOUS METEORS.

1869.

Month and Day, 1869.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	No. for Reference.
		h m s						°	
April	21	10. 33. 40	M.	1	Bluish-white	1·5	None	20	1
	„	12. 4. 30	M.	2	White	1	None	20	2
May	8	10. 8. 45	M.	2	White	0·5	None	10	3
	31	9. 49. 0	W.	Jupiter × 2	Yellowish	3	Train	40	4
	„	11. 59. 30	W.	3	Bluish-white	1	None	10	5
June	5	10. 25. 0	S.	1	Reddish	1·5	None	. .	6
	6	11. 43. 20	W.	1	Yellowish	2	Train	15	7
	7	11. 24. 50	M.	2	Bluish-white	0·5	None	10	8
	„	11. 51. 15	W.	1	Yellowish	2	Train	10	9
July	11	11. 57. 0	. .	2	Bluish-white	0·7	Slight	. .	10
	16	10. 32. 50	M.	1	Bluish-white	1	None	20	11
	21	10. 34. 26	S.	1	Bluish-white	. . .	None	. .	12
August	9	10. 23. 0	S.	2	White	1·5	Fine	20	13
	„	10. 46. 0	S.	3	Bluish-white	0·5	Slight	. .	14
	„	10. 47. 0	S.	> 1	Bluish-white	1·5	Fine	. .	15
	„	11. 11. 53	S.	Jupiter	Blue	1·5	Slight	25	16
	„	11. 23. 53	S.	1	Blue	2·0	Slight	25	17
	„	11. 30. 10	S.	3	. . .	0·5	Slight	. .	18
	„	11. 36. 19	S.	1	White	. . .	Fine, sparks	. .	19
	„	11. 44. 29	S.	2	Yellow	3	None	. .	20
		11. 54. 32	S.	2	Yellow	0·3	. . .	. .	21
	„	11. 57. 52	S.	1	Bluish	0·5	Slight	. .	22
	10	9. 54. 20	M.	1	Reddish-white	1·5	Train	15	23
	„	10. 18. 40	M.	2	White	0·5	None	10	24
	„	10. 25. 15	M.	2	Blue	0·5	None	. .	25
	12	8. 37. 23	S.	1	Yellow	2	None	30	26
	„	9. 18. 10	M.	2	Blue	1	. . .	20	27
	„	9. 29. 36	M.	2	Blue	1	. . .	10	28
	„	9. 41. 45	S.	2	. . .	0·5	None	15	29
	„	9. 47. 33	S., M.	1	Bluish	1·5	Fine	30	30
	„	9. 54. 56	M.	2	Blue	1	None	10	31
	„	9. 55. 5	S.	1	Bluish-white	0·5	Small	10	32
	„	10. 2. 2	S., M.	2	Bluish-white	. . .	Slight	. .	33
	„	10. 7. 3	S.	3	. . .	. . .	None	. .	34
	„	10. 7. 44	M.	1	White	1·5	Slight	25	35
	„	10. 7. 54	M.	3	Blue	0·5	None	10	36
	„	10. 8. 5	N.	1	Bluish-white	0·8	None	12	37
	„	10. 12. 29	S.	2	Bluish-white	0·7	Slight	10	38
	„	10. 18. 49	S., M.	2	Bluish-white	1	. . .	. .	39
	„	10. 22. 6	S.	2	Bluish-white	0·5	Slight	. .	40
	„	10. 25. 49	M.	3	Blue	0·5	. . .	5	41
	„	10. 31. 41	S., M.	1	Bluish-white	0·7	. . .	15	42
	„	10. 41. 31	M.	3	Blue	0·5	. . .	5	43
	„	10. 46. 48	S.	4	. . .	. . .	Slight	. .	44
	„	10. 51. 46	N.	2	Bluish-white	0·5	Fine	5	45
	„	10. 52. 47	S.	1	Bluish-white	0·5	None	15	46
	„	10. 53. 15	N.	Jupiter	Bluish-white	0·6	Train	10	47
	„	10. 54. 4	M.	1	Bluish-white	1·5	. . .	15	48
	„	11. 5. 41	S.	2	Bluish-white	0·5	Slight	. .	49
	„	11. 5. 55	N.	3	. . .	1	. . .	. .	50
	„	11. 7. 0	N.	1	Bluish-white	0·5	Train	10	51
	„	11. 7. 0	M.	2	Blue	0·7	. . .	15	52
	„	11. 7. 27	S.	1	Bluish-white	0·7	None	. .	53
	„	11. 12. 10	N.	3	Bluish-white	0·5	. . .	12	54
	„	11. 16. 19	S., M.	3	Bluish-white	0·5	None	5	55
	„	11. 16. 45	N.	4	. . .	0·4	. . .	3	56

No. for Reference.	Path of Meteor through the Stars.
1	From Polaris fell vertically.
2	From λ Virginis inclined.
3	From ο Leonis fell vertically.
4	From direction of δ Herculis towards Delphinus.
5	From direction of Arcturus towards α Ophiuchi.
6	From a point a few degrees to the left of α Leonis to within a short distance of Mars.
7	From β Aquilæ shot towards κ Scuti.
8	From α Aquilæ fell vertically.
9	From the direction of γ Serpentis towards λ Serpentis.
10	From the direction of γ Cygni.
11	From η Draconis fell vertically.
12	From the direction of α Coronæ shot close to β Ursæ Minoris.
13	From the direction of β Cygni towards Ursa Minor.
14	From the direction of ε Cassiopeiæ passed a few degrees below Polaris.
15	From the direction of ε Cassiopeiæ passed 15° below Polaris.
16	From the direction of ζ Cassiopeiæ to a point a little below α Ursæ Majoris.
17	From χ Persei across β Andromedæ.
18	From 1° below α Andromedæ passed about 2° or 3° below β Andromedæ.
19	Nearly stationary, close to γ Persei.
20	Moved in a curved line from θ Pegasi past θ Piscium.
21	Passed across α Andromedæ, a little above α Pegasi, and across θ Pegasi.
22	Passed from γ Pegasi across α Persei to a point half way between α and ε Persei.
23	Fell from a point near α Pegasi.
24	From θ Coronæ fell vertically.
25	From η Draconis fell nearly vertically.
26	From the direction of α Cassiopeiæ passed above α Pegasi.
27	From μ Persei towards α Aquarii.
28	From δ Ursæ Minoris towards λ Ursæ Minoris.
29	From α Cassiopeiæ through Honores.
30	From a little below δ Cassiopeiæ passed between β and η Pegasi, and disappeared near ε Pegasi.
31	From between δ and ε Cassiopeiæ towards θ Persei.
32	From *g* and *d* Lacertæ passed across ε Cygni.
33	From a little above θ Cassiopeiæ passed across φ and α Andromedæ.
34	From ε Pegasi passed midway between β and η Pegasi to a little below Honores.
35	From κ Honorum disappeared a little above *l* Pegasi.
36	From a little above Polaris disappeared above α Draconis.
37	Directed from α Andromedæ passed across α Pegasi.
38	Passed across α Draconis from the direction of Cassiopeia.
39	From β Cephei across κ Honorum.
40	From ζ Cygni passed across β Aquarii.
41	From γ Cephei passed close to Polaris.
42	From a little above η Pegasi passed between ζ and ε Pegasi.
43	Passed from a point a little above Polaris to a short distance below that star.
44	From β Cassiopeiæ towards *g* and *d* Lacertæ.
45	Started 4° above α Pegasi, and moved parallel to a line joining α and ζ Pegasi
46	From a point a little above β Cassiopeiæ passed midway between β and η Pegasi
47	From direction of α Cephei moved towards α Andromedæ.
48	From γ Trianguli passed towards β Persei.
49	From between υ and φ Persei to θ Persei.
50	Passed vertically downwards on the right of *n* Tauri Poniatowski.
51	From direction of Cepheus disappeared close to α Lyræ.
52	From between μ and λ Pegasi to midway between α and γ Aquarii.
53	Fell nearly vertically from B Camelopardali.
54	From direction of γ Draconis disappeared near α Herculis.
55	From Honores passed between α Andromedæ and β Pegasi.
56	Passed close to δ Aquilæ from direction of ζ Aquilæ.

Month and Day, 1869.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	No. for Reference.
		h m s						°	
August	12	11. 28. 14	S., M.	2	Bluish-white	0·7	Slight	. .	1
	„	11. 30. 55	N.	4	Bluish-white	0·5	. . .	5	2
	„	11. 34. 55	S.	3	. . .	0·5	Slight	. .	3
	„	11. 39. 23	S.	2	Bluish-white	0·5	White	. .	4
	„	11. 46. 33	S.	2	Bluish-white	0·5	. . .	10	5
	„	12. 9. 20	M.	2	Bluish-white	0·5	. . .	10	6
	13	10. 13. 16	S., M.	1	Bluish-white	0·7	Slight	15	7
	„	10. 26. 13	S., M.	1	Bluish-white	0·5	. . .	20	8
	„	10. 50. 18	M.	3	Bluish-white	0·5	. . .	15	9
	„	11. 2. 38	M.	1	Bluish-white	1	Train	25	10
	„	11. 9. 50	M.	1	Bluish-white	1·5	Train, sparks	30	11
	„	11. 15. 3	M.	2	White	0·7	Train	15	12
	„	11. 25. 15	M.	1	Bluish-white	1	Train	20	13
	„	11. 25. 32	M.	3	Blue	0·5	. . .	5	14
	„	11. 32. 23	M.	1	Bluish-white	1	Train	20	15
	„	11. 41. 2	M.	2	Bluish-white	0·5	. . .	10	16
	17	10. 27. 50	M.	1	Bluish-white	1·5	Train	25	17
	24	9. 57. 10	M.	2	Bluish-white	0·5	. . .	20	18
	27	9. 5. 45	M.	1	Bluish-white	1·5	Train	25	19
	„	9. 6. 30	M.	2	Bluish-white	0·7	Slight	10	20
	28	8. 47. 50	M.	2	Bluish-white	0·5	None	15	21
	30	8. 32. 30	M.	2	Bluish-white	0·7	. . .	15	22
September	5	9. 9. 45	M.	1	Bluish-white	1	None	20	23
	„	10. 17. 30	W.	1	Yellowish	1	Fine, green	40	24
	9	9. 15. 45	M.	1	Bluish-white	1	None	15	25
	28	8. 45. 15	S.	2	Bluish-white	0·5	None	15	26
October	3	9. 32. 0	N., M.	Jupiter	Bluish-white	> 4	Train	. .	27
	5	7. 52. 50	M.	2	Bluish-white	0·5	None	10	28
	„	10. 59. 0	S.	1	Bluish-white	0·7	. . .	> 30	29
	„	11. 26. 50	N.	4	. . .	. . .	. . .	About 2	30
	6	9. 13. 40	M.	2	Bluish-white	0·5	None	10	31
	„	10. 37. 27	W.	1	Yellow	1	Train	15	32
	7	8. 55. 1	W.	3	Bluish-white	0·5	None	4	33
	9	7. 33. 12	W.	3	Bluish-white	0·5	None	4	34
	„	7. 42. 28	W.	2	Yellowish	1	None	10	35
	„	10. 44. 25	W.	3	Bluish-white	0·5	None	Short	36
	„	10. 53. 31	W.	3	Bluish-white	0·5	None	15	37
	„	10. 57. 30	S.	1	Bluish	0·7	Slight	. .	38
	„	11. 3. 48	S.	2	Bluish-white	0·3	. . .	. .	39
	„	11. 8. 30	S.	1	Bluish-white	1·5	None	. .	40
	„	11. 17. 30	S.	3	Bluish-white	Rapid	Slight	30	41
	11	8. 44. 45	W.	1	Yellowish	0·8	None	5	42
	„	9. 38. 10	W.	1	Yellowish	1	Slight	10	43
	„	10. 9. 37	W.	2	Bluish-white	1	None	15	44
	12	8. 19. 35	W.	> Jupiter	Yellowish	5	Fine	25	45
	18	10. 37. 53	N.	> 1	Bluish-white	0·7	Train	7	46
	„	10. 46. 41	N.	2	Bluish-white	0·8	None	10	47
	21	8. 16. 19	W.	> Jupiter	Yellowish	3	Train	30	48
	„	9. 45. 48	S.	> 1	Bluish	1·5	None	40	49
	24	8. 54. 0	W.	> 1	Yellowish	3	Train	30	50
	26	7. 17. 12	W.	> 1	Bluish-white	3	Fine	45	51
	„	7. 22. 0	W.	> 1	Greenish	5	Fine, green	35	52
	„	9. 51. 54	W.	> 1	Reddish	3	Fine	20	53
November	4	6. 25. 0	M.	2	Bluish-white	0·7	Train	15	54
	„	9. 47. 0	C.	Sirius	Bluish-white	2	None	. .	55
	„	10. 17. 45	W.	1	Yellowish	1	Train	10 +	56
	10	9. 17. 0	N.	2	Bluish-white	0·7	None	12	57

No. for Reference.	Path of Meteor through the Stars.
1	From σ Persei passed between d_1 and d_2 Camelopardali.
2	From direction of α Lyræ passed towards θ Serpentis.
3	From between β and A Ursæ Minoris passing between ε and ζ Ursæ Majoris.
4	From between *c* and *d* Camelopardali to between σ and π Ursæ Majoris.
5	Passed in a straight line from θ across ζ Pegasi.
6	From γ Persei passed by β Persei.
7	From a little above γ Cephei passed a little above δ Ursæ Minoris.
8	From a point about 10° below Polaris, and passed between α and δ Ursæ Majoris.
9	From κ Honorum disappeared a little above γ Pegasi.
10	From *f* Custodis passed close to Polaris, and disappeared a little below λ Draconis.
11	From φ Pegasi passed a little above β Andromedæ, and disappeared between α and δ Persei.
12	From ε Pegasi passed by α Pegasi, and disappeared a little above γ Pegasi.
13	From a point between α and β Pegasi passed close to β Pegasi, and disappeared between α Andromedæ and κ Honorum.
14	From β Andromedæ towards φ Andromedæ.
15	From θ Pegasi towards ε Cygni.
16	From *f* Custodis disappeared a little above Polaris.
17	From κ Pegasi disappeared near β Piscium.
18	From α Cygni passed a little below Cassiopeia, and disappeared a little above γ Andromedæ.
19	From Polaris passed close by β Ursæ Minoris, and disappeared near ζ Ursæ Majoris.
20	From ε Boötis to ι Serpentis.
21	From δ Cygni towards ι Aquilæ.
22	From α Lyræ fell towards β Herculis.
23	From a point between β and δ Persei fell towards the horizon.
24	From the direction of γ Cygni passed close to ε Aquilæ.
25	From a point a little below Polaris fell towards Capella.
26	From near ζ Draconis passed across η Ursæ Majoris.
27	Passed from direction of ε Pegasi with center of path below β Aquilæ; end of path not seen. Inclination 45°.
28	Passed from α Lyræ towards δ Aquilæ.
29	From direction of β Cassiopeiæ fell vertically close to ο Ursæ Majoris.
30	Appeared nearly in the center of the square formed by α Andromedæ and α, β, and γ Pegasi, moving towards West.
31	From α Andromedæ towards ι Pegasi.
32	From the direction of *g* Vulpeculæ to β Sagittæ.
33	Passed midway between γ and δ Sagittæ towards α Aquilæ.
34	From η Draconis fell towards η Ursæ Majoris.
35	Directed from μ Boötis, passed midway between α and γ Coronæ.
36	Passed midway between δ and *c* Persei, directed towards α Tauri.
37	Directed from α Persei, passed about 1° above β Arietis.
38	From a point 5° left and 3° below the Pleiades shot across *f* and *g* Aurigæ.
39	From near ε Persei passed close to ο Tauri and a little above the Pleiades.
40	From a point close to ε Delphini passed close to α and γ Aquarii.
41	From near α Aurigæ passed midway between α and β Ursæ Minoris.
42	From δ towards *q* Piscium.
43	Directed from α Persei, passed immediately above *a* Camelopardali.
44	Directed from δ Trianguli, passed about 1° above ι Persei.
45	Seen through clouds. No stars visible. Apparently passed from zenith at an angle of 20° from vertical across the portion of sky where Ursa Major was visible when the clouds had cleared away.
46	From a point near θ Aurigæ fell at right angles to line joining β and θ Aurigæ.
47	Passed very rapidly about 5° to left of Polaris, moving towards γ Ursæ Minoris.
48	Passed in continuation of a line joining α Aquilæ and δ Cygni, from the former star towards horizon.
49	Came from a point a few degrees South of α Cassiopeiæ, and passed midway between β and η Pegasi.
50	Fell from a point about 25° North of Capella towards horizon at an angle of about 75°.
51	From direction of α Lyræ shot towards λ Aquilæ.
52	Fell vertically from Delphinus past β Aquarii towards horizon.
53	From direction of Castor passed nearly midway between Aldebaran and β Orionis.
54	Passed from M Camelopardali towards δ Ursæ Minoris.
55	From Capella to α Ursæ Majoris.
56	Passed, from the direction of β Cygni, about 10° above α Aquilæ.
57	In a space devoid of stars in N.N.E., falling perpendicularly from direction of α Cassiopeiæ.

Month and Day, 1869.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	No. for Reference.
		h m s						°	
November	12	11. 0. 0	N.	. . .	. . .	. . .	. . .	..	1
	„	11. 50. 0	..	. . .	. . .	. . .	. . .	..	2
	„	12. 0. 0	..	. . .	. . .	. . .	. . .	..	3
	„	12. 10. 0	..	. . .	. . .	. . .	. . .	..	4
	„	12. 21. 43	N.	Jupiter	Bluish-white	1·5	Train	12	5
	„	12. 30. 0	..	. . .	. . .	. . .	. . .	..	6
	„	12. 35. 35	M., S.	1	Bluish	1	Slight	10	7
	„	12. 49. 1	W.	2	Bluish-white	1	Slight	20	8
	„	12. 50. 0	..	. . .	. . .	. . .	. . .	..	9
	„	13. 0. 0	..	. . .	. . .	. . .	. . .	..	10
	„	13. 28. 34	W., M.	1	Bluish-white	1	Slight	10	11
	„	13. 30. 0	..	. . .	. . .	. . .	. . .	..	12
	„	13. 37. 0	..	. . .	. . .	. . .	. . .	..	13
	„	13. 58. 2	M.	2	Bluish-white	0·5	None	7	14
	„ {	14. 0. 0	..	. . .	. . .	. . .	. . .	..	15
		15. 0. 0	..	. . .	. . .	. . .	. . .	..	16
	„	15. 0. 0	..	. . .	. . .	. . .	. . .	..	17
	13	11. 0. to 13h.	N.	. . .	. . .	. . .	. . .	..	18
	„	13. 0. 0	N.	. . .	. . .	. . .	. . .	..	19
	„	14. 0. 0	N.	. . .	. . .	. . .	. . .	..	20
	„	15. 0. 0	N.	. . .	. . .	. . .	. . .	..	21
	„	16. 0. 0	N.	. . .	. . .	. . .	. . .	..	22
	14	11. 0. to 12h. 30m.	..	. . .	. . .	. . .	. . .	..	23
	„	11. 9. 45	W.	1	Bluish-white	1	Slight	8	24
	„	11. 51. 53	W., M.	1	Yellowish	Rapid	Slight	50	25
	„	12. 15. 45	N., M.	2	Bluish-white	0·7	None	10	26
	„	13. 0. 0	..	. . .	. . .	. . .	. . .	..	27
	15	10. 21. 26	M.	2	Bluish-white	0·5	None	15	28
	„	11. 46. 30	J.B.	1	Bluish	0·5	Slight	..	29
	„	11. 48. 20	M.	2	Bluish-white	0·7	None	12	30
	„	12. 0. 17	M.	2	Bluish-white	0·7	Slight	20	31
	„	12. 15. 20	J.B.	1	Yellow	1	Train	28	32
	„	12. 17. 22	M.	1	Yellowish	1·5	Very fine.	30	33
	„	12. 35. 0	J.B.	2	Blue	1	None	6	34
	16	9. 19. 30	W.	1	Bluish-white	1	None	10	35
	18	7. 44. 50	N., S., J.B.	Jupiter	White	1·5	Train	..	36
	„	8. 50. 43	M.	1	Bluish-white	1	Slight	20	37
	25	7. 29. 15	S.	Jupiter	Bluish-white	3	. . .	..	38
	28	6. 10. 51	W.	1	Bluish-white	1	None	10	39
	„	8. 53. 0	N.	Jupiter	Bluish-white	2	Slight	15	40
	30	9. 11. 0	N.	< Jupiter	Bluish-white	1	Train	20	41
December	12	6. 9. 40	M.	> Jupiter	Greenish-white	5	Train, sparks	30	42
	„	8. 5. 50	W.	2	Bluish-white	0·5	None	10	43
	„	8. 11. 35	W.	1	Bluish-white	1	None	20	44
	„	8. 12. 25	W.	2	Yellowish	1	None	15	45
	„	8. 16. 5	M., J.B.	Sirius	Greenish-white	1·5	Slight	25	46
	„	8. 49. 25	W., J.B.	> Jupiter	Bluish-white	2·5	Train	30	47
	„	8. 54. 5	M.	1	Orange	0·5	None	10	48
	„	9. 4. 55	W.	> Jupiter	Yellowish	Rapid	Fine	..	49
	„	9. 5. 35	W.	3	Bluish-white	0·5	None	4	50
	„	9. 40. 55	N.	2	White	0·4	None	5	51
	„	9. 55. 5	N.	2	White	0·3	None	3	52
	„	9. 55. 34	W.	2	Bluish-white	1	None	6	53
	„	9. 58. 59	W.	2	Bluish-white	0·5	None	4	54
	„	10. 5. 9	W., M., J.B.	2	Bluish-white	0·7	None	10	55
	„	10. 10. 59	W.	> Jupiter	Yellowish	1	Fine	..	56
	„	10. 17. 19	W.	3	Bluish-white	0·5	None	4	57

No. for Reference.	Path of Meteor through the Stars.
1	Sky overcast. 11h. 25m. Clouds breaking; stars dimly visible.
2	Again cloudy.
3	Generally cloudy; thin clouds in zenith.
4	Clearing rapidly.
5	From direction of Capella disappeared about 1° from Polaris.
6	Sky nearly cloudless.
7	From a point about 1° below Jupiter passed towards η Piscium.
8	From direction of μ Ursæ Majoris passed about 1° above υ Ursæ Majoris.
9	Thin clouds coming over from the North and West.
10	Thin clouds prevail.
11	Fell vertically towards horizon from a point midway between γ and ζ Leonis.
12	Generally cloudless.
13	Very cloudy.
14	From β Arietis fell with inclination to left, about 30° from vertical.
15, 16	Occasional breaks.
17	Overcast onwards.
18	Overcast. Strong wind.
19	Generally overcast. A few breaks here and there. Jupiter and a few principal stars now visible. 13h. 5m. Overcast.
20	Overcast. Very gusty. A few breaks for a few minutes about 14½h. No traces of meteors.
21	Overcast. Still gusty. Thin rain now and then falls.
22	Overcast. Thin rain.
23	Partially cloudy.
24	From about 1° above κ Geminorum towards horizon; path prolonged backwards would cross β Tauri.
25	From the direction of Castor passed across zenith towards δ Andromedæ.
26	From direction of β Tauri fell to a point 6° below Pollux.
27	Overcast onwards. 14½h. Thin rain falling.
28	From α Cephei fell towards α Lyræ.
29	From a point nearly midway between Jupiter and the Pleiades fell almost perpendicularly towards horizon.
30	From a point midway between α and δ Ceti fell towards horizon at an inclination of 30° from vertical.
31	From a point near μ Tauri disappeared about 5° below δ Ceti.
32	Passed midway between ε and ζ Orionis to a point a few degrees above α Ceti.
33	From λ Geminorum disappeared between ζ and ι Orionis.
34	From a little below ε Persei disappeared about 6° above β Orionis.
35	From the direction of ν Cygni fell towards a point about 1° to the right of β Cygni.
36	From direction of a point about 3° above Polaris disappeared close to β Aurigæ.
37	From a point a few degrees above ε Arietis passed in the direction of α Pegasi.
38	From a point midway between α Ursæ Minoris and γ Cephei to a point a few degrees to the right of β Ursæ Minoris.
39	From μ Draconis fell in a line parallel to line joining τ and υ Herculis.
40	From a point between β and θ Aurigæ almost to β Geminorum.
41	From direction of γ Pegasi passed between β Piscium and β Pegasi. Fell at an inclination of 45°.
42	From direction of Gemini at an inclination of 60° from vertical.
43	Path almost parallel to line joining ε and ζ Ursæ Majoris and about 5° above.
44	Passed about 5° below and parallel to line joining β and γ Ursæ Majoris.
45	Passed midway between ι and θ Orionis from direction of β Eridani.
46	From a point a little above δ Orionis towards γ Eridani.
47	From the direction of κ Orionis passed towards horizon at an angle of 40° from horizontal.
48	From direction of γ Eridani fell at an inclination of 30°.
49	Passed in a line almost parallel to β and γ Ursæ Minoris from direction of Capella.
50	Fell from β Ursæ Majoris almost vertically towards horizon.
51	Passed midway between α and γ Orionis from direction of η Geminorum.
52	Appeared about 1° above α Orionis, moving from direction of ν Geminorum.
53	From direction of θ Aurigæ passed towards ε Aurigæ.
54	From direction of γ Geminorum to a point nearly midway between α and γ Orionis.
55	From δ Aurigæ. Path prolonged forwards would cross β Ursæ Minoris.
56	Passed from ι Draconis in prolongation of line joining α Ursæ Minoris with that star.
57	Point of appearance *h* Ursæ Majoris. Directed from a point about midway between α Aurigæ and α Geminorum.

REPRINT

OF

HALLEY'S MAGNETIC CHART.

In works on Magnetism, reference is frequently made to Halley's Magnetic Chart. I have not, however, ascertained that any writer had ever seen it. As I was desirous of making myself acquainted with a document so important in the history of magnetic science, I made inquiries in nearly every Academy in Europe, but could not find any where a copy of this Chart. At length, by the kindness of J. Winter Jones, Esq., Principal Librarian of the British Museum, I discovered that there is one copy of the original edition in the British Museum.

On my expressing a wish to obtain copies of the Chart, for publication in the Greenwich Observations, Mr. Jones liberally undertook to give every facility. It was soon arranged that the most convenient process for multiplying copies would be that of photolithography. Accordingly, Messrs. Vincent Brooks, Day, and Son, Photographers and Lithographers, were engaged, under the superintendence of Mr. J. Carpenter, Assistant of the Royal Observatory, to make copies of the Chart, which they have effected with perfect success.

The measure of the original Chart is 48 inches by 20½ inches. A few copies of the Chart were taken very nearly of the same size, for limited distribution. But, as this size would have been inconvenient for insertion in the Volume of Greenwich Observations, an impression was also taken of copies on a smaller scale. These are the copies inserted in the present Volume. It is almost unnecessary to remark that, as the reduced copies were taken by use of the camera obscura, they contain every mark which is to be found in the full-size copies.

G. B. AIRY.

Royal Observatory, Greenwich,
1871, *April.*

Reduced by Photolithography 1870, September, with the permission of the Principal Librarian of the British Museum, from the copy (presumed to be of the original edition) preserved in the Library of the Museum.

The size of the Copy in the British Museum is 48 inches × 20½ inches.