RESULTS

OF THE

MAGNETICAL AND METEOROLOGICAL

OBSERVATIONS

MADE AT

THE ROYAL OBSERVATORY, GREENWICH,

IN THE YEAR

1884:

UNDER THE DIRECTION OF

W. H. M. CHRISTIE, M.A. F.R.S.

ASTRONOMER ROYAL.

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GREENWICH MAGNETICAL AND METEOROLOGICAL OBSERVATIONS, 1884.

INTRODUCTION.

§ 1. *Personal Establishment and Arrangements.*

During the year 1884 the establishment of Assistants in the Magnetical and Meteorological Department of the Royal Observatory consisted of William Ellis, Superintendent, and William Carpenter Nash, Assistant, aided usually by four Computers. The names of the Computers employed at different times during the year are, John A. Greengrass, William Hugo, Ernest E. McClellan, Frederick C. Robinson, and Edward Finch.

Mr. Ellis controls and superintends the whole of the work of the Department. Mr. Nash is charged generally with the instrumental adjustments, the determination of the values of instrumental constants, and the more delicate magnetic observations. He also specially superintends the Meteorological Reductions. The routine magnetical and meteorological observations are in general made by the Computers.

§ 2. *General Description of the Buildings and Instruments of the Magnetical and Meteorological Observatory.*

The Magnetical and Meteorological Observatory was erected in the year 1838. Its northern face is distant about 170 feet south-south-east from the nearest point of the South-East Dome, and about 35 feet south from the carpenters' workshop. On its east stands the New Library (erected at the end of the year 1881), in the construction of which non-magnetic bricks were used, and every care was taken to exclude iron. The Magnetical and Meteorological Observatory 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 is that of a cross, the arms of the cross being nearly in the directions of the cardinal magnetic points as they were in 1838. The northern arm is longer than the others, and is separated from them by a partition, and used as a computing room; the stove which warms this room, and its flue, are of copper. The remaining portion, consisting of the eastern, southern, and western arms, is known as the Upper Magnet Room. The upper declination magnet and its theodolite for determination of absolute declination, are placed in the southern arm, an opening in the roof allowing circumpolar stars to be observed by the theodolite for determination of the position of the astronomical meridian. Both the magnet and its theodolite are supported on piers built from the ground. In the eastern arm is placed the Thomson electrometer for photographic record of the variations of atmospheric electricity, its water cistern being supported by a platform fixed to the western side of the southern arm, near the ceiling. The Standard barometer is suspended near the junction of the southern and western arms. The sidereal clock, Grimalde and Johnson, is fixed at the junction of the eastern and southern arms, and there is in addition a mean solar chronometer, McCabe No. 649, for general use. A mean solar clock (Molyneux), transferred from the Astronomical Department, was set up in the northern arm during the year 1883.

Until the year 1863 the horizontal and vertical force magnets were also located in the Upper Magnet Room, the upper declination magnet being up to that time employed for photographic record of the variations of declination, as well as for absolute measure of the element. But experience having shown that the horizontal and vertical force magnets were exposed in the upper room to large variations of temperature, a room known as the Magnet Basement (in which the variations of temperature are inconsiderable) was excavated in the year 1864 below the Upper Magnet Room, and the horizontal and vertical force magnets, as well as a new declination magnet for photographic record of declination, were mounted therein. The Magnet Basement is of the same dimensions as the Upper Magnet Room. The lower declination magnet and the horizontal force and vertical force magnets, as now located in the Basement, are used entirely for record of the variations of the respective magnetic elements. The declination magnet is suspended in the southern arm, immediately under the upper declination magnet, to avoid mutual interference; the horizontal and vertical force magnets are placed in the eastern and western arms respectively, in positions nearly underneath those which they occupied when in the Upper Magnet Room. All are mounted on or suspended from supports carried by piers built from the ground. A photographic barometer is fixed to the northern wall of the Basement, and an apparatus for photographic registration of earth currents is placed near the southern wall of the eastern arm. A mean solar clock of peculiar construction for interruption of the photographic traces at each hour is fixed to the pier which supports the upper declination theodolite. Another mean solar clock is attached to the western wall of the southern arm. On the northern wall, near the photographic barometer, is fixed the Sidereal standard clock of the Astronomical Observatory, Dent 1906, communicating with the chronograph and with clocks of the Astronomical Department by means of underground wires. This clock is placed in the Magnet Basement, because of its nearly uniform temperature.

The Basement is warmed when necessary by a gas stove (of copper), and ventilated by means of a large copper tube nearly two feet in diameter, which receives the flues from the stove and all gas-lights and passes through the Upper Magnet Room to a revolving cowl above the roof. Each of the arms of the Basement has a well window facing the south, but these wells are usually closely stopped up with bags packed with straw or jute.

A platform erected above the roof of the Magnet House is used for the observation of meteors. The sunshine instrument and a rain gauge are placed on a table on this platform.

An apparatus for naphthalizing the gas used for the photographic registration is mounted in a small detached zinc-built room adjacent to the computing room on its western side.

The Dip instrument and Deflexion apparatus are placed in the New Library. Each instrument rests on a heavy slate slab supported by strong wooden framework rising from brick work built into the ground.

To the south of the Magnet House, in what is known as the Magnet Ground, is an open shed, consisting principally of a roof supported on four posts, under which is placed the photographic dry-bulb and wet-bulb thermometer apparatus. On the roof of this shed there is fixed an ozone box and a rain gauge, and close to its north-western corner are placed the earth thermometers, the upper portions of which, projecting above the ground, are protected by a small wooden hut. About 25 feet to the west of the photographic thermometers is situated the thermometer stand carrying the thermometers used for eye observations, and adjacent to the thermometer stand on the north side are several rain gauges. Between the rain gauges and the Magnet House are placed the thermometers for solar and terrestrial radiation; they are laid on short grass, and freely exposed to the sky.

The Magnet Ground is bounded on its south side by a range of seven rooms, known as the Magnet Offices. No. 1 is used as a general store room, and in it is placed the Watchman's Clock; Nos. 2, 3, and 4 are used for photographic purposes in connexion with the Photoheliograph, placed in a dome adjoining No. 3, on its south side; Nos. 5 and 6 are store rooms; No. 7 forms an ante-room and means of approach to the Lassell dome.

Two Anemometers, Osler's, giving continuous record of direction and pressure of wind and amount of rain, and Robinson's, giving continuous record of velocity, are fixed, the former above the north-western turret of the Octagon Room (the ancient part of the Observatory), the latter above the small building on the roof of the Octagon Room.

On 1883 March 3 the iron tube of the Lassell reflecting telescope was brought into the ground south of the Magnet Offices (known as the South Ground), and on

March 9 the iron supports of the same. On 1883 December 31 the iron work of the dome was brought into the same ground, and on 1884 June 26, the iron gutter of the dome in 16 pieces, weighing together about 2 tons 6 cwt. A careful examination of the magnetic registers on each of these occasions shows that no disturbance of the declination, horizontal force, or vertical force magnets was caused by the location of these masses of iron in the South Ground, at a distance of more than 100 feet from the magnets.

In order to determine the effect of a mass of iron on the magnets, experiments were made on 1884 July 2, with 4, 8, 12, and 16 pieces of the gutter respectively, placed at a distance of 25 feet from the declination magnet in a direction south-east (magnetic) from it, so that the maximum effect would be produced. The following are the results for the deflexions of the Upper Declination magnet:—

	Mean Deflexion.	
	′	″
With 4 pieces of the iron gutter - - -	1	4
,, 8 pieces ,, - - -	2	2
,, 12 pieces ,, - - - -	3	12
,, 16 pieces ,, - - -	3	40

Each piece weighs nearly 3 cwt.

As the effect of a mass of iron on a magnet varies as the sine of twice its magnetic azimuth divided by the cube of its distance from the magnet, these experiments show that the deflection caused by the whole of the iron in the Lassell instrument and dome (which is at a distance of 100 feet and very nearly in the magnetic meridian of the declination magnet) would be quite insensible.

Regular observation of the principal magnetical and meteorological elements was commenced in the autumn of the year 1840, and has been continued, with some additions to the subjects of observation, to the present time. Until the end of the year 1847 observations were in general made every two hours, but at the beginning of the year 1848 these were superseded by the introduction of the method of photographic registration, by which means a continuous record of the various elements is obtained.

For information on many particulars concerning the history of the Magnetical and Meteorological Observatory, especially in regard to alterations not recited in this volume, which have been made from time to time, the reader is referred to the Introduction to the Magnetical and Meteorological Observations for the year 1880 and previous years, and to the Descriptions of the Buildings and Grounds, with accompanying Plans, given in the Volumes of Astronomical Observations for the years 1845 and 1862.

§ 3. *Subjects of Observation in the year* 1884.

The observations comprise determinations of absolute magnetic declination, horizontal force, and dip; continuous photographic record of the variations of declination, horizontal force, and vertical force, and of the earth currents indicated in two distinct lines of wire; eye observations of the ordinary meteorological instruments, including the barometer, dry and wet bulb thermometers, and radiation and earth thermometers; continuous photographic record of the variations of the barometer, dry and wet bulb thermometers, and electrometer (for atmospheric electricity); continuous automatic record of the direction, pressure, and velocity of the wind, and of the amount of rain; registration of the duration of sunshine, and amount of ozone; observations of some of the principal meteor showers; general record of ordinary atmospheric changes of weather, including numerical estimation of the amount of cloud, and occasional phenomena.

§ 4. *Magnetic Instruments.*

UPPER DECLINATION MAGNET AND ITS THEODOLITE.—The upper declination magnet, employed solely for the determination of absolute declination, is by Meyerstein of Göttingen; it is a bar of hard steel, 2 feet long, $1\frac{1}{2}$ inch broad, and about $\frac{1}{4}$ inch thick, attached by two pinching screws to the magnet carrier, also by Meyerstein, but since altered by Troughton and Simms. To a stalk extending upwards from the magnet carrier is attached the torsion circle, which consists of two circular brass discs, one turning independently of the other on their common vertical axis, the lower and graduated portion being firmly fixed to the stalk of the magnet carrier; to the upper portion carrying the vernier is attached, by a hook, the suspension skein. This is of silk, and consists of several fibres united by juxtaposition, without apparent twist; its length is about 6 feet.

The magnet, with its suspending skein, &c., is carried by a braced wooden tripod stand, whose feet rest on slates covering brick piers, built from the ground and rising through the Magnet Basement nearly to the roof. The upper end of the suspension skein is attached to a short square wooden rod, sliding in the corresponding square hole of a fixed wooden bracket. To the upper end of the rod is fixed a leather strap, which, passing over two brass pulleys carried by the upper portion of the tripod stand, is attached to a cord which passes down to a small windlass fixed to the stand. Thus in raising or lowering the magnet, an operation necessary in determinations of its collimation error, no alteration is made in the length of the suspension skein. The magnet is inclosed in a double rectangular wooden box (one box within another), both boxes being covered externally and internally with gilt paper, and having holes at their south and north ends, for illumination of the magnet-collimator and for viewing the collimator with the theodolite telescope respectively. The holes in the outer box are covered with glass. The magnet-collimator is formed by a diagonally placed cobweb cross, and a lens of 13 inches focal length and nearly 2 inches aperture, carried by two sliding frames fixed by pinching screws to the south and north arms of the magnet respectively. The cobweb cross is in the principal focus of the lens, and its image in the theodolite telescope is well seen. From the lower side of the magnet carrier a rod extends downwards, terminating below the magnet box in a horizontal brass bar immersed in water, for the purpose of checking small vibrations of the magnet.

The theodolite, by which the position of the upper declination magnet is observed, is by Troughton and Simms. It is planted about 7 feet north of the magnet. The radius of its horizontal circle is 8·3 inches, and the circle is divided to 5′, and read, by three verniers, to 5″. The theodolite has three foot-screws, which rest in brass channels let into the stone pier placed upon the brick pier which rises from the ground through the Magnet Basement. The length of the telescope is 21 inches, and the aperture of its object glass 2 inches: it is carried by a horizontal transit axis 10½ inches long, supported on Y's carried by the central vertical axis of the theodolite. The eye-piece has one fixed horizontal wire and one vertical wire moved by a micrometer-screw, the field of view in the observation of stars being illuminated through the pivot of the transit-axis on that side of the telescope which carries the micrometer-head. The value of one division of the striding level is considered to be equal to 1″·05. The opening in the roof of the Magnet House permits of observation of circumpolar stars as high as δ Ursæ Minoris above the pole and as low as β Cephei below the pole. A fixed mark, consisting of a small hole in a plate of metal, placed on one of the buildings of the Astronomical Observatory, at a distance of about 270 feet from the theodolite, affords an additional check on its continued steadiness.

The inequality of the pivots of the axis of the theodolite telescope was found from several independent determinations made at different times to be very small. It appears that when the level indicates the axis to be horizontal the pivot at the illuminated end of the axis is really too low by $1^{div}\cdot 3$, equivalent to 1″·4.

The value in arc of one revolution of the telescope-micrometer is 1′. 34″·2.

The reading for the line of collimation of the theodolite telescope was found, by ten double observations, 1883 December 12, to be $100^{r}\cdot 334$, by ten double observations, 1884 September 11, $100^{r}\cdot 347$, and by ten double observations, 1884 December 11, $100^{r}\cdot 342$. The value used throughout the year 1884 was $100^{r}\cdot 350$.

The effect of the plane glass in front of the outer box of the declination-magnet at that end of the box towards the theodolite was determined by ten double observations made on 1882 September 14, which showed that in the ordinary position of the glass the theodolite readings were diminished by 20″·1. Other sets of observations, made on 1883 December 12 and 1884 December 11, gave 18″·9 and 19″·5 respectively. The mean of these, 19″·5, has been added to all readings throughout the year 1884.

The error of collimation of the magnet collimator is found by observing the position of the magnet, first with its collimator in the usual position (above the magnet), then with the collimator reversed (or with the magnet placed in its carrier with the collimator below), repeating the observations several times. The value used during the year 1884 was 26′. 5″·4, being the mean of determinations made on 1880 October 26, 1881 September 8, 1882 September 12, 1883 December 13, and 1884 December 12, giving respectively 25′. 56″·6, 26′. 18″·9, 26′. 15″·0, 25′. 53″·5, and 26′. 2″·9. With the collimator in its usual position, above the magnet, the quantity 26′. 5″·4 has been subtracted from all readings.

The effect of torsion of the suspending skein is eliminated by turning the lower portion of the torsion-circle until a brass bar (of the same size as the magnet, and weighted with lead weights to be also of equal weight), inserted in place of the magnet, rests in the plane of the magnetic meridian. The brass bar is thus inserted usually about once a month, and whenever the adjustment is found not to have been sufficiently close, the observed positions of the magnet are corrected for displacement of the magnet from the meridian by the torsion of the skein. Such correction is determined experimentally, with the magnet in position, by changing the reading of the torsion circle by a definite amount, usually 90°, thus giving the skein that amount of azimuthal twist, and observing, with the theodolite, the change in the position of the magnet thereby produced, from which is derived the ratio of the couple due to torsion of the skein to the couple due to the earth's horizontal magnetic force. This ratio was, on 1882 September 13, found to be $\frac{1}{126}$, on 1883 December 12, $\frac{1}{137}$, and on 1884 December 12, $\frac{1}{132}$. During the year 1884 the plane in which the suspension skein was free from torsion generally coincided with the magnetic meridian, small corrections of the absolute measures of magnetic declination for deviation from the plane of no torsion being required only in the months of June and November and in portions of the months of January, July, and December.

The time of vibration of the upper declination magnet under the influence of terrestrial magnetism was found on 1880 December 29 to be 30s·78, on 1881 September 9, 31s·30, on 1882 September 14, 31s·20, on 1883 December 13, 31s·15, and on 1884 December 11, 31s·17.

The reading of the azimuthal circle of the theodolite corresponding to the astronomical meridian is determined about once in each month by observation of the stars Polaris and δ Ursæ Minoris. The fixed mark is usually observed weekly.

The concluded mean reading of the circle for the south astronomical meridian (deduced entirely from the observations of the polar stars), used during the year 1884 for reduction of the observations of the declination magnet, was until June 4, 27°. 3′. 14″·4, and from June 5 to the end of the year, 27°. 3′. 4″·6.

In regard to the manner of making observations with the upper declination magnet:—The observer on looking into the theodolite telescope sees the image of the diagonal cross of the magnet collimator vibrating alternately right and left. The time of vibration of the magnet being about 30 seconds, he first applies his eye to the telescope about one minute, or two vibrations, before the pre-arranged time of observation, and, with the vertical wire carried by the telescope-micrometer, bisects the magnet-cross at its next extreme limit of vibration, reading the micrometer. He similarly observes the next following extreme vibration, in the opposite direction, and so on, taking in all four readings. The mean of each pair of adjacent readings of the micrometer is taken, giving three means, and the mean of these three is adopted. In practice this is done by adding the first and fourth readings to twice the second and third, and dividing the sum by 6. Should the magnet be nearly free from vibration, two bisections only of the cross are made, one at the vibration next before the pre-arranged time, the other at the vibration following. The verniers of the theodolite-circle are then read. The excess of the adopted micrometer-reading above the reading for the line of collimation of the telescope being converted into arc and applied to the mean circle-reading, and also the corrections for collimation of the magnet and for collimation of the plane glass in front of its box, the concluded circle-reading corresponding to the position of the magnet is found. The difference between this reading and the adopted reading of the circle for the south astronomical meridian gives, when, as is usually the case, no correction for torsion of the skein is necessary, the observed value of absolute declination, afterwards used for determining the value of the photographed base line on the photographic register of the lower declination magnet. The times of observation of the upper declination magnet are usually $1^h. 5^m$, $3^h. 5^m$, $9^h. 5^m$, and $21^h. 5^m$ of Greenwich mean time, reckoning from noon.

LOWER DECLINATION MAGNET.—The lower declination magnet is used simply for the purpose of obtaining photographic register of the variations of magnetic declination. It is by Troughton and Simms, and is of the same dimensions as the upper declination magnet, being 2 feet long, $1\frac{1}{2}$ inch broad, and $\frac{1}{4}$ inch thick. The magnet is suspended, in the Magnet Basement, immediately below the upper declination magnet, in order that the absolute measure of declination by the upper magnet should not be affected by the proximity of the lower magnet.

The manner of suspension of the magnet is in general similar to that of the upper declination magnet, the suspension pulleys being carried by a small pier built on one of the crossed slates resting on the brick piers rising up from the ground. The length of free suspending skein is about 6 feet, but, unlike the arrangement adopted for the upper magnet, the skein is itself carried over the suspension pulleys. The position of the azimuthal plane in which the brass bar rests, when substituted for the magnet, is examined from time to time, and adjustment made as necessary, to keep this plane in or near the magnetic meridian, such exact adjustment as is required for the upper declination-magnet not being necessary in this case.

To destroy the small accidental vibrations to which the magnet would be otherwise liable, it is encircled by a damper consisting of a copper bar, about 1 inch square, which is bent into a long oval form, the plane of the oval being vertical; a lateral bend is made in the upper bar of the oval to avoid interference with the suspension piece of the magnet. The effect of the damper is to reduce the amplitude of the oscillation after every complete or double vibration of the magnet in the proportion of 5 : 2 nearly.

In regard to photographic arrangements, it may be convenient, before proceeding to speak of the details peculiar to each instrument, to remark that the general principle adopted for obtaining continuous photographic record is the same for all instruments. For the register of each indication a cylinder of ebonite is provided, the axis of the cylinder being placed parallel to the direction of the change of indication to be registered. If, as is usually the case, there are two indications whose movements are in the same direction, both may be registered on the same cylinder: thus the movements in the case of magnetic declination and horizontal magnetic force, being both horizontal, can be registered on different parts of one cylinder with axis horizontal: so also can two different galvanic earth currents. The movements in the case of vertical magnetic force, and of the barometer, being both vertical, can similarly be registered on different parts of one cylinder having its axis vertical, as also can the indications of the dry-bulb and wet-bulb thermometers. In the electrometer the movement being horizontal, a horizontal cylinder is provided.

The cylinder is in each case driven by chronometer or accurate clock-work to ensure uniform motion. The pivots of the horizontal cylinders turn on anti-friction wheels: the vertical cylinders rest each on a circular plate turning on anti-friction wheels, the driving mechanism being placed below. A sheet of sensitized paper being wrapped round the cylinder, and held by a slender brass clip, the cylinder thus prepared is placed in position, and connected with the clock-movement: it is then ready to receive the photographic record, the optical arrangements for producing which will be found explained in the special description of each particular instrument. The cylindrical glass cover to the cylinder as used in former years is still employed for the electrometer. The sheets are removed from the cylinders and fresh sheets supplied every day, usually at noon. On each sheet, a reference line is also photographed, the arrangements for which will be more particularly described in each special case. All parts of the apparatus and all parts of the paths of light are protected, as found necessary, by wood or zinc casings or tubes, blackened on the inside, in order to prevent stray light from reaching the photographic paper.

In June 1882 the photographic process employed for so many years was discarded, and a dry paper process introduced, the argentic-gelatino-bromide-paper, as prepared by Messrs. Morgan and Kidd of Richmond (Surrey), being used with ferrous oxalate development. The greater sensitiveness of this paper permits diminution of the effective surface of the magnet mirrors, and allows also the use of smaller gas flames. In the case of the vertical force magnet the old and comparatively heavy mirror has been replaced by a small and light mirror with manifest advantage, as will be seen in the description of the vertical force magnet. The new paper works equally well at all seasons of the year, and any loss of register on account of photographic failure is now extremely rare.

Referring now specially to the lower declination magnet, there is attached to the magnet carrier, for the purpose of obtaining photographic register of the motions of the magnet, a concave mirror of speculum metal, 5 inches in diameter (reduced by a stop, on the introduction of the new photographic paper, to an effective diameter of about 1 inch), which thus partakes in all the angular movements of the magnet. The revolving ebonite cylinder is $11\frac{1}{2}$ inches long and $14\frac{1}{4}$ inches in circumference: it is supported, in an approximately east and west position, on brass uprights carried by a metal plate, the whole being planted on a firm wooden platform, the supports of which rest on blocks driven into the ground. The platform is placed midway between the declination and horizontal force magnets, in order that the variations of magnetic declination and horizontal force may both be registered on the same cylinder, which makes one complete revolution in 26 hours.

The light used for obtaining the photographic record is that given by a flame of coal gas, charged with the vapour of coal naphtha. A vertical slit about $0^{in}\cdot3$ long and $0^{in}\cdot01$ wide, placed close to the light, is firmly supported on the pier which carries the magnet. It stands slightly out of the straight line joining the mirror and the registering cylinder, and its distance from the concave mirror of the magnet is about 25 inches. The distance of the axis of the registering cylinder from the concave mirror is 134·4 inches. Immediately above the cylinder, and parallel to its axis, are placed two long reflecting prisms (each 11 inches in length) facing opposite ways towards the mirrors carried by the declination and horizontal force magnets respectively. The front surface of each prism is convex, being a portion of a horizontal cylinder. The light of the declination lamp, after passing through the vertical slit, falls on the concave mirror, and is thence reflected as a converging beam to form an image of the slit on the convex surface of the reflecting prism, by the action of which it is reflected downwards to the paper on the cylinder as a small spot of light. The concave mirror can be so adjusted in azimuth on the magnet that the spot shall fall not at the centre of the cylinder but rather towards its western side, in order that the declination trace shall not interfere with that of horizontal force, which is made to fall towards the eastern side of the cylinder. The special advantage of the arrangement here described is that the registers of both magnets are made at the same part of the circumference of the cylinder, a line joining the two spots being parallel to its axis, so that when the traces on the paper are developed, the parts of the two registers which appear in juxtaposition correspond to the same Greenwich time.

By means of a small prism, fixed near the registering cylinder, the light from another lamp is made to form a spot of light on the cylinder in a fixed position, so that, as the cylinder revolves, a reference or base line is traced out on the paper, from which, in the interpretation of the records, the ordinates are measured.

A clock of special construction, arranged by Messrs. E. Dent and Co., acting upon a small shutter placed near the declination slit, cuts off the light from the mirror two minutes before each hour, and lets it in again two minutes after the hour, thus producing at each hour a visible interruption in the trace, and so ensuring accuracy as regards time scale. By means of another shutter the observer occasionally cuts off the light for a few minutes, registering the times at which it was cut off and at which it was again let in. The visible interruptions thus made at definite times in the trace obviate any possibility of error being made by wrong numeration of the hourly breaks.

The usual hour of changing the photographic sheet is noon, but on Sundays, and occasionally on other days, this rule is not strictly followed. To obviate any uncertainty that might arise on such occasions from the interference of the two ends of a trace slightly longer than 24 hours, it has been arranged that one revolution of the cylinder should be made in 26 hours. The actual length o 24 hours on the sheet is about 13·3 inches.

The scale for measurement of ordinates of the photographic curve is thus determined. The distance from the concave mirror to the surface of the cylinder, in the actual path of the ray of light through the prism, is practically the same as the horizontal distance of the centre of the cylinder from the mirror, 134·4 inches. 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, representing a change of 1° of magnetic declination, is equal to 4·691 inches on the photographic paper. A small strip of cardboard is therefore prepared, graduated on this scale to degrees and minutes. The ordinates of the curve as referred to the base line being measured for the times at which absolute values of declination were determined by the upper declination magnet, usually four times daily, the apparent value of the base line, as inferred from each observation, is found. The process assumes that the movements of the upper and lower declination magnets are precisely similar. The separate base line values being divided into groups, usually monthly, a mean base line value is adopted for use through each group. This adopted base line value is written upon every sheet. Then, with the cardboard scale, there is laid down, conveniently near to the photographic trace, a new base line, whose ordinate represents some whole number of degrees or other convenient quantity. Thus every sheet carries its own scale of magnetic measure. From the new base line the hourly ordinates (see page *xxviii*) are measured.

HORIZONTAL FORCE MAGNET.—The horizontal force magnet, for measure of the variations of horizontal magnetic force, was made by Meyerstein of Göttingen, and like the two declination magnets, is 2 feet long, $1\frac{1}{2}$ inch broad, and about $\frac{1}{4}$ inch thick. For support of its suspension skein the back and sides of its brick pier rise through the eastern arm of the Magnet Basement to the Upper Magnet Room, being there covered by a slate slab, to the top of which a brass plate is attached, carrying, immediately above the magnet, two brass pulleys, with their axes in the same east and west line; and at the back of the pier, and opposite to these pulleys, two others, with their axes similarly in an east and west line: these constitute the upper suspension piece, and support the upper portions of the two branches of the suspension skein. The two lower pulleys, having their axes in the same horizontal plane, and their grooves in the same vertical plane, are attached to a small horizontal bar which forms the upper portion of the torsion circle: it carries the verniers for reading the torsion circle, and can be turned independently of the lower and graduated portion of the torsion circle, below which, and in rigid connexion with it, is the magnet carrier.

The suspension skein is led under the two pulleys carried by the upper portion of the torsion circle, its two branches then rise up and pass over the front pulleys of the upper suspension piece, thence to and over the back pulleys, thence descending to a single pulley, round which the two branches are tied: from this pulley a cord goes to a small windlass fixed to the back of the pier. The effective length of each of the two branches of the suspension skein is about $7^{ft}\ 6^{in}$. The distance between the branches of the skein, where they pass over the upper pulleys, is $1^{in}\cdot14$: at the lower pulleys the distance between the branches is $0^{in}\cdot80$. The two branches are not intended to hang in one plane, but are to be so twisted that their torsion will maintain the magnet in a direction very nearly east and west magnetic, the marked end being west. In this state an increase of horizontal magnetic force draws the marked end of the magnet towards the north, whilst a diminution of horizontal force allows the marked end to recede towards the south under the influence of torsion. An oval copper bar, exactly similar to that used with the lower declination magnet, is applied also to the horizontal force magnet, for the purpose of diminishing the small accidental vibrations.

Below the magnet carrier there is attached a small plane mirror to which is directed a small telescope for the purpose of observing by reflexion the graduations of a horizontal opal glass scale, attached to the southern wall of the eastern arm of the basement. The magnet, with its plane mirror, hangs within a double rectangular box, covered with gilt paper in the same way as was described for the upper declination magnet. The numbers of the fixed scale increase from east to west, so that when the magnet is inserted in its usual position, with its marked end towards the west, increasing readings of the scale, as seen in the telescope, denote increasing horizontal force. The normal to the scale that meets the centre of the plane mirror is situated at the division 51 of the scale nearly, the distance of the scale from the centre of the plane mirror being 90·84 inches. The angle between the normal to the scale, which coincides nearly with the normal to the axis of the magnet, and the axis of the fixed telescope is about 38°, the plane of the mirror being therefore inclined about 19° to the axis of the magnet.

To adjust the magnet so that it shall be truly transverse to the magnetic meridian, which position is necessary in order that the indications of the instrument may apply truly to changes in the magnitude of horizontal magnetic force, without regard to changes of direction, the time of vibration of the magnet and the reading of the fixed scale are determined for different readings of the torsion circle. In regard to the interpretation of such experiments the following explanation may be premised.

Suppose that the magnet is suspended in its carrier with its marked end in a magnetic westerly direction, not exactly west but in any westerly direction, and suppose that, by means of the fixed telescope, the reading of the scale is taken. The position of the axis of the magnet is thereby defined. Now let the magnet be taken out of its carrier, and replaced with its marked end easterly. The terrestrial magnetic force will now act, as regards torsion, in the direction opposite to that in which it acted before, and the magnet will take up a different position. But by turning the torsion-circle so as to reverse the direction of the torsion produced by the oblique tension of the two branches of the suspending skein, the magnet may be made to take the same position as before but with poles reversed, which will be proved by the reading of the scale, as seen in the fixed telescope, being the same. We thus obtain two readings of the torsion circle corresponding to the same direction of the magnet axis, but with the marked end opposite ways, without however possessing any information as to whether the magnet axis is accurately transverse to the magnetic meridian, inasmuch as the same operation can be performed whether the magnet axis be transverse or not.

But there is another observation which will indicate whether the magnet axis is or is not accurately transverse. Let, in addition, the time of vibration be taken in each position of the magnet. Resolve the terrestrial magnetic forces acting on the poles of the magnet each 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, 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, if there were no other force, the time of vibration would also be the same. But there is another force, the longitudinal force, and when the marked end is northerly this tends from the centre of the magnet's length, and when it is southerly it tends towards the centre of the magnet's length, and in a vibration of given extent this force, in one case increases that due to the torsion, and in the other case diminishes it. The times of vibration will therefore 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, and the times of vibration in both positions of the magnet become the same.

The criterion then of the position truly transverse to the meridian is this. Find the readings of the torsion circle which, with the magnet in reversed positions, will give the same readings of the scale and the same time of vibration for the magnet. With such readings of the torsion circle the magnet is, in either position, transverse to the meridian, and the difference of readings is the difference between the position in which the terrestrial magnetism acting on the magnet twists it one way and the position in which the same force twists it the opposite way, and is therefore double of the angle of torsion of the suspending lines for which, in either position, the force of terrestrial magnetism is neutralized by the torsion.

The present suspension skein was mounted on 1880 December 30, and on December 31 the following observations were made:—

1880, Day.	The Marked End of the Magnet. West. Torsion-Circle Reading.	West. Scale Reading.	West. Difference of Scale Readings for change of 1° of Torsion-Circle Reading.	West. Mean of the Times of Vibration.	East. Torsion-Circle Reading.	East. Scale Reading.	East. Difference of Scale Readings for change of 1° of Torsion-Circle Reading.	East. Mean of the Times of Vibration.
	°	div.	div.	s	°	div.	div.	s
Dec. 31	144	36·80	8·46	21·30	227	32·52	7·55	20·50
	145	45·26	7·89	21·12	228	40·07	7·28	20·62
	146	53·15	8·94	20·94	229	47·35	7·97	20·76
	147	62·09	8·06	20·74	230	55·32	7·94	20·90
	148	70·15		20·54	231	63·26	8·67	21·00
					232	71·93		21·12

From these observations it appeared that the times of vibration and scale readings were sensibly the same when the torsion circle read 146°. 15′, marked end west, and 230°. 0′, marked end east, the difference being 83°. 45′. Half this difference, or 41°. 52′·5, is therefore the angle of torsion when the magnet is transverse to the meridian. The values similarly found from other sets of observations made on 1882 January 3, 1883 February 16, 1883 December 31, and 1885 January 1, were respectively 42°. 9′, 41°. 56′, 42°. 1′·5, and 42°. 9′. The value adopted in the reduction of the observations during the year 1884 was 42°. 0′.

The adopted reading of torsion-circle, for transverse position of the magnet, the marked end being west, was 146° throughout the year.

The angle through which the magnet turns to produce a change of one division of scale reading, and the corresponding variation of horizontal force in terms of the whole horizontal force, is thus found.

The length of $30^{div}·85$ of the fixed scale is exactly 12 inches, and the distance of the centre of the face of the plane mirror from the scale 90·84 inches; consequently the angle at the mirror subtended by one division of the scale is 14′. 43″·2, or for change of one division of scale-reading the magnet is turned through an angle of 7′. 21″·6.

The variation of horizontal force, in terms of the whole horizontal force, producing angular motion of the magnet corresponding to change of one division of scale reading = cotan. angle of torsion × value of one division in terms of radius. Using the numbers above given, the change of horizontal force corresponding to change of one division of scale-reading was found to be 0·002378, which value has been used throughout the year 1884 for conversion of the observed scale-readings into parts of the whole horizontal force.

In regard to the manner of making observations with the horizontal force magnet. A fine vertical wire is fixed in the field of view of the observing telescope, across which the graduations of the fixed scale, as reflected by the plane mirror carried by the magnet, are seen to pass alternately right and left as the magnet oscillates, and the scale reading for the extreme points of vibration is easily taken. The hours of observation are usually 1^h, 3^h, 9^h, and 21^h of Greenwich mean time (reckoning from noon). Remarking that the time of vibration of the magnet is about 20 seconds, and that the observer looks into the telescope about 40 seconds before the pre-arranged time, the manner of making the observation is generally similar to that already described for the upper declination magnet.

A thermometer, the bulb of which reaches considerably below the attached scale, is so planted in a nearly upright position on the outer magnet box that the bulb projects into the interior of the inner box containing the magnet. Readings of this thermometer are usually taken at 0^h, 1^h, 2^h, 3^h, 9^h, 21^h, 22^h, and 23^h. It reads too high by 0°·3, but no correction has been applied.

The photographic record of the movements of the horizontal force magnet is made on the same revolving cylinder as is used for record of the motions of the lower declination magnet. And as described for that magnet, there is also attached to the carrier of the horizontal force magnet a concave mirror, 4 inches in diameter, reduced by a stop (on the introduction of the new photographic paper) to an effective diameter of about 1 inch. The arrangements as regards lamp, slit, and other parts are precisely similar to those for the lower declination magnet already described, and may be perfectly understood by reference to that description (pages *xii* and *xiii*), in which was incidentally included an explanation of some parts specially referring to register of horizontal force. The distance of the vertical slit from the concave mirror of the magnet is about 21 inches, and the distance of the axis of the registering cylinder from the concave mirror is 136·8 inches, the slit standing slightly out of the straight line joining the mirror and the registering cylinder. The same base line is used for measure of the horizontal force ordinates, and the register is similarly interrupted at each hour by the clock, and occasionally by the observer, for determination of time scale, the length of which is of course the same as that for declination.

The scale for measure of ordinates of the photographic curve is thus constructed. The distance from the concave mirror to the surface of the cylinder, in the actual path of the ray of light through the prism is (as for declination) practically the same as the horizontal distance of the centre of the cylinder from the mirror, or

136·8 inches. But, because of the reflexion at the concave mirror, the double of this measure, or 273·6 inches, is the distance that determines the extent of motion on the cylinder of the spot of light, which, in inches, for a change of 0·01 part of the whole horizontal force will therefore be 273·6 × tan. angle of torsion × 0·01. Taking for angle of torsion 42°. 0′ the movement of the spot of light on the cylinder for a change of 0·01 of horizontal force is thus found to be 2·464 inches, and with this unit the cardboard scale for measure of the ordinates was prepared. The ordinates being measured for the times at which eye observations of the scale were made, combination of the measured ordinates with the observed scale readings converted into parts of the whole horizontal force, gives an apparent value of the base line for each observation. These being divided into groups, mean base line values are adopted, written on the sheets, and new base lines laid down, from which the hourly ordinates (see page *xxviii*) are measured, exactly in the same way as described for declination.

The indications of horizontal force are in a slight degree affected by the small changes of temperature to which the Magnet Basement is subject. The temperature coefficient of the magnet was determined by artificially heating the Magnet Basement to different temperatures, and observing the change of position of the magnet thereby produced. This process seems preferable to others in which was observed the effect which the magnet, when inclosed within a copper trough or box and artificially heated by hot water or hot air to different temperatures, produced on another suspended magnet, since the result obtained includes the entire effect of temperature upon all the various parts of the mounting of the magnet, as well as on the magnet itself. Referring to previous volumes for details, it is sufficient here to state that from a series of experiments made in the early part of the year 1868 on the principle mentioned, it appeared that when the marked end of the horizontal force magnet was to the west (its ordinary position) a change of 1° of temperature (Fahrenheit) produced an apparent change of ·000174 of the whole horizontal force, a smaller number of observations made with the marked end of the magnet east indicating that a change of 1° of temperature produced an apparent change of ·000187 of horizontal force, increase of temperature in both cases being accompanied by decrease of magnetic force. It is concluded that an increase of 1° of temperature produces an apparent decrease of ·00018 of horizontal force.

On November 10 the cord attaching the single pulley to the small windlass gave way. It was renewed on November 11.

VERTICAL FORCE MAGNET.—The vertical force magnet, for measure of the variations of vertical magnetic force, is by Troughton and Simms. It is 1 ft. 6 ins. long and lozenge shaped, being broad at the centre and pointed at the ends; it is mounted on a solid brick pier capped with stone, situated in the western arm of the basement, its position being nearly symmetrical with that of the horizontal force magnet in the eastern arm. The supporting frame consists of two pillars, connected at their bases, on whose tops are the agate planes upon which rest the extreme parts of the continuous steel knife edge, attached to the magnet carrier by clamps and pinching screws. The knife edge, eight inches long, passes through an aperture in the magnet. The axis of the magnet is approximately transverse to the magnetic meridian, its marked end being east; its axis of vibration is thus nearly north and south magnetic. The magnet carrier is of iron; at its southern end there is fixed a small plane mirror for use in eye observations, whose plane makes with the vertical plane through the magnet an angle of $52\frac{3}{4}^{\circ}$ nearly. A telescope fixed to the west side of the brick pier supporting the theodolite of the upper declination magnet is directed to the mirror, for observation by reflexion of the divisions of a vertical opal glass scale fixed to the pier that carries the telescope, very near to the telescope itself. The numbers of this fixed scale increase downwards, so that when the magnet is placed in its usual position with the marked end east, increasing readings of the scale, as seen in the telescope, denote increasing vertical force.

The magnet is placed excentrically between the bearing parts of its knife edge, nearer to the southern side, leaving a space of about four inches in the northern part of the iron frame, in which the concave mirror used for the photographic register is planted. Two screw stalks, carrying adjustable screw weights, are fixed to the magnet carrier, near its northern side; one stalk is horizontal, and a change in the position of the weight affects the position of equilibrium of the magnet; the other stalk is vertical, and change in the position of its weight affects the delicacy of the balance, and so varies the magnitude of its change of position produced by a given change in the vertical force of terrestrial magnetism.

In the year 1882 Messrs. Troughton and Simms substituted for the old mirror of 4 inches diameter a much lighter mirror of 1 inch diameter, and also lowered the position of the knife-edge bar with respect to the magnet so as to permit of a diminution of the adjustable counterpoise weights which as well as the mirror appear to largely affect the temperature correction of this balance-magnet. The use of a smaller and much lighter mirror was rendered possible by the much greater sensitiveness of the new photographic paper introduced in 1882 June.

The whole is enclosed in a rectangular box, resting upon the pier before mentioned, and having apertures, covered with glass, opposite to the two mirrors carried by the magnet.

The time of vibration of the magnet in the vertical plane is observed usually about once in each week, or more often should it appear to be desirable. From 22 observations made between January 1 and April 30 the time of vibration was found to be $21^{s}\cdot941$; and from 43 observations made between May 3 and December 29, $19^{s}\cdot798$. The time of vertical vibration was altered on May 1 and again on May 3 by a slight shift of the screw weight on the vertical stalk in order to make equal changes of amplitude in the horizontal and vertical force photographs more nearly correspond to equal changes of absolute magnetic force.

The time of vibration of the magnet in the horizontal plane is determined by suspending the magnet with all its attached parts from a tripod stand, its broad side being in a plane parallel to the horizon, so that its moment of inertia is the same as when in observation. A telescope, with a wire in its focus, being directed to the plane mirror carried by the magnet, a scale of numbers is placed on the floor, at right angles to the long axis of the magnet, so as to be seen, by reflexion, in the fixed telescope. The magnet is observed only when swinging through a small arc. Observations made in the way described on 1884 December 30 gave for the time of vibration of the magnet in the horizontal plane, $17^{s}\cdot027$. This value has been used throughout the year 1884.

The length of the normal to the fixed vertical scale that meets the face of the plane mirror is 186·07 inches, and $30^{div}\cdot85$ of the scale correspond to 12 inches. Consequently the angle which one division of the scale subtends, as seen from the mirror, is 7′. 11″·2, or the angular movement of the normal to the mirror, corresponding to a change of one division of scale reading, is 3′. 35″·6.

But the angular movement of the normal to the mirror is equal to the angular movement of the magnet multiplied by the sine of the angle which the plane of the mirror makes with a vertical plane through the magnet. This angle, as already stated, is $52\frac{3}{4}°$, therefore dividing the result just obtained, 3′. 35″·6, by Sin. $52\frac{3}{4}°$, the angular motion of the magnet corresponding to a change of one division of scale reading is found to be 4′. 30″·9.

The variation of vertical force, in terms of the whole vertical force, producing angular motion of the magnet corresponding to change of one division of scale reading $=$ cotan. dip $\times \left(\frac{T'}{T}\right)^2 \times$ value of one division in terms of radius, in which T' is the time of vibration of the magnet in the horizontal plane, and T that in the vertical plane. From January 1 to April 30, assuming $T' = 17^{s}\cdot027$, $T = 21^{s}\cdot941$, and dip $= 67°. 30'$, the change of vertical force corresponding to change of one division of scale reading was found to be 0·000328; and from May 3 to December 29 with the same value for T', and assuming $T = 19^{s}\cdot798$, and dip $= 67°. 29\frac{1}{2}'$, it was found to be 0·000403. These values have been severally used during the periods mentioned for conversion of the observed scale readings into parts of the whole vertical force.

The hours of observation of the vertical force magnet are the same as those for the horizontal force magnet, and the method of observation is precisely similar, the time of vertical vibration being substituted for that of horizontal. The wire in the fixed telescope is here horizontal, and as the magnet oscillates the divisions of the scale are seen to pass upwards and downwards in the field of view.

As in the case of the horizontal force magnet a thermometer is provided whose bulb projects into the interior of the magnet box. Readings are taken usually at 0^h, 1^h, 2^h, 3^h, 9^h, 21^h, 22^h, and 23^h. It reads too high by $0°\cdot2$, but no correction has been applied.

The photographic register of the movements of the vertical force magnet is made on a cylinder of the same size as that used for declination and horizontal force, driven also by chronometer movement. The cylinder is here placed vertical instead of horizontal, and the variations of the barometer are also registered on it. The slit is horizontal, and other arrangements are generally similar to those already described for declination and horizontal force. The concave mirror carried by the magnet is 1 inch in diameter, and the slit is distant from it about 22 inches, being placed a little out of the straight line joining the mirror and the registering cylinder. There is a slight deviation in the further optical arrangements. Instead of falling on a reflecting prism (as for declination and horizontal force) the converging horizontal beam from the concave mirror falls on a system of plano-convex cylindrical lenses, placed in front of the cylinder, with their axes parallel to that of the cylinder. The trace is made on the western side of the cylinder, the position of the magnet being so adjusted that the spot of light shall fall on the lower part of the sheet to avoid interference with the barometer trace. A base line is photographed, and the record is interrupted at each hour by the clock, and occasionally by the observer, for establishment of time scale, in the same way as for the other magnets. The length of the time scale is the same as that for the other magnetic registers.

The scale for measure of ordinates of the photographic curve is determined as follows:—The distance from the concave mirror to the surface of the registering cylinder is 100·2 inches. But the double of this measure, or 200·4 inches, is the distance that determines the extent of motion on the cylinder of the spot of light, which, in inches, for a change of 0·01 part of the whole vertical force, will therefore be $= 200{\cdot}4 \times \tan.\ \text{dip} \times \left(\frac{T}{T'}\right)^2 \times 0{\cdot}01$. Using the values of T, T′, and of dip, before given (page *xxi*), the movement of the spot of light on the cylinder for a change of 0·01 of vertical force is thus found to be, for the period January 1 to

April 30, 8·034 inches, and from May 3 to December 29, 6·538 inches, and with these units the scales for measure of the ordinates were constructed. Base line values were then determined, and written on the sheets, and new base lines laid down, from which the hourly ordinates (see page *xxviii*) were measured, exactly in the same way as was described for horizontal force.

In regard to the temperature correction of the vertical force magnet, it is only necessary here to say that, according to a series of experiments made in a similar manner to those for the horizontal force magnet (page *xix*), it appeared that an increase of 1° of temperature (Fahrenheit) produced an apparent increase of 0·00020 of vertical force. The value of the coefficient is thus much less than was found in the old state of the magnet with the large mirror, although still not following the ordinary law of increase of temperature producing loss of magnetic power. In practice a nearly uniform temperature is as far as possible maintained.

On February 27 the driving chronometer was sent to Messrs. E. Dent and Co. to be cleaned; it was returned on February 29.

DIP INSTRUMENT.—The instrument with which the observations of magnetic dip have been made during the year 1884 is that which is known as Airy's instrument. It is mounted in the New Library on a slate slab supported by a braced wooden stand built up from the ground independently of the floor. The plan of the instrument was arranged by Sir G. B. Airy so that the points of the needles should be viewed by microscopes and if necessary observed whilst the needles were in a state of vibration, that there should be power of employing needles of different lengths, and that the field of view of each microscope should be illuminated from the side opposite to the observer, in such way that the needle point should form a dark image in the bright field.

The instrument is adapted to the observation of needles of 9 inches, 6 inches, and 3 inches in length. The main portion of the instrument, that in which the needle under observation is placed, consists of a square box made of gun metal (carefully selected to ensure freedom from iron), with back and front of glass. Six microscopes, so planted as to command the points of the three different lengths of needles, turn on a horizontal axis so as to follow the points of the needles in the different positions which in observation they take up. The object glasses and field glasses of the microscopes are within the front glass plate, their eye glasses being outside, and turning with them on the same axis. Upon the plane side of each field glass (the side next the object glass and on which the image of the needle point is formed) a scale is etched. And on the inner side of the front glass plate is etched the graduated circle, divided to 10′, and read by two verniers to 10″. The verniers (thin plates of metal, with notches instead of lines, for use with transmitted light) are carried by the horizontal axis, inside the front glass plate, their reading lenses, attached to the same axis, being outside. A suitable clamp with slow motion is provided. The microscopes and verniers can be illuminated by one gas lamp, the light from which falling on eight corresponding prisms is thereby directed to each separate microscope and vernier. The prisms are carried behind the back glass plate on a circular frame in such a way that, on reversion of the instrument in azimuth, the whole set of prisms can at one motion of the frame be shifted so as to bring each one again opposite to its proper microscope or vernier.

Since the instrument has been placed in the New Library artificial light has not been employed in making the observation.

The whole of the apparatus is planted upon a circular horizontal plate, admitting of rotation in azimuth: a graduated circle near the circumference of the plate is read by two fixed verniers.

A brass zenith point needle, having points corresponding in position to the three different lengths of dip needles, is used to determine the zenith point for each particular length of needle.

The instrument carries two levels, one parallel to the plane of the vertical circle, the other at right angles to that plane, by means of which the instrument is adjusted in level from time to time. The readings of the first-mentioned level are also regularly employed to correct the apparent value of dip for any small outstanding error of level: the correction seldom exceeds a very few seconds.

The needles in regular use are of the ordinary construction; they are two 9-inch needles, B_1 and B_2, two 6-inch needles, C_1 and C_2, and two 3-inch needles, D_1 and D_2. Needle B_2 was taken away by Mr. Dover on May 29 to fit a new axis; it was returned on June 23.

DEFLEXION INSTRUMENT.—The observations of deflexion of a magnet in combination with observations of vibration of the deflecting magnet, for determination of the absolute measure of horizontal magnetic force, are made with a unifilar instrument, which, with the exception of some slight modification of the mechanical arrangements, is similar to those issued from the Kew Observatory. Until the beginning of March 1883 it was mounted on a block of wood in the Magnet Office No. 7, on the south side of the Dip instrument. It is now mounted in the New Library on a slate slab in the same way as the Dip instrument.

The deflected magnet, used merely to ascertain the ratio which the power of the deflecting magnet at a given distance bears to the power of terrestrial magnetism, is 3 inches long, and carries a small plane mirror, to which is directed a telescope fixed to and rotating with the frame that carries also the suspension piece of the deflected magnet: a scale fixed to the telescope is seen by reflexion at the plane mirror. The deflecting magnet is a hollow cylinder 4 inches long, containing in its internal tube a collimator, by means of which in another apparatus its time of vibration is observed. In observations of deflexion the deflecting magnet is placed on the transverse deflexion rod, carried by the rotating frame, at the distances 1·0 foot and 1·3 foot of the engraved scale from the deflected magnet, and with one end towards the deflected magnet. Observations are made at the two distances mentioned, with the deflecting magnet both east and west of the deflected magnet, and also with its poles in reversed positions. The fixed horizontal circle is 10 inches in diameter: it is graduated to 10′, and read by two verniers to 10″.

It will be convenient in this case to include with the description of the instrument an account of the method of reduction employed, in which the Kew precepts and generally the Kew notation are followed. Previous to the establishment of the instrument at the Royal Observatory the values of the various instrumental constants, as determined at the Kew Observatory, were kindly communicated by Professor Balfour Stewart, and these have been since used in the reduction of all observations made with the instrument at Greenwich.

The instrumental constants as thus furnished are as follows:—

The increase in the magnetic moment of the deflecting magnet produced by the inductive action of unit magnetic force in the English system of absolute measurement $= \mu =$ 0·00015587.

The correction for decrease of the magnetic moment of the deflecting magnet required in order to reduce to the temperature 35° Fahrenheit $= c =$ 0·00013126 $(t - 35) +$ 0·000000259 $(t-35)^2$: t representing the temperature (in degrees Fahrenheit) at which the observation is made.

Moment of inertia of the deflecting magnet $= K$. At temperature 30°, log. $K =$ 0·66643: at temperature 90° log. $K =$ 0·66679.

The distance on the deflexion rod from 1^{ft}·0 east to 1^{ft}·0 west of the engraved scale, at temperature 62°, is too long by 0·0034 inch, and the distance from 1^{ft}·3 east to 1^{ft}·3 west is too long by 0·0053 inch. The coefficient of expansion of the scale for 1° is ·00001.

The adopted value of K was confirmed in the year 1878 by a new and entirely independent determination made at the Royal Observatory, giving log. K at temperature 30° = 0·66727.

Let $m =$ Magnetic moment of deflecting or vibrating magnet.
$X =$ Horizontal component of Earth's magnetic force.

Then, if in the two deflexion observations, r_1, r_2 be the apparent distances of centre of deflecting magnet from deflected magnet, corrected for scale error and temperature (about 1·0 and 1·3 foot).

u_1, u_2 the observed angles of deflexion.

$$A_1 = \tfrac{1}{2}\, r_1^3 \sin.\, u_1 \left\{1 + \frac{2\mu}{r_1^3} + c\right\}$$
$$A_2 = \tfrac{1}{2}\, r_2^3 \sin.\, u_2 \left\{1 + \frac{2\mu}{r_2^3} + c\right\}$$
$$P = \frac{A_1 - A_2}{\frac{A_1}{r_1^2} - \frac{A^2}{r_2^2}}$$ [P being a constant depending on the distribution of magnetism in the deflecting and deflected magnets],

we have :—

$\frac{m}{X} = A_1\left(1 - \frac{P}{r_1^2}\right)$, from observation at distance r_1.

$\frac{m}{X} = A_2\left(1 - \frac{P}{r_2^2}\right)$, from observation at distance r_2.

The mean of these is adopted as the true value of $\frac{m}{X}$.

For determination, from the observed vibrations, of the value of mX :—let T_1=time of vibration of the deflecting magnet, corrected for rate and arc of vibration,

$\frac{H}{F}$ = ratio of the couple due to torsion of the suspending thread to the couple due to the Earth's magnetic force. [This is obtained from the formula $\frac{H}{F} = \frac{\theta}{90^\circ - \theta}$, where θ = the angle through which the magnet is deflected by a twist of 90° in the thread.]

$$\text{Then } T^2 = T_1^2 \left\{ 1 + \frac{H}{F} + \mu \frac{X}{m} - c \right\}$$
$$\text{and } mX = \frac{\pi^2 K}{T^2}.$$

The adopted time of vibration is the mean of 100 vibrations observed immediately before, and of 100 vibrations observed immediately after the observations of deflexion.

From the combination of the values of $\frac{m}{X}$ and mX, m and X are immediately found. The computation is made with reference to English measure, taking as units of length and weight the foot and grain, but it is desirable to express X also in metric measure. If the English foot be supposed equal to α times the millimètre, and the grain equal to β times the milligramme, then for reduction to metric measure $\frac{m}{X}$ and mX must be multiplied by α^3 and $\alpha^2\beta$ respectively, or X must be multiplied by $\sqrt{\frac{\beta}{\alpha}}$. Taking the mètre as equal to 39·37079 inches, and the gramme as equal to 15·43249 grains, the factor by which X is to be multiplied in order to obtain X in metric measure is $0{\cdot}46108 = \frac{1}{2{\cdot}1689}$. The values of X in metric measure thus derived from those in English measure are given in the proper table. Values of X in terms of the centimètre and gramme, known as the C.G.S. unit (centimètre-gramme-second unit), are readily obtained by dividing those referred to the millimètre and milligramme by 10.

EARTH CURRENT APPARATUS.—For observation of the spontaneous galvanic currents which in some measure are almost always discoverable in the earth, and which are occasionally very powerful, two insulated wires having earth connexions at Angerstein Wharf (on the bank of the River Thames near Charlton) and Lady Well for one circuit; and at the Morden College end of the Blackheath Tunnel and the North Kent East Junction of the South-Eastern Railway for the other circuit, have been employed. The connecting wires pass from the Royal Observatory to the Greenwich Railway Station and thence, by kind permission of the Directors of the South-Eastern Railway Company, along the lines of the South-Eastern Railway to the respective earths, in each case a copper plate. The direct distance between the earth plates of the Angerstein Wharf—Lady Well circuit is 3 miles, and the azimuth of the line, reckoning from magnetic north towards east, 50°; in the Blackheath—North Kent East circuit the direct distance is $2\frac{1}{2}$ miles, and the azimuth, from magnetic north towards west, 46°. The actual lengths of wire in the circuitous courses which the wires necessarily take in order to reach the Observatory registering apparatus are about $7\frac{1}{2}$ miles and 5 miles respectively. The identity of the four branches is tested from time to time as appears necessary.

In each circuit at the Royal Observatory there is placed a horizontal galvanometer, having its magnet suspended by a hair. Each galvanometer coil contains 150 turns of No. 29 copper wire, or the double coil of each instrument consists of 300 turns of wire. They are placed on opposite sides of the registering cylinder which is horizontal. One galvanometer stands towards one end of the cylinder, and the other towards the other end, and each carries, on a light stalk extending downwards from its magnet, a small plane mirror. Immediately above the cylinder are placed two long reflecting prisms which, except that they are each but half the length of the cylinder, and are placed end to end, are generally similar to those used for magnetic declination and horizontal force, the front convex surfaces facing opposite ways, each towards the mirror of its respective galvanometer. In each case the light of a gas lamp, passing through a vertical slit and a cylindrical lens having its axis vertical, falls upon the galvanometer mirror, which reflects the converging beam to the convex surface of the reflecting prism, by whose action it is made to form on the paper on the cylinder a small spot of light; thus all the azimuthal motions of the galvanometer magnet are registered. The extent of trace for each galvanometer is thus confined to half the length of the cylinder, which is of the same size as those used for the magnetic registers. The arrangements for turning the cylinder, automatically determining the time scale, and forming a base line are similar to those which have been before described. When the traces on the paper are developed the parts of the registers which appear in juxtaposition correspond, as for declination and horizontal force, to the same Greenwich time, and the scale of time is of the same length as for the magnetic registers.

§ 5. *Magnetic Reductions.*

The results given in the Magnetic Section refer to the astronomical day, commencing at noon.

Before proceeding to discuss the photographic records of magnetic declination, horizontal force, and vertical force, they were divided into two groups, one including all days on which the traces showed no particular disturbance, and which therefore were suitable for the determination of diurnal inequality; the other comprising days of unusual and violent disturbance, when the traces were so irregular that it appeared impossible to treat them except by the exhibition of every motion of each magnet through the day. Following the principle of separation hitherto adopted, there are 5 days in the year 1884 which have been classed as days of great disturbance. These are July 2, 3, October 1, 2, and November 2. Other days of lesser disturbance were February 23, 24, 25, 29, March 1, 2, 3, 28, April 17, 24, 30, June 22, 23, August 8, 9, September 17, 18, November 1, 3, and December 22.

Separating the 5 days of great disturbance to be spoken of hereafter, the photographic sheets for the remaining available days, including those of lesser disturbance, were thus treated. Through each photographic trace a pencil line was drawn representing the general form of the curve, without its petty irregularities. The ordinates of these pencil curves were then measured, with the proper pasteboard scales, at every hour, the measures being entered in a form having double argument, the vertical argument ranging through the 24 hours of the astronomical day, and the horizontal argument through the days of a calendar month, the means of the numbers standing in the vertical columns giving the mean daily value of the element, and the means of the numbers in the horizontal columns the mean monthly value at each hour of the day. Tables I. and II. contain the results for declination, Tables III. to VI. those for horizontal force, with corresponding tables of temperature, and Tables VII. to X. those for vertical force, with corresponding tables of temperature. Table XI. gives the collected monthly values for declination, horizontal force, and vertical force, and Table XII. the mean diurnal inequalities for the year.

The temperature of the horizontal and vertical force magnets was maintained so nearly uniform through each day that the determination of the diurnal inequalities of horizontal and vertical force should possess great exactitude. It was not possible under the circumstances to maintain similar uniformity of temperature through the seasons, a point however of less importance. In preceding years the results for horizontal and vertical force have been given uncorrected for temperature, leaving the correction to be applied when the results for series of years are collected for discussion; but commencing with the year 1883 it has been considered desirable to add also, in Tables III., V., VII., and IX., results corrected for temperature, in order to render them more immediately available. In Tables XI. and XII., only results corrected for temperature are given. The corrected mean daily and mean hourly values of horizontal force given in Tables III. and V. respectively are obtained by applying to the uncorrected values the correction $(t^\circ - 32^\circ) \times \cdot 00018$, where t° is the temperature (Fahrenheit), and to those of vertical force, Tables VII. and IX., the correction $-(t^\circ - 32^\circ) \times \cdot 00020$. The corrections applied are founded on the daily and hourly values of temperature given in Tables IV., VI., VIII., and X.

In order to economise space the daily values as exhibited in Tables III. and VII., both uncorrected and corrected, have been diminished by constants. The division ═══ in these Tables and in Table XI. indicates that the instrument has been disturbed for experiment or adjustment, or that for some reason the continuity of the values has been broken, the constants deducted being different before and after each break. In the interval between two breaks the constant deducted remains the same, and that deducted in Tables III. and VII. from the corrected values differs from that deducted from the uncorrected values by some multiple of 100. In Tables II., V., IX., and XII. the separate hourly values of the different elements have been simply diminished by the smallest hourly value.

The variations of declination are given in the sexagesimal division of the circle, and those of horizontal and vertical force in terms of ·00001 of the whole horizontal and vertical forces respectively taken as units. In Tables XI. and XII. they have been also expressed in terms of ·00001 of Gauss's absolute unit, as referred to the metrical system of the millimètre-milligramme-second.

The factors for conversion from the former to the latter system of measures are as follows:—

For variation of declination, expressed in minutes, the factor is

$$\text{H. F. in metrical measure} \times \sin 1' = 1 \cdot 812 \times \sin 1' = 0 \cdot 0005271.$$

For variation of horizontal force, the factor is

$$\text{H. F. in metrical measure} = 1 \cdot 812,$$

and for variation of vertical force

$$\text{V. F. in metrical measure} = \text{H. F. in metrical measure} \times \tan \text{dip},$$
$$= 1 \cdot 812 \times \tan 67^\circ . 29\tfrac{1}{2}' = 4 \cdot 373.$$

The measures as referred to the millimètre-milligramme-second are convertible into measures on the centimètre-gramme-second (C. G. S.) system by dividing by 10.

Table XIII. exhibits the diurnal range of declination and horizontal force on each separate day, as determined from the 24 hourly ordinates of each element measured from the photographic register (as explained on page *xxviii*), and the monthly means of these numbers, the results for horizontal force being corrected for temperature The first portion of Table XIV. contains the difference between the greatest and least hourly mean values in each month, for declination, horizontal force, and vertical force, as extracted from Table II., and columns *c* of Tables V. and IX. In the second portion of the table there are given for each month the numerical sums of the deviations of the 24 hourly values from the mean, taken without regard to sign.

The magnetic diurnal inequalities of declination, horizontal force, and vertical force, for each month and for the year, have been treated by the method of harmonic analysis, and the results are given in Tables XV. and XVI. The values of the coefficients contained in Table XV. have been thus computed, 0 representing the value at 0^h, 1 that at 1^h, and so on.

$$
\begin{aligned}
m &= \tfrac{1}{24}\,(0+1+2\ldots\ldots22+23).\\
12\,a_1 &= 0-12 + (\overline{1+23} - \overline{11+13}) \cos 15^\circ + (\overline{2+22} - \overline{10+14}) \cos 30^\circ\\
&\quad + (\overline{3+21} - \overline{9+15}) \cos 45^\circ + (\overline{4+20} - \overline{8+16}) \cos 60^\circ\\
&\quad + (\overline{5+19} - \overline{7+17}) \cos 75^\circ.\\
12\,b_1 &= 6-18 + (\overline{5+7} - \overline{17+19}) \sin 75^\circ + (\overline{4+8} - \overline{16+20}) \sin 60^\circ\\
&\quad + (\overline{3+9} - \overline{15+21}) \sin 45^\circ + (\overline{2+10} - \overline{14+22}) \sin 30^\circ\\
&\quad + (\overline{1+11} - \overline{13+23}) \sin 15^\circ.\\
12\,a_2 &= \overline{0+12} - \overline{6+18} + (\overline{1+11+13+23} - \overline{5+7+17+19}) \cos 30^\circ\\
&\quad + (\overline{2+10+14+22} - \overline{4+8+16+20}) \cos 60^\circ.\\
12\,b_2 &= \overline{3+15} - \overline{9+21} + (\overline{2+4+14+16} - \overline{8+10+20+22}) \sin 60^\circ\\
&\quad + (\overline{1+5+13+17} - \overline{7+11+19+23}) \sin 30^\circ.\\
12\,a_3 &= \overline{0+8+16} - \overline{4+12+20} + (\overline{1+7+9+15+17+23} - \overline{3+5+11+13+19+21}) \cos 45^\circ.\\
12\,b_3 &= \overline{2+10+18} - \overline{6+14+22} + (\overline{1+3+9+11+17+19} - \overline{5+7+13+15+21+23}) \sin 45^\circ.\\
12\,a_4 &= \overline{0+6+12+18} - \overline{3+9+15+21}\\
&\quad + (\overline{1+5+7+11+13+17+19+23} - \overline{2+4+8+10+14+16+20+22}) \cos 60^\circ.\\
12\,b_4 &= (\overline{1+2+7+8+13+14+19+20} - \overline{4+5+10+11+16+17+22+23}) \sin 60^\circ.
\end{aligned}
$$

The values of the coefficients c_1, and of the constant angles α contained in Table XVI., are then determined by means of the following relations:—

$$\frac{a_1}{b_1} = \tan\alpha \qquad\qquad c_1 = \frac{a_1}{\sin\alpha} = \frac{b_1}{\cos\alpha}.$$

Similarly for c_2, β, &c.

Finally, the values of the angles α', β', &c. were thus found. Calling the Sun's hour angle east at mean solar noon $= h$, then—

$$
\begin{aligned}
\alpha' &= \alpha + h\\
\beta' &= \beta + 2h\\
\&c. &= \&c.,
\end{aligned}
$$

a mean value of h for the month being employed.

The values of a_5 and b_5 for the diurnal inequalities for the year were also calculated, but could not be conveniently included in Table XV.; they are as follows:—

1884.	a_5.	b_5.
	′	′
Declination	+0·09	+0·04
Horizontal Force........	+0·4	+1·7
Vertical Force	−0·9	+0·4

In order to give some indication of the accuracy with which the results of observation are represented by the harmonic formula, the sums of squares of residuals remaining after the introduction of m and of each successive pair of terms of the expression on page (xii), corresponding to the single terms of the expressions on page (xiii), have been calculated for the mean diurnal inequalities for the year (columns 1, 2, and 3 of Table XII.). The respective sums of squares of residuals are as follows:—

SUMS OF SQUARES OF RESIDUALS OF DIURNAL INEQUALITIES.

For the Year 1884.	Declination.	Horizontal Force.	Vertical Force.
	′		
Sums of Squares of Observed Values (Table XII)............	422·47	453983·0	25503·0
Sums of Squares of Residuals after the introduction of m......	174·01	74419·2	4728·9
” ” a_1 and b_1	65·14	21248·4	2091·1
” ” a_2 and b_2	15·13	4124·7	434·9
” ” a_3 and b_3	1·80	914·4	68·9
” ” a_4 and b_4	0·18	53·3	17·8
” ” a_5 and b_5	0·06	18·0	5·5

The unit in the case of horizontal and vertical force being ·00001 of the whole horizontal and vertical forces respectively, it thus appears that there would be no advantage in carrying the approximation (Table XV.) beyond the determination of a_4, b_4.

As regards Magnetic Dip, the result of each separate observation of dip with each of the six needles in ordinary use is given in Table XVII., and in Table XVIII. the concluded monthly and yearly values for each needle.

The results of the observations for Absolute Measure of Horizontal Force contained in Table XIX. require no special remark, the method of reduction and all necessary explanation having been given with the description of the instrument.

No numerical discussion of Earth Current records is contained in the present volume.

In the treatment of disturbed days it was formerly the custom to measure out for each element all salient points of the curves and to print the numerical values. But, since the year 1882, it has been considered preferable to give instead of these tables reduced copies of the actual photographic curves (reproduced by photo-lithography from full-sized tracings of the original photographs), adding thereto copies of the corresponding earth current curves. The registers thus exhibited are those for the days of great and of lesser disturbance mentioned on page *xxviii.*

The plates are preceded by a brief description of *all* significant magnetic motions (superposed on the ordinary diurnal movement) recorded throughout the year. These, in combination with the plates, give very complete information on magnetic disturbances during the year 1884, affording thereby, it is hoped, facilities for making comparison with solar phenomena.

In regard to the plates, it may be remarked that on each day five distinct registers are given, viz.: declination, horizontal force, vertical force, and the two earth currents, all necessary information for proper understanding of the plates being given in the notes on page (xxiv). No attempt has been made to determine earth current scales in terms of any electrical unit, but it may be stated that the instrumental conditions are similar for the two circuits, excepting that the communicating wire of the E_1 circuit is longer than that of the E_2 circuit in the proportion of 3 to 2, and that the distances between the earth plates of the former and of the latter are in the proportion of 6 to 5.

An additional plate (XI.) exhibits the registers of declination, horizontal force, and vertical force on four quiet days, which may be taken as types of the ordinary diurnal movement at four seasons of the year. The earth currents on these days are insensible on the scale of the photographic register.

The indications of horizontal and vertical force are given precisely as registered; they are therefore affected, slightly as compared with the amount of motion on disturbed days, by the small recorded changes of temperature of the magnets. The observed temperatures being inserted on the plates, reference to the temperature coefficients of the magnets, given at page *xix* for horizontal force, and page *xxiii* for vertical force, will show the effect produced. Briefly, an increase of nearly 6° of temperature throws the horizontal force curve upward by 0·001 of the whole horizontal force; an increase of 5° of temperature throws the vertical force curve downward by 0·001 of the whole vertical force.

The original photographs have been reduced in the proportion of 20 to 11 on the plates, and the corresponding scale values are :—

—	Length in Inches			
	Of 1° of Declination throughout the Year.	Of 0·01 of Horizontal Force throughout the Year.	Of 0·01 of Vertical Force.	
			January 1 to April 30.	May 3 to December 29.
	in.	in.	in.	in.
On the Photographs -	4·691	2·464	8·034	6·538
On the Plates -	2·580	1·355	4·419	3·596

The scales actually attached to the plates are, however, so arranged as to correspond with the tables of the magnetic section, that is to say, the units for horizontal force and vertical force are ·00001 of the whole horizontal and vertical forces respectively.

But the preceding scale values are not immediately comparable for the different elements, and it will therefore be desirable to refer them all to the same unit, say 0·01 of the horizontal force.

Now, the transverse force represented by a variation of 1° of Declination

$$= \cdot 0175 \text{ of Horizontal Force}$$

$$\text{and Vertical Force} = \text{Horizontal Force} \times \tan.\ \text{dip}\ [\text{dip} = 67^\circ.\ 29\tfrac{1}{2}']$$

$$= \text{Horizontal Force} \times 2\cdot 4132$$

whence we have the following equivalent scale values for the different elements, as applying to the plates :—

Length of Unit, equivalent to 0·01 of Horizontal Force.			
For Declination Curve throughout the Year.	For Horizontal Force Curve throughout the Year.	For Vertical Force Curve.	
		January 1 to April 30.	May 3 to December 29.
in.	in.	in.	in.
1·47	1·36	1·83	1·49

It may be convenient to give also comparative scale values for the different systems of absolute measurement, viz.:—

Foot-grain-second, or	British unit, in terms of which Mean H. F. for 1884	= 3·931
Millimètre-milligramme-second, or	Metric unit, " " "	= 1·812
Centimètre-gramme-second, or	C. G. S. unit, " " "	= 0·1812

Dividing therefore the scale values last given by 3·931, 1·812, and 0·1812 respectively, the following comparative scale values for each of the elements on the plates as referred to 0·01 of these units respectively are found:—

UNIT.	LENGTH OF 0·01 OF UNIT.			
	Declination throughout the Year.	Horizontal Force throughout the Year.	Vertical Force.	
			January 1 to April 30.	May 3 to December 29.
	in.	in.	in.	in.
British - -	0·38	0·34	0·47	0·38
Metric - -	0·81	0·75	1·01	0·82
C. G. S. - -	8·1	7·5	10·1	8·2

Slight interruptions in the traces on the plates are due to various causes. In the originals there are breaks at each hour for time scale, so slight however that, in the copies, the traces could usually be made continuous without fear of error: in a few cases, however, this could not be done. Further, to check the numeration of hours, the observer interrupts the register at definite times for about five minutes, usually at or near $2^h. 30^m$, $8^h. 30^m$, and $21^h. 30^m$, and at somewhat different times on Sundays. The interruption in the earth-current registers is greater than in the other registers because of the necessity of also temporarily disconnecting the wires for determination of the instrumental zeros. A weekly clearing of the gas pipes also causes a somewhat longer interruption, usually at about 22^h, as on February $29^d. 22\frac{1}{2}^h$. There are other small interruptions due to various causes which scarcely call for special remark.

The original photographic records were first traced on thin paper, the separate records on each day being arranged one under another on the same sheet, and great attention being paid to accuracy as regards the scale of time. Each sheet containing the records for two or more days was then reduced by photo-lithography, in the proportion of 20 to 11, to bring it to a convenient size for insertion in the printed volume.

§ 6. *Meteorological Instruments.*

STANDARD BAROMETER.—The standard barometer, mounted in 1840 on the southern wall of the western arm of the upper magnet room, is Newman No. 64. Its tube is $0^{in}\cdot565$ in diameter, and the depression of the mercury due to capillary action is $0^{in}\cdot002$, but no correction is applied on this account. The cistern is of glass, and the graduated scale and attached rod are of brass; at its lower end the rod terminates in a point of ivory, which in observation is made just to meet the reflected image of the point as seen in the mercury. The scale is divided to $0^{in}\cdot05$, subdivided by vernier to $0^{in}\cdot002$.

The readings of this barometer until 1866 August 20 are considered to be coincident with those of the Royal Society's flint-glass standard barometer. It then became necessary to remove the sliding rod, for repair of its slow motion screw, which was completed on August 30. Before the removal of the rod the barometer had been compared with three other barometers, one of which, during repair of the rod, was used for the daily readings. After restoration of the rod a comparison was again made with the same three barometers, from which it appeared that the readings of the standard, in its new state, required a correction of $-0^{in}\cdot006$, all three auxiliary barometers giving accordant results. This correction has been applied to every observation since 1866 August 30.

An elaborate comparison of the standard barometers of the Greenwich and Kew Observatories, made, under the direction of the Kew Committee, by Mr. Whipple, Superintendent of the Kew Observatory, in the spring of the year 1877, showed that the difference between the two barometers (after applying to the Greenwich barometer readings the correction $-0^{in}\cdot006$) did not exceed $0^{in}\cdot001$. (*Proceedings of the Royal Society*, vol. 27, page 76.)

The height of the barometer cistern above the mean level of the sea is 159 feet, being $5^{ft}\ 2^{in}$ above Mr. Lloyd's reference mark in the then transit room, now the Astronomer Royal's official room (*Philosophical Transactions*, 1831).

The barometer is usually read at 21^h, 0^h, 3^h, 9^h (astronomical reckoning). Each reading is corrected by application of the index correction above mentioned, and reduced to the temperature 32° by means of Table II. of the "Report of the

Committee of Physics" of the Royal Society. The readings thus found are used to determine the value of the instrumental base line on the photographic record.

PHOTOGRAPHIC BAROMETER.—The barometric record is made on the same cylinder as is used for magnetic vertical force, the register being arranged to fall on the upper half of the cylinder, on its eastern side. A siphon barometer fixed to the northern wall of the Magnet Basement is employed, the bore of the upper and lower extremities of the tube being about 1·1 inch. A metallic float is partly supported by a counterpoise acting on a light lever, leaving a definite part of its weight to be supported by the mercury. The lever carries at its other end a vertical plate of blackened mica, having a small horizontal slit, whose distance from the fulcrum is about eight times that of the point of connexion with the float, and whose vertical movement is therefore about four times that of the ordinary barometric column. The light of a gas lamp, passing through this slit and falling on a cylindrical lens, forms a spot of light on the paper. The barometer can, by screw action, be raised or lowered so as to keep the photographic trace in a convenient part of the sheet. A base line is traced on the sheet, and the record is interrupted at each hour by the clock and occasionally by the observer in the same way as for the magnetic registers. The length of the time scale is also the same.

The barometric scale is determined by experimentally comparing the measured movement on the paper with the observed movement of the standard barometer; one inch of barometric movement is thus found = $4^{\text{in}}{\cdot}39$ on the paper. Ordinates measured for the times of observation of the standard barometer, combined with the corrected readings of the standard barometer, give apparent values of the base line, from which mean values for each day are formed; these are written on the sheets and new base lines drawn, from which the hourly ordinates (see page *xlvi*) are measured as for the magnetic registers.

As regards the effect of temperature, it will be understood from the construction of the apparatus that the photographic record is influenced only by the expansion of the column of mercury (about 4 inches in length) in the lower tube of the barometer, and as the diurnal change of temperature in the basement is very small, no appreciable differential effect is produced on the photographic register.

From February 27 to 29 the driving chronometer was in the hands of Messrs. E. Dent and Co. for the purpose of being cleaned.

DRY AND WET BULB THERMOMETERS.—The dry and wet bulb thermometers and maximum and minimum self-registering thermometers, both dry and wet, are mounted on a revolving frame planned by Sir G. B. Airy. A vertical axis fixed in the ground, in a position about 35 feet south of the south-west angle of the Magnetic Observatory, carries the frame, which consists of a horizontal board as base, of a vertical board projecting upwards from it and connected with one edge of the horizontal board, and of two parallel inclined boards (separated about 3 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, and the air passes freely between all the boards. The dry and wet bulb thermometers are mounted near the centre of the vertical board, with their bulbs about 4 feet from the ground; the maximum and minimum thermometers for air temperature are placed towards one side of the vertical board, and those for evaporation temperature towards the other side, with their bulbs at about the same level as those of the dry and wet bulb thermometers. A small roof projecting from the frame protects the thermometers from rain. The frame is turned in azimuth during the day so as to keep the inclined side always towards the sun. In 1878 September, a circular table 3 feet in diameter was fixed, below the frame, round the supporting post, at a height of 2 feet 6 inches above the ground, with the object of protecting the thermometers from radiation from the ground.

The corrections to be applied to the thermometers in ordinary use (except the earth thermometers) are determined usually once each year for the whole extent of scale actually employed, by comparison with the standard thermometer, No. 515, kindly supplied to the Royal Observatory by the Kew Committee of the Royal Society.

The dry and wet bulb thermometers are Negretti and Zambra, Nos. 45354 and 45355 respectively. The correction $-0^{\circ}\cdot2$ has been applied to dry bulb readings, and $-0^{\circ}\cdot1$ to wet bulb readings throughout.

The self-registering thermometers for temperature of air and evaporation are all by Negretti and Zambra. The maximum thermometers are on Negretti and Zambra's principle, the minimum thermometers are of Rutherford's construction. To the readings of No. 8527 for maximum temperature of the air a correction of $-0^{\circ}\cdot9$ has been applied, and to those of No. 4386, for minimum temperature of the air, a correction of $-0^{\circ}\cdot3$ throughout. The readings of No. 44285 for maximum temperature of evaporation required a correction of $-0^{\circ}\cdot5$, and the readings of No. 3627 for minimum temperature of evaporation a correction of $+1^{\circ}\cdot3$ until February 15, and a correction of $+1^{\circ}\cdot6$ after that date.

The dry and wet bulb thermometers are usually read at 21^{h}, 0^{h}, 3^{h}, 9^{h} (astronomical reckoning). Readings of the maximum and minimum thermometers are usually taken at 21^{h} and 9^{h}. Those of the dry and wet bulb thermometers are employed to correct the indications of the photographic dry and wet bulb thermometers.

PHOTOGRAPHIC DRY AND WET BULB THERMOMETERS.—About 28 feet south-south-east of the south-east angle of the Magnetic Observatory, and about 25 feet east-north-east of the stand carrying the thermometers for eye-observation already described, is an open shed, 10 ft. 6 in. square, standing upon posts 8 feet high, under which are placed the photographic thermometers, the dry bulb towards the east and the wet-bulb towards the west. The bulbs are 8 inches in length and 0·4 inch internal bore, and their centres are about 4 feet above the ground. A registering cylinder of ebonite, 10 inches long and 19 inches in circumference, is placed with its axis vertical between the stems of the two thermometers. The registers are made simultaneously on opposite sides of the cylinder, and to avoid any accidental overlapping of the two registers the cylinder is made to revolve once in about 52 hours. The thermometer frames are covered by metal plates having longitudinal slits, so that light can pass through the slit only above the surface of the mercury. At each degree a fine cross wire is placed, thicker at the decades of degrees, and also at 32°, 52°, and 72°. A gas lamp is placed about 9 inches from each thermometer (east of the dry-bulb and west of the wet-bulb), and in each case the light shines through the tube above the mercury, and forms a well-defined line of light upon the paper. As the cylinder revolves horizontally under the light passing through the thermometer tube, the paper thus 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. When the sheet is developed the whole of that part of the paper which in each case passed the slit above the mercury will show photographic trace, with thin white lines corresponding to the degrees, the lower part of the paper remaining white; thus the boundary of the photographic trace indicates the varying temperature. The time scale is determined by interruption of the traces made by the observer at registered times, usually three times a day. The length of 24 hours on each of the thermometer traces is about 9 inches.

RADIATION THERMOMETERS.—These thermometers are placed in the Magnet Ground, a little south of the Magnet House. The thermometer for solar radiation is a self-registering mercurial maximum thermometer by Negretti and Zambra, No. 38592; its bulb is blackened, and the thermometer is enclosed in a glass sphere from which the air has been exhausted. The thermometer for radiation to the sky is a self-registering spirit minimum thermometer of Rutherford's construction, by Horne and Thornthwaite, No. 3120. The thermometers are laid on short grass; they require no correction for index error.

EARTH THERMOMETERS.—These thermometers were made by Adie, of Edinburgh, under the superintendence of Professor J. D. Forbes. They are placed at the north-west corner of the photographic thermometer shed.

The thermometers are four in number, 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 being attached in its whole length to a slender piece of wood. The thermometer No. 1 was dropped into the hole to such a depth that the centre 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 centre of its bulb was 12 French feet below the surface; Nos. 3 and 4 till the centres 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, 8·5, 10·0, 11·0, and 14·5 inches respectively are in each case tube with narrow bore. The length of 1° on the scales is 1·9 inch, 1·1 inch, 0·9 inch, and 0·5 inch in each case respectively. The ranges of the scales are for No. 1, 46°·0 to 55°·5; No. 2, 43°·0 to 58°·0; No. 3, 44°·0 to 62°·0; and for No. 4, 37°·0 to 68°·0.

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 each tube, from the bulb to the graduated scale, is very small; in that part to which the scale is attached it is larger; the fluid in the tubes is alcohol tinged red; the scales are of opal glass.

The ranges of scale having in previous years been found insufficient, fluid has at times been removed from or added to the thermometers as necessary, corresponding alterations being made in the positions of the attached scales. Information in regard to these changes will be found in previous Introductions.

The parts of the tubes above the ground are protected by a small wooden hut fixed to the ground; the sides of the hut are perforated with numerous holes, and it has a double roof; in the north face is a plate of glass, through which the readings are taken. Within the hut are two small thermometers, one, No. 5, with bulb one inch in the ground, another, No. 6, whose bulb is freely exposed in the centre of the hut.

These thermometers are read every day at noon, and the readings are given without correction. The index errors of Nos. 1, 2, 3, and 4 are unknown; No. 5 appears to read too high by 0°·2, and No. 6 by 0°·4, but no corrections have been applied.

THAMES THERMOMETERS.—Observations of the temperature of the water of the river Thames, which had been discontinued in the year 1879 in consequence of inability to find a suitable station after the placing of the police ship "Royalist" on the river bank, were resumed in the year 1883, under the direction of the Corporation of the City of London. The thermometers are placed at the end of one of the jetties of the Foreign Cattle Market at Deptford, the record including observations (by means of two Six's self-registering thermometers made by Negretti and Zambra) of the maximum and minimum temperature of the water at a depth of two feet below the surface, and also near the bottom of the river, the thermometers being read daily at 21^h (astronomical reckoning). By arrangement with the officers of the Corporation a copy of the record is furnished weekly to the Royal Observatory, in order that the readings of the surface thermometers may be included in the tables of "Daily Results of Meteorological Observations," page (xxvi) in which the highest and lowest readings recorded each morning at 21^h are entered to the same civil day. The observations are made by Mr. G. Philcox, Clerk of the Market. The thermometers having been broken, the observations were suspended from July 26 to December 2 when new thermometers were mounted. The Royal Observatory authorities are not responsible for the accuracy of the observations.

OSLER'S ANEMOMETER. — This self-registering anemometer, devised by A. Follett Osler, is fixed above the north-western turret of the ancient part of the Observatory. For direction of the wind a large vane, from which a vertical shaft proceeds down to the registering table within the turret, gives motion, by a pinion fixed at its lower end, to a rack-work carrying a pencil. A collar on the vane shaft bears upon anti-friction rollers, running in a cup of oil, rendering the vane very sensitive to changes of direction in light winds. The pencil marks a paper fixed to a board moved horizontally and uniformly by a clock, in a direction transverse to that of the motion of the pencil. The paper carries lines corresponding to the positions of N., E., S., and W. of the vane, with transversal hour-lines. The vane is 60 feet above the adjacent ground, and 215 feet above the mean level of the sea. A fixed mark on the north-eastern turret, in a known azimuth, as determined by celestial observation, is used for examining at any time the position of the direction plate over the registering table, to which reference is made by means of a direction pointer when adjusting a new sheet on the travelling board.

For the pressure of the wind the construction is as follows. At a distance of 2 feet below the vane there is placed a circular pressure plate having an area of $1\frac{1}{3}$ square feet, or 192 square inches, which, moving with the vane, and being thereby kept directed towards the wind, acts against a combination of springs in such way that, with a light wind, slender springs are first brought into action, but, as the wind increases, stiffer springs come into play. For a detailed account of the arrangement adopted the reader is referred to the Introduction for the year 1866. [Until 1866 the pressure plate was a square plate, 1 foot square, for which in that year a circular plate, having an area of 2 square feet, was substituted and employed until the spring of the year 1880, when the present circular plate, having an area of $1\frac{1}{3}$ square feet, was introduced.] A short flexible snake chain, fixed to a cross bar in connexion with the pressure plate, and passing over a pulley in the upper part of the shaft is attached to a brass chain (formerly a copper wire) running down the centre of the shaft to the registering table, just before reaching which the chain communicates with a short length of silk cord, which, led round a pulley, gives horizontal motion to the arm carrying the pressure pencil. The substitution of the flexible brass chain for the copper wire has greatly increased the delicacy of movement of the pressure pencil, every small movement of the pressure plate being now registered. The scale for pressure, in lbs. on the square foot, is experimentally determined from time to time as appears necessary; the pressure pencil is brought to zero by a light spiral spring.

A rain gauge of peculiar construction forms part of the apparatus: this is described under the heading "Rain Gauges."

A new sheet of paper is applied to the instrument every day at noon. The scale of time is the same as that of the magnetic registers.

ROBINSON'S ANEMOMETER.—This instrument, mounted above the small building on the roof of the Octagon Room, is constructed on the principle described by the late Dr. Robinson in the *Transactions of the Royal Irish Academy*, Vol. XXII. The motion is given by the pressure of the wind on four hemispherical cups, each 5 inches in diameter, the centre of each cup being 15 inches distant from the vertical axis of rotation. The foot of the axis is a hollow flat cone bearing upon a sharp cone, which rises up from the base of a cup of oil. An endless screw acts on a train of wheels furnished with indices for reading off the amount of motion of the air in miles, and a pinion on the axis of one of the wheels draws upwards a rack, to which is attached a rod passing down to the pencil, which marks the paper placed on the vertical revolving cylinder in the chamber below. A motion of the pencil upwards through a space of one inch represents horizontal motion of the air through 100 miles. The revolving hemispherical cups are 56 feet above the adjacent ground, and 211 feet above the mean level of the sea.

The cylinder is driven by a clock in the usual way, and makes one revolution in 24 hours. A new sheet of paper is applied every day at noon. The scale of time is the same as that of Osler's Anemometer and of the magnetic registers.

It is assumed, in accordance with the experiments made by Dr. Robinson, that the horizontal motion of the air is three times the space described by the centres of the cups. To verify this conclusion experiments were made in the year 1860 in Greenwich Park with the anemometer then in use, not the same as that now employed. The instrument was fixed to the end of a horizontal arm, which was made to revolve round a vertical axis. For more detailed account of these experiments see the Introduction for 1880. With the arm revolving in the direction N., E., S., W., opposite to the direction of rotation of the cups, for movement of the instrument through one mile 1·15 was registered; with the arm revolving in the direction N., W., S., E., in the same direction as the rotation of the cups, 0·97 was registered. This was considered to confirm sufficiently the accuracy of the assumption.

RAIN GAUGES.—During the year 1884 eight rain-gauges were employed, placed at different elevations above the ground, complete information in regard to which will be found at page (lxxii) of the Meteorological Section.

The gauge No. 1 forms part of the Osler Anemometer apparatus, and is self-registering, the record being made on the sheet on which the direction and pressure of the wind are recorded. The receiving surface is a rectangular opening 10 × 20 inches (200 square inches in area). The collected water passes into a vessel suspended by spiral springs, which lengthen as the water accumulates, until 0·25 inch is collected. The water then discharges itself by means of the following modification of the siphon. A vertical copper tube, open at both ends, is fixed in the receiver, with one end just projecting below the bottom. Over this tube a larger tube, closed at the top, is loosely placed. The accumulating water, having risen to the top of the inner tube, begins to flow off into a small tumbling bucket, fixed in a globe placed underneath, and carried by the receiver. When full the bucket falls over, throwing the water into a small exit pipe at the lower part of the globe—the only outlet. The water filling the bore of the pipe creates a partial vacuum in the globe sufficient to cause the longer leg of the siphon to act, and the whole remaining contents of the receiver then run off, through the globe, to a waste pipe. The spiral springs at the same time shorten, and raise the receiver. The gradual descent of the water vessel as the rain falls, and the immediate ascent on discharge of the water, act upon a pencil, and cause a corresponding trace to be made on the paper fixed to the moving board of the anemometer. The rain scale on the paper was determined experimentally by passing a known quantity of water through the receiver. The continuous record thus gives complete information on the rate of the fall of rain.

Gauge No. 2 is a ten-inch circular gauge, placed close to gauge No. 1, its receiving surface being precisely at the same level. The gauge is read daily.

Gauges Nos. 3, 4, and 5 are eight-inch circular gauges, placed respectively on the roof of the Octagon Room, over the roof of the Magnetic Observatory, and on the roof of the Photographic Thermometer Shed. All are read daily.

Gauges Nos. 6, 7, and 8 are also eight-inch circular gauges, placed on the ground south of the Magnetic Observatory; No. 6 is the old daily gauge, No. 7 the old monthly gauge, and No. 8 an additional gauge brought into use in July 1881, as a check on the readings of Nos. 6 and 7, the monthly amounts collected by these gauges having occasionally shown greater differences than seemed proper. The positions of these gauges were slightly shifted on April 1, 1884. All three gauges have been read daily since the beginning of July 1881.

The gauges are also read at midnight on the last day of each calendar month.

ELECTROMETER.—The electric potential of the atmosphere is measured by means of a Thomson self-recording electrometer, constructed by Mr. White of Glasgow.

For a full description of the principle of the electrometer reference may be made to Sir William Thomson's "Report on Electrometers and Electrostatic Measurements," contained in the *British Association Report* for the year 1867. It will be sufficient here to give a general description of the instrument which, with its registering apparatus, is planted in the Upper Magnet Room on the slate slab which carries the suspension pulleys of the Horizontal Force Magnet. A thin flat needle of aluminium, carrying immediately above it a small light mirror, is suspended, on the bifilar principle, by two silk fibres from an insulated support within a large Leyden jar. A little strong sulphuric acid is placed in the bottom of the jar, and from the lower side of the needle depends a platinum wire, kept stretched by a weight, which connects the needle with the sulphuric acid, that is with the inner coating of the jar. A positive charge of electricity being given to the needle and jar, this charge is easily maintained at a constant potential by means of a small electric machine or replenisher forming part of the instrument, and by which the charge can be either increased or diminished at pleasure. A gauge is provided for the purpose of indicating at any moment the amount of charge. The needle hangs within four insulated quadrants, which may be supposed to be formed by cutting a circular flat brass box into quarters, and then slightly separating them. The opposite quadrants are placed in metallic connexion.

Sir William Thomson's water-dropping apparatus is used to collect the atmospheric electricity. For this purpose a rectangular cistern of copper, capable of holding above 30 gallons of water, is placed near the ceiling on the west side of the south arm of the Upper Magnet Room. The cistern rests on four pillars of glass, each

f 2

one encircled and nearly completely enclosed by a glass vessel containing sulphuric acid. A pipe passing out from the cistern, through the south face of the building, extends about six feet into the atmosphere, the nozzle, (about ten feet above the ground), having a very small hole, through which the water passes and breaks almost immediately into drops. The cistern is thus brought to the same electrical potential as that of the atmosphere, near the nozzle, and this potential is communicated by means of a connecting wire to one of the pairs of electrometer quadrants, the other pair being connected to earth. The varying atmospheric potential thus influences the motions of the included needle, causing it to be deflected from zero in one direction or the other, according as the atmospheric potential is greater or less than that of the earth, that is according as it is positive or negative.

The small mirror carried by the needle is used for the purpose of obtaining photographic record of its motions. The light of a gas-lamp, falling through a slit upon the mirror, is thence reflected, and by means of a plano-convex cylindrical lens is brought to a focus at the surface of a horizontal cylinder of ebonite, nearly 7 inches long and 16 inches in circumference, which is turned by clock-work. A second fixed mirror, by means of the same gas-lamp, causes a reference line to be traced round the cylinder. The actual zero is found by cutting off the cistern communication, and placing the pairs of quadrants in metallic connexion with each other and with earth. The break of register at each hour is made by the driving-clock of the electrometer cylinder itself. Other photographic arrangements are generally similar to those which have been described for other instruments.

On May 13 the bifilar snspension of the needle gave way; the threads were renewed on May 17. On November 11 the suspension again failed; it was renewed on November 18 using a somewhat stronger silk thread.

The scale of time is the same as that of the magnetic registers.

Inconvenience is sometimes caused by cobwebs making connexion between the cistern or its pipe and the walls of the building, and in winter, interruptions occasionally occur owing to the freezing of the water in the exit pipe.

SUNSHINE INSTRUMENT.—This instrument, contrived by the late Mr. J. F. Campbell, and presented by him to the Royal Observatory, consists of a sphere of glass, nearly 4 inches in diameter, supported concentrically within a well turned hemispherical metal bowl in such a manner that the image of the sun, formed when the sun shines, falls always on the concave surface of the bowl. A strip of blackened millboard being fixed in the bowl, the sun, when shining, burns away the surface at the points where the image successively falls, by which means the record of periods of sunshine is obtained. The strip is removed after sunset, and a new one fixed ready for the following day. The place of the meridian is marked on the strip before removing it from the bowl. A series of time scales, suitable for different periods of the year, having been prepared, the proper scale is selected and placed against the record, which is then easily transferred to a sheet of paper specially ruled with equal vertical spaces to represent hours, each sheet containing the record for one calendar month. The daily sums, and sums for each hour (reckoning from apparent noon) through the month are thus readily formed. The recorded durations are to be understood as indicating the amount of *bright* sunshine, no register being obtained when the sun shines faintly through fog or cloud, or when the sun's altitude is less than 5°. The instrument is placed on a table upon the platform above the Magnetic Observatory.

OZONOMETER.—This apparatus is fixed on the south-west corner of the roof of the Photographic Thermometer shed, at a height of about 10 feet from the ground. The box in which the papers are exposed is of wood: it is about 8 inches square, blackened inside, and so constructed that there is free circulation of air through the box, without exposure of the paper to light. The papers exposed at 21^h, 3^h, and 9^h are collected respectively at 3^h, 9^h, and 21^h, and the degree of tint produced is compared with a scale of graduated tints, numbered from 0 to 10. The value of ozone for the civil day is determined by taking the degree of tint obtained at each hour of collection as proportional to the period of exposure. Thus to form the values for any given civil day, three-fourths of the value registered at 21^h, the values registered at 3^h and 9^h, and one-fourth of that registered at the following 21^h, are added together, the resulting sum (which appears in the tables of "Daily Results of the Meteorological Observations") being taken as the value referring to the civil day. The means of the 21^h, 3^h, and 9^h values, as observed, are also given for each month in the foot notes.

§ 7. *Meteorological Reductions.*

The results given in the Meteorological section refer in general to the civil day, commencing at midnight.

All results in regard to atmospheric pressure, temperature of the air and of evaporation with deductions therefrom, and atmospheric electricity, are derived from the photographic records, excepting that the maximum and minimum values of air temperature are those given by eye-observation of the ordinary maximum and minimum thermometers at 21^h and 9^h (astronomical reckoning), reference being made, however, to the photographic register when necessary to obtain the values corresponding to the civil day from midnight to midnight. The hourly readings of the photographic traces for the elements mentioned are entered into a form having double argument, the horizontal argument ranging through the 24 hours of the civil day, and the vertical argument through the days of a calendar month. Then, for all the photographic elements, the means of the numbers standing in the vertical columns of the monthly forms, into which the values are entered, give the mean monthly photographic values for each hour of the day, the means of the numbers in the horizontal columns giving the mean daily value. It should be mentioned that before measuring out the electrometer ordinates, a pencil line was first drawn through the trace to represent the general form of the curve in the way described for the magnetic registers (page *xxviii*), excepting that no day has been omitted on account of unusual electrical disturbance, as it has been found difficult to decide on any limit of disturbance beyond which it would seem proper, as regards determination of diurnal inequality, to reject the results. In measuring the electrometer ordinates a scale of inches is used, and the values given in the tables which follow are expressed in thousandths of an inch, positive and negative potential being denoted by positive and negative numbers respectively.

To correct the photographic indications of barometer and dry and wet bulb thermometers for small instrumental error, the means of the photographic readings at 21^h, 0^h, 3^h, and 9^h in each month are compared with the corresponding corrected mean readings of the standard barometer and standard dry and wet bulb thermometers, as given by eye-observation. A correction applicable to the photographic reading at each of these hours is thus obtained, and, by interpolation, corrections for the intermediate hours are found. The mean of the twenty-four hourly corrections in each month is adopted as the correction applicable to each mean daily value in the month. Thus mean hourly and mean daily values of the several elements are obtained for each month. The process of correction is equivalent to giving photographic indications in terms of corrected standard barometer, and in terms of the standard dry and wet bulb thermometers exposed on the free stand.

The mean daily temperature of the dew-point and degree of humidity are deduced from the mean daily temperatures of the air and of evaporation by use of Glaisher's *Hygrometrical Tables*. The factors by which the dew-point given in these tables is calculated were 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 and wet bulb thermometers, combining observations made at the Royal Observatory, Greenwich, with others made in India and at Toronto. The factors are given in the following table.

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

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		

In the same way the mean hourly values of the dew-point temperature and degree of humidity in each month (pages (lv) and (lvi)) have been calculated from the corresponding mean hourly values of air and evaporation temperatures (pages (liv) and (lv)).

The excess of the mean temperature of the air on each day above the average of 20 years, given in the "Daily Results of Meteorological Observations," is found by comparing the numbers contained in column 6 with a table of average daily temperatures found by smoothing the accidental irregularities of the numbers given in Table LXXVII. of the "Reduction of Greenwich Meteorological Observations, 1847–1873," which are similarly deduced from photographic records. The smoothed numbers are given in the following table.

ADOPTED VALUES of MEAN TEMPERATURE of the AIR, deduced from TWENTY-FOUR HOURLY READINGS on each Day, for every Day of the Year, as obtained from the PHOTOGRAPHIC RECORDS for the Period 1849–1868.

Day of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	°	°	°	°	°	°	°	°	°	°	°	°
1	38·1	40·5	40·3	45·3	48·7	57·5	61·6	62·6	60·1	54·7	47·0	41·5
2	37·9	40·6	40·4	45·7	48·9	57·7	61·5	62·7	60·0	54·4	46·7	41·8
3	37·8	40·7	40·5	46·1	49·1	57·9	61·4	62·7	59·8	54·0	46·4	42·1
4	37·7	40·7	40·5	46·4	49·4	58·1	61·4	62·7	59·7	53·7	46·0	42·4
5	37·6	40·6	40·5	46·6	49·7	58·2	61·5	62·7	59·5	53·4	45·6	42·6
6	37·6	40·4	40·5	46·7	50·0	58·3	61·7	62·7	59·3	53·0	45·2	42·7
7	37·6	40·2	40·6	46·8	50·3	58·4	61·9	62·7	59·0	52·7	44·7	42·8
8	37·7	39·9	40·6	46·8	50·6	58·5	62·2	62·7	58·8	52·5	44·3	42·8
9	37·7	39·6	40·7	46·9	50·8	58·5	62·5	62·7	58·5	52·3	43·8	42·8
10	37·8	39·3	40·7	46·9	51·1	58·6	62·7	62·7	58·3	52·1	43·4	42·7
11	37·9	39·1	40·8	47·0	51·4	58·7	62·9	62·7	58·1	51·9	43·0	42·5
12	38·1	38·9	40·8	47·1	51·8	58·8	63·1	62·6	58·0	51·7	42·6	42·2
13	38·2	38·8	40·9	47·2	52·1	58·9	63·3	62·5	57·8	51·6	42·3	41·8
14	38·3	38·7	41·0	47·4	52·5	59·1	63·4	62·4	57·6	51·4	42·0	41·5
15	38·4	38·7	41·1	47·5	52·9	59·3	63·4	62·3	57·4	51·3	41·8	41·1
16	38·5	38·8	41·2	47·6	53·3	59·5	63·5	62·1	57·3	51·2	41·6	40·8
17	38·6	38·9	41·3	47·8	53·7	59·7	63·5	61·9	57·1	51·1	41·5	40·5
18	38·8	39·0	41·4	47·9	54·1	59·9	63·4	61·8	56·9	51·0	41·5	40·2
19	38·9	39·2	41·4	48·0	54·4	60·2	63·3	61·6	56·8	50·8	41·4	40·0
20	39·1	39·3	41·5	48·1	54·7	60·5	63·2	61·4	56·6	50·6	41·3	39·8
21	39·3	39·5	41·6	48·2	55·0	60·8	63·0	61·3	56·4	50·4	41·2	39·6
22	39·5	39·6	41·7	48·2	55·3	61·1	62·9	61·3	56·2	50·1	41·1	39·4
23	39·6	39·7	41·8	48·3	55·5	61·4	62·8	61·2	56·1	49·7	41·0	39·3
24	39·7	39·8	42·0	48·3	55·7	61·7	62·7	61·1	55·9	49·4	41·0	39·3
25	39·8	39·9	42·3	48·4	55·9	61·9	62·7	61·0	55·8	49·1	40·9	39·2
26	39·9	40·0	42·6	48·4	56·1	62·0	62·7	60·9	55·7	48·8	40·8	39·1
27	40·0	40·1	43·0	48·4	56·3	62·0	62·6	60·8	55·5	48·5	40·8	39·0
28	40·1	40·2	43·4	48·5	56·5	61·9	62·6	60·7	55·4	48·2	40·9	38·8
29	40·2		43·8	48·5	56·8	61·8	62·6	60·6	55·2	47·9	41·0	38·7
30	40·3		44·3	48·6	57·0	61·7	62·6	60·4	54·9	47·6	41·2	38·5
31	40·4		44·8		57·3		62·6	60·3		47·3		38·3
Means	38·7	39·7	41·5	47·5	53·1	59·8	62·6	61·9	57·5	51·0	42·7	40·8

The mean of the twelve monthly values is 49°·7.

The daily register of rain contained in column 18 is that recorded by the gauge No. 6, whose receiving surface is 5 inches above the ground. This gauge is usually read at 21ʰ and 9ʰ. The continuous record of Osler's self-registering gauge shows whether the amounts measured at 21ʰ are to be placed to the same, or to the preceding civil day; and in cases in which rain fell both before and after midnight, also gives the means of ascertaining the proper proportion of the 21ʰ amount which should be placed to each civil day. The number of days of rain given in the foot notes, and in the abstract tables, pages (liii) and (lxxii), is formed from the records of this gauge. In this numeration only those days are counted on which the fall amounted to or exceeded 0^{in}·005.

The indications of atmospheric electricity are derived from Thomson's Electrometer. Occasionally, during interruption of photographic registration, the results depend on eye observations.

No particular explanation of the anemometric results seems necessary. It may be understood generally that the greatest pressures usually occur in gusts of short duration.

The mean amount of cloud given in a foot note on the right-hand page, and in the abstract table, page (liii), is the mean found from observations made usually at 21^h, 0^h, 3^h, and 9^h, of each day.

For understanding the divisions of time under the headings "Clouds and Weather" and "Electricity," the following remarks are necessary:—In regard to Clouds and Weather, the day is divided by columns into two parts (from midnight to noon, and from noon to midnight), and each of these parts is subdivided into two or three parts by colons (:). Thus, when there is a single colon in the first column, it denotes that the indications 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. In regard to Electricity the results are included in one column; in this case the colons divide the whole period of 24 hours (midnight to midnight).

The notation employed for Clouds and Weather is as follows, it being understood that for clouds Howard's Nomenclature is used. The figure denotes the proportion of sky covered by cloud, an overcast sky being represented by 10.

a denotes *aurora borealis*
ci ... *cirrus*
ci-cu ... *cirro-cumulus*
ci-s ... *cirro-stratus*
cu ... *cumulus*
cu-s ... *cumulo-stratus*
d ... *dew*
hy-d ... *heavy dew*
f ... *fog*
slt-f ... *slight fog*
tk-f ... *thick fog*
fr ... *frost*
ho-fr ... *hoar frost*
g ... *gale*
hy-g ... *heavy gale*

glm denotes *gloom*
gt-glm ... *great gloom*
h ... *haze*
slt-h ... *slight haze*
hl ... *hail*
l ... *lightning*
li-cl ... *light clouds*
lu-co ... *lunar corona*
lu-ha ... *lunar halo*
m ... *mist*
slt-m ... *slight mist*
n ... *nimbus*
p-cl ... *partially cloudy*
r ... *rain*
c-r ... *continued rain*

fr-r	denotes	*frozen rain*	oc-shs	denotes	*occasional showers*
fq-r	...	*frequent rain*	s	...	*stratus*
hy-r	...	*heavy rain*	sc	...	*scud*
c-hy-r	...	*continued heavy rain*	li-sc	...	*light scud*
m-r	...	*misty rain*	sl	...	*sleet*
fq-m-r	...	*frequent misty rain*	sn	...	*snow*
oc-m-r	...	*occasional misty rain*	oc-sn	...	*occasional snow*
oc-r	...	*occasional rain*	slt-sn	...	*slight snow*
sh-r	...	*shower of rain*	so-ha	...	*solar halo*
shs-r	...	*showers of rain*	sq	...	*squall*
slt-r	...	*slight rain*	sqs	...	*squalls*
oc-slt-r	...	*occasional slight rain*	fq-sqs	...	*frequent squalls*
th-r	...	*thin rain*	hy-sqs	...	*heavy squalls*
fq-th-r	...	*frequent thin rain*	fq-hy-sqs	...	*frequent heavy squalls*
oc-th-r	...	*occasional thin rain*	oc-sqs	...	*occasional squalls*
hy-sh	...	*heavy shower*	t	...	*thunder*
slt-sh	...	*slight shower*	t-sm	...	*thunder storm*
fq-shs	...	*frequent showers*	th-cl	...	*thin clouds*
hy-shs	...	*heavy showers*	v	...	*variable*
fq-hy-shs	...	*frequent heavy showers*	vv	...	*very variable*
oc-hy-shs	...	*occasional heavy showers*	w	...	*wind*
li-shs	...	*light showers*	st-w	...	*strong wind*

The following is the notation employed for Electricity:—

N	denotes	*negative*	w	denotes	*weak*
P	...	*positive*	s	...	*strong*
m	...	*moderate*	v	...	*variable*

The duplication of the letter denotes intensity of the modification described, thus, ss, is very strong; vv, very variable. 0 indicates zero potential, and a dash "—" accidental failure of the apparatus.

The remaining columns in the tables of "Daily Results" seem to require no special remark; all necessary explanation regarding the results therein contained will be found in the notes at the foot of the left-hand page, or in the descriptions ot the several instruments given in § 6.

In regard to the comparisons of the extremes and means, &c. of meteorological elements with average values, contained in the foot notes, it may be mentioned that the photographic barometric results are compared with the corresponding barometric results, 1854–1873, and the photographic thermometric results and deductions therefrom with the corresponding thermometric results, 1849–1868 (see "Reduction of Greenwich Meteorological Observations 1847–1873"). Other deductions, from eye observations, are compared with averages for the period 1841–1883.

The tables of Meteorological Abstracts following the tables of "Daily Results" require no lengthened explanation.

It may be pointed out that the monthly means for barometer and temperature of the air and of evaporation contained in the tables referring to diurnal inequality, pages (liv) and (lv), do not in some cases agree with the true monthly means given in the daily results, pages (xxvi) to (xlviii), and in the table on page (liii), in consequence of occasional interruption of the photographic register, at which times daily values to complete the daily results could be supplied from the eye observations, as mentioned in the foot notes, but hourly values, for the diurnal inequality tables, could not be so supplied. In such cases however the means given with these tables are the proper means to be used in connexion with the numbers standing immediately above them, for formation of the actual diurnal inequality.

The table "Abstract of the Changes of the Direction of the Wind" as derived from Osler's Anemometer, page (lxii), exhibits every change of direction of the wind occurring throughout the year whenever such change amounted to two nautical points or $22\frac{1}{2}°$. It is to be understood that the change from one direction to another during the interval between the times mentioned in each line of the table was generally gradual. All complete turnings of the vane which were evidently of accidental nature, and which in the year 1881 and in previous years had been included, are here omitted. Between any time given in the second column and that next following in the first column no change of direction in general occurred varying from that given by so much as one point or $11\frac{1}{4}°$. From the numbers given in this table the monthly and yearly excess of motion, page (lxvi), is formed. By direct motion it is to be understood that the change of direction occurred in the order N, E, S, W, N, &c., and by retrograde motion that the change occurred in the order N, W, S, E, N, &c.

In regard to Electric Potential of the Atmosphere, in addition to giving the hourly values in each month, including all available days, the days in each month have been (since the year 1882) further divided into two groups, one containing all days on which the rainfall amounted to or exceeded $0^{in}\cdot020$, the other including only days on which no rainfall was recorded, the values of daily rainfall given in column 18 of the "Daily Results of Meteorological Observations" being adopted in selecting the days. These additional tables are given on pages (lxx) and (lxxi) respectively.

In regard to the observations of Luminous Meteors it is simply necessary to say that in general only special meteor showers are watched for, such as those of

April, August, and November. The observers of meteors in the year 1884 were Mr. Nash, Mr. Hugo, and Mr. McClellan; their observations are distinguished by the initials N, H, and M respectively.

Royal Observatory, Greenwich,
1886, April 27.

W. H. M. CHRISTIE.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

MAGNETICAL OBSERVATIONS

(EXCLUDING THE DAYS OF GREAT MAGNETIC DISTURBANCE).

1884.

TABLE I.—MEAN MAGNETIC DECLINATION WEST FOR EACH ASTRONOMICAL DAY.

(Each result is the mean of 24 hourly ordinates from the photographic register.)

1884.

Day of Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	18°	18°	18°	18°	18°	18°	18°	18°	18°	18°	18°	18°
d	′	′	′	′	′	′	′	′	′	′	′	′
1	10·8	10·2	8·5	9·0	8·8	7·8	8·2	6·2	7·3	..	5·2	4·6
2	11·0	10·6	9·4	9·4	8·4	11·0	..	7·5	7·2	..	..	4·3
3	10·6	9·0	10·6	9·0	8·8	7·6	..	7·8	7·6	4·8	5·7	4·3
4	10·5	9·5	9·4	9·3	9·0	7·8	9·0	7·2	6·8	4·4	4·4	5·0
5	10·6	10·8	10·0	9·1	9·1	8·1	8·1	8·1	6·6	5·0	4·1	4·7
6	10·9	10·0	10·0	8·5	8·8	8·1	8·8	8·2	6·7	4·2	3·0	4·7
7	11·1	9·7	10·0	8·6	7·8	8·6	8·6	7·0	7·6	4·1	4·2	4·8
8	10·5	9·5	11·0	8·5	8·0	7·4	9·2	7·8	6·9	5·0	4·0	4·5
9	10·7	9·5	9·7	9·0	7·9	8·8	8·7	8·0	6·6	4·7	3·3	5·1
10	10·0	9·7	9·8	10·5	7·8	7·4	8·9	8·2	7·0	5·3	3·9	4·8
11	10·7	10·0	10·2	9·1	8·3	7·5	9·2	7·7	6·5	5·6	4·6	4·7
12	10·5	10·3	9·8	8·8	7·9	7·5	8·1	7·9	6·9	5·3	3·7	4·5
13	10·4	11·2	10·1	8·7	8·3	7·4	9·5	8·1	4·9	6·2	4·2	4·8
14	9·9	10·6	9·8	7·4	8·3	7·2	8·8	9·1	5·5	4·7	4·2	3·6
15	10·6	10·6	9·0	9·1	8·4	7·8	8·5	8·1	5·6	4·5	4·6	5·8
16	10·6	10·6	9·4	9·1	7·6	8·5	8·8	7·9	6·5	4·6	4·8	5·5
17	10·7	9·8	9·7	7·8	8·0	8·6	8·0	7·5	6·6	5·1	4·7	4·8
18	9·3	10·7	9·6	8·6	7·1	7·2	7·5	7·9	4·4	4·2	4·2	5·1
19	10·1	9·4	8·4	8·3	7·4	7·9	8·9	8·4	6·5	5·1	5·0	4·8
20	10·0	10·5	8·3	8·1	8·7	7·1	7·9	8·7	6·3	4·6	5·8	4·3
21	10·9	10·5	8·9	8·2	8·3	5·9	7·5	10·1	6·2	5·0	5·7	4·6
22	9·7	10·7	9·5	7·6	7·8	8·2	7·0	8·4	7·1	5·0	5·3	5·5
23	10·3	9·8	10·1	7·7	8·5	8·6	7·9	8·1	6·0	4·8	5·4	4·5
24	10·7	9·9	10·4	7·9	7·5	7·9	9·8	8·1	6·0	5·7	5·2	4·0
25	9·8	9·7	8·3	7·4	7·6	7·8	7·5	8·2	6·1	4·7	4·8	4·2
26	10·4	9·4	8·6	7·3	8·5	7·7	7·6	7·2	5·7	5·8	4·8	4·8
27	10·8	9·0	8·7	8·2	9·0	6·6	8·7	7·5	5·6	5·0	5·9	5·8
28	9·9	9·5	6·6	7·7	8·8	7·8	7·8	6·9	5·3	4·2	5·4	5·1
29	8·7	7·9	9·6	7·5	8·4	8·2	8·2	7·2	5·7	4·5	4·9	4·8
30	9·4		8·4	10·3	7·3	7·6	7·5	7·0	5·6	4·3	4·8	4·0
31	9·2		8·6		9·3		7·9	7·3		4·5		4·6

TABLE II.—MONTHLY MEAN DIURNAL INEQUALITY OF MAGNETIC DECLINATION WEST.

(The results in each month are diminished by the smallest hourly value.)

1884.

Hour, Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
h	′	′	′	′	′	′	′	′	′	′	′	′
0	5·3	6·2	10·0	11·7	10·5	10·8	9·5	9·4	9·8	8·6	6·0	5·1
1	6·3	7·7	11·4	13·2	11·3	12·1	10·8	10·4	10·9	9·4	6·6	5·9
2	5·7	8·1	11·1	12·8	10·9	12·4	10·5	9·4	9·6	9·0	6·1	5·3
3	4·2	7·5	9·4	10·6	9·2	11·5	8·8	7·5	7·6	7·3	5·0	4·4
4	3·3	5·8	7·0	8·3	7·5	9·7	7·2	5·6	5·5	5·5	3·6	3·9
5	3·0	4·5	5·3	6·0	5·9	7·8	5·9	3·9	4·0	4·3	2·9	3·3
6	2·7	4·0	4·8	4·5	4·9	6·3	5·3	3·1	3·3	3·7	2·5	2·9
7	2·1	3·6	4·3	4·0	4·4	5·1	4·8	3·1	2·8	3·0	1·8	2·3
8	1·6	2·6	3·5	4·0	4·0	5·0	4·6	2·9	2·2	2·4	1·1	1·6
9	1·1	1·7	2·6	3·7	4·0	5·0	4·4	2·5	1·9	2·0	0·7	0·7
10	0·5	1·3	2·3	3·8	4·2	4·8	4·1	2·1	1·9	1·6	0·3	0·0
11	0·0	1·2	2·1	3·6	4·1	4·4	3·6	2·0	1·9	1·8	0·0	0·1
12	0·0	1·2	2·0	3·3	3·9	3·8	3·1	1·8	1·9	2·1	0·4	0·0
13	0·5	1·4	2·0	3·1	3·8	3·5	2·8	1·7	1·6	2·1	1·0	0·9
14	0·8	2·0	2·3	3·3	3·6	3·4	2·4	1·5	1·5	2·1	1·8	1·5
15	1·0	2·4	2·8	3·3	3·1	2·9	2·4	1·6	1·4	2·1	1·7	1·9
16	1·2	2·6	2·8	2·9	2·4	2·0	1·9	1·0	1·8	2·2	1·8	2·4
17	1·2	2·6	2·7	2·4	1·3	0·9	0·8	0·9	1·9	2·3	1·9	2·5
18	1·0	2·1	2·3	1·9	0·5	0·1	0·0	0·3	1·4	2·1	1·8	2·2
19	0·8	1·6	1·3	0·5	0·0	0·0	0·0	0·0	0·2	1·5	1·6	2·3
20	0·3	0·6	0·0	0·0	0·2	0·4	0·7	0·1	0·0	0·2	0·9	1·9
21	0·2	0·0	0·5	0·9	1·9	2·0	2·1	1·2	1·0	0·0	0·3	1·4
22	1·5	1·2	3·0	3·2	4·4	4·6	4·1	3·7	3·4	2·2	1·3	2·2
23	3·5	3·9	6·9	7·2	7·5	7·8	7·0	6·9	6·5	5·6	3·6	3·6
Means	1·99	3·16	4·27	4·92	4·73	5·26	4·45	3·44	3·50	3·46	2·28	2·43

TABLE III.—MEAN HORIZONTAL MAGNETIC FORCE (diminished by a Constant) FOR EACH ASTRONOMICAL DAY.

(Each result is the mean of 24 hourly ordinates from the photographic register, expressed in terms of the whole Horizontal Force, the unit in the table being ·00001 of the whole Horizontal Force. The letters u *and* c *indicate respectively values uncorrected for, and corrected for temperature.)*

1884.

Day of Month.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	u	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*
d																								
1	398	380	536	531	297	297	414	465	500	540	513	560	480	630	502	711	438	620	..	..	522	593	639	582
2	410	418	411	406	303	302	486	539	525	572	487	550	..	..	480	687	458	629	..	..	..	..	640	608
3	489	516	358	355	386	390	496	549	585	625	442	516	..	..	535	703	398	569	358	466	257	324	641	652
4	458	502	418	433	392	396	529	565	577	608	530	602	356	549	527	686	418	568	400	494	405	476	632	647
5	432	479	369	386	429	431	566	597	601	637	553	625	396	584	525	689	445	575	454	534	413	482	630	654
6	452	487	375	374	450	476	531	580	645	660	572	630	441	605	579	759	462	594	457	549	450	515	559	579
7	450	472	444	416	426	457	542	591	604	637	557	601	452	613	539	745	436	568	377	480	494	548	583	594
8	421	430	438	422	430	434	546	586	635	684	559	604	413	602	338	572	453	599	437	526	496	534	471	482
9	449	473	506	515	421	418	552	581	678	723	603	650	444	646	275	527	466	646	495	557	522	571	577	574
10	441	468	548	554	401	432	523	554	609	672	569	632	468	647	309	569	367	553	478	516	..	..	646	646
11	375	386	576	578	435	466	438	480	533	607	567	659	527	691	304	578	399	581	513	540	462	513	553	564
12	378	382	614	614	453	462	494	548	564	647	575	685	522	695	326	605	402	590	505	550	421	465	613	624
13	441	459	562	579	452	476	583	618	616	687	567	674	440	622	298	563	294	498	511	553	468	513	569	605
14	460	491	530	554	461	490	537	563	599	657	574	659	428	605	288	530	327	529	373	433	498	534	459	479
15	425	452	535	534	492	536	520	553	627	681	578	638	478	667	302	524	369	582	379	459	464	482	486	488
16	461	476	522	512	488	530	523	552	581	661	609	665	460	639	282	504	423	652	431	534	492	507	523	514
17	490	510	495	490	469	513	518	540	577	655	662	724	479	640	302	529	285	528	443	544	429	451	555	530
18	484	502	433	446	480	538	414	440	666	719	626	691	515	650	317	546	273	515	490	588	431	457	535	517
19	462	477	436	454	425	472	381	407	605	659	516	587	523	633	343	554	307	523	456	545	423	458	541	543
20	445	489	438	460	463	480	400	436	582	629	499	586	462	590	360	567	342	540	475	547	466	492	513	506
21	512	550	452	478	485	478	395	424	655	700	557	647	443	593	261	474	393	584	425	492	500	509	535	512
22	551	582	394	425	543	542	402	426	554	623	563	666	484	650	240	464	386	557	463	526	549	549	509	482
23	491	518	315	344	538	537	409	442	544	634	435	533	475	634	260	503	438	581	494	543	486	481	553	516
24	489	502	275	320	542	533	303	343	523	606	477	576	494	631	218	488	486	616	488	533	501	478	547	499
25	464	468	354	378	532	529	330	374	563	621	491	599	483	604	278	518	478	612	460	507	528	496	571	525
26	396	393	366	388	511	535	434	456	548	602	526	645	502	621	324	503	465	597	463	505	550	540	586	536
27	387	371	375	402	500	520	497	515	588	648	564	699	465	588	349	513	482	628	532	583	538	531	609	559
28	397	397	398	400	378	384	560	587	591	631	566	700	475	607	352	518	434	609	459	521	479	456	567	510
29	457	481	310	310	341	377	547	587	605	638	566	696	515	670	353	508	450	609	403	448	549	521	573	518
30	519	541			334	392	558	594	547	594	508	647	513	686	424	594	475	610	483	548	648	596	579	511
31	582	590			408	462			550	595			500	689	485	673			517	589			600	521

On November 10 the cord attaching the pulley of the suspension skein to the small windlass at the back of the brick pier was found broken; and at the end of the year experiments were made for determination of the angle of torsion; thus, in each case, breaking the continuity of the values.

TABLE IV.—MEANS of READINGS of the THERMOMETER placed within the box inclosing the HORIZONTAL FORCE MAGNET, for each Astronomical Day.

1884.

Day of Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d 1	58°·8	59°·5	59°·8	62°·6	62°·0	62°·4	68°·1	71°·4	69°·9	° ..	63°·7	56°·6
2	60·2	59·5	59·7	62·7	62·4	63·3	..	71·3	69·3	..	..	58·0
3	61·3	59·6	60·0	62·7	62·0	63·9	..	69·1	69·3	65·8	63·5	60·4
4	62·2	60·6	60·0	61·8	61·5	63·8	70·5	68·6	68·1	65·0	63·7	60·6
5	62·4	60·7	59·9	61·5	61·8	63·8	70·2	68·9	67·0	64·2	63·6	61·1
6	61·7	59·7	61·2	62·5	60·6	63·0	68·9	69·8	67·1	64·9	63·4	60·9
7	61·0	58·2	61·5	62·5	61·6	62·2	68·7	71·2	67·1	65·5	62·8	60·4
8	60·3	58·9	60·0	62·0	62·5	62·3	70·3	72·8	67·9	64·7	61·9	60·4
9	61·1	60·3	59·6	61·4	62·3	62·4	71·0	73·8	69·8	63·2	62·5	59·6
10	61·3	60·1	61·5	61·5	63·3	63·3	69·7	74·2	70·1	61·9	..	59·8
11	60·4	59·9	61·5	62·1	63·9	64·9	68·9	75·0	69·9	61·3	62·6	60·4
12	60·0	59·8	60·3	62·8	64·4	65·9	69·4	75·3	70·2	62·3	62·2	60·4
13	60·8	60·7	61·1	61·7	63·7	65·7	69·9	74·5	71·1	62·1	62·3	61·8
14	61·5	61·1	61·4	61·2	63·0	64·5	69·6	73·2	71·0	63·1	61·8	60·9
15	61·3	59·7	62·2	61·6	62·8	63·1	70·3	72·1	71·6	64·2	60·8	59·9
16	60·6	59·2	62·1	61·4	64·2	62·9	69·7	72·1	72·5	65·5	60·6	59·3
17	60·9	59·5	62·2	61·0	64·1	63·2	68·7	72·4	73·3	65·4	61·0	58·4
18	60·8	60·5	63·0	61·2	62·7	63·4	67·3	72·5	73·2	65·2	61·2	58·8
19	60·6	60·8	62·4	61·2	62·8	63·7	65·9	71·5	71·8	64·7	61·7	59·9
20	62·2	61·0	60·7	61·8	62·4	64·6	66·9	71·3	70·8	63·8	61·2	59·4
21	61·9	61·2	59·4	61·4	62·3	64·8	68·1	71·6	70·4	63·5	60·3	58·5
22	61·5	61·5	59·7	61·1	63·6	65·5	69·0	72·2	69·3	63·3	59·8	58·3
23	61·3	61·4	59·7	61·6	64·8	65·2	68·6	73·3	67·7	62·5	59·5	57·7
24	60·5	62·3	59·3	62·0	64·4	65·3	67·4	74·8	67·0	62·3	58·5	57·1
25	60·0	61·1	59·6	62·2	63·0	65·8	66·5	73·1	67·2	62·4	58·0	57·2
26	59·6	61·0	61·1	61·0	62·8	66·4	66·4	69·7	67·1	62·1	59·2	57·0
27	58·9	61·3	60·9	60·8	63·1	67·3	66·6	68·9	67·9	62·6	59·4	57·0
28	59·8	59·9	60·1	61·3	62·0	67·2	67·1	69·0	69·5	63·2	58·5	56·6
29	61·1	59·8	61·8	62·0	61·6	67·0	68·4	68·4	68·6	62·3	58·2	56·7
30	61·0		63·0	61·8	62·4	67·5	69·4	69·2	67·3	63·4	56·9	56·0
31	60·2		62·8		62·3		70·3	70·2		63·8		55·4
Means	60°·81	60°·30	60°·89	61°·75	62°·78	64°·48	68°·68	71°·66	69°·43	63°·59	1d to 9d, 63°·13 11d to 30d, 60°·20.	58°·85

TABLE V.—MONTHLY MEAN DIURNAL INEQUALITY OF HORIZONTAL MAGNETIC FORCE.

(The results are expressed in terms of the whole Horizontal Force, diminished in each case by the smallest hourly value, the unit in the table being ·00001 of the whole Horizontal Force. The letters u *and* c *indicate respectively values uncorrected for, and corrected for temperature.)*

1884.

Hour, Greenwich Mean Solar Time.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	u	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*
h 0	5	4	14	16	40	40	38	38	49	57	52	56	86	93	75	79	96	97	30	34	0	0	2	2
1	42	42	47	50	88	91	93	96	84	93	82	91	126	138	119	127	154	157	72	76	26	28	35	37
2	73	75	87	92	127	132	151	154	103	116	117	130	149	163	139	148	181	186	110	116	60	62	58	60
3	91	95	120	125	158	165	187	192	119	134	162	178	174	192	154	165	197	206	134	141	75	77	68	72
4	101	105	133	139	168	175	220	226	144	161	175	193	190	210	159	171	202	212	144	151	80	82	69	73
5	122	125	150	156	170	178	242	248	164	183	211	231	205	227	170	183	203	214	155	163	90	91	77	81
6	128	131	158	165	193	201	257	264	182	202	238	259	220	243	185	200	211	222	162	170	103	104	75	79
7	135	138	166	174	216	224	263	271	182	204	230	253	230	255	196	212	226	238	166	174	111	112	69	73
8	127	129	155	163	210	219	255	263	170	194	210	235	232	259	196	213	230	243	179	188	125	125	70	74
9	123	125	147	156	199	208	250	259	158	184	190	217	218	247	181	199	223	237	187	196	121	121	65	69
10	104	106	153	161	193	201	238	246	137	161	179	204	212	238	181	198	212	225	186	194	114	114	57	61
11	105	107	152	160	196	204	240	248	121	143	164	186	199	223	167	182	205	217	186	194	116	115	55	58
12	106	107	162	169	194	201	232	239	116	136	161	181	186	207	157	171	208	218	184	191	115	114	61	64
13	105	106	164	171	196	202	216	222	111	128	146	163	167	186	143	155	200	209	179	185	117	115	67	69
14	107	108	156	162	196	202	209	214	108	123	141	156	168	184	136	147	199	207	177	182	117	115	73	75
15	110	111	151	156	203	208	201	206	109	122	140	152	169	183	138	147	198	205	187	192	118	115	76	78
16	117	117	166	171	203	207	200	204	110	121	141	151	169	180	133	140	199	205	190	194	129	125	86	87
17	125	125	179	183	212	216	200	203	100	109	130	138	153	161	123	129	195	200	194	197	143	139	98	99
18	135	135	186	190	204	207	198	200	81	87	102	107	135	141	102	106	173	177	188	190	161	156	106	106
19	132	131	188	191	180	182	170	171	51	55	79	82	103	106	77	80	133	135	162	163	151	146	107	107
20	109	108	152	155	125	127	112	113	28	30	42	42	61	62	40	41	75	76	113	114	117	111	90	89
21	57	56	91	93	60	61	49	49	8	8	9	7	11	9	6	6	26	26	45	45	72	66	48	47
22	15	15	38	40	9	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	20	12	11
23	0	0	0	0	0	0	1	1	23	25	21	25	38	41	16	18	24	24	1	1	11	5	0	0
Means corrected for Temperature	95·9		134·9		160·9		180·3		115·7		143·2		164·5		134·0		172·3		143·8		94·1		65·5	

TABLE VI.—MONTHLY MEANS of READINGS of the THERMOMETER placed within the box inclosing the HORIZONTAL FORCE MAGNET, at each of the ordinary Hours of Observation.

1884.

Hour, Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	For the Year.
h 0	° 60·75	° 60·23	° 60·70	° 61·63	° 62·66	° 64·19	° 68·52	° 71·51	° 69·34	° 63·58	° 61·11	° 58·84	° 63·59
1	60·79	60·34	60·87	61·78	62·82	64·47	68·76	71·68	69·42	63·62	61·16	58·87	63·71
2	60·86	60·37	60·97	61·84	62·97	64·67	68·94	71·82	69·54	63·71	61·19	58·93	63·82
3	60·95	60·43	61·06	61·95	63·13	64·88	69·12	71·93	69·68	63·80	61·19	58·97	63·92
9	60·90	60·58	61·23	62·07	63·66	65·49	69·74	72·34	69·97	63·88	61·12	58·95	64·16
21	60·75	60·16	60·79	61·56	62·25	63·90	67·98	71·28	69·16	63·36	60·83	58·72	63·40
22	60·76	60·17	60·76	61·56	62·29	64·02	68·10	71·31	69·15	63·37	60·84	58·73	63·42
23	60·76	60·14	60·75	61·58	62·45	64·18	68·32	71·38	69·20	63·41	60·84	58·77	63·48

TABLE VII.—MEAN VERTICAL MAGNETIC FORCE (diminished by a Constant) FOR EACH ASTRONOMICAL DAY.

(Each result is the mean of 24 hourly ordinates from the photographic register, expressed in terms of the whole Vertical Force, the unit in the table being ·00001 of the whole Vertical Force. The letters u *and* c *indicate respectively values uncorrected for, and corrected of temperature.)*

1884.

Day of Month.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	u	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*
1	651	623	668	616	543	491	586	472	..	..	594	468	743	513	765	467	612	358	..	..	342	212	120	146
2	683	631	677	629	543	493	593	475	..	..	667	525	..	..	759	465	596	344	..	..	..	..	147	139
3	717	643	661	617	553	493	595	481	555	457	632	482	..	..	716	462	592	342	485	305	408	286	188	134
4	752	658	669	599	550	490	580	486	538	448	621	473	814	540	680	436	568	346	448	286	367	247	197	155
5	775	679	683	605	551	491	573	485	548	452	646	502	791	527	669	415	528	324	419	275	362	240	202	140
6	765	677	671	615	571	487	584	476	535	457	636	506	755	515	678	406	531	323	400	240	361	243	211	141
7	740	664	625	589	579	491	587	479	539	443	611	493	750	510	706	416	532	328	449	281	365	263	213	151
8	723	661	632	592	550	488	590	496	558	456	596	482	792	520	764	452	539	313	434	282	326	244	234	180
9	739	661	623	571	532	490	574	496	564	458	588	474	782	500	775	449	579	319	400	280	325	229	207	177
10	747	671	611	563	559	483	555	475	601	471	625	485	764	512	783	449	610	346	361	275	333	231	189	157
11	726	676	599	549	570	488	579	485	630	486	651	479	735	497	794	446	611	349	317	239	334	236	217	171
12	700	658	589	535	555	487	581	481	666	512	682	490	748	496	798	444	612	346	330	234	324	230	221	161
13	694	638	613	539	563	479	546	476	655	515	688	518	745	483	781	447	622	338	321	227	317	223	240	166
14	693	623	631	551	579	497	504	424	645	523	661	525	765	509	732	426	647	367	357	245	300	222	227	175
15	716	632	597	551	595	499	532	442	630	510	618	510	759	493	696	406	648	352	393	251	265	203	236	206
16	687	627	581	547	607	513	540	456	650	506	611	505	758	506	685	401	654	340	415	249	236	184	207	193
17	685	621	565	527	616	520	528	460	668	532	617	497	725	487	681	387	640	310	436	270	246	178	176	174
18	682	612	585	523	635	527	504	438	615	501	607	481	694	478	686	392	703	377	423	263	244	170	173	149
19	690	622	583	511	630	536	490	412	622	506	653	515	627	437	660	384	677	379	423	273	250	170	168	126
20	710	624	612	532	599	537	504	412	614	500	669	523	655	447	643	367	633	353	395	261	241	169	179	151
21	702	620	608	528	570	528	506	418	598	482	664	504	681	451	682	386	622	352	388	264	216	164	160	146
22	690	612	602	520	546	500	488	408	606	470	680	512	700	454	699	385	591	343	369	247	190	146	153	145
23	688	618	605	527	547	497	490	400	657	495	731	565	703	475	715	379	538	322	342	236	195	157	128	136
24	674	610	644	556	533	491	487	391	663	509	711	539	657	445	741	373	510	306	337	237	181	161	117	117
25	638	582	614	548	524	478	523	425	623	499	719	537	630	430	700	370	495	287	337	233	167	141	111	115
26	..	..	..	..	533	457	494	416	613	513	707	511	625	435	596	348	499	287	330	238	169	121	..	..
27	630	602	..	..	520	444	495	417	615	513	705	489	637	437	562	336	500	284	315	209	168	122	88	96
28	628	580	..	..	489	421	502	420	584	508	719	505	651	435	551	333	535	295	340	224	198	172	91	107
29	660	580	555	501	556	468	521	431	559	477	719	515	673	435	542	328	529	301	343	237	171	161	85	99
30	681	595			589	485	505	417	588	468	736	518	707	451	555	319	503	293	339	213	135	149	..	..
31	680	608			577	467			586	466			740	464	599	343			339	207			..	..

At the beginning of the month of May the time of vibration of the magnet in the vertical plane was altered; and on December 30 the magnet was dismounted for determination of its time of vibration in the horizontal plane; thus, in each case, breaking the continuity of the values.

TABLE VIII.—MEANS of READINGS of the THERMOMETER placed within the box inclosing the VERTICAL FORCE MAGNET, for each Astronomical Day.

1884.

Day of Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	58·4	59·6	59·6	62·7	..	63·3	68·5	71·9	69·7	..	63·5	55·7
2	59·6	59·4	59·5	62·9	..	64·1	..	71·7	69·6	..	..	57·4
3	60·7	59·2	60·0	62·7	61·9	64·5	..	69·7	69·5	66·0	63·1	59·7
4	61·7	60·5	60·0	61·7	61·5	64·4	70·7	69·2	68·1	65·1	63·0	59·1
5	61·8	60·9	60·0	61·4	61·8	64·2	70·2	69·7	67·2	64·2	63·1	60·1
6	61·4	59·8	61·2	62·4	60·9	63·5	69·0	70·6	67·4	65·0	62·9	60·5
7	60·8	58·8	61·4	62·4	61·8	62·9	69·0	71·5	67·2	65·4	62·1	60·1
8	60·1	59·0	60·1	61·7	62·1	62·7	70·6	72·6	68·3	64·6	61·1	59·7
9	60·9	59·6	59·1	60·9	62·3	62·7	71·1	73·3	70·0	63·0	61·8	58·5
10	60·8	59·4	60·8	61·0	63·5	64·0	69·6	73·7	70·2	61·3	62·1	58·6
11	59·5	59·5	61·1	61·7	64·2	65·6	68·9	74·4	70·1	60·9	61·9	59·3
12	59·1	59·7	60·4	62·0	64·7	66·6	69·6	74·7	70·3	61·8	61·7	60·0
13	59·8	60·7	61·2	60·5	64·0	65·5	70·1	73·7	71·2	61·7	61·7	60·7
14	60·5	61·0	61·1	61·0	63·1	63·8	69·8	72·3	71·0	62·6	60·9	59·6
15	61·2	59·3	61·8	61·5	63·0	62·4	70·3	71·5	71·8	64·1	60·1	58·5
16	60·0	58·7	61·7	61·2	64·2	62·3	69·6	71·2	72·7	65·3	59·6	57·7
17	60·2	58·9	61·8	60·4	63·8	63·0	68·9	71·7	73·5	65·3	60·4	57·1
18	60·5	60·1	62·4	60·3	62·7	63·3	67·8	71·7	73·3	65·0	60·7	58·2
19	60·4	60·6	61·7	60·9	62·8	63·9	66·5	70·8	71·9	64·5	61·0	59·1
20	61·3	61·0	60·1	61·6	62·7	64·3	67·4	70·8	71·0	63·7	60·6	58·4
21	61·1	61·0	59·1	61·4	62·8	65·0	68·5	71·8	70·5	63·2	59·6	57·7
22	60·9	61·1	59·3	61·0	63·8	65·4	69·3	72·7	69·4	63·1	59·2	57·4
23	60·5	60·9	59·5	61·5	65·1	65·3	68·4	73·8	67·8	62·3	58·9	56·6
24	60·2	61·4	59·1	61·8	64·7	65·6	67·6	75·4	67·2	62·0	58·0	57·0
25	59·8	60·3	59·3	61·9	63·2	66·1	67·0	73·5	67·4	62·2	58·3	56·8
26	..	..	60·8	60·9	62·0	66·8	66·5	69·4	67·6	61·6	59·4	..
27	58·4	..	60·8	60·9	62·1	67·8	67·0	68·3	67·8	62·3	59·3	56·6
28	59·4	..	60·4	61·1	60·8	67·7	67·8	67·9	69·0	62·8	58·3	56·2
29	61·0	59·7	61·4	61·5	61·1	67·2	68·9	67·7	68·4	62·3	57·5	56·3
30	61·3		62·2	61·4	63·0	67·9	69·8	68·8	67·5	63·3	56·3	..
31	60·6		62·5		63·0		70·8	69·8		63·6		..
Means	60·39	60·00	60·63	61·48	62·84	64·73	68·94	71·48	69·55	63·39	60·56	58·31

TABLE IX.—MONTHLY MEAN DIURNAL INEQUALITY OF VERTICAL MAGNETIC FORCE.

(*The results are expressed in terms of the whole Vertical Force, diminished in each case by the smallest hourly value, the unit in the table being* ·00001 *of the whole Vertical Force. The letters* u *and* c *indicate respectively values uncorrected for, and corrected for temperature.*)

1884.

Hour, Greenwich Mean Solar Time.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	u	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*	*u*	*c*
h 0	2	3	5	1	0	0	0	0	0	0	0	0	2	0	5	1	3	0	9	5	14	8	6	4
1	7	6	12	6	13	9	15	11	19	15	14	8	17	9	20	12	15	10	19	13	29	23	12	10
2	19	16	18	10	31	25	45	39	45	39	35	25	42	30	43	33	30	23	33	25	41	33	23	19
3	25	22	33	25	50	44	63	57	63	55	55	43	59	45	61	49	44	33	47	39	44	38	26	20
4	22	19	42	34	62	56	76	70	79	70	76	63	67	52	70	57	52	41	55	47	45	39	26	21
5	19	17	42	34	65	58	87	82	92	82	92	77	73	57	75	62	56	44	55	47	43	38	24	19
6	18	16	40	32	63	56	92	87	100	89	103	87	75	58	75	61	55	43	53	45	39	34	23	19
7	17	15	39	31	59	52	90	85	100	88	103	86	74	56	72	57	52	40	51	43	37	32	22	19
8	15	14	38	30	59	51	87	83	99	86	95	76	73	54	71	56	50	37	49	41	32	28	21	18
9	13	12	36	28	55	47	81	77	94	80	85	65	68	48	67	51	47	34	44	36	29	25	20	18
10	12	11	32	25	50	43	73	70	85	73	77	59	61	43	61	47	44	32	39	32	24	20	16	14
11	13	12	28	21	47	41	65	62	81	71	72	56	56	41	57	44	36	26	36	30	22	19	13	11
12	9	8	26	20	41	35	61	59	80	72	65	52	50	37	53	42	33	24	33	27	20	17	12	10
13	7	6	21	16	38	33	54	53	75	69	62	51	44	34	49	40	31	23	31	26	16	14	8	7
14	3	2	17	12	33	29	52	51	70	66	58	49	41	33	48	40	28	22	25	21	13	11	5	4
15	3	2	14	10	28	25	48	48	68	66	56	49	36	31	48	42	25	20	24	21	12	11	2	1
16	4	3	14	11	27	25	49	50	69	69	59	54	35	33	47	43	24	20	24	22	12	12	1	0
17	3	2	11	8	27	25	53	54	69	71	58	55	36	36	48	45	24	22	22	21	12	12	1	0
18	2	1	8	6	29	28	57	59	65	69	51	51	32	35	46	45	29	28	23	22	9	10	0	0
19	3	2	9	8	37	37	57	60	58	64	45	47	29	34	46	47	31	31	28	28	7	8	1	1
20	4	3	12	11	38	39	51	54	46	54	37	41	25	33	39	41	28	30	30	31	12	14	3	3
21	1	0	12	12	29	31	35	39	30	40	24	30	16	26	22	26	19	22	23	25	10	12	3	3
22	0	1	4	4	13	13	20	22	13	23	12	16	8	14	9	11	10	13	11	13	3	5	4	4
23	2	1	0	0	2	2	3	5	0	6	3	3	0	2	0	0	0	1	0	0	0	0	4	2
Means corrected for Temperature	8·1		16·5		33·5		53·2		59·0		47·6		35·0		39·7		25·8		27·5		19·3		9·5	

TABLE X.—MONTHLY MEANS of READINGS of the THERMOMETER placed within the box inclosing the VERTICAL FORCE MAGNET, at each of the ordinary Hours of Observation.

1884.

Hour. Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	For the Year.
h 0	60°·32	60°·02	60°·50	61°·41	62°·80	64°·54	68°·83	71°·43	69°·50	63°·42	60°·67	58°·33	63°·48
1	60·42	60·11	60·72	61·60	62·98	64·84	69·08	71·56	69·63	63·51	60·75	58·35	63·63
2	60·46	60·17	60·78	61·67	63·09	64·95	69·26	71·69	69·72	63·57	60·76	58·39	63·71
3	60·50	60·21	60·82	61·75	63·23	65·08	69·43	71·80	69·85	63·63	60·74	58·47	63·79
9	60·40	60·20	60·90	61·61	63·54	65·46	69·72	72·03	70·01	63·61	60·63	58·26	63·86
21	60·35	59·75	60·44	61·22	62·25	64·16	68·21	71·02	69·18	63·08	60·27	58·21	63·18
22	60·33	59·80	60·45	61·26	62·32	64·33	68·38	71·11	69·23	63·10	60·30	58·23	63·24
23	60·36	59·77	60·45	61·30	62·54	64·48	68·61	71·22	69·30	63·18	60·36	58·28	63·32

TABLE XI.—MEAN MAGNETIC DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE in each MONTH.

(The results for Horizontal Force and Vertical Force are corrected for temperature.)

Month.	DECLINATION WEST in Arc.	HORIZONTAL FORCE in terms of the whole Horizontal Force (diminished by a Constant).	VERTICAL FORCE in terms of the whole Vertical Force (diminished by a Constant).	DECLINATION diminished by 17° and expressed as Westerly Force. (in terms of GAUSS'S METRICAL UNIT.)	HORIZONTAL FORCE (diminished by a Constant). (in terms of GAUSS'S METRICAL UNIT.)	VERTICAL FORCE (diminished by a Constant). (in terms of GAUSS'S METRICAL UNIT.)
	° '					
January	18. 10·3	472	630	3706	855	2755
February	18. 10·0	450	559	3690	815	2445
March	18. 9·4	461	491	3658	835	2147
April	18. 8·5	516	448	3611	935	1959
May	18. 8·2	640	487	3595	1160	2130
June	18. 7·9	632	504	3579	1145	2204
July	18. 8·3	630	479	3600	1142	2095
August	18. 7·8	578	401	3574	1047	1754
September	18. 6·3	582	331	3495	1055	1447
October	18. 4·9	524	251	3421	949	1098
November	18. 4·7	Nov. 1–9 505 Nov. 11–30 501	196	3410	Nov. 1–9 915 Nov. 11–30 908	857
December	18. 4·7	551	148	3410	998	647
Means	18° 7'·6	....	....	3562	....	....
Number of Column	1	2	3	4	5	6

The units in columns 2 and 3 are ·00001 of the whole Horizontal and Vertical Forces respectively; in columns 4, 5, and 6 the unit is ·00001 of the Millimètre-Milligramme-Second Unit, or ·000001 of the Centimètre-Gramme-Second (C.G.S.) Unit, in terms of which Units the values of whole Horizontal Force (applicable to columns 4 and 5) are 1·812 and 0·1812 respectively for the year, and of whole Vertical Force (applicable to column 6) 4·373 and 0·4373 respectively for the year.

HORIZONTAL FORCE.—On November 10 the cord attaching the pulley of the suspension skein to the small windlass at the back of the brick pier was found broken; and at the end of the year experiments were made for determination of the angle of torsion, thus, in each case, breaking the continuity of the values.

VERTICAL FORCE.—At the beginning of the month of May the time of vibration of the magnet in the vertical plane was altered; and on December 30 the magnet was dismounted for determination of its time of vibration in the horizontal plane; thus, in each case, breaking the continuity of the values.

TABLE XII.—MEAN DIURNAL INEQUALITIES of MAGNETIC DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE for the Year 1884.

(Each result is the mean of the twelve monthly mean values, the annual means for each element being diminished by the smallest hourly value. The results for Horizontal Force and Vertical Force are corrected for temperature.)

Hour, Greenwich Mean Solar Time.	Inequality of			Inequality of		
	DECLINATION WEST in Arc.	HORIZONTAL FORCE in terms of the whole Horizontal Force.	VERTICAL FORCE in terms of the whole Vertical Force.	DECLINATION expressed as WESTERLY FORCE (in terms of GAUSS'S METRICAL UNIT)	HORIZONTAL FORCE (in terms of GAUSS'S METRICAL UNIT)	VERTICAL FORCE (in terms of GAUSS'S METRICAL UNIT)
h 0	8·14	35·0	0·0	429·1	63·4	0·0
1	9·23	77·5	9·2	486·5	140·4	40·2
2	8·80	111·5	24·6	463·8	202·0	107·6
3	7·31	137·2	37·4	385·3	248·6	163·6
4	5·63	150·2	45·6	296·8	272·2	199·4
5	4·29	165·3	49·6	226·1	299·5	216·9
6	3·56	178·7	50·5	187·6	323·8	220·8
7	3·00	186·0	48·5	158·1	337·0	212·1
8	2·52	184·1	46·0	132·8	333·6	201·2
9	2·08	176·8	41·6	109·6	320·4	181·9
10	1·80	167·8	37·3	94·9	304·1	163·1
11	1·63	161·7	34·4	85·9	293·0	150·4
12	1·52	158·5	31·8	80·1	287·2	139·1
13	1·59	151·3	29·2	83·8	274·2	127·7
14	1·74	148·2	26·5	91·7	268·5	115·9
15	1·78	148·3	25·4	93·8	268·7	111·1
16	1·64	150·5	26·7	86·4	272·7	116·8
17	1·34	150·2	27·4	70·6	272·2	119·8
18	0·87	142·2	27·7	45·9	257·7	121·1
19	0·38	121·1	28·8	20·0	219·4	125·9
20	0·00	81·0	27·7	0·0	146·8	121·1
21	0·52	31·4	20·4	27·4	56·9	89·2
22	2·46	0·0	9·8	129·7	0·0	42·9
23	5·39	3·7	0·0	284·1	6·7	0·0
Means	3·22	125·8	29·4	169·6	227·9	128·7
Number of Column	1	2	3	4	5	6

The units in columns 2 and 3 are ·00001 of the whole Horizontal and Vertical Forces respectively; in columns 4, 5, and 6 the unit is ·00001 of the Millimètre-Milligramme-Second Unit or ·000001 of the Centimètre-Gramme-Second (C.G.S.) Unit, in terms of which Units the values of whole Horizontal Force (applicable to columns 4 and 5) are 1·812 and 0·1812 respectively, and of whole Vertical Force (applicable to column 6) are 4·373 and 0·4373 respectively.

TABLE XIII.—DIURNAL RANGE of DECLINATION and HORIZONTAL FORCE, on each ASTRONOMICAL DAY, as deduced from the TWENTY-FOUR HOURLY MEASURES of ORDINATES of the PHOTOGRAPHIC REGISTER.

(The Declination is expressed in minutes of arc: the unit for Horizontal Force is ·00001 of the whole Horizontal Force. The results for Horizontal Force are corrected for temperature.)

1884.

Day of Month.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.	Dec.	H.F.
d	′		′		′		′		′		′		′		′		′		′		′		′	
1	4·7	170	9·7	350	16·1	280	15·1	330	10·3	250	15·1	220	9·5	310	7·5	230	10·8	260	..	..	8·9	310	7·6	180
2	6·7	140	9·7	260	15·1	270	17·6	400	8·9	260	14·1	410	..	..	11·6	310	11·4	270	..	..	..	..	5·3	180
3	5·6	170	8·3	220	12·2	260	14·2	280	11·3	270	11·8	360	..	..	10·9	310	13·9	280	11·0	270	15·3	360	4·8	100
4	5·8	170	17·3	300	11·1	280	15·7	300	12·5	270	11·6	340	10·8	290	12·3	200	12·0	240	11·7	350	8·8	290	5·7	170
5	7·0	140	8·7	190	10·2	290	16·0	320	12·9	250	12·6	190	14·5	270	12·8	210	13·1	240	12·4	220	8·6	260	4·5	130
6	5·5	110	9·6	170	9·7	320	16·7	310	12·8	230	14·8	430	15·3	310	11·1	160	12·9	410	17·5	390	14·3	230	3·9	130
7	6·2	160	6·8	210	14·7	240	13·2	330	9·8	230	11·5	250	13·0	310	8·0	150	14·2	290	12·6	320	6·9	210	6·3	230
8	11·0	200	7·6	240	12·3	170	14·2	370	8·1	210	12·1	300	14·9	290	15·8	420	14·4	250	10·4	210	8·0	270	9·4	160
9	6·3	150	9·3	280	9·0	210	18·4	310	13·7	250	11·1	280	15·0	360	17·0	390	12·9	410	10·6	290	10·4	300	7·0	210
10	8·5	190	9·0	220	10·7	270	16·9	450	15·5	380	13·7	320	16·3	310	13·5	280	14·6	380	9·5	270	11·5	..	5·8	150
11	7·8	210	8·6	280	13·5	240	16·6	340	10·7	330	14·4	320	13·9	300	12·9	220	13·4	320	12·1	270	7·7	260	15·1	190
12	13·8	190	6·4	270	11·3	270	15·2	320	9·6	250	13·9	330	8·7	260	11·0	330	10·5	240	11·6	260	7·3	140	5·2	100
13	5·4	140	5·2	160	14·7	240	12·9	260	10·8	260	16·5	380	15·9	520	9·0	250	19·5	260	10·0	260	6·5	160	4·5	230
14	7·6	220	5·0	160	15·3	270	15·2	330	12·9	270	13·8	280	11·7	250	11·4	380	13·8	220	14·3	330	6·7	310	20·5	230
15	8·7	230	7·6	160	11·0	280	15·1	270	13·7	250	11·8	210	12·4	370	10·3	230	9·5	230	12·4	250	6·8	170	12·1	230
16	5·5	170	7·7	230	12·6	300	16·0	360	10·2	240	14·8	190	12·4	210	8·8	140	11·5	210	8·7	260	7·2	230	7·6	150
17	6·7	160	10·0	290	13·6	260	21·0	380	10·0	160	15·4	230	7·2	220	13·0	240	19·1	630	12·2	160	9·2	290	5·5	160
18	9·2	250	7·5	230	12·0	260	12·6	320	10·4	180	17·3	480	9·2	220	10·4	310	17·3	390	6·8	190	8·3	150	6·3	150
19	6·8	160	4·7	180	14·8	250	12·1	410	11·4	230	10·0	170	12·3	370	12·4	310	8·7	230	9·2	210	9·0	160	7·3	250
20	7·3	140	8·9	180	12·9	350	11·6	250	12·2	230	12·9	270	11·3	300	18·4	530	10·6	250	7·1	270	7·5	140	9·2	130
21	8·1	170	9·3	220	12·2	290	10·0	220	14·9	160	16·3	270	10·8	190	15·0	450	14·7	420	10·1	230	5·8	170	9·4	210
22	7·0	190	9·1	290	13·7	300	14·6	180	15·2	350	15·3	540	12·5	320	14·7	330	12·3	250	9·8	290	6·1	180	13·2	280
23	5·8	150	18·9	290	17·5	370	12·6	230	9·8	240	15·8	390	11·8	360	10·6	310	12·8	260	10·0	290	12·5	210	7·1	130
24	6·3	190	14·9	390	15·8	300	22·2	600	13·5	200	12·0	370	10·8	380	11·7	280	14·1	240	10·0	300	8·1	150	6·0	130
25	12·3	330	12·6	330	12·2	280	16·7	370	13·4	150	14·9	370	14·4	370	12·6	220	11·1	320	12·2	240	6·6	130	4·5	100
26	8·5	240	12·5	250	13·6	360	14·2	380	15·6	280	13·2	250	10·5	260	13·6	210	12·2	300	11·0	190	3·9	140	5·8	110
27	8·0	190	11·8	290	12·5	330	14·4	280	14·6	290	16·1	280	7·0	270	13·0	220	10·2	270	8·3	190	7·8	250	8·2	270
28	8·6	200	13·6	300	22·5	480	14·5	370	14·5	240	14·0	330	11·7	170	11·0	240	10·0	230	10·9	350	11·1	380	8·3	150
29	9·3	210	20·1	410	13·4	330	12·1	220	13·6	220	13·0	300	9·5	280	10·4	140	10·2	250	14·0	220	7·6	150	4·9	140
30	8·5	180			14·1	230	10·5	380	11·5	270	13·4	290	7·4	290	8·7	220	12·6	340	7·9	270	6·3	140	6·7	90
31	8·3	190			12·6	310			13·0	430			11·1	150	8·3	250			8·5	170			5·0	90
Means	7·6	184	10·0	251	13·3	287	14·9	329	12·2	253	13·8	312	11·8	293	11·9	273	12·8	296	10·8	259	8·4	219	7·5	166

The mean of the twelve monthly values is, for Declination 11′·2, and for Horizontal Force 260.

TABLE XIV.—MONTHLY MEAN DIURNAL RANGE, and SUMS of HOURLY DEVIATIONS from MEAN, for DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE, as deduced from the Monthly Mean Diurnal Inequalities, Tables II., V., and IX.

(The Declination is expressed in minutes of arc: the units for Horizontal Force and Vertical Force are ·00001 of the whole Horizontal and Vertical Forces respectively. The results for Horizontal Force and Vertical Force are corrected for temperature.)

Month.	Difference between the Greatest and Least of 24 Hourly Values.			Sums of the 24 Hourly Deviations from the Mean Value.		
	Declination.	Horizontal Force.	Vertical Force.	Declination.	Horizontal Force.	Vertical Force.
	′			′		
January	6·3	138	22	36·4	767	146
February	8·1	191	34	46·0	1056	229
March	11·4	224	58	63·8	1329	314
April	13·2	271	87	70·4	1643	429
May	11·3	204	89	59·5	1152	481
June	12·4	259	87	72·9	1509	429
July	10·8	259	58	59·6	1460	283
August	10·4	213	62	58·2	1241	306
September	10·9	243	44	58·8	1386	219
October	9·4	197	47	51·7	1245	232
November	6·6	156	39	36·3	832	233
December	5·9	107	21	29·9	501	169
Means	9·7	205	54	53·6	1177	289

TABLE XV.—VALUES of the CO-EFFICIENTS in the PERIODICAL EXPRESSION

$$V_t = m + a_1 \cos t + b_1 \sin t + a_2 \cos 2t + b_2 \sin 2t + a_3 \cos 3t + b_3 \sin 3t + a_4 \cos 4t + b_4 \sin 4t$$

(in which t is the time from mean solar noon converted into arc at the rate of 15° to each hour, and V_t the mean value of the magnetic element at the time t for each month and for the year, as given in Tables II., V., IX., and XII., the values for Horizontal Force and Vertical Force being corrected for temperature.).

The values of the co-efficients for Declination are given in minutes of arc: the units for Horizontal Force and Vertical Force are ·00001 of the whole Horizontal and Vertical Forces respectively.

Month.	m	a_1	b_1	a_2	b_2	a_3	b_3	a_4	b_4
					DECLINATION WEST.				
	′	′	′	′	′	′	′	′	′
January	1·99	+ 1·80	+ 1·09	+ 0·45	+ 1·03	+ 0·76	+ 0·38	+ 0·31	+ 0·28
February	3·16	+ 1·82	+ 1·58	+ 0·29	+ 1·85	+ 0·65	+ 0·74	+ 0·25	+ 0·33
March	4·27	+ 2·78	+ 2·16	+ 1·27	+ 2·08	+ 1·20	+ 0·92	+ 0·48	+ 0·27
April	4·92	+ 2·77	+ 2·62	+ 2·07	+ 2·34	+ 1·12	+ 1·18	+ 0·31	+ 0·25
May	4·73	+ 2·26	+ 2·60	+ 2·21	+ 1·63	+ 0·84	+ 0·42	+ 0·18	+ 0·07
June	5·26	+ 2·68	+ 3·55	+ 2·03	+ 1·83	+ 0·60	+ 0·53	− 0·06	− 0·01
July	4·45	+ 2·34	+ 2·85	+ 1·80	+ 1·21	+ 0·83	+ 0·43	+ 0·02	+ 0·14
August	3·44	+ 2·76	+ 2·03	+ 1·89	+ 1·28	+ 1·02	+ 0·58	+ 0·26	+ 0·22
September	3·50	+ 2·83	+ 1·76	+ 1·74	+ 1·59	+ 1·07	+ 0·81	+ 0·54	+ 0·14
October	3·46	+ 2·22	+ 1·57	+ 1·16	+ 1·77	+ 0·89	+ 0·82	+ 0·62	+ 0·30
November	2·28	+ 1·85	+ 0·70	+ 0·48	+ 1·40	+ 0·66	+ 0·48	+ 0·35	+ 0·40
December	2·43	+ 1·82	+ 0·41	− 0·03	+ 1·06	+ 0·54	+ 0·22	+ 0·24	+ 0·27
For the Year	3·22	+ 2·33	+ 1·91	+ 1·28	+ 1·59	+ 0·85	+ 0·63	+ 0·29	+ 0·22
					HORIZONTAL FORCE.				
January	95·9	− 37·8	+ 7·4	− 38·4	+ 6·4	− 10·5	+ 10·4	− 0·4	+ 9·9
February	134·9	− 56·6	− 2·5	− 44·7	+ 7·4	− 19·8	+ 13·1	+ 0·9	+ 10·7
March	160·9	− 75·7	+ 17·3	− 43·4	+ 23·3	− 5·7	+ 22·0	+ 1·6	+ 13·6
April	180·3	− 88·6	+ 51·3	− 47·1	+ 23·5	− 11·6	+ 20·3	+ 4·6	+ 9·2
May	115·7	− 47·5	+ 61·5	− 24·1	+ 18·7	+ 8·8	+ 6·1	+ 4·2	+ 2·9
June	143·2	− 64·6	+ 74·1	− 33·5	+ 22·8	+ 3·9	+ 5·8	+ 6·5	+ 1·7
July	164·5	− 69·0	+ 68·7	− 23·9	+ 26·4	+ 9·2	+ 19·4	+ 6·1	+ 5·3
August	134·0	− 55·2	+ 61·1	− 16·5	+ 24·3	+ 7·7	+ 18·2	+ 4·4	+ 7·4
September	172·3	− 68·5	+ 49·8	− 24·9	+ 38·3	+ 6·4	+ 27·2	+ 5·0	+ 11·1
October	143·8	− 73·9	+ 11·8	− 35·1	+ 22·0	− 6·6	+ 24·5	+ 1·5	+ 7·5
November	94·1	− 44·1	− 9·8	− 33·9	+ 1·2	− 10·1	+ 14·9	− 0·5	+ 8·9
December	65·5	− 18·4	− 5·6	− 28·9	+ 9·2	− 9·8	+ 10·7	− 1·5	+ 8·2
For the Year	125·8	− 58·3	+ 32·1	− 32·9	+ 18·6	− 3·2	+ 16·0	+ 2·7	+ 8·0
					VERTICAL FORCE.				
January	8·1	− 0·3	+ 8·6	− 1·7	+ 1·8	− 2·1	+ 1·6	− 1·0	− 0·1
February	16·5	− 5·6	+ 12·0	− 5·6	− 0·5	− 3·9	− 1·0	− 1·9	− 0·9
March	33·5	− 9·1	+ 12·8	− 12·9	− 1·8	− 9·4	− 0·1	− 3·3	+ 0·9
April	53·2	− 19·2	+ 14·7	− 21·2	− 2·8	− 8·5	+ 1·2	− 2·5	+ 1·5
May	59·0	− 25·7	+ 9·8	− 20·8	+ 1·0	− 6·7	+ 0·5	− 1·5	+ 1·2
June	47·6	− 20·8	+ 13·8	− 21·3	− 0·4	− 4·4	− 2·7	+ 0·3	0·0
July	35·0	− 11·1	+ 11·8	− 13·8	+ 0·6	− 6·2	+ 0·7	− 2·6	+ 0·4
August	39·7	− 13·3	+ 9·0	− 16·3	+ 2·9	− 6·9	+ 2·3	− 2·5	+ 1·2
September	25·8	− 5·4	+ 8·3	− 11·1	− 0·6	− 6·2	+ 0·8	− 2·0	+ 1·2
October	27·5	− 5·1	+ 10·8	− 10·0	0·0	− 6·7	+ 0·3	− 2·8	+ 1·2
November	19·3	+ 0·4	+ 13·5	− 5·0	+ 4·2	− 3·4	+ 2·1	− 2·1	+ 1·3
December	9·5	− 0·1	+ 10·5	− 1·1	+ 0·5	− 1·7	+ 1·0	− 1·3	+ 0·7
For the Year	29·4	− 9·6	+ 11·3	− 11·7	+ 0·4	− 5·5	+ 0·6	− 1·9	+ 0·7

TABLE XVI.—VALUES of the CO-EFFICIENTS and CONSTANT ANGLES in the PERIODICAL EXPRESSIONS

$$V_t = m + c_1 \sin(t+\alpha) + c_2 \sin(2t+\beta) + c_3 \sin(3t+\gamma) + c_4 \sin(4t+\delta)$$

$$V_{t'} = m + c_1 \sin(t'+\alpha') + c_2 \sin(2t'+\beta') + c_3 \sin(3t'+\gamma') + c_4 \sin(4t'+\delta')$$

(in which t and t' are the times from mean solar noon and apparent solar noon respectively converted into arc at the rate of 15° to each hour, and V_t, $V_{t'}$ the mean value of the magnetic element at the time t or t' for each month and for the year, as given in Tables II., V., IX., and XII., the values for Horizontal Force and Vertical Force being corrected for temperature).

The values of the co-efficients for Declination are given in minutes of arc: the units for Horizontal Force and Vertical Force are ·00001 of the whole Horizontal and Vertical Forces respectively.

Month.	m	c_1	α	α'	c_2	β	β'	c_3	γ	γ'	c_4	δ	δ'
						DECLINATION WEST.							
	′	′	° ′	° ′	′	° ′	° ′	′	° ′	° ′	′	° ′	° ′
January	1·99	2·10	58. 45	61. 9	1·12	23. 42	28. 30	0·85	63. 32	70. 44	0·42	47. 58	57. 34
February	3·16	2·41	48. 59	52. 28	1·87	8. 49	15. 47	0·99	41. 20	51. 47	0·41	38. 2	51. 58
March	4·27	3·52	52. 7	54. 12	2·44	31. 22	35. 32	1·51	52. 36	58. 51	0·56	60. 26	68. 46
April	4·92	3·82	46. 34	46. 32	3·13	41. 28	41. 24	1·63	43. 22	43. 16	0·40	51. 4	50. 56
May	4·73	3·45	41. 1	40. 9	2·75	53. 36	51. 52	0·94	63. 23	60. 47	0·19	70. 4	66. 36
June	5·26	4·45	37. 5	37. 13	2·73	48. 3	48. 19	0·80	48. 13	48. 37	0·06	263. 9	263. 41
July	4·45	3·69	39. 24	40. 47	2·17	56. 10	58. 56	0·94	62. 24	66. 33	0·15	9. 50	15. 22
August	3·44	3·42	53. 41	54. 34	2·28	55. 52	57. 38	1·17	60. 21	63. 0	0·34	50. 1	53. 33
September	3·50	3·33	58. 12	56. 51	2·35	47. 35	44. 53	1·34	52. 51	48. 48	0·55	75. 39	70. 15
October	3·46	2·72	54. 40	51. 7	2·12	33. 18	26. 12	1·20	47. 21	36. 42	0·69	64. 7	49. 55
November	2·28	1·97	69. 16	65. 39	1·48	18. 54	11. 40	0·82	53. 46	42. 55	0·53	41. 46	27. 18
December	2·43	1·87	77. 12	76. 19	1·06	358. 36	356. 50	0·58	67. 36	64. 57	0·36	41. 41	38. 9
For the Year...	3·22	3·01	50. 39	50. 39	2·04	38. 55	38. 55	1·05	53. 29	53. 29	0·37	52. 54	52. 54
						HORIZONTAL FORCE.							
			° ′	° ′		° ′	° ′		° ′	° ′		° ′	° ′
January	95·9	38·5	281. 0	283. 24	39·0	279. 27	284. 15	14·8	314. 46	321. 58	9·9	357. 50	7. 26
February	134·9	56·6	267. 28	270. 57	45·3	279. 22	286. 20	23·8	303. 27	313. 54	10·7	4. 54	18. 50
March	160·9	77·7	282. 54	284. 59	49·3	298. 17	302. 27	22·7	345. 22	351. 37	13·7	6. 39	14. 59
April	180·3	102·4	300. 6	300. 4	52·6	296. 28	296. 24	23·4	330. 12	330. 6	10·3	26. 24	26. 16
May	115·7	77·7	322. 21	321. 29	30·5	307. 51	306. 7	10·7	55. 26	52. 50	5·1	55. 51	52. 23
June	143·2	98·3	318. 56	319. 4	40·5	304. 16	304. 32	6·9	33. 56	34. 20	6·7	75. 4	75. 36
July	164·5	97·3	314. 53	316. 16	35·6	317. 52	320. 38	21·5	25. 32	29. 41	8·1	49. 19	54. 51
August	134·0	82·4	317. 54	318. 47	29·3	325. 51	327. 37	19·8	22. 50	25. 29	8·6	30. 58	34. 30
September	172·3	84·7	305. 59	304. 38	45·8	327. 4	324. 22	27·9	13. 20	9. 17	12·2	24. 13	18. 49
October	143·8	74·8	279. 2	275. 29	41·4	302. 4	294. 58	25·4	345. 0	334. 21	7·7	11. 18	357. 6
November	94·1	45·2	257. 27	253. 50	33·9	272. 3	264. 49	18·0	326. 4	315. 13	8·9	356. 30	342. 2
December	65·5	19·2	253. 8	252. 15	30·3	287. 36	285. 50	14·5	317. 25	314. 46	8·4	349. 40	346. 8
For the Year...	125·8	66·6	298. 50	298. 50	37·8	299. 33	299. 33	16·4	348. 48	348. 48	8·5	18. 38	18. 38
						VERTICAL FORCE.							
			° ′	° ′		° ′	° ′		° ′	° ′		° ′	° ′
January	8·1	8·6	358. 6	0. 30	2·5	317. 44	322. 32	2·6	308. 19	315. 31	1·0	261. 56	271. 32
February	16·5	13·2	335. 8	338. 37	5·6	265. 15	272. 13	4·0	255. 35	266. 2	2·1	243. 20	257. 16
March	33·5	15·7	324. 34	326. 39	13·0	261. 55	266. 5	9·4	269. 42	275. 57	3·4	284. 34	292. 54
April	53·2	24·2	307. 26	307. 24	21·4	262. 30	262. 26	8·6	278. 4	277. 58	2·9	301. 40	301. 32
May	59·0	27·5	290. 47	289. 55	20·8	272. 44	271. 0	6·7	274. 39	272. 3	1·9	307. 41	304. 13
June	47·6	24·9	303. 37	303. 45	21·3	269. 1	269. 17	5·2	238. 21	238. 45	0·3	90. 0	90. 32
July	35·0	16·2	316. 36	317. 59	13·8	272. 25	275. 11	6·2	276. 6	280. 15	2·6	277. 46	283. 18
August	39·7	16·1	304. 15	305. 8	16·6	280. 10	281. 56	7·3	288. 30	291. 9	2·7	296. 29	300. 1
September	25·8	9·9	326. 52	325. 31	11·1	266. 41	263. 59	6·3	277. 1	272. 58	2·4	300. 58	295. 34
October	27·5	11·9	334. 38	331. 5	10·0	270. 0	262. 54	6·7	272. 30	261. 51	3·1	292. 14	278. 2
November	19·3	13·5	1. 31	357. 54	6·5	309. 44	302. 30	4·0	302. 28	291. 37	2·5	301. 58	287. 30
December	9·5	10·5	359. 22	358. 29	1·2	293. 34	291. 48	1·9	302. 3	299. 24	1·5	298. 32	295. 0
For the Year...	29·4	14·8	319. 33	319. 33	11·7	272. 0	272. 0	5·5	275. 52	275. 52	2·1	289. 49	289. 49

TABLE XVII.—SEPARATE RESULTS of OBSERVATIONS of MAGNETIC DIP made in the Year 1884.

Day and Hour, 1884.	Needle.	Magnetic Dip.	Observer.
d h		° ′ ″	
Jan. 2. 2	C 1	67. 30. 40	N
10. 2	D 1	67. 29. 39	N
10. 3	D 2	67. 30. 35	N
17. 0	C 2	67. 30. 47	N
21. 2	B 1	67. 27. 25	N
25. 1	B 1	67. 29. 13	N
25. 2	B 2	67. 27. 15	N
26. 0	C 1	67. 30. 50	N
30. 0	B 2	67. 30. 25	N
30. 1	D 1	67. 30. 28	N
31. 0	D 2	67. 30. 53	N
31. 1	C 2	67. 29. 20	N
Feb. 7. 1	D 2	67. 29. 53	N
12. 1	C 1	67. 29. 39	N
13. 0	C 2	67. 29. 23	N
13. 2	D 2	67. 30. 21	N
14. 1	B 1	67. 28. 18	N
20. 2	D 1	67. 29. 25	N
20. 23	B 2	67. 29. 57	N
22. 0	C 2	67. 28. 43	N
22. 1	C 1	67. 29. 42	N
26. 1	B 1	67. 30. 12	N
27. 2	D 1	67. 30. 44	N
28. 0	B 2	67. 30. 31	N
28. 1	C 2	67. 31. 33	N
28. 23	D 2	67. 31. 21	N
29. 1	B 1	67. 30. 25	N
Mar. 3. 2	C 1	67. 31. 52	N
7. 2	D 1	67. 32. 33	N
7. 3	D 2	67. 32. 27	N
14. 1	C 2	67. 29. 8	N
14. 2	C 1	67. 29. 55	N
19. 2	B 1	67. 29. 23	N
21. 1	B 2	67. 30. 31	N
21. 2	C 2	67. 29. 56	N
26. 0	B 1	67. 30. 2	N
26. 1	B 2	67. 30. 31	N
31. 2	D 2	67. 31. 22	N
Apr. 5. 1	C 1	67. 30. 5	N
10. 1	D 1	67. 28. 18	N
14. 0	D 2	67. 29. 49	N
14. 1	C 2	67. 30. 10	N
17. 1	B 1	67. 29. 4	N
17. 2	B 2	67. 26. 2	N
18. 1	B 2	67. 31. 5	N
23. 0	C 1	67. 30. 31	N
23. 1	C 2	67. 30. 5	N
25. 2	D 1	67. 31. 12	N
29. 1	D 2	67. 30. 10	N
30. 1	B 1	67. 27. 39	N
30. 2	B 2	67. 29. 2	N
May 6. 1	D 1	67. 30. 0	N
9. 2	C 1	67. 28. 40	N
10. 1	C 2	67. 27. 28	N
16. 2	D 2	67. 28. 49	N
16. 3	D 1	67. 27. 8	N
20. 1	B 1	67. 27. 23	N
20. 2	C 2	67. 28. 15	N
23. 2	B 2	67. 30. 0	N
28. 0	B 1	67. 27. 44	N
28. 1	B 2	67. 25. 2	N
31. 1	C 1	67. 27. 27	N
June 6. 23	C 1	67. 28. 44	N
11. 1	D 1	67. 28. 57	N
11. 2	D 2	67. 29. 22	N
13. 2	B 1	67. 28. 33	N
19. 0	C 2	67. 30. 3	N
19. 1	D 1	67. 30. 14	N
20. 2	D 2	67. 32. 20	N
26. 0	B 2	67. 27. 25	N
26. 1	C 2	67. 29. 24	N
27. 2	C 1	67. 27. 53	N
July 5. 2	D 1	67. 27. 48	N
9. 2	D 2	67. 29. 35	N
11. 2	C 2	67. 29. 55	N
11. 3	D 1	67. 29. 13	N
15. 1	B 1	67. 28. 24	N
15. 2	C 1	67. 28. 51	N
19. 1	B 2	67. 29. 58	N
21. 2	D 1	67. 30. 21	N
29. 1	C 1	67. 30. 25	N
29. 2	C 2	67. 30. 18	N
31. 1	B 2	67. 30. 26	N
31. 2	D 2	67. 31. 41	N
Aug. 2. 0	C 1	67. 29. 59	N
13. 2	C 2	67. 28. 44	N
14. 1	B 1	67. 27. 48	N
14. 2	D 1	67. 28. 37	N
15. 1	B 2	67. 29. 55	N
22. 1	D 2	67. 29. 12	N
23. 1	D 1	67. 27. 35	N
27. 0	B 1	67. 27. 34	N
27. 1	B 2	67. 29. 35	N
27. 2	D 1	67. 29. 20	N
29. 1	C 1	67. 28. 6	N
29. 2	B 2	67. 32. 25	N
Sept. 5. 1	C 1	67. 28. 40	N
5. 2	C 2	67. 27. 59	N
11. 1	D 2	67. 31. 16	N
16. 1	D 1	67. 27. 52	N
16. 2	D 2	67. 28. 57	N
17. 1	B 1	67. 27. 56	N
23. 2	B 2	67. 30. 14	N
24. 1	C 2	67. 29. 26	N
29. 2	C 1	67. 28. 21	N
30. 2	D 2	67. 30. 7	N
Oct. 6. 2	C 2	67. 31. 33	N
10. 2	D 2	67. 29. 9	N
14. 2	C 1	67. 31. 24	N
14. 23	B 1	67. 32. 12	N
17. 1	B 2	67. 31. 16	N
23. 1	D 1	67. 32. 35	N
24. 1	C 1	67. 30. 2	N
24. 2	C 2	67. 29. 15	N
30. 1	D 2	67. 33. 37	N
30. 2	D 1	67. 32. 35	N
31. 1	B 1	67. 29. 54	N
Nov. 5. 1	B 2	67. 32. 43	N
14. 1	D 1	67. 28. 26	N
14. 2	D 2	67. 28. 12	N
15. 1	C 1	67. 28. 59	N
19. 2	C 2	67. 29. 28	N
21. 2	B 1	67. 29. 0	N
24. 2	D 2	67. 31. 10	N
27. 1	B 2	67. 27. 11	N
28. 1	D 1	67. 34. 11	N
28. 2	C 1	67. 31. 16	N
Dec. 3. 2	B 1	67. 25. 51	N
12. 2	C 1	67. 29. 11	N
13. 1	D 2	67. 29. 31	N
15. 2	D 1	67. 29. 37	N
20. 1	C 2	67. 29. 12	N
24. 0	B 2	67. 31. 16	N
24. 1	B 1	67. 26. 52	N
24. 2	C 1	67. 28. 9	N
31. 2	C 2	67. 28. 40	N

The needles B 1 and B 2 are 9 inches in length; C 1 and C 2, 6 inches; and D 1 and D 2, 3 inches.
The initial N is that of Mr. Nash.

TABLE XVIII.—MONTHLY and YEARLY MEANS of MAGNETIC DIP in the YEAR 1884.

Monthly Means of Magnetic Dip.

Month, 1884.	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. 28. 19	2	67. 28. 50	2	67. 30. 45	2
February	67. 29. 38	3	67. 30. 14	2	67. 29. 40	2
March	67. 29. 42	2	67. 30. 31	2	67. 30. 54	2
April	67. 28. 21	2	67. 28. 43	3	67. 30. 18	2
May	67. 27. 33	2	67. 27. 31	2	67. 28. 4	2
June	67. 28. 33	1	67. 27. 25	1	67. 28. 18	2
July	67. 28. 24	1	67. 30. 12	2	67. 29. 38	2
August	67. 27. 41	2	67. 30. 38	3	67. 29. 2	2
September	67. 27. 56	1	67. 30. 14	1	67. 28. 30	2
October	67. 31. 3	2	67. 31. 16	1	67. 30. 43	2
November	67. 29. 0	1	67. 29. 57	2	67. 30. 7	2
December	67. 26. 21	2	67. 31. 16	1	67. 28. 40	2
Means	67. 28. 37	21	67. 29. 40	22	67. 29. 33	24

Month, 1884.	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. 30. 3	2	67. 30. 4	2	67. 30. 44	2
February	67. 29. 53	3	67. 30. 5	2	67. 30. 32	3
March	67. 29. 32	2	67. 32. 33	1	67. 31. 54	2
April	67. 30. 8	2	67. 29. 45	2	67. 29. 59	2
May	67. 27. 51	2	67. 28. 34	2	67. 28. 49	1
June	67. 29. 44	2	67. 29. 35	2	67. 30. 51	2
July	67. 30. 6	2	67. 29. 7	3	67. 30. 38	2
August	67. 28. 44	1	67. 28. 31	3	67. 29. 12	1
September	67. 28. 43	2	67. 27. 52	1	67. 30. 7	3
October	67. 30. 24	2	67. 32. 35	2	67. 31. 23	2
November	67. 29. 28	1	67. 31. 19	2	67. 29. 41	2
December	67. 28. 56	2	67. 29. 37	1	67. 29. 31	1
Means	67. 29. 31	23	67. 29. 52	23	67. 30. 26	23

The monthly means have been formed without reference to the hour at which the observation on each day was made.
In combining the monthly results, to form annual means, weights have been given proportional to the number of observations.

COLLECTED YEARLY MEANS of MAGNETIC DIP for each of the NEEDLES, and GENERAL MEAN for the Year 1884.

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	21	67. 28. 37	67. 29. 8	67. 29. 36
	B 2	22	67. 29. 40		
6-inch Needles	C 1	24	67. 29. 33	67. 29. 32	
	C 2	23	67. 29. 31		
3-inch Needles	D 1	23	67. 29. 52	67. 30. 9	
	D 2	23	67. 30. 26		

TABLE XIX.—DETERMINATIONS OF THE ABSOLUTE VALUE OF HORIZONTAL MAGNETIC FORCE IN THE YEAR 1884.

Abstract of the Observations of Deflexion of a Magnet for Absolute Measure of Horizontal Force.

Month and Day, 1884.		Distances of Centres 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	47·8	10. 36. 54 4. 49. 4	5·652 5·657	100 100	46·4 46·7	N
February	21	1·0 1·3	52·1	10. 36. 18 4. 48. 40	5·651 5·653	100 100	52·1 52·7	N
March	28	1·0 1·3	49·7	10. 36. 13 4. 48. 35	5·659 5·651	100 100	48·5 49·1	N
April	24	1·0 1·3	50·9	10. 36. 17 4. 48. 34	5·660 5·655	100 100	50·6 51·2	N
May	30	1·0 1·3	57·2	10. 34. 53 4. 47. 45	5·661 5·659	100 100	58·1 58·4	N
June	30	1·0 1·3	67·9	10. 32. 3 4. 46. 54	5·660 5·664	100 100	68·5 69·5	N
July	18	1·0 1·3	64·8	10. 32. 48 4. 47. 12	5·662 5·660	100 100	65·0 65·3	N
August	26	1·0 1·3	60·4	10. 32. 35 4. 47. 2	5·662 5·661	100 100	60·3 61·1	N
September	26	1·0 1·3	60·0	10. 32. 8 4. 46. 46	5·661 5·665	100 100	61·0 60·9	N
October	29	1·0 1·3	60·0	10. 33. 9 4. 47. 18	5·669 5·670	100 100	58·6 58·1	N
November	25	1·0 1·3	50·9	10. 33. 3 4. 47. 16	5·661 5·665	100 100	48·9 48·4	N
December	30	1·0 1·3	51·4	10. 33. 4 4. 47. 18	5·666 5·671	100 100	48·7 49·5	N

The deflecting magnet is placed on the east side of the suspended magnet, with its marked pole alternately east and west, and on the west side with its marked pole also alternately east and west: the deflexion given in the table above is the mean of the four deflexions observed in these positions of the magnets.
The initial N is that of Mr. Nash.
In the subsequent calculations every observation is reduced to the temperature 35°.

Computation of the Values of Horizontal Force in Absolute Measure.

Month and Day, 1884.		In English Measure.									In Metric Measure.
		Apparent Value of A_1.	Apparent Value of A_2.	Apparent Value of P.	Mean Value of P.	Log. $\frac{m}{X}$	Adopted Time of Vibration of Deflecting Magnet.	Log. m X.	Value of m.	Value of X.	Value of X.
							s				
January	26	0·09229	0·09244	−0·00395		8·96652	5·6545	0·15446	0·3635	3·9262	1·8103
February	21	0·09227	0·09238	−0·00282		8·96633	5·6520	0·15526	0·3637	3·9306	1·8123
March	28	0·09222	0·09231	−0·00237		8·96607	5·6550	0·15454	0·3633	3·9286	1·8114
April	24	0·09225	0·09233	−0·00209		8·96616	5·6575	0·15432	0·3633	3·9272	1·8108
May	30	0·09215	0·09216	−0·00039		8·96554	5·6600	0·15440	0·3631	3·9303	1·8122
June	30	0·09191	0·09206	−0·00406		8·96475	5·6620	0·15486	0·3629	3·9360	1·8148
July	18	0·09197	0·09211	−0·00372	−0·00295	8·96500	5·6610	0·15475	0·3630	3·9344	1·8141
August	26	0·09187	0·09199	−0·00310		8·96446	5·6615	0·15442	0·3626	3·9353	1·8145
September	26	0·09180	0·09190	−0·00265		8·96408	5·6630	0·15420	0·3624	3·9360	1·8148
October	29	0·09195	0·09207	−0·00327		8·96484	5·6695	0·15302	0·3622	3·9273	1·8108
November	25	0·09179	0·09191	−0·00338		8·96410	5·6630	0·15335	0·3620	3·9321	1·8130
December	30	0·09180	0·09193	−0·00361		8·96416	5·6685	0·15256	0·3617	3·9283	1·8113
Means		..	..	..	..	..	..	..	..	3·9310	1·8125

The value of X in English Measure is referred to the Foot-Grain-Second unit, and in Metric Measure to the Millimètre-Milligramme-Second unit. To obtain X in the Centimètre-Gramme-Second (C.G.S.) unit, the values in the last column of the table must be divided by 10.

ROYAL OBSERVATORY, GREENWICH.

MAGNETIC DISTURBANCES

AND

EARTH CURRENTS.

1884.

MAGNETIC DISTURBANCES in DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE, and EARTH CURRENTS; recorded at the ROYAL OBSERVATORY, GREENWICH, in the Year 1884.

The following notes give a brief description of all magnetic movements (superposed on the ordinary diurnal movement) exceeding 3′ in Declination, 0·001 in Horizontal Force, or 0·0003 in Vertical Force, as taken from the photographic records of the respective Magnetometers. The movements in Horizontal and Vertical Force are expressed in parts of the whole Horizontal and Vertical Force respectively. When any one of the three elements is not specifically mentioned it is to be understood that the movement, if any, was insignificant. Any failure or want of register is specially indicated.

The term "wave" is used to indicate a movement in one direction and return; "double wave" a movement in one direction and return with continuation in the opposite direction and return; "two successive waves" consecutive wave movements in the same direction; "fluctuations" a number of movements in both directions. The extent and direction of the movement are indicated in brackets, + denoting an increase and − a decrease of the magnetic element. In the case of fluctuations the sign ± denotes positive and negative movements of generally equal extent.

In all cases of magnetic movement the earth-current photographs show corresponding earth currents, but it has not been thought necessary to refer to these in detail.

Magnetic movements which do not admit of brief description in this way are exhibited with their corresponding earth currents on accompanying plates.

The time is Greenwich Mean Solar Time (Astronomical Reckoning, commencing at noon).

1884.

January 4. $9\frac{1}{4}^h$ to $9\frac{3}{4}^h$ Wave in Dec. (+ 2′): in H.F. (+ ·001): in V.F. (+ ·0001).

5. 11^h to 12^h Wave in Dec. (+ 3′).

7. 9^h to 21^h Fluctuations in Dec. (± 2′): in H.F. small.

8. 5^h to 16^h Fluctuations in Dec. (± 2′): in H.F. (± ·001).

10. 9^h to 18^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. (± ·0002).

12. 13^h to $15\frac{1}{2}^h$ Wave in Dec. (− 8′). 12^h to 17^h Fluctuations in H.F. (± ·001): in V.F. (± ·0001).

18. 9^h to 19^h Fluctuations in Dec. (± 4′): in H.F. (± ·001): in V.F. (± ·0001).

25. 10^h to 14^h Double-crested wave in Dec. (− 10′ and −7′). 16^h to 19^h Double wave in Dec. (+5′ to −3′). 10^h to 18^h Fluctuations in H.F. (± ·0005): in V.F. (± ·0001).

26. 0^h to 12^h Fluctuations in Dec. (± 3′): in H.F. (± ·0005), with wave $10\frac{3}{4}^h$ to $11\frac{3}{4}^h$ (+ ·0015).

27. $9\frac{3}{4}^h$ to 11^h Wave in Dec. (− 5′): in H.F. (− ·0005): in V.F. (− ·0001).

29. 9^h to 15^h Fluctuations in Dec. (± 2′): in H.F. small.

30. $11\frac{1}{2}^h$ to $13\frac{1}{2}^h$ Double wave in Dec. (+ 3′ to − 2′): wave in H.F. (+ ·001).

February 1. 5^h to 22^h Fluctuations in Dec. (± 2′): in H.F. (± ·001): in V.F. (± ·0001).

2. 1^h to 9^h Fluctuations in Dec. (± 2′): in H.F. (± ·001).

3. 7^h to 17^h Fluctuations in Dec. (± 2′): long wave in H.F. more steep at commencement (− ·002).

4. $2\frac{1}{2}^h$ to 6^h Fluctuations in Dec. (± 3′); followed by waves $8\frac{3}{4}^h$ to $10\frac{1}{4}^h$ (− 7′) and $11\frac{1}{2}^h$ to 16^h (− 10′). Waves in H.F. $3\frac{1}{2}^h$ to 5^h (− ·003); 12^h to $13\frac{3}{4}^h$ (+ ·004). $2\frac{1}{2}^h$ to 14^h Fluctuations in V.F. (± ·0001).

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February 5. 8^h to 14^h Fluctuations in Dec. (± 4′): in H.F. (± ·001): in V.F. (± ·0001).

8. $7\frac{1}{2}^h$ to $8\frac{1}{2}^h$ Double wave in Dec. (− 5′ to + 3′): in H.F. (− ·0005 to + ·0005). 8^h to $8\frac{1}{2}^h$ Wave in V.F. (+ ·0002). $16\frac{1}{2}^h$ to $17\frac{1}{2}^h$ Wave in Dec. (+ 3′): in H.F. (+ ·001): in V.F. (+ ·0001).

16. 5^h to 9^h Fluctuations in Dec. (± 2′): in H.F. (± ·001): in V.F. small.

17. 11^h to 14^h Wave in Dec. (− 10′), followed by fluctuations till 17^h (±2′). 11^h to 13^h Wave in H.F. (+ ·002): in V.F. (− ·0003).

19. $6\frac{1}{2}^h$ to 9^h Flat wave in Dec. (− 3′): fluctuations in H.F. (± ·0005): in V.F. small.

21. $7\frac{3}{4}^h$ to $8\frac{1}{2}^h$ Wave in Dec. (− 4′).

23, 24, 25. See Plate I.

26. 5^h to 12^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

27. 5^h to 15^h Fluctuations in Dec. (± 2′): in H.F. (± ·001): no register of V.F.

29. See Plate II.

March 1, 2, 3. See Plates II. and III.

6. 14^h to 20^h Small fluctuations in Dec. (±$1\frac{1}{2}$′), with wave 16^h to $17\frac{1}{4}^h$ (+5′): fluctuations in H.F. (± ·001): in V.F. (± ·0002).

7. $6\frac{1}{2}^h$ Sudden movement in Dec. (+ 2′): in H.F. (+ ·003): in V.F. (+ ·0003): followed in Dec. by waves 7^h to $8\frac{1}{2}^h$ (− 4′); 9^h to 11^h (− 13′); and in H.F. and V.F. by small fluctuations until 11^h.

8. 1^h to 6^h Fluctuations in Dec. (± 3′): in H.F. (± ·001). 14^h to $15\frac{1}{2}^h$ Wave in Dec. (+ 5′): in H.F. (+ ·001): in V.F. (+ ·0001).

15. 10^h to 21^h Fluctuations in Dec. (± 4′): in H.F. (± ·001): in V.F. small.

16. $10\frac{1}{2}^h$ Small sharp wave in Dec. (+ 2′): in H.F. (+ ·001): in V.F. (+ ·0002): followed in H.F. by small fluctuations until 15^h.

17. 0^h to 16^h Fluctuations in Dec. (± 1′): in H.F. (± ·0005): in V.F. small.

19. $7\frac{1}{4}^h$ to $8\frac{1}{2}^h$ Steep wave in Dec. (− 10′). $9\frac{1}{2}^h$ to 11^h Wave in Dec. (− 4′). $13\frac{1}{2}^h$ to 18^h Double wave in Dec. (+10′ to −7′). 6^h to 18^h Fluctuations in H.F. (± ·001): in V.F. small.

20. 4^h to 16^h Fluctuations in Dec. (± 5′): in H.F. (± ·0015): in V.F. small.

21. 6^h to 18^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

22. 12^h to 19^h Fluctuations in Dec. (± 2′): in H.F. small.

23. 8^h to 17^h Fluctuations in Dec. (± 2′): in H.F. small, with sharp wave $8\frac{1}{2}^h$ to $9\frac{1}{4}^h$ (+ ·003). 8^h to $9\frac{1}{4}^h$ Wave in V.F. (+ ·0003).

24. 10^h to 15^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

25. 7^h to 16^h Fluctuations in Dec. (± 2′): in H.F. (± ·0007): in V.F. small.

26. 8^h to 14^h Fluctuations in Dec. (± 2′): in H.F. (± ·001).

27. 0^h to 20^h Fluctuations in Dec. (± 2′): in H.F. (± ·0007): in V.F. small.

28. See Plate III.

29. 1^h to 16^h Fluctuations in Dec. (± 1′): in H.F. (± ·0005): in V.F. small.

31. 9^h to 20^h Fluctuations in Dec. (± 4′): in H.F. (± ·001): in V.F. small.

April 1. $8\frac{1}{2}^h$ to $10\frac{1}{2}^h$ Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

9. $21\frac{3}{4}^h$ to 22^h Steep wave in Dec. (− 4′): in H.F. (+ ·002): in V.F. (− ·0002).

10. 9^h to 13^h Wave in Dec. (− 10′), with superposed fluctuations. $8\frac{1}{2}^h$ to $13\frac{1}{4}^h$ Fluctuations in H.F. (± ·0015).

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10. 18^h to 11. 2^h Small rapid fluctuations in Dec. and H.F.

11. 6^h to 15^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·0006): in V.F. small.

14. 10^h to 20^h Fluctuations in Dec. ($\pm$ 5′): in H.F. ($\pm$ ·0015): in V.F. ($\pm$ ·0003).

15. 7^h to 15^h Fluctuations in Dec. ($\pm$ 5′). 2^h to 16^h Fluctuations in H.F. ($\pm$ ·001): in V.F. small.

16. 0^h to 17^h Fluctuations in Dec. ($\pm$ 3′): in H.F. ($\pm$ ·0015): in V.F. small.

17. See Plate IV.

18, 19, 20. Fluctuations, nearly continuously shown, in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·0015): in V.F. small.

23. $22\frac{1}{4}^h$ to $22\frac{1}{2}^h$ Wave in Dec. (− 2′): steep in H.F. (− ·002): in V.F. (− ·0002).

24. See Plate IV.

26. $4\frac{1}{3}^h$ Sudden movement in Dec. (+4′): in H.F. (+·003): in V.F. (+·0003): followed till 9^h by fluctuations in Dec. small: in H.F. ($\pm$ ·001): in V.F. small. $10\frac{3}{4}^h$ to 12^h Two successive waves in Dec. (+ 6′ and + 3′): in H.F. (+ ·0015 and + ·001).

30. See Plate IV.

May

1. $6\frac{1}{2}^h$ to 8^h Wave in Dec. (− 3′): in H.F. (− ·0015). 12^h to $13\frac{1}{4}^h$ Wave in Dec. (+ 3′).

6. 11^h to 22^h Fluctuations in Dec. ($\pm$ 2′). 2^h to 22^h Fluctuations in H.F. ($\pm$ ·001).

7. 14^h to $15\frac{1}{2}^h$ Wave in Dec. (+ 6′).

8. $13\frac{1}{2}^h$ to $14\frac{1}{4}^h$ Wave in Dec. (+ 4′): in V.F. (+ ·0001).

10. 1^h to 21^h Fluctuations in Dec. ($\pm$ 3′), with wave. $8\frac{1}{2}^h$ to 10^h (− 11′): fluctuations in H.F. ($\pm$ ·0015): in V.F. ($\pm$ ·0001).

11. 7^h to 20^h Fluctuations in Dec. ($\pm$ 5′). 3^h to 18^h Fluctuations in H.F. ($\pm$ ·001): in V.F. small.

12. $8\frac{1}{2}^h$ to $9\frac{1}{2}^h$ Wave in Dec. (− 5′): in H.F. double wave (− ·0007 to + ·0007): in V.F. (− ·0001 to + ·0001).

13. 2^h to 14^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·0005): in V.F. small.

14. 6^h to 11^h Fluctuations in Dec. ($\pm$ 2′). 2^h to 11^h Fluctuations in H.F. ($\pm$ ·001).

15. 2^h to 10^h Fluctuations in H.F. ($\pm$ ·0005).

19. $2\frac{1}{2}^h$ to 5^h Wave in H.F. (− ·002). 10^h to $11\frac{1}{2}^h$ Wave in Dec. (− 4′).

22. 7^h to 20^h Fluctuations in Dec. ($\pm$ 5′). 0^h to 18^h Fluctuations in H.F. ($\pm$ ·002): in V.F. ($\pm$ ·0002).

23. 0^h to 5^h Fluctuations in H.F. ($\pm$ ·001). 9^h to $9\frac{1}{2}^h$ Wave in Dec. (+ 5′): in H.F. (+ ·0015): in V.F. (+ ·0001).

30. $18\frac{1}{2}^h$ Small sudden movement in Dec. H.F. and V.F.

31. 0^h to 12^h Many small fluctuations in H.F. and V.F.

June

1. 3^h to 17^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·001).

2. $1\frac{1}{4}^h$ to 7^h Small fluctuations in Dec. ($\pm$ 2′): increase of H.F. (+ ·003), with superposed fluctuations ($\pm$ ·002). $1\frac{1}{4}^h$ to 11^h Wave in V.F. (+ ·002). 17^h to 19^h Wave in Dec. (+ 8′). 17^h to 18^h Wave in H.F. (− ·002).

6. 7^h to 14^h Fluctuations in Dec. ($\pm$ 2′). 0^h to 10^h Fluctuations in H.F. ($\pm$ ·001).

12. $8\frac{1}{4}^h$ to $9\frac{1}{2}^h$ Wave in Dec. (− 4′).

13. 11^h to 15^h Double crested wave in Dec. (− 7′ and − 6′). 3^h to 15^h Fluctuations in H.F. ($\pm$ ·001). 12^h to 16^h Wave in V.F. (− ·0005).

14. $3\frac{1}{2}^h$ to $4\frac{3}{4}$ Wave in H.F. (− ·002).

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June 17. 1^h to 7^h Fluctuations in H.F. (± ·0015): in V.F. small.

18. 7^h to 20^h Fluctuations in Dec. (± 5′): in H.F. (± ·002): in V.F. (± ·0002).

22, 23. See Plate V.

28. 0^h to 7^h Fluctuations in H.F. (± ·001). $8\frac{1}{4}^h$ to $9\frac{3}{4}^h$ Wave in Dec. (− 9′): in H.F. (+ ·0015): in V.F. (+ ·0002).

30. 1^h to 6^h Fluctuations in H.F. (± ·0007): in V.F. small.

July 2, 3. See Plates V. and VI.

4. 2^h to 9^h Fluctuations in H.F. (± ·001): in V.F. small.

5. 1^h to 9^h Fluctuations in H.F. (± ·001). $9\frac{1}{2}^h$ to $10\frac{1}{2}^h$ Wave in Dec. (− 6′). 15^h to $17\frac{3}{4}^h$ Wave in Dec. (+ 6′).

6. 8^h to $9\frac{1}{4}^h$ Wave in Dec. (− 5′). 0^h to 10^h Fluctuations in H.F. (± ·0008).

9. $9\frac{3}{4}^h$ to 11^h Movement in Dec. (− 5′): wave in H.F. (+ ·0015): small movement in V.F. (− ·0003).

13. $10\frac{3}{4}$ to 16^h Wave in Dec. (− 10′), with superposed fluctuations (± 3′). 2^h to 16^h Fluctuations in H.F. (± ·002), with steep double wave $11\frac{3}{4}^h$ to 13^h (+ ·003 to − ·002): small fluctuations in V.F., terminating with wave $11\frac{1}{2}^h$ to 15^h (− ·001).

15. $15\frac{1}{2}$ to $17\frac{1}{2}^h$ Wave in Dec. (+ 9′): in H.F. (+ ·0015): in V.F. (− ·0004).

19. 13^h to 17^h Fluctuations in Dec. (± 5′): in H.F. (± ·0015): in V.F. (± ·0001).

25. 12^h to 17^h Fluctuations in Dec. (± 6′). 13^h to 16^h Two successive waves in H.F. (+ ·0015 and + ·003). 13^h to 18^h Wave in V.F. (− ·001).

29. 1^h to $3\frac{1}{2}^h$ Wave in Dec. (+ 5′): in H.F. (− ·0045): fluctuations in V.F. (± ·0002).

30. 8^h to 11^h Fluctuations in Dec. (± 3′): in H.F. (± ·0012): in V.F. small.

August 1. 2^h to 18^h Fluctuations in Dec. (± 2′): in H.F. (± ·0005).

2. 7^h to 11^h Fluctuations in H.F. (± ·001).

3. 1^h to 13^h Fluctuations in H.F. (± ·001).

7. $3\frac{1}{4}^h$ to 6^h Wave in H.F., steep at commencement (− ·002).

8, 9. See Plates VI. and VII.

10. $10\frac{3}{4}^h$ to $11\frac{3}{4}^h$ Wave in H.F. (+ ·002).

11. $9\frac{1}{4}^h$ to $9\frac{3}{4}^h$ Wave in Dec. (− 5′).

12. 2^h to 8^h Fluctuations in H.F. (± ·0015). $11\frac{3}{4}^h$ to $12\frac{3}{4}^h$ Wave in Dec. (− 4′): in H.F. (+ ·0015): in V.F. (− ·0002).

13. 0^h to 14^h Fluctuations in Dec. (± 3′): in H.F. (± ·001).

14. 3^h to 6^h Fluctuations in H.F. (± ·001). $9\frac{1}{4}^h$ to $10\frac{3}{4}^h$ Wave in Dec., steep at commencement (− 12′), followed by fluctuations till 18^h (± 3′): fluctuations in H.F. (± ·001). $9\frac{1}{4}^h$ to 10^h Small wave in V.F. (− ·0003).

18. $11\frac{1}{2}^h$ to 16^h Fluctuations in Dec. (± 2′). 2^h to 16^h Fluctuations in H.F. (± ·001).

20. 5^h to 22^h Fluctuations in Dec. (± 5′): in H.F. (± ·001), with wave at $5\frac{1}{2}^h$ (+ ·0035): in V.F. (± ·0002).

21. 1^h to 7^h Fluctuations in H.F. (± ·001): in V.F. small. 10^h to 12^h Two successive waves in Dec. (+ 5′ and + 7′): in H.F. double-crested wave (+ ·0015 and + ·004): small fluctuations in V.F..

22. 0^h to 13^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

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August 23. 1^h to 7^h Fluctuations in Dec. (± 2′): in H.F. (± ·001).

25. 7^h to 16^h Fluctuations in Dec. (± 3′): in H.F. (± ·0005).

September 6. $6\frac{1}{2}^h$ to 10^h Fluctuations in H.F. (± ·0015). 8^h Movement in Dec. (− 5′): in V.F. (− ·0004).

9. $14\frac{1}{2}^h$ to $15\frac{1}{4}^h$ Wave in Dec. (+ 4′): movement in H.F. and V.F. small.

10. 4^h to 18^h Fluctuations in H.F. (± ·001). 9^h to 16^h Fluctuations in Dec. (± 5′).

11. 9^h to 11^h Double wave in Dec. (− 3′ to + 5′): in H.F. fluctuations (± ·001).

12. 13^h to 22^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

13. 2^h to 20^h Fluctuations in H.F. (± ·0015). 7^h to $8\frac{1}{2}^h$ Wave in Dec. (− 8′). 12^h to 17^h Wave in Dec. (− 10′), with superposed fluctuations: in V.F. small fluctuations.

14. 7^h to 19^h Fluctuations in Dec. (± 3′), with sharp wave at 8^h (− 10′): in H.F. (± ·001): in V.F. small.

17, 18. See Plate VII.

20. $9\frac{3}{4}^h$ to 13^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. (± ·0001).

30. $1\frac{1}{2}^h$ to 4^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. (± ·0002).

October 1, 2. See Plate VIII.

3. 10^h to 14^h Fluctuations in Dec. (± 2′): in H.F. (± ·0008): in V.F. small.

4. 10^h to 14^h Fluctuations in Dec. (± 2′): in H.F. (± ·001): in V.F. (± ·0001).

5. 15^h to 17^h Double wave in Dec. (+5′ to −3′): wave in H.F. (+ ·0015): double wave in V.F. (+ ·0001 to − ·0002).

6. 1^h to 17^h Fluctuations in Dec. (± 5′): in H.F. (± ·001): in V.F. (± ·0003).

7. $3\frac{3}{4}^h$ to $5\frac{1}{2}^h$ Wave in Dec. (− 13′), with superposed fluctuations (±2′), followed by fluctuations till 10^h (±5′). $3\frac{3}{4}^h$ to $4\frac{3}{4}^h$ Wave in H.F. (+ ·003), followed by fluctuations till 10^h (± ·0015): fluctuations in V.F. (± ·0002).

9. 6^h to 7^h Wave in Dec. (− 7′): in H.F. (− ·002). $15\frac{1}{4}^h$ to 17^h Wave in Dec. (+ 7′). $15\frac{1}{2}^h$ to 18^h Shallow wave in H.F. (+ ·002).

13. 12^h to 20^h Fluctuations in Dec. (± 3′): in H.F. small.

14. 2^h to 7^h Fluctuations in Dec. (± 2′): in H.F. (± ·001). $7\frac{3}{4}^h$ to 9^h Wave in Dec. (− 8′): in H.F. (− ·002). 12^h to $12\frac{3}{4}^h$ Wave in Dec. (+ 7′): in H.F. (+ ·003): in V.F. (− ·0003). $12\frac{3}{4}^h$ to 16^h Fluctuations in Dec. (± 3′).

15. 3^h to 17^h Fluctuations in Dec. (± 2′): in H.F. (± ·0008): in V.F. small.

17. 0^h to 9^h Fluctuations in Dec. (±2′): in H.F. (± ·001): in V.F. small.

19. 0^h to 5^h Fluctuations in Dec. (± 2′): in H.F. (± ·001): in V.F. small.

21. 3^h to 7^h Fluctuations in Dec. (± 3′): in H.F. (± ·001).

24. 16^h to 20^h Fluctuations in Dec. (± 3′): in H.F. (± ·001): in V.F. small.

25. 1^h to 14^h Fluctuations in Dec. (± 2′): in H.F. (± ·0005): in V.F. small.

28. $1\frac{3}{4}$ to $2\frac{1}{4}^h$ Wave in Dec. (+ 4′): in H.F. (+ ·0015): in V.F. (+ ·0002). 13^h to $14\frac{1}{2}^h$ Wave in Dec. (+ 6′).

29. 3^h to 11^h Fluctuations in Dec. (± 4′): in H.F. (± ·001), with wave $9\frac{3}{4}^h$ to 11^h (+ ·0035): in V.F. small.

November 1, 2, 3. See Plates IX. and X.

4. $5\frac{1}{2}^h$ to 6^h Wave in Dec. (− 7′): in H.F. (− ·001): in V.F. (− ·0002).

6. $8\frac{1}{2}^h$ to 12^h Two successive waves in Dec. (− 5′ and − 9′). 9^h to 14^h Fluctuations in H.F. (± ·0005). $9\frac{1}{2}^h$ to 11^h Wave in V.F. (− ·0003).

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November 8. 10^h to 16^h Fluctuations in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·001): in V.F. small.

9. $12\frac{3}{4}^h$ to 14^h Sharp wave in Dec. (+ 13′): small fluctuation in H.F.: wave in V.F. (+ ·0004).

10. 8^h to 16^h Fluctuations in Dec. ($\pm$ 4′): no register of H.F.: in V.F. small.

12. 6^h to 15^h Fluctuations in Dec. ($\pm$ 2′).

17. 3^h to 9^h Fluctuations in Dec. ($\pm$ 3′): in H.F. ($\pm$ ·0007).

18. $6\frac{1}{4}^h$ to $7\frac{1}{4}^h$ Wave in Dec. (− 5′), followed by fluctuations till 15^h ($\pm$ 2′). 6^h to 14^h Fluctuations in H.F. ($\pm$ ·0005).

19. 4^h to 13^h Fluctuations in Dec. ($\pm$ 3′): in H.F. ($\pm$ ·001): in V.F. small.

23. $3\frac{1}{2}^h$ Simultaneous small wave in Dec. (+ 2′): in H.F. (+ ·0008): in V.F. (+ ·0002). 5^h to 18^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·002): in V.F. small.

24. $3\frac{3}{4}^h$ to 5^h. Steep wave in Dec. (− 18′). $6\frac{1}{2}^h$ to 8^h Wave in Dec. (− 5′). $3\frac{3}{4}^h$ to 8^h Fluctuations in H.F. ($\pm$ ·001).

27. 12^h to 28. 3^h Fluctuations in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·0013): in V.F. ($\pm$ ·0002).

29. $3\frac{1}{2}^h$ to $4\frac{3}{4}^h$ Wave in Dec. (− 4′): in H.F. (− ·0015). $10\frac{1}{4}^h$ to 12^h Double-crested wave in Dec. (− 6′ and − 5′).

December 1. 8^h to 13^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·0005).

4. $9\frac{1}{4}^h$ to 11^h Wave in Dec. (− 5′).

8. 3^h to 4^h Wave in Dec. (− 6′). 12^h to 16^h Fluctuations in Dec. ($\pm$ 2′). 2^h to 14^h Fluctuations in H.F. ($\pm$ ·0005).

9. $11\frac{1}{2}^h$ to $12\frac{1}{4}^h$ Wave in Dec. (− 4′).

11. $8\frac{3}{4}^h$ to $9\frac{1}{2}^h$ Wave in Dec. (− 9′): in H.F. (+ ·003).

14. $8\frac{1}{2}^h$ to $10\frac{1}{4}^h$ Steep wave in Dec. (− 18′), followed by fluctuations till 17^h ($\pm$ 3′). 7^h to 17^h Fluctuations in H.F. ($\pm$ ·001): in V.F. ($\pm$ ·0002).

December 15. 4^h to 15^h Fluctuations in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·001): in V.F. small.

16. 0^h to 9^h Fluctuations in Dec. ($\pm$ 2′): in H.F. ($\pm$ ·0007): in V.F. small.

19. $7\frac{3}{4}^h$ Sudden movement in Dec. (+ 2′): in H.F. (+ ·0016): no available register of V.F.

20. 6^h to 15^h Fluctuations in Dec. ($\pm$ 3′): in H.F. and V.F. small.

21. 11^h to $13\frac{1}{2}^h$ Shallow wave in Dec. (− 5′).

22. See Plate X.

23. $8\frac{1}{2}^h$ to $10\frac{1}{2}^h$ Two successive waves in Dec. (− 4′ and − 8′). $9\frac{1}{4}^h$ to $9\frac{3}{4}^h$ Wave in H.F. (+ ·0015).

27. 15^h to 23^h Fluctuations in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·0015): in V.F. ($\pm$ ·0002).

28. 4^h to 14^h Fluctuations in Dec. ($\pm$ 4′): in H.F. ($\pm$ ·001).

EXPLANATION OF THE PLATES.

The magnetic motions figured on the Plates are—

(1.) Those for days of great disturbance—July 2, 3, October 1, 2, November 2.

(2.) Those for days of lesser disturbance—February 23, 24, 25, 29, March 1, 2, 3, 28, April 17, 24, 30, June 22, 23, August 8, 9, September 17, 18, November 1, 3, December 22.

(3.) Those for four quiet days, January 1, April 6, July 21, November 5, which are given as types of the ordinary diurnal movement at four seasons of the year. The earth currents on these days are insensible on the photographic registers.

The day is the astronomical day commencing at Greenwich mean noon.

The magnetic declination, horizontal force, and vertical force are indicated by the letters D., H., and V. respectively; the declination (west) is expressed in minutes of arc, the units for horizontal and vertical force are ·00001 of the whole horizontal and vertical forces respectively, the corresponding scales being given on the sides of each diagram.

At the beginning of the month of May the scale of vertical force movement on the photographic sheet was diminished in order to make equal changes of amplitude in the horizontal and vertical force photographs more exactly correspond to equal changes of absolute magnetic force.

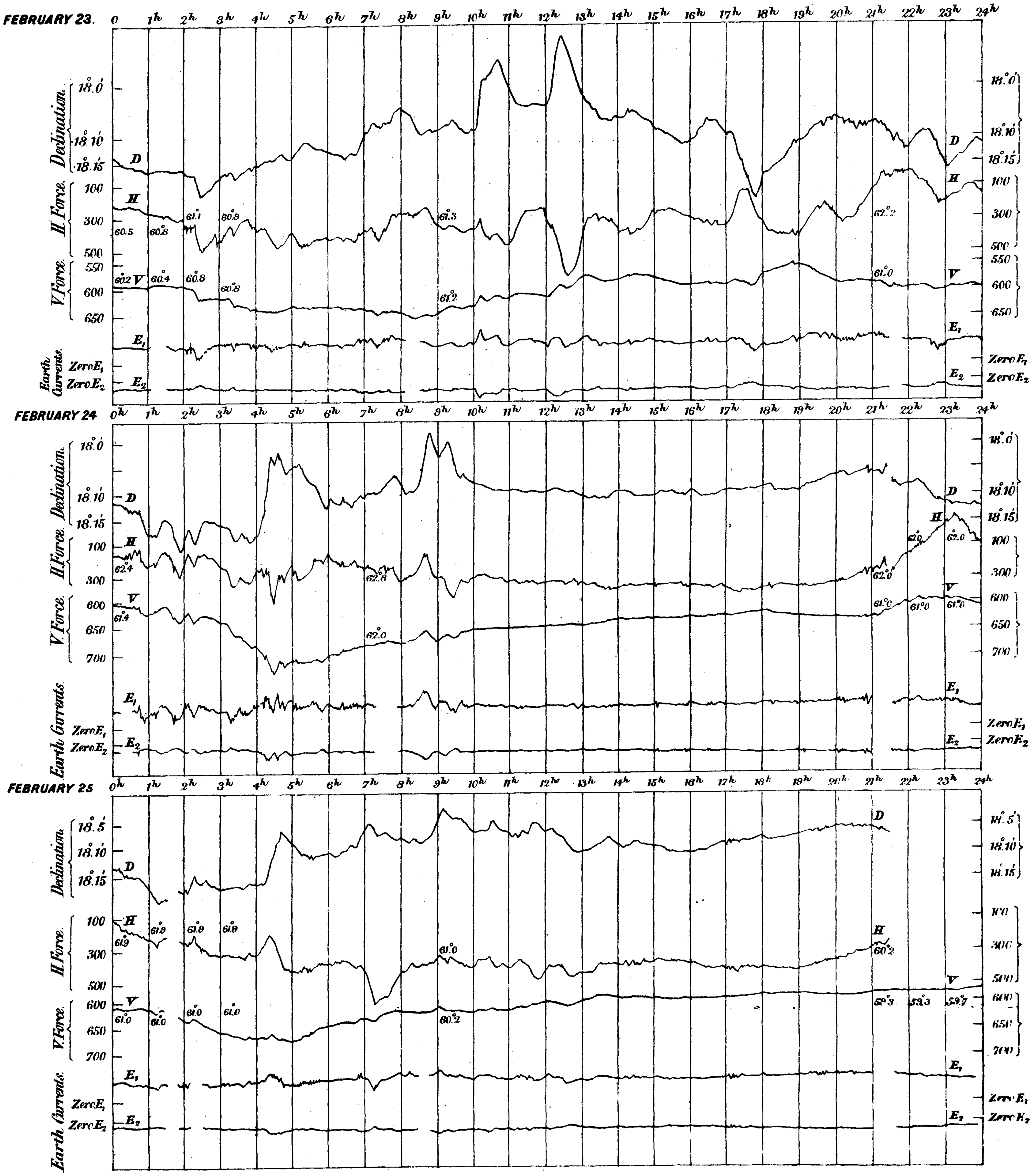
Downward motion indicates increase of declination and of horizontal and vertical force.

The earth current register E_1 is that of the line Angerstein Wharf—Lady Well, making an angle of 50° with the magnetic meridian, reckoning from north to east. The E_2 register is that of the line Blackheath—North Kent East, making an angle of 46° with the magnetic meridian, reckoning from north to west. Zero E_1 and Zero E_2 indicate the respective instrumental zeros.

Downward motion of earth current register indicates in the E_1 circuit the passage of a current, corresponding to that from the copper pole of a battery, in the direction Angerstein Wharf to Lady Well (N.E. to S.W.), and in the E_2 circuit to the passage of a similar current in the direction Blackheath to North Kent East (S.E. to N.W.)

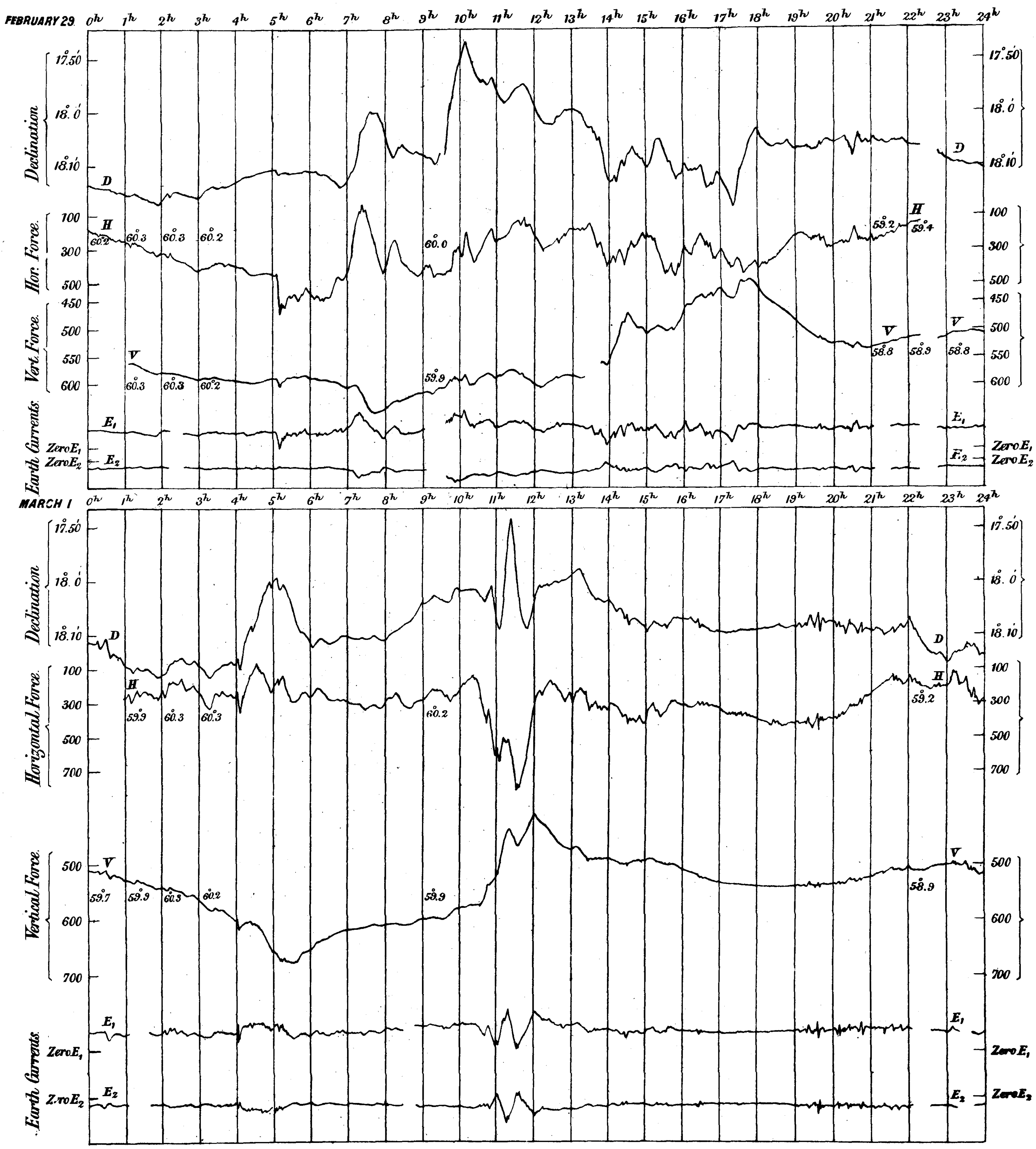
The temperatures (Fahrenheit) given in small figures on the Diagrams represent those of the horizontal and vertical force magnets at the corresponding hours of observation, usually 0^h, 1^h, 2^h, 3^h, 9^h, 21^h, 22^h, 23^h.

Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.



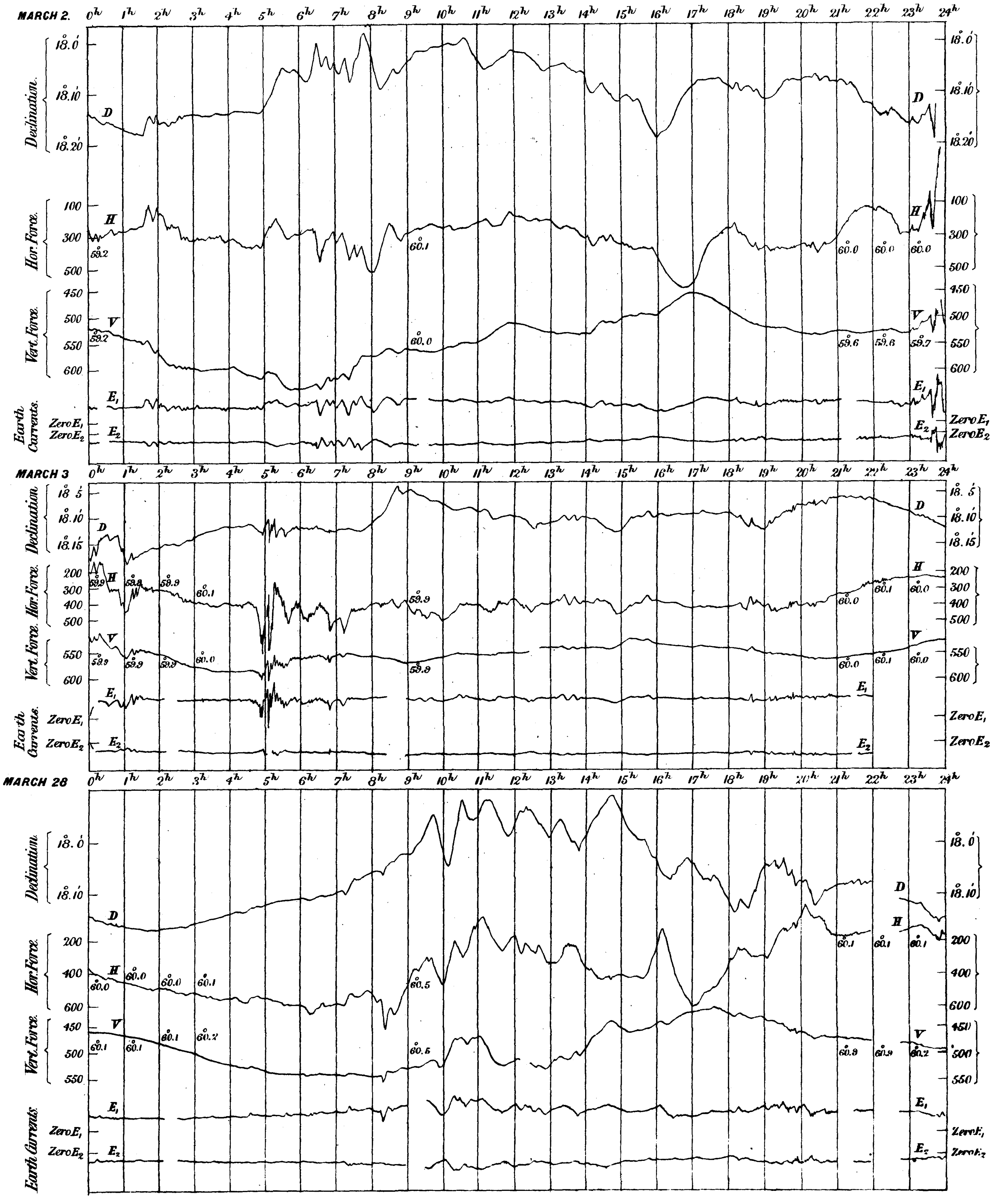
DANGERFIELD LITH. 22 BEDFORD ST COVENT GARDEN.

Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.

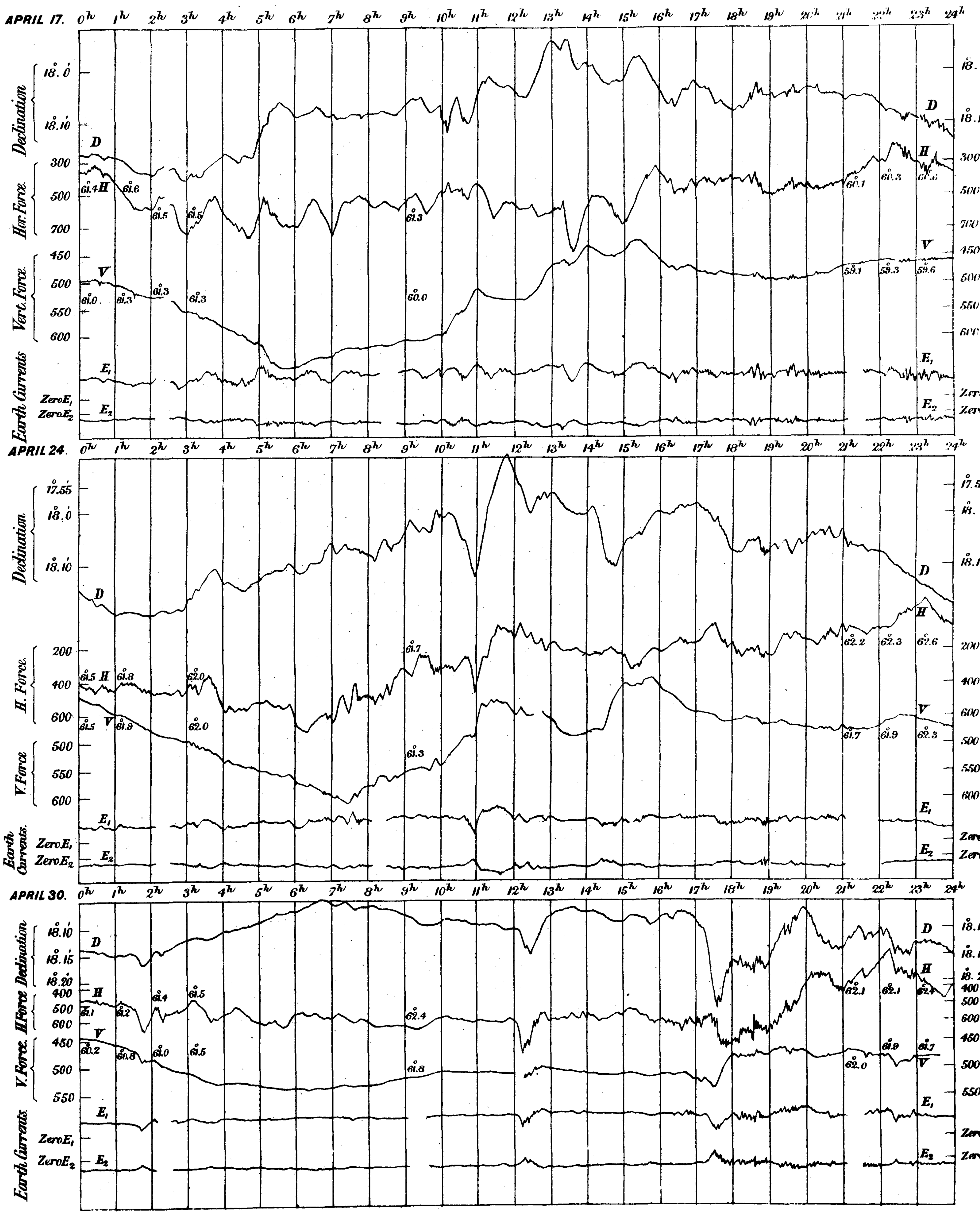


DANGERFIELD, LITH. 22, BEDFORD ST. COVENT GARDEN.

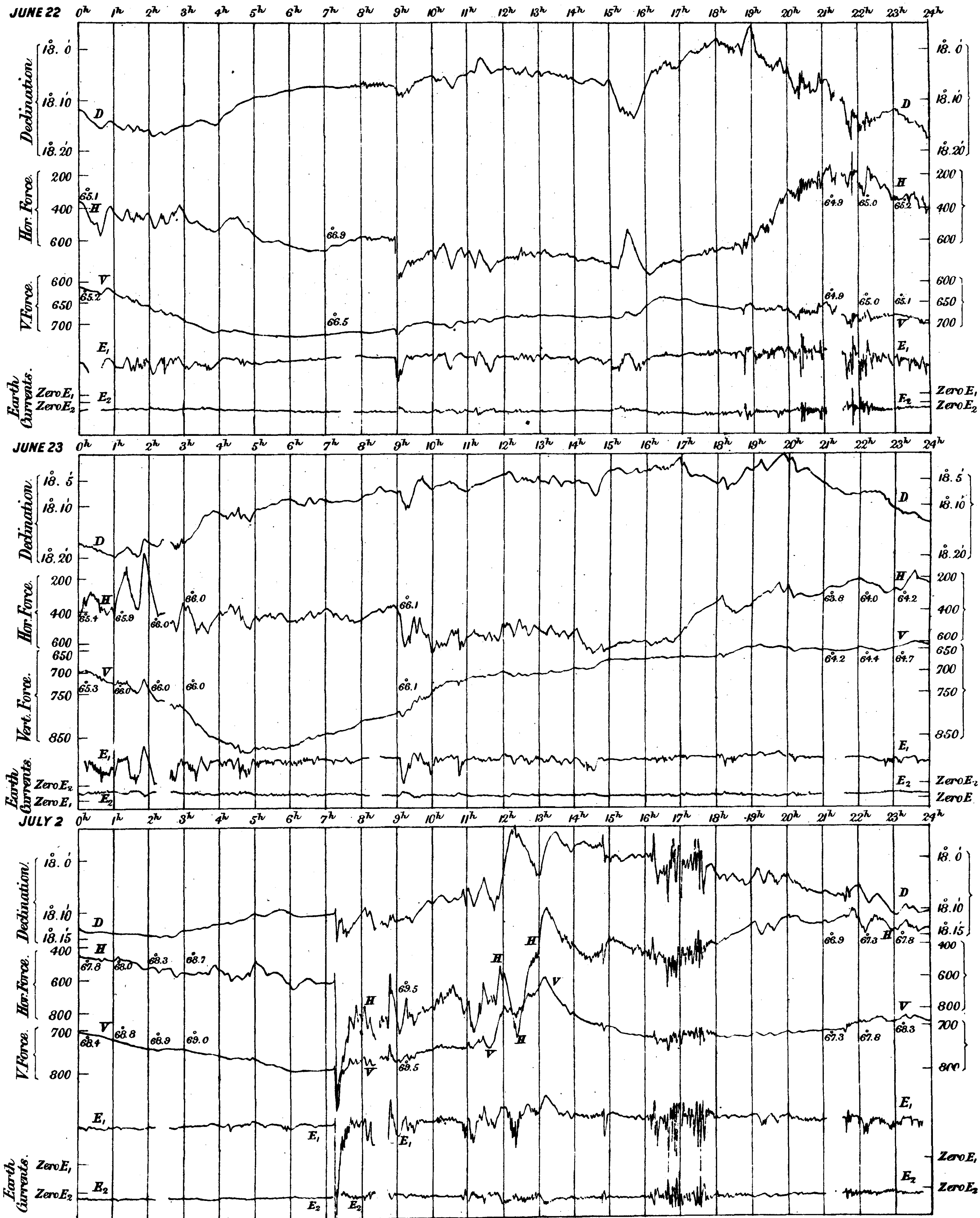
Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.



Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.

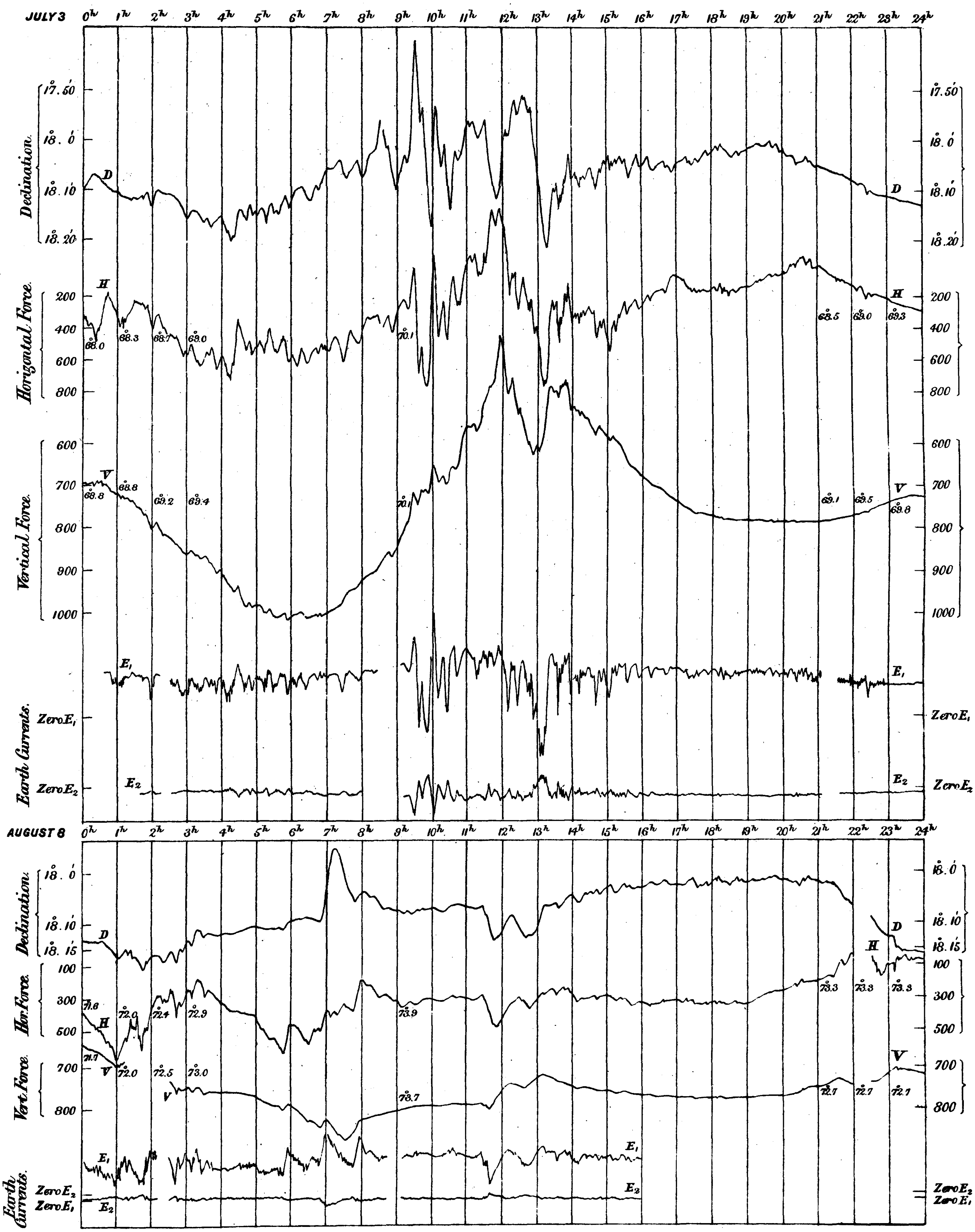


Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.

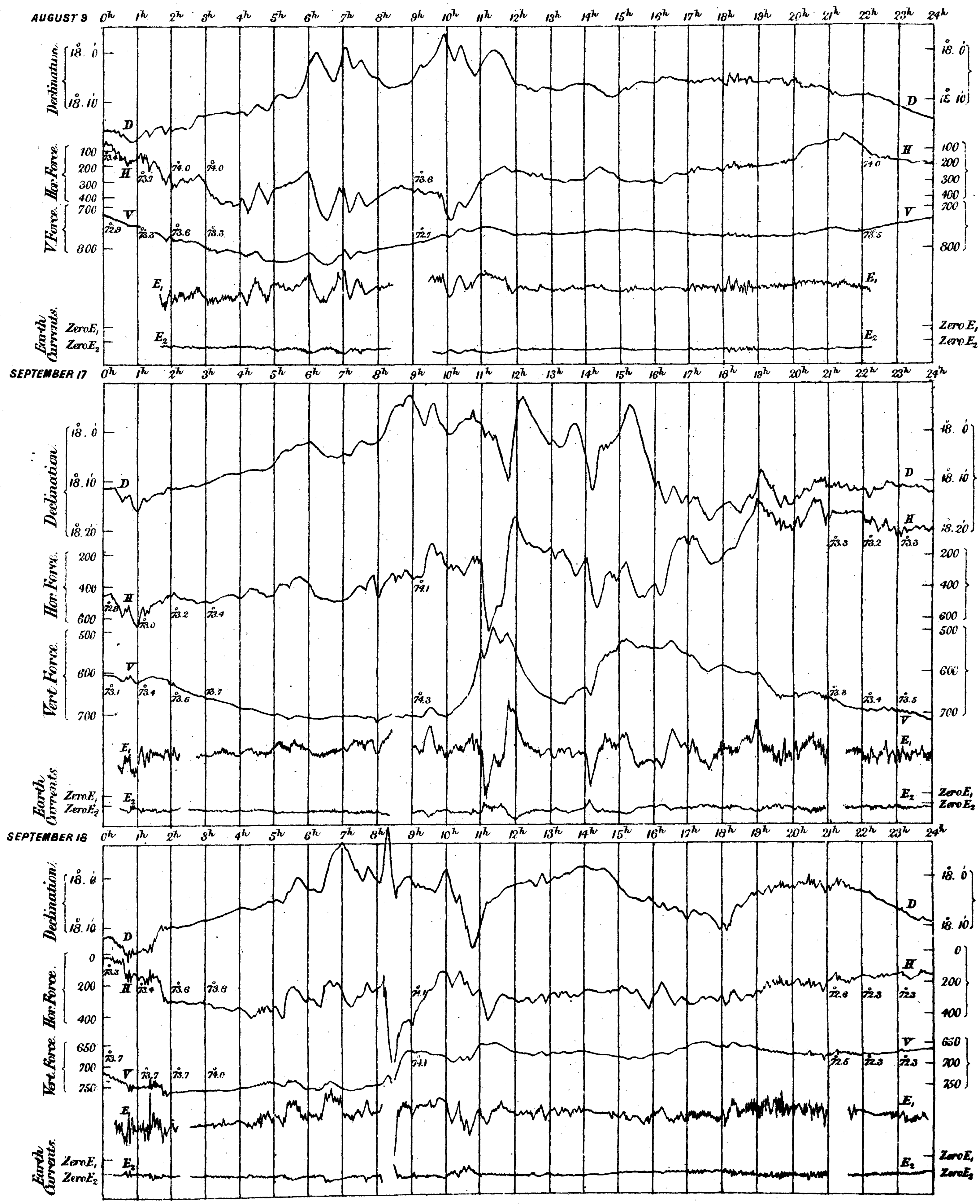


Dangerfield. Lith. 22. Bedford St. Covent Garden

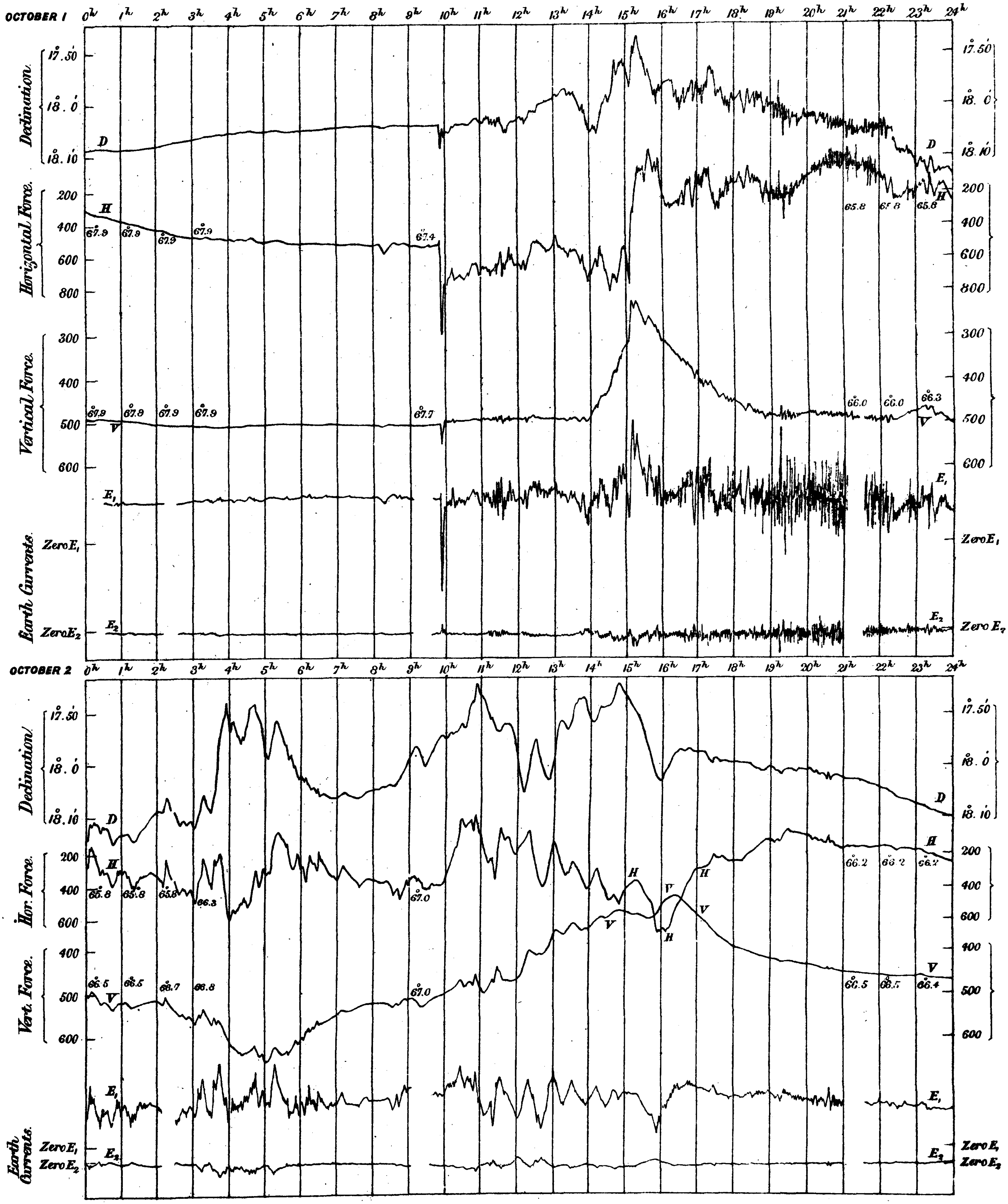
Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.



Magnetic Disturbances and Earth Currents recorded at the Royal Observatory Greenwich, 1884.

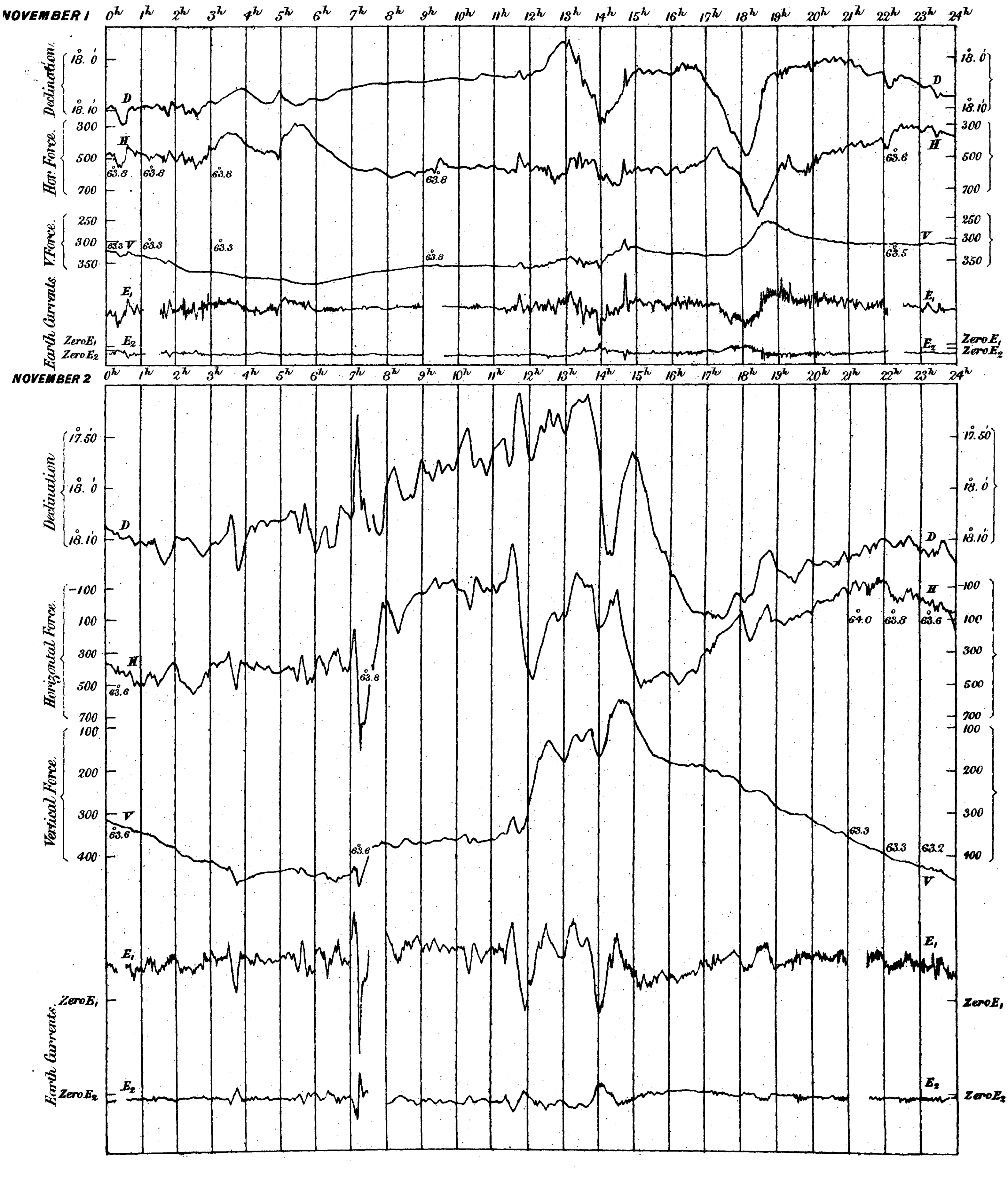


Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.

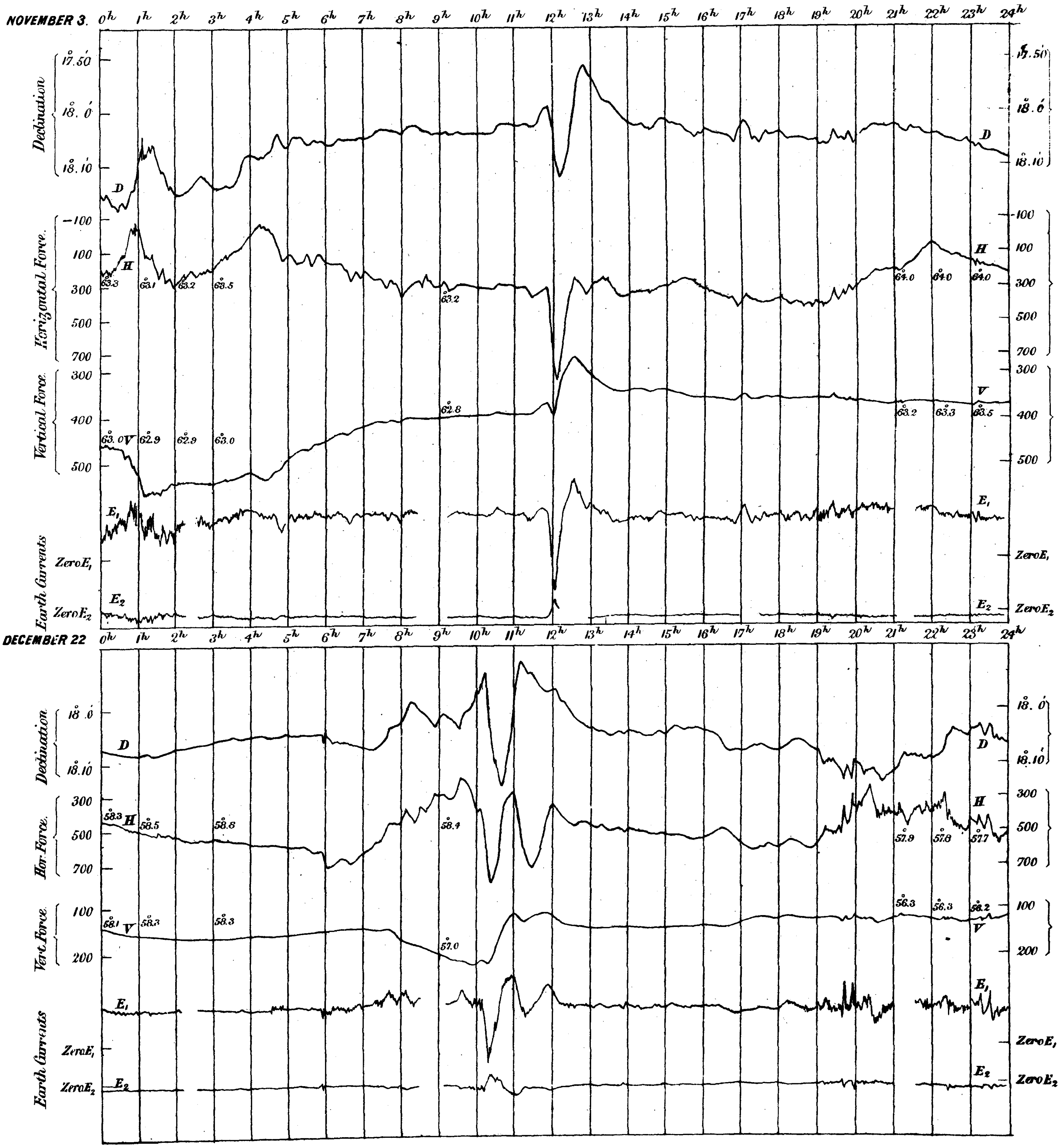


Dangerfield, Lith. 22, Bedford St. Covent Garden.

Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.

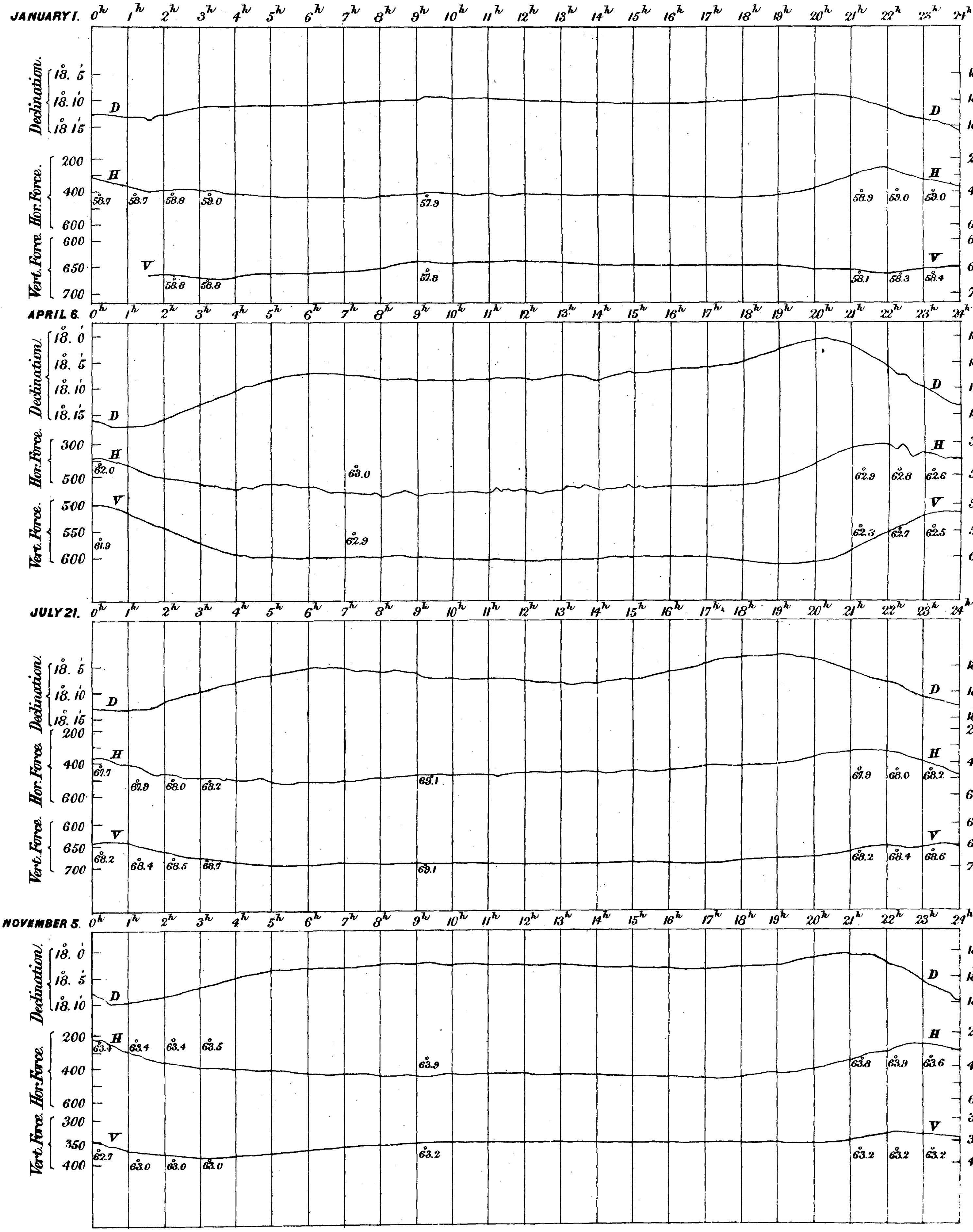


Magnetic Disturbances and Earth Currents recorded at the Royal Observatory, Greenwich, 1884.



DANGERFIELD, LITH. 22, BEDFORD ST COVENT GARDEN. 11363/86.

Types of Magnetic Diurnal Variations at four seasons of the year, recorded at the Royal Observatory, Greenwich, 1884.



ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS.

1884.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	TEMPERATURE. Of the Air. Lowest.	TEMPERATURE. Of the Air. Daily Range.	TEMPERATURE. Of the Air. Mean of 24 Hourly Values.	TEMPERATURE. Of the Air. Excess above Average of 20 Years.	TEMPERATURE. Of Evaporation. Mean of 24 Hourly Values.	TEMPERATURE. Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Difference between the Air Temperature and Dew Point Temperature. Greatest.	Difference between the Air Temperature and Dew Point Temperature. Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	TEMPERATURE. Of Radiation. Lowest on the Grass.	TEMPERATURE. Of the Water of the Thames at Deptford. Highest.	TEMPERATURE. Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in		
Jan. 1	..	30·119	35·3	31·2	4·1	34·0	− 4·1	33·3	32·0	2·0	3·2	0·0	92	37·1	31·1	41·6	41·4	0·023	0·0	vP
2	..	29·928	43·4	32·7	10·7	38·7	+ 0·8	38·5	38·3	0·4	2·3	0·0	99	45·5	29·1	41·3	41·2	0·004	1·5	mP
3	..	29·791	50·1	41·9	8·2	46·9	+ 9·1	46·8	46·7	0·2	1·0	0·0	99	55·3	39·0	41·6	41·0	0·081	6·5	wP
4	In Equator	29·966	50·1	44·2	5·9	47·3	+ 9·6	47·1	46·9	0·4	1·3	0·0	99	54·1	39·0	41·7	41·4	0·050	0·0	wP
5	First Qr.	29·827	49·8	44·0	5·8	47·7	+10·1	47·2	46·6	1·1	3·1	0·0	97	55·3	38·4	42·1	42·0	0·121	2·0	wP
6	..	29·659	51·3	44·8	6·5	47·9	+10·3	46·1	44·1	3·8	7·3	1·0	87	64·1	41·0	42·3	42·2	0·003	12·2	wP : mP
7	..	29·764	46·4	40·0	6·4	44·2	+ 6·6	42·2	39·8	4·4	9·0	1·4	84	64·1	36·9	43·6	43·0	0·045	8·7	mP : sP : vN, vP
8	..	29·976	47·0	36·3	10·7	42·3	+ 4·6	41·1	39·7	2·6	5·3	0·0	90	53·4	30·4	43·5	43·0	0·117	0·8	mP : mP, wN
9	Perigee	30·133	50·9	43·7	7·2	47·1	+ 9·4	45·8	44·4	2·7	6·0	0·4	91	57·8	40·6	43·7	43·5	0·004	2·5	wP : mP
10	Greatest Declination N.	30·194	52·0	42·7	9·3	46·5	+ 8·7	44·2	41·6	4·9	10·6	1·1	84	66·8	37·8	43·8	43·7	0·000	0·7	wP : mP : sP
11	..	29·932	47·8	37·4	10·4	42·8	+ 4·9	40·4	37·5	5·3	8·8	2·6	82	69·7	31·5	43·7	43·6	0·022	2·0	mP : sP, sN : sP
12	Full	30·207	42·7	34·8	7·9	39·0	+ 0·9	37·3	35·1	3·9	6·2	1·5	86	53·7	28·9	43·3	43·2	0·000	0·0	vP
13	..	30·285	44·7	34·5	10·2	41·8	+ 3·6	40·4	38·7	3·1	5·3	1·2	90	49·0	29·8	43·3	43·2	0·000	0·0	vP : sP
14	..	30·245	50·0	39·8	10·2	45·1	+ 6·8	43·2	41·0	4·1	6·9	2·0	86	63·1	35·5	42·1	42·0	0·000	0·0	vP
15	..	30·371	49·8	41·7	8·1	46·8	+ 8·4	45·3	43·6	3·2	5·5	0·4	90	51·3	34·5	42·1	42·0	0·000	1·0	wP
16	..	30·450	44·0	36·7	7·3	40·1	+ 1·6	40·1	40·1	0·0	2·4	0·0	100	44·0	29·1	42·6	42·0	0·000	0·0	vP
17	In Equator	30·426	42·5	37·8	4·7	40·5	+ 1·9	39·9	39·2	1·3	3·3	0·0	95	42·5	35·0	43·3	42·8	0·000	0·0	wP : vP
18	..	30·392	45·0	39·6	5·4	42·3	+ 3·5	41·0	39·4	2·9	5·1	1·1	90	46·9	38·2	42·6	42·5	0·000	1·0	vP
19	..	30·417	47·0	37·7	9·3	43·1	+ 4·2	40·9	38·3	4·8	7·0	1·8	83	53·7	31·5	42·6	42·4	0·000	0·0	vP : sP
20	Last Qr.	30·296	49·4	39·0	10·4	44·2	+ 5·1	42·8	41·1	3·1	7·3	0·6	89	76·3	32·0	42·5	42·4	0·007	2·0	vP
21	Apogee	30·296	51·5	42·0	9·5	46·5	+ 7·2	44·9	43·1	3·4	8·0	0·0	89	65·0	38·0	43·1	43·0	0·000	7·7	wP : vP
22	..	30·001	51·5	45·7	5·8	48·6	+ 9·1	46·9	45·0	3·6	6·3	1·3	88	57·0	41·5	43·3	43·2	0·069	11·0	wP
23	..	29·428	53·8	42·5	11·3	49·9	+10·3	48·7	47·4	2·5	7·3	0·0	92	54·1	38·0	44·3	44·2	0·138	7·2	wP : wP, wN
24	Greatest Declination S.	29·635	43·5	36·7	6·8	40·4	+ 0·7	38·0	34·9	5·5	8·6	1·4	81	62·2	31·6	44·1	44·0	0·000	0·0	vP
25	..	29·478	47·1	37·7	9·4	42·3	+ 2·5	40·6	38·5	3·8	8·0	1·1	87	59·0	33·1	44·1	44·0	0·060	0·0	mP : vP, vN
26	..	28·856	48·9	37·7	11·2	42·8	+ 2·9	41·4	39·7	3·1	5·5	1·3	89	57·0	31·9	43·5	43·0	0·627	2·3	vP, vN
27	..	28·883	40·0	32·6	7·4	37·4	− 2·6	35·7	33·2	4·2	7·4	1·3	86	71·6	31·4	42·1	42·0	0·000	9·2	wP, wN : mP
28	New	29·436	43·8	33·9	9·9	38·5	− 1·6	36·8	34·5	4·0	6·8	1·2	86	73·1	30·0	41·9	40·5	0·000	3·5	mP : sP
29	..	29·637	55·3	38·0	17·3	47·3	+ 7·1	46·2	45·0	2·3	5·2	0·0	92	74·8	32·3	40·6	39·4	0·151	1·5	wN, vP : wP
30	..	29·716	55·2	44·8	10·4	50·7	+10·4	49·0	47·2	3·5	5·9	1·6	88	69·5	41·5	40·9	40·2	0·089	4·5	wP : vP
31	In Equator	29·626	51·0	43·7	7·3	48·1	+ 7·7	47·4	46·6	1·5	3·4	0·0	95	53·2	41·0	42·1	41·4	0·160	1·5	wN, wP : wP
Means	..	29·915	47·8	39·2	8·5	43·9	+ 5·2	42·6	40·9	3·0	5·8	0·8	89·9	58·1	34·8	42·7	42·4	Sum 1·771	2·9	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29^in·915, being 0^in·186 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 55°·3 on January 29; the lowest in the month was 31°·2 on January 1; and the range was 24°·1.
The mean of all the highest daily readings in the month was 47°·8, being 4°·7 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 39°·2, being 5°·7 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 8°·5, being 1°·1 *less* than the average for the 43 years, 1841–1883.
The mean for the month was 43°·9, being 5°·2 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Jan. 1	0·0	7·9	E : ESE	E	2·8	0·0	0·22	227	10 : 10	10, sn : 10, sn, sl : 10
2	0·0	7·9	E	E : SE	0·2	0·0	0·01	120	10 : 10, slt.-f	10, th.-r : 10, slt.-r : v
3	0·0	7·9	SE : S : SW	SW : SSW	1·8	0·0	0·16	243	v : shs.-r : 10	10 : 10
4	0·0	7·9	SW : SSE : SSW	SSW : S	0·5	0·0	0·02	158	10 : 10, sh.-r : 10	10, m.-r : v
5	0·0	7·9	SSE	S : SW	6·0	0·0	0·94	319	v : 10	10, shs.-r : v, slt.-r
6	0·3	8·0	WSW	WSW	7·2	0·2	2·22	533	v, w : 9, sc, ci.-cu, w	v, ci.-cu, sc, shs.-r : v, ci.-cu
7	0·3	8·0	WSW	SW : NW	5·2	0·0	1·12	373	v : v, li.-cl, ci, ci.-cu	8, ci.-cu, ci.-s, cu.-s : 10, sh.-r : v, li.-cl
8	0·0	8·0	WNW : SW	SSW : WSW	4·0	0·0	0·62	332	p.-cl : 10, slt.-r	10, r : v
9	0·0	8·1	SW	WSW : SW	4·8	0·0	0·97	389	10 : 10	8, ci.-cu, th.-cl : v, ci.-cu
10	0·0	8·1	SW : WSW	SW : SSW	5·1	0·0	0·96	386	p.-cl : 7, ci.-cu, th.-cl	7, ci, ci.-s, ci.-cu : li.-cl, lu.-ha
11	2·1	8·1	SW : WSW	WSW : W	11·5	0·0	2·20	529	v : v, ci.-s, cu.-s, st.-w	8, st.-w, r, ci.-cu, cu.-s : o, w
12	0·3	8·2	W : NW	NW : W : SW	3·5	0·0	1·14	363	o, ho.-fr : o, ho.-fr, slt.-f	2, ci.-cu, h : o, f, h, ho.-fr
13	0·0	8·2	WSW	WSW	1·0	0·0	0·26	265	f : 10, slt.-f	10, slt.-f : 10, slt.-f
14	0·0	8·2	WSW	WSW : W : NW	2·9	0·0	0·48	307	10, f : 10, f	9, ci.-cu, cu.-s : 10
15	0·0	8·3	NNW : NW : WSW	NW : NNW	1·2	0·0	0·15	203	10 : 10, f, glm	9, slt.-f, ci.-cu, cu.-s : 10
16	0·0	8·3	W : WSW	WSW : SW	0·0	0·0	0·00	130	10 : 10, glm, tk.-f	10, tk.-f, glm : 10, f
17	0·0	8·3	SW : WSW	WSW	1·0	0·0	0·08	209	10 : 10, oc.-m.-r	10 : 10
18	0·0	8·4	NW : NNW : Calm	Calm : SW	0·2	0·0	0·00	113	10 : 10	10 : 10
19	0·0	8·4	WSW : SSW	SW : SSW : S	0·1	0·0	0·01	162	10 : 10, m	10 : v
20	2·2	8·5	SSW : SW	SW	3·5	0·0	0·82	378	v : 8, ci.-cu, cu.-s	v, ci.-cu : 10 : 10, m.-r
21	0·0	8·5	SW : WSW	WSW : SSW	5·2	0·0	0·59	353	p.-cl : v, li.-cl, ci.-cu	10, th.-cl : v
22	0·0	8·6	SW	SW : WSW	17·7	0·5	3·31	797	10, st.-w : 10, sc, st.-w	10, sc, st.-w, th.-r : 10, r, st.-w
23	0·0	8·6	WSW : SW	SW : WSW	(22·7)	..	..	891	10, sc, st.-w : 10, sc, st.-w, r	10, st.-w, shs.-r : v, hy.-g
24	3·2	8·7	W	W : SW	..	..	..	634	v, st.-w : o, w	2, ci.-cu, cu, th.-cl : 1, th.-cl
25	0·0	8·7	SW	WSW : SW	..	..	..	584	o, l : 3, ci.-s, s	9, ci.-cu, ci.-s, sc, hy.-sh : 10, l, oc.-slt.-r
26	0·0	8·8	SW : WSW : WNW	SW : WSW	..	..	..	816	10, hy.-sh, st.-w : 9, ci.-s, s	10, hy.-shs, sc, st.-w : v, l, hy.-g
27	2·5	8·8	WSW	WSW	..	..	..	653	v, w : v, slt.-sn, w	v, ci.-cu, w : v, l, w
28	5·3	8·9	W : WNW	W : SW	..	..	..	582	p.-cl, w : o, w, ho.-fr	1, ci.-cu, w : p.-cl
29	0·4	8·9	SE : W	WSW	..	..	..	452	10, fq.-r : p.-cl, slt.-f, m.-r	v, ci.-cu, cu.-s, sc, w : v, li.-cl, sc
30	0·0	9·0	W : WSW	WSW : W	..	..	..	570	10, w : 10, m.-r	10, shs.-r : p.-cl
31	0·0	9·0	SW	SW	..	..	..	468	10, fq.-shs : 10, sc, r	10, sc, r : 10, fq.-r
Means	0·5	8·4	...	...	..	..	(22 days) 0·74	404		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 42°·6, being 5°·2 *higher* than
The mean *Temperature of the Dew Point* for the month was 40°·9, being 5°·5 *higher* than
The mean *Degree of Humidity* for the month was 89·9, being 2·6 *greater* than
The mean *Elastic Force of Vapour* for the month was 0in·256, being 0in·049 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 3grs·0, being 0gr·6 *greater* than
The mean *Weight of a Cubic Foot of Air* for the month was 550 grains, being 2 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 8·0.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·06. The maximum daily amount of *Sunshine* was 5·3 hours on January 28.

The highest reading of the *Solar Radiation Thermometer* was 76°·3 on January 20; and the lowest reading of the *Terrestrial Radiation Thermometer* was 28°·9 on January 12.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 2·0; for the 6 hours ending 3 p.m., 0·4; and for the 6 hours ending 9 p.m., 0·5.

The *Proportions of Wind* referred to the cardinal points were N. 1, E. 3, S. 10, and W. 17.

The chain of the *Pressure* apparatus gave way on January 23 (at 4h. 40m. p.m.) and was not renewed until February 26. The mean daily *Horizontal Movement of the Air* for the month was 404 miles; the greatest daily value was 891 miles on January 23; and the least daily value was 113 miles on January 18.

Rain fell on 15 days in the month, amounting to 1in·771, as measured by gauge No. 6 partly sunk below the ground; being 0in·266 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Difference. Greatest.	Difference. Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Feb. 1	..	29·273	50·0	43·3	6·7	46·6	+ 6·1	44·8	42·8	3·8	8·0	0·6	87	72·0	40·7	43·3	43·0	0·240	9·2	wN, wP : vN, vP
2	..	29·688	43·9	33·7	10·2	40·0	− 0·6	38·4	36·3	3·7	10·8	0·0	87	57·2	30·7	44·1	43·5	0·133	2·2	vN, wP : vP : sP
3	..	30·252	41·7	27·8	13·9	35·7	− 5·0	33·8	30·9	4·8	11·0	2·6	82	55·7	25·1	44·1	44·0	0·000	0·0	sP : vP
4	First Quarter: Perigee.	30·257	50·1	41·7	8·4	45·7	+ 5·0	43·9	41·9	3·8	6·7	1·1	87	70·9	39·5	43·7	42·2	0·000	0·0	wP : mP
5	..	30·217	48·3	43·2	5·1	45·2	+ 4·6	43·7	42·0	3·2	6·1	1·8	89	58·8	42·0	43·1	42·6	0·000	2·0	vP
6	Greatest Declination N.	30·082	46·4	35·4	11·0	42·5	+ 2·1	40·2	37·4	5·1	10·3	1·0	83	56·1	30·0	42·6	42·3	0·000	0·0	vP
7	..	29·933	44·8	32·7	12·1	38·2	− 2·0	37·6	36·8	1·4	5·1	0·0	95	77·7	28·1	42·5	42·2	0·000	0·0	vP
8	..	29·746	45·7	37·1	8·6	41·1	+ 1·2	40·8	40·4	0·7	3·5	0·0	98	51·1	33·5	42·7	42·4	0·012	0·2	wP : vP
9	..	29·365	51·4	43·9	7·5	48·2	+ 8·6	47·2	46·1	2·1	5·5	0·2	93	60·3	40·1	42·6	42·4	0·066	7·0	wP, wN
10	..	29·365	50·2	37·0	13·2	43·6	+ 4·3	40·8	37·5	6·1	9·2	3·1	79	87·8	33·0	43·9	43·2	0·138	14·8	wP, vN : vP, vN
11	Full	29·577	47·5	36·1	11·4	39·7	+ 0·6	38·2	36·3	3·4	6·1	1·1	89	88·6	31·0	43·7	43·4	0·175	9·5	wN, mP : sN, sP
12	..	29·761	50·2	37·2	13·0	45·1	+ 6·2	43·0	40·6	4·5	8·6	0·2	84	87·1	33·0	43·5	43·2	0·001	8·2	wP : mP
13	In Equator	29·779	57·6	43·7	13·9	49·7	+10·9	47·1	44·3	5·4	10·6	1·8	83	98·9	38·2	42·9	42·6	0·027	7·2	wP : vP, vN
14	..	29·952	53·0	43·4	9·6	48·9	+10·2	47·0	44·9	4·0	8·4	0·4	87	76·1	41·0	43·1	43·0	0·037	4·0	vP
15	..	29·936	43·4	33·8	9·6	40·0	+ 1·3	38·1	35·6	4·4	8·0	0·7	85	78·8	30·0	44·1	43·8	0·000	1·5	vP : sP
16	..	29·898	40·7	32·5	8·2	36·2	− 2·6	33·5	29·5	6·7	9·9	4·3	77	79·6	28·5	43·3	43·2	0·000	8·7	vP : sP
17	..	29·763	42·9	35·2	7·7	38·1	− 0·8	35·7	32·5	5·6	8·8	3·7	80	74·1	33·1	42·9	42·8	0·000	3·7	mP : sP
18	Apogee	29·684	42·8	31·6	11·2	36·3	− 2·7	34·3	31·4	4·9	9·0	1·2	83	91·4	27·0	42·1	42·0	0·000	3·0	vP
19	Last Qr.	29·592	49·6	35·2	14·4	43·4	+ 4·2	42·6	41·6	1·8	4·6	0·0	94	78·5	32·0	42·1	41·8	0·170	1·0	vN, vP : wP, wN
20	..	29·664	53·1	44·9	8·2	48·3	+ 9·0	45·4	42·2	6·1	11·0	2·1	80	100·2	40·8	42·3	42·2	0·000	8·0	wP : mP
21	Greatest Declination S.	29·560	53·0	42·7	10·3	46·3	+ 6·8	44·5	42·5	3·8	10·4	0·2	87	96·1	38·2	42·6	42·5	0·226	10·0	vP, vN : vP
22	..	29·462	52·1	40·3	11·8	46·0	+ 6·4	44·2	42·1	3·9	8·0	0·2	87	77·8	39·5	43·1	43·0	0·192	11·2	wP, : vP, wN
23	..	29·350	51·8	38·4	13·4	43·7	+ 4·0	41·6	39·1	4·6	10·7	0·0	84	93·8	35·8	43·7	43·0	0·047	8·0	vP, mN : vP, vN
24	..	29·443	48·0	36·8	11·2	43·5	+ 3·7	41·1	38·3	5·2	9·4	3·0	81	76·9	31·0	44·7	44·6	0·003	3·8	vP
25	..	29·700	48·2	34·0	14·2	41·2	+ 1·3	38·8	35·8	5·4	11·1	1·3	80	82·0	29·9	44·1	44·0	0·028	0·0	vP : vP, vN
26	New	29·766	48·0	32·5	15·5	39·8	− 0·2	37·8	35·2	4·6	10·5	0·2	84	82·6	26·0	44·1	44·0	0·000	3·0	vP
27	In Equator	29·833	45·5	30·6	14·9	36·9	− 3·2	35·5	33·6	3·3	10·3	0·0	88	68·9	25·7	43·6	43·0	0·000	0·0	vP : mP
28	..	29·769	39·6	31·2	8·4	35·3	− 4·9	33·5	30·7	4·6	8·5	2·0	83	59·5	28·0	43·1	43·0	0·001	0·0	mP : vP
29	..	29·773	43·4	30·0	13·4	35·6	− 4·6	33·0	29·0	6·6	13·1	2·2	76	91·7	25·0	42·3	42·2	0·000	0·0	vP
Means	..	29·739	47·7	36·8	10·9	42·1	+ 2·4	40·2	37·8	4·3	8·7	1·2	85·2	76·9	33·0	43·2	42·9	Sum 1·496	4·4	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers. The results for February 27, 28, and 29, for Barometer are deduced from eye-observations, on account of temporary interruption of the photographic register.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29in·739, being 0in·093 *lower* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 57°·6 on February 13; the lowest in the month was 27°·8 on February 3; and the range was 29°·8.

The mean of all the highest daily readings in the month was 47°·7, being 2°·2 *higher* than the average for the 43 years, 1841–1883.

The mean of all the lowest daily readings in the month was 36°·8, being 2°·4 *higher* than the average for the 43 years, 1841–1883.

The mean of the daily ranges was 10°·9, being 0°·2 *less* than the average for the 43 years, 1841–1883.

The mean for the month was 42°·1, being 2°·4 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Feb. 1	1·2	9·1	SW : WSW	SW : SSW	..	..	..	545	10, fq.-r : p.-cl,ci.-cu,cu.-s,r,w	10, r, st.-w : v, fq.-r, st.-w
2	0·0	9·2	SE : NE	NE : NNE	..	..	..	483	10, fq.-shs : 10, hy.-sh : 10, sc, r	v, ci.-cu : v
3	0·0	9·2	NNE : WSW	WSW	..	..	..	289	0 : 0, h, slt.-f, ho.-fr	10, th.-cl : 10
4	0·7	9·3	WSW : W	W : WSW	..	..	..	356	10 : 8, ci.-cu, cu.-s	9, ci.-cu, ci.-s: 9, th.-r : 10
5	0·0	9·3	WSW : W	WSW	..	..	..	275	10 : 10, m.-r	10 : 10
6	0·0	9·4	W : WSW	WSW : SW : SSW	..	..	..	183	10 : 10	10, sc : p.-cl : v, th.-cl
7	0·2	9·4	SSW : SE	ESE : ENE	..	..	..	104	p.-cl : 10, th.-cl	9, ci.-cu, ci, s: 9 : 10
8	0·0	9·5	NE : Calm	SSE : S	..	..	..	78	10 : 10, slt.-f, glm	10 : 10, slt.-f, slt.-r
9	0·0	9·6	SW	SW : WSW	..	..	..	554	10, th.-r : 10, slt.-r	10, sc, st.-w, fq.-r: p.-cl,st.-w,fq.-r: p.-cl
10	2·5	9·6	W : WSW	WSW : SW	..	..	..	535	p.-cl, st.-w : 10, st.-w, hl, t	v,ci.-cu,cu,cu.-s,sh.-r: 1, li.-cl
11	2·0	9·7	SW	WSW : SW	..	..	..	486	p.-cl, r : v, ci.-s, li.-cl, w	10, t, fq.-r : 0
12	1·8	9·8	SW	SSW : S	..	..	..	464	1, li.-cl : 2, ci.-cu	8,ci,ci.-s,cu.-s,so.-ha: 3
13	6·0	9·8	SSW : S	SSW : SSE	..	..	..	346	3, li.-cl, lu.-ha, d : 3, ci	3, ci, ci--cu, li.-cl : p.-cl, hy.-sh
14	0·3	9·9	SW : WSW : NW	NE : NNE	..	..	..	189	7, r : 10, f : 10, slt.-f	7,ci,ci.-cu,ci.-s,cu,-s,h: 10, shs.-r : 10, th.-r
15	1·3	9·9	E : ESE	ESE	..	..	..	391	10 : 10	8, ci.-cu, li.-cl: 0 : 0
16	3·3	10·0	ESE	ESE	..	..	..	376	0 : 3, li.-cl, ho.-fr	7, ci.-cu, cu.-s : 10, w
17	0·4	10·1	SE	SE	..	..	..	344	p.-cl : 9, ci.-cu, ci.-s	7, ci, ci.-s : 2, li.-cl, m
18	7·1	10·1	SE	ESE	..	..	..	279	0, ho.-fr : 0, ho.-fr	0 : 0 : 10, slt.-r
19	0·1	10·2	ESE : SSW	SSW : SW	..	..	..	222	10, r : 10, r, slt.-f	10, m.-r : 10, m.-r
20	6·0	10·3	SW	SW	..	..	..	511	p.-cl : 5, ci.-cu, ci.-s	3, ci.-cu, cu : p.-cl, w : v, w, oc.-r
21	2·7	10·3	SW	SW	..	..	..	423	10, hy.-sh : 10, hy.-r : 10, r	6,ci.-cu,ci,cu: 1 : v, li.-cl, s, d
22	0·3	10·4	SW : WSW	SW : S : SSE	..	..	..	373	p.-cl : 3, ci.-cu, ci.-s	10,ci.-cu,th.-cl,so.-ha,slt.-r: 10, r
23	3·2	10·5	WSW : SW	WSW	..	..	..	385	p.-cl, slt.-r : v, ci.-cu, ci.-s	8,ci,cu,ci.-cu,cu--s,li.-shs,hl: v,hl,oc.-shs: v, fq.-shs
24	1·2	10·5	WSW : NW	NNW : NW : W	..	..	..	460	p.-cl : 9, li.-shs	10, w, li.-sh : 0, m
25	0·9	10·6	WSW : W : NW	NW : WNW : W	..	..	..	361	0 : p.-cl, slt.-f	7, cu.-s, slt.-r, hl : v
26	3·4	10·7	WSW : N	N : NE : SE	..	..	..	155	p.-cl : 8, f, glm	6, ci.-cu, cu.-s,h : 0, ho.-fr, slt.-f
27	0·4	10·7	ENE : ESE	SE : ESE	2·6	0·0	0·31	180	v : tk.-f	8, ci.-cu, ci.-s : v
28	0·0	10·8	ESE	ESE : E : NE	3·7	0·0	0·44	237	v : 10	10, sl, sn : v
29	1·3	10·8	NE	E : ESE	1·5	0·0	0·03	175	10 : 10	v, li.-cl : 0, h
Means	1·6	10·0	...	...	..	..	..	337		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 40°·2, being 2°·3 *higher* than
The mean *Temperature of the Dew Point* for the month was 37°·8, being 2°·4 *higher* than
The mean *Degree of Humidity* for the month was 85·2, being 0·4 *greater* than
The mean *Elastic Force of Vapour* for the month was 0in·227, being 0in·020 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 2grs·6, being 0gr·2 *greater* than
The mean *Weight of a Cubic Foot of Air* for the month was 549 grains, being 5 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 7·0.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·16. The maximum daily amount of *Sunshine* was 7·1 hours on February 18.

The highest reading of the *Solar Radiation Thermometer* was 100°·2 on February 20; and the lowest reading of the *Terrestrial Radiation Thermometer* was 25°·0 on February 29.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 2·8; for the 6 hours ending 3 p.m., 0·9; and for the 6 hours ending 9 p.m., 0·7.

The *Proportions of Wind* referred to the cardinal points were N. 3, E. 6, S. 10, and W. 10.

The *Pressure* apparatus was not in action during the greater part of the month of February. The mean daily *Horizontal Movement of the Air* for the month was 337 miles; the greatest daily value was 554 miles on February 9; and the least daily value was 78 miles on February 8.

Rain fell on 13 days in the month, amounting to 1in·496, as measured by gauge No. 6 partly sunk below the ground; being 0in·019 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	Barometer. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	Temperature. Of the Air. Highest.	Temperature. Of the Air. Lowest.	Temperature. Of the Air. Daily Range.	Temperature. Of the Air. Mean of 24 Hourly Values.	Temperature. Of the Air. Excess above Average of 20 Years.	Temperature. Of Evaporation. Mean of 24 Hourly Values.	Temperature. Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Difference between the Air Temperature and Dew Point Temperature. Greatest.	Difference between the Air Temperature and Dew Point Temperature. Least.	Degree of Humidity (Saturation = 100).	Temperature. Of Radiation. Highest in Sun's Rays.	Temperature. Of Radiation. Lowest on the Grass.	Temperature. Of the Water of the Thames at Deptford. Highest.	Temperature. Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Mar. 1	Perigee	29·846	42·4	27·7	14·7	35·0	− 5·3	32·6	28·8	6·2	12·1	1·7	77	94·9	24·0	41·7	41·6	0·000	0·5	vP
2	..	29·877	45·7	28·6	17·1	37·2	− 3·2	35·4	32·9	4·3	11·4	0·0	85	97·8	25·0	42·9	42·2	0·000	3·2	vP
3	..	29·700	43·8	27·3	16·5	37·4	− 3·1	36·5	35·3	2·1	6·7	0·0	92	50·5	24·0	41·9	41·8	0·047	4·8	vP, vN
4	First Qr.	29·495	52·0	41·3	10·7	46·1	+ 5·6	44·6	42·9	3·2	8·4	0·2	89	65·1	40·0	41·1	41·0	0·172	15·5	wP, wN : wP
5	Greatest Declination N.	29·904	50·5	36·6	13·9	42·8	+ 2·3	39·9	36·4	6·4	12·6	1·4	79	87·8	31·5	42·1	42·0	0·000	0·0	vP
6	..	30·002	50·4	33·6	16·8	42·3	+ 1·8	40·6	38·5	3·8	9·5	0·2	87	83·2	30·2	42·1	42·0	0·000	2·0	sP : vP, wN
7	..	29·778	54·1	32·1	22·0	41·5	+ 0·9	39·4	36·8	4·7	13·6	0·2	84	102·2	27·2	42·6	42·5	0·000	0·0	vP
8	..	29·580	50·4	34·6	15·8	41·2	+ 0·6	39·6	37·6	3·6	10·5	0·2	88	80·1	31·0	42·3	42·0	0·010	0·0	vP
9	..	29·349	51·0	38·6	12·4	42·7	+ 2·0	40·3	37·4	5·3	15·1	0·0	82	91·0	34·8	43·6	43·4	0·182	2·2	vP, vN : vP
10	..	29·142	51·5	37·2	14·3	43·9	+ 3·2	41·3	38·3	5·6	12·6	0·5	80	101·3	31·7	43·9	43·8	0·252	11·0	vP, vN : vP
11	Full	29·200	44·6	36·1	8·5	40·9	+ 0·1	39·6	38·0	2·9	6·4	0·2	90	56·6	31·9	44·5	44·4	0·631	3·8	vN : wN, wP : vP
12	In Equator	29·541	53·7	36·5	17·2	43·7	+ 2·9	41·5	38·9	4·8	11·6	0·0	83	98·2	32·1	44·1	44·0	0·000	2·0	vP
13	..	29·880	56·6	42·3	14·3	48·6	+ 7·7	46·6	44·5	4·1	8·0	1·3	86	96·1	38·6	44·6	44·4	0·000	7·5	wP : mP
14	..	29·951	60·5	46·1	14·4	51·5	+10·5	48·5	45·5	6·0	10·8	2·7	80	102·2	39·3	45·6	45·5	0·000	4·5	mP : sP
15	..	29·915	68·0	46·6	21·4	55·2	+14·1	51·0	47·0	8·2	19·1	2·5	74	117·5	40·0	46·3	46·1	0·000	4·0	vP
16	..	29·880	68·8	41·6	27·2	54·6	+13·4	49·1	43·8	10·8	20·5	1·3	67	116·4	34·0	47·2	47·0	0·000	0·0	vP
17	Apogee	29·876	68·1	39·2	28·9	53·7	+12·4	49·0	44·4	9·3	18·9	1·5	71	122·5	30·9	48·6	48·5	0·000	0·0	vP
18	..	29·886	64·7	47·3	17·4	54·3	+12·9	50·4	46·6	7·7	17·5	2·1	75	115·4	41·8	49·6	49·5	0·000	2·0	vP
19	Greatest Dec. S. Last Quarter.	29·880	59·3	42·4	16·9	49·4	+ 8·0	47·0	44·4	5·0	12·4	0·4	84	111·8	37·0	50·1	50·0	0·000	3·0	vP
20	..	29·755	53·5	40·0	13·5	46·0	+ 4·5	41·5	36·3	9·7	16·4	2·1	70	105·4	35·0	50·7	50·0	0·028	0·0	vP : wN, vP
21	..	29·785	52·4	37·5	14·9	43·9	+ 2·3	40·6	36·7	7·2	13·0	3·4	75	100·0	32·0	49·9	49·8	0·012	0·0	vP, vN
22	..	29·882	53·9	31·9	22·0	43·5	+ 1·8	40·3	36·5	7·0	14·0	2·0	76	95·7	27·1	49·6	49·5	0·000	3·0	sP : vP
23	..	29·920	53·9	40·0	13·9	45·8	+ 4·0	42·4	38·5	7·3	15·0	2·2	76	96·8	33·8	49·1	49·0	0·000	0·0	vP
24	..	29·970	52·2	35·0	17·2	43·6	+ 1·6	41·0	37·9	5·7	12·4	1·2	80	101·3	26·9	48·9	48·5	0·000	0·0	vP
25	..	29·967	47·2	34·5	12·7	40·5	− 1·8	38·5	35·9	4·6	10·8	0·5	84	92·9	25·0	47·1	47·0	0·000	0·0	vP
26	In Equator	29·923	44·4	36·7	7·7	40·2	− 2·4	38·7	36·8	3·4	6·2	1·1	88	84·9	33·1	47·7	47·5	0·011	2·5	vP : vN, vP
27	New	29·959	42·0	37·3	4·7	39·6	− 3·4	36·5	32·5	7·1	11·0	3·9	76	59·0	35·0	47·5	46·4	0·000	4·5	vP
28	..	29·906	43·2	35·9	7·3	39·8	− 3·6	37·6	34·7	5·1	8·1	2·9	82	59·2	34·1	46·1	45·4	0·000	0·0	vP
29	Perigee	29·822	47·1	36·5	10·6	41·5	− 2·3	38·7	35·2	6·3	12·4	2·3	79	72·3	30·4	46·5	45·0	0·000	0·2	vP
30	..	29·619	52·8	37·0	15·8	43·8	− 0·5	41·6	39·0	4·8	10·2	0·2	83	91·1	30·8	44·3	44·0	0·015	3·5	vP : vP, vN
31	..	29·384	54·6	41·8	12·8	46·6	+ 1·8	44·1	41·3	5·3	13·6	1·3	83	92·0	37·2	45·1	45·0	0·009	4·2	vP, wN
Means	..	29·760	52·7	37·4	15·3	44·4	+ 2·9	41·8	38·7	5·7	12·3	1·3	80·8	91·7	32·4	45·7	45·4	Sum 1·369	2·7	....
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29in·760, being 0in·038 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 68°·8 on March 16; the lowest in the month was 27°·3 on March 3; and the range was 41°·5.
The mean of all the highest daily readings in the month was 52°·7, being 2°·8 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 37°·4, being 2°·2 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 15°·3, being 0°·6 *greater* than the average for the 43 years, 1841–1883.
The mean for the month was 44°·4, being 2°·9 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Mar. 1	4·4	10·8	NE	NE : NNE	1·0	0·0	0·06	145	0 : 4, ci, ho.-fr	4, li.-cl, cu, cu.-s : 9, th.-cl
2	3·2	10·9	N : NNE	NNE : S	0·8	0·0	0·02	140	p.-cl : 4,ci.-cu,cu.-s,h,m	6,cu.-s,ci.-cu: p.-cl : 0, f
3	0·0	11·0	SSE	S : SSW	10·8	0·0	1·65	362	v : 10, sl	10, sc, sl, th.-r, w : 10, th.-r
4	0·0	11·1	SSE : S	SSE : SW : WSW	12·5	0·0	2·68	478	10, oc.-r : 10, sc, r	10, sc, r, w : 10, th.-r, w
5	4·7	11·1	WSW : W	NW : WSW	4·4	0·0	0·66	326	p.-cl : 0	6, ci.-cu, cu : 0, slt.-f, d
6	2·8	11·2	WSW : SW	SW	0·2	0·0	0·00	150	0 : 2, ci, ci.-cu, m	7,th.-cl,ci.-cu,cu.-s,h: 8, glm : v, h, m
7	3·2	11·2	SW : SSW	SW : SSW	0·8	0·0	0·00	150	0 : 2,li.-cl,m,hy.-d,f	8,ci.-cu,cu,ci.-s,cu.-s,so.-ha: 9, cu.-s : 2,li.-cl,m,h,d
8	0·0	11·3	SSE : SSW	SSW : SW	1·3	0·0	0·14	216	p.-cl : 10	10, sc, shs.-r : v, li.-cl
9	3·7	11·4	SSW : WNW	SW : SSE	1·8	0·0	0·25	251	v : 10, hy.-r : 8,ci.-cu,cu.-s,m	5, ci.-cu, h : v, li.-cl, cu.-s
10	4·3	11·4	SSE : SW	WSW : SE	8·6	0·0	1·35	358	10, r : 10, sc, r	5, ci.-cu, cu, cu.-s : v, th.-cl, lu.-ha
11	0·0	11·5	ESE : ENE : N	N : SE	5·4	0·0	0·60	221	10, r : 10, sc, r	10, glm : 10
12	2·8	11·6	SE : SW	SSW	2·6	0·0	0·32	202	p.-cl : 9, ci, ci.-s	v, ci.-cu, cu : 0
13	1·4	11·6	SSW	SW : SSW	9·2	0·1	1·30	408	v : 9, ci.-s, th.-cl	7, ci.-cu, cu, cu.-s : 10
14	2·1	11·7	SSW : S	SSW : SSE	3·9	0·0	0·88	334	10 : 10	7,ci.-cu,cu.-s: li.-cl : v, li.-cl, d
15	7·4	11·8	S : SSE	SSE	3·8	0·0	0·34	259	p.-cl, d : 7, ci.-cu, ci.-s	3, li.-cl : 0
16	8·8	11·8	E : SE : S	S : SE	2·0	0·0	0·11	164	0 : 1, th.-cl	0 . 0
17	5·6	11·9	SE : S	SSW : SW	2·3	0·0	0·11	178	0, d : 1, slt.-f, d	5, li.-cl : v, th.-cl
18	5·0	12·0	SW : S	SW : WSW	3·9	0·0	0·53	310	0 : 2, ci.-cu, ci	7, ci, ci.-cu, ci.-s, so.-ha : 5, li.-cl, m, d
19	2·1	12·0	WSW : SW	SW : SSW	3·7	0·0	0·60	314	v, hy.-d : p.-cl	p.-cl, ci, ci.-cu : v, sc, oc.-slt.-r
20	7·1	12·1	WSW	WSW	10·2	0·2	2·67	555	v, slt.-r : p.-cl, ci.-cu	4, cu, cu.-s, slt.-sh, w : v, li.-cl
21	4·2	12·2	WSW:WNW:NNW	NW : WNW	7·3	0·0	1·89	439	p.-cl, slt.-r : 9	7, ci.-cu, cu, cu.-s : v, oc.-slt.-r
22	1·6	12·2	WNW : WSW	W : WSW	1·2	0·0	0·15	241	0 : v, slt.-f	10 : 10 : v
23	2·4	12·3	WSW : NW : N	N : NE : S	2·0	0·0	0·13	221	v : 7, ci.-cu, cu.-s	9, cu, cu.-s : v
24	4·7	12·4	N : NNE	NNE : ESE	1·7	0·0	0·24	169	p.-cl : 1, th.-cl	8, ci.-cu, cu.-s : 0
25	1·6	12·4	NE:NNE:ENE	ENE : NE	2·2	0·0	0·30	224	0 : 4,ci.-cu,ci.-s,th.-cl	10, slt.-r : 10 : p.-cl
26	0·1	12·5	NE : ENE	ENE	6·0	0·0	1·16	383	p.-cl : 10	10, sc, slt.-r : 10
27	0·0	12·6	ENE : E	ENE : E	4·1	0·0	0·90	309	10 : 10	10 : 10
28	0·0	12·6	NE : ENE	ESE : E : ENE	2·0	0·0	0·10	202	10 : 10	10, slt.-r : 10
29	0·5	12·7	NE : ENE	ENE	2·3	0·0	0·28	247	10 : 10	9, ci.-cu, ci.-s: 2, li.-cl : v
30	1·8	12·8	N	N : S	0·2	0·0	0·00	101	10 : 10	8, so.-ha : 10, slt.-f : 10, slt.-f, slt.-r
31	0·3	12·8	S : SSE	SW : SSE	6·4	0·0	0·82	282	10 : 10, slt.-sh	7, ci, ci.-cu, ci.-s, slt.-h : v, th.-cl
Means	2·8	11·8	...	...	..	..	0·65	269		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 41°·8, being 2°·8 *higher* than
The mean *Temperature of the Dew Point* for the month was 38°·7, being 2°·7 *higher* than
The mean *Degree of Humidity* for the month was 80·8, being 0·1 *less* than
The mean *Elastic Force of Vapour* for the month was 0in·235, being 0in·023 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 2grs·7, being 0gr·2 *greater* than
The mean *Weight of a Cubic Foot of Air* for the month was 547 grains, being 3 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 6·8.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·24. The maximum daily amount of *Sunshine* was 8·8 hours on March 16.

The highest reading of the *Solar Radiation Thermometer* was 122°·5 on March 17; and the lowest reading of the *Terrestrial Radiation Thermometer* was 24°·0 on March 1 and 3.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 1·7; for the 6 hours ending 3 p.m., 0·5; and for the 6 hours ending 9 p.m., 0·5.

The *Proportions of Wind* referred to the cardinal points were N. 5, E. 7, S. 12, and W. 7.

The *Greatest Pressure of the Wind* in the month was 12lbs·5 on the square foot on March 4. The mean daily *Horizontal Movement of the Air* for the month was 269 miles; the greatest daily value was 555 miles on March 20; and the least daily value was 101 miles on March 30.

Rain fell on 11 days in the month, amounting to 1in·369, as measured by gauge No. 6 partly sunk below the ground; being 0in·064 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Difference. Greatest.	Difference. Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Apr. 1	Greatest Declination N.	29·434	62·5	44·0	18·5	52·4	+ 7·1	48·8	45·1	7·3	13·7	3·8	77	121·7	39·0	45·6	45·0	0·008	18·2	mP, vP
2	First Qr.	29·454	68·7	44·8	23·9	56·4	+10·7	51·8	47·5	8·9	18·4	2·7	72	127·1	39·5	48·9	48·8	0·000	5·8	vP : vP, vN
3	..	29·329	64·8	46·6	18·2	55·7	+ 9·6	52·0	48·5	7·2	14·4	0·6	78	123·8	39·3	48·9	48·8	0·053	4·0	vN, vP
4	..	29·314	63·4	41·7	21·7	52·3	+ 5·9	48·6	44·8	7·5	16·3	0·0	76	121·8	35·8	49·5	49·0	0·139	8·0	wP : vP, vN
5	..	29·201	56·1	43·7	12·4	49·9	+ 3·3	47·6	45·2	4·7	10·4	1·3	85	94·0	40·3	50·1	50·0	0·000	19·8	vP
6	..	29·408	59·9	44·0	15·9	49·9	+ 3·2	48·1	46·2	3·7	10·1	0·4	87	102·8	41·0	51·1	50·9	0·238	9·2	wP : vP, vN
7	..	29·404	53·7	46·2	7·5	49·1	+ 2·3	47·7	46·2	2·9	7·0	0·0	90	65·9	42·8	51·3	50·0	0·197	3·0	vP, wN
8	In Equator	29·710	56·3	43·0	13·3	48·9	+ 2·1	47·5	46·0	2·9	5·6	0·0	90	73·3	40·0	51·6	51·2	0·000	0·0	wP, wN : vP
9	..	29·771	57·6	37·5	20·1	49·0	+ 2·1	45·9	42·6	6·4	15·4	0·0	78	125·1	29·5	51·9	51·4	0·000	5·0	vP
10	Full	29·783	53·1	36·5	16·6	44·7	— 2·2	42·0	38·8	5·9	12·0	0·7	80	104·8	29·5	52·4	52·0	0·000	0·0	vP
11	..	29·867	52·4	38·8	13·6	44·5	— 2·5	41·2	37·4	7·1	11·8	2·5	75	109·9	34·6	51·7	51·6	0·000	0·0	mP : vP
12	..	29·862	53·1	36·3	16·8	43·9	— 3·2	42·3	40·4	3·5	10·8	0·0	87	93·9	29·5	51·6	51·2	0·024	0·0	vP
13	Apogee	29·369	52·6	33·1	19·5	42·5	— 4·7	40·7	38·5	4·0	11·4	0·0	86	108·0	27·1	51·1	51·0	0·000	0·0	mP : vP
14	..	29·866	52·5	35·3	17·2	43·7	— 3·7	41·6	39·1	4·6	10·1	0·0	84	103·0	30·4	50·1	50·0	0·040	0·0	vP, vN
15	Greatest Declination S.	29·760	50·2	39·8	10·4	44·6	— 2·9	42·4	39·8	4·8	8·4	1·1	84	81·9	38·0	49·9	49·8	0·020	0·0	vP, vN : vP
16	..	29·675	50·0	37·0	13·0	43·4	— 4·2	41·1	38·4	5·0	11·3	0·7	82	90·7	34·0	51·3	50·5	0·000	0·0	mP : vP
17	..	29·771	45·7	35·4	10·3	39·6	— 8·2	37·2	34·1	5·5	10·6	0·7	81	89·0	31·3	50·7	49·0	0·019	1·7	vP, vN : vP
18	Last Qr.	29·770	46·3	35·3	11·0	39·2	— 8·7	34·9	29·2	10·0	14·5	7·2	68	112·1	34·4	49·9	47·8	0·000	11·5	vP
19	..	29·685	46·2	34·7	11·5	39·5	— 8·5	35·3	29·8	9·7	14·3	6·0	69	105·3	32·1	48·9	47·2	0·000	3·8	vP : sP
20	..	29·765	49·5	32·1	17·4	41·5	— 6·6	37·4	32·3	9·2	14·3	1·6	70	112·3	27·4	48·5	46·5	0·000	0·0	sP
21	..	29·793	51·0	30·9	20·1	40·6	— 7·6	37·9	34·5	6·1	15·5	0·0	79	118·6	26·7	47·9	46·0	0·038	0·0	vP : vN, vP
22	In Equator	29·828	49·1	29·3	19·8	40·0	— 8·2	36·5	32·4	7·6	15·5	0·0	72	113·8	23·0	47·6	44·8	0·000	0·0	mP : vP
23	..	29·777	52·6	27·0	25·6	40·3	— 8·0	36·7	32·1	8·2	17·2	0·0	72	124·3	17·9	47·5	44·5	0·000	0·0	sP : vP
24	..	29·661	51·2	28·0	23·2	39·6	— 8·7	37·1	33·8	5·8	14·1	0·0	80	114·0	21·9	47·1	44·4	0·031	0·0	vP : vP, vN
25	New	29·679	49·7	31·1	18·6	41·2	— 7·2	39·3	36·9	4·3	9·7	0·0	85	81·8	26·1	47·3	44·0	0·000	4·0	mP : vP
26	Perigee	29·636	53·8	37·4	16·4	43·5	— 4·9	40·9	37·8	5·7	15·2	0·2	80	93·8	34·4	47·1	44·8	0·071	1·0	vP : vP, vN
27	..	29·502	53·1	34·7	18·4	43·9	— 4·5	43·0	41·9	2·0	9·2	0·0	93	80·1	30·0	45·1	45·0	0·207	5·0	vN, vP
28	Greatest Declination N.	29·573	52·4	37·7	14·7	45·2	— 3·3	43·6	41·7	3·5	8·2	0·0	88	94·9	33·1	47·6	46·0	0·006	6·0	vP, vN : wN, vP
29	..	29·600	59·8	33·7	26·1	46·1	— 2·4	44·0	41·6	4·5	13·1	0·0	85	129·1	27·2	47·5	46·0	0·000	0·0	vP : vN, vP
30	..	29·593	61·7	37·6	24·1	48·3	— 0·3	44·6	40·6	7·7	16·9	0·0	75	122·1	31·4	48·5	46·8	0·017	0·0	vP : vP, vN
Means	..	29·645	54·3	37·1	17·2	45·3	— 2·1	42·6	39·4	5·9	12·5	1·0	80·3	104·6	32·2	49·3	48·1	Sum 1·108	3·5	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29in·645, being 0in·158 *lower* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 68°·7 on April 2; the lowest in the month was 27°·0 on April 23; and the range was 41°·7.

The mean of all the highest daily readings in the month was 54°·3, being 3°·3 *lower* than the average for the 43 years, 1841–1883.

The mean of all the lowest daily readings in the month was 37°·1, being 2°·1 *lower* than the average for the 43 years, 1841–1883.

The mean of the daily ranges was 17°·2, being 1°·2 *less* than the average for the 43 years, 1841–1883.

The mean for the month was 45°·3, being 2°·1 *lower* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
April 1	5·8	12·9	S	S	8·5	0·0	1·40	375	1, th.-cl : 5, ci.-cu, ci.-s	7,ci,cu,ci.-cu,li.-cl,li.-shs: 10, slt.-r : v, li.-cl
2	8·7	13·0	SE : SSE	S : SE	5·5	0·0	0·48	271	li.-cl : 3, ci, ci.-cu	4, ci, ci.-cu, cu, cu.-s: v, s, l, t
3	5·1	13·0	ENE : SE	SSE : SW	2·7	0·0	0·15	190	10, r, l : 5, th.-cl, m	8,ci,ci.-s,ci.-cu,cu,cu.-s: v, r
4	9·3	13·1	SW : SSE	SE	6·6	0·0	0·96	326	p.-cl : 6, cu, cu.-s	2,ci.-cu,th.-cl: 10, shs.-r : 10, hy.-r
5	0·5	13·2	S : SSE	SSE : SSW : S	5·9	0·0	0·54	261	10 : 10	9,th.-cl,cu,ci.-cu,cu.-s: v, slt.-sh
6	0·7	13·2	SSE : SSW	SSW : SE : N	0·9	0·0	0·05	211	v : 7, cu, cu.-s	10, r : 10, r
7	0·0	13·3	N : NW	NW : SW : W	4·3	0·0	0·45	293	10, hy.-sh : 10, r, glm	9, cu, cu.-s : 10
8	0·0	13·4	WSW	SSE : ESE	0·4	0·0	0·00	155	p.-cl : 8, ci.-cu, li.-cl, m	8,ci.-cu,ci.-s,glm,slt.-f: v, th.-cl, h, slt.-f
9	8·4	13·4	E : NE : ENE	E : ESE : NNE	1·9	0·0	0·24	205	p.-cl : 1, li.-cl	3, cu : o
10	5·0	13·5	N	NNE : N	5·3	0·0	1·18	323	v : 8, ci.-cu, cu, cu.-s	7, ci.-cu, cu.-s : v, h, d
11	3·9	13·6	NNE : NE	NE : E	0·5	0·0	0·03	143	p.-cl : p.-cl	10 : 10
12	0·7	13·6	Calm : NE	NE	1·8	0·0	0·03	107	d : 10, glm	10, r : v, th.-cl, h, f
13	2·5	13·7	N	NE : E : NNE	3·6	0·0	0·27	203	p.-cl, f : 10	8, hl, li.-shs : v, li.-cl
14	1·1	13·7	NNE	NNE	5·2	0·0	0·62	315	p.-cl : 9, cu.-s, sh.-r	9, hy.-sh : 10, oc.-slt.-r
15	0·0	13·8	N : NNE	NNE	2·6	0·0	0·29	274	10 : 10, slt.-r	10, sc, slt.-r : 10
16	0·1	13·9	N : NNE	NE : E : ENE	1·2	0·0	0·11	221	10 : 10, slt.-r	10 : v
17	0·1	13·9	ENE	ENE	15·0	0·0	3·29	522	v : 10, w, hl, shs.-r	10, w, slt.-sn : 10, w
18	6·9	14·0	ENE	ENE : NE	11·0	0·0	2·86	522	p.-cl, w : 10, w	6, cu, cu.-s, w : 10
19	0·5	14·1	NNE : NE	NE : ENE	2·1	0·0	0·25	334	10 : 10	10 : 10
20	1·2	14·1	NE	NE : ENE	2·0	0·0	0·03	218	10 : 10	10 : 10 : v, li.-cl
21	4·0	14·2	NNE : NE	ENE : NE	3·5	0·0	0·17	221	v : p.-cl, cu.-s, r, sn	v, cu, cu.-s, sn, r : o
22	4·4	14·2	NNE : NE	ENE : NE	4·7	0·0	0·40	281	v, sn : v,cu,cu.-s,slt.-earthquake	8,ci.-cu,cu,cu.-s: v : o
23	6·2	14·3	NE : N	ENE : E : NE	0·6	0·0	0·00	185	o : 6, ci.-cu, cu	7,ci.-cu,cu,ci.-s,cu.-s: v, slt.-r
24	4·2	14·4	NNE : NE	NE	1·6	0·0	0·01	180	o : 4, ci.-cu, ci.-s	8,ci.-cu,cu,cu.-s,oc.-shs,hl: v, li.-cl, m
25	0·3	14·4	NNE : NE	E : ESE	1·3	0·0	0·00	153	v : 10	10, oc.-shs, slt.-sn : 10, slt.-r
26	0·8	14·5	SE : SW	SW : S	3·3	0·0	0·05	177	10 : 9, h	5, cu, cu.-s, th.-cl, h : 10, r
27	1·3	14·5	S : E	E : S : SW	3·1	0·0	0·01	194	10, shs.-r : 10, r	10, r : v, oc.-shs : o
28	1·0	14·6	SE	SW : S	0·0	0·0	0·00	144	v : 7, ci.-cu, ci.-s	10, slt.-r : 2, li.-cl, d
29	2·9	14·7	S : NE : SW	N : NE : SE	0·0	0·0	0·00	105	o, d : o, tk.-f	9, cu.-s, slt.-f : v, f
30	2·3	14·7	Calm : SW	WSW : NNW	7·0	0·0	0·29	266	f : 6,th.-cl,slt.-f,so.-ha	9,ci.-cu,cu,ci.-s: 10, oc.-r : o
Means	2·9	13·8	...	...	..	..	0·47	246		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 42°·6, being 1°·3 *lower* than the average for the 20 years, 1849–1868.
The mean *Temperature of the Dew Point* for the month was 39°·4, being 0°·9 *lower* than the average for the 20 years, 1849–1868.
The mean *Degree of Humidity* for the month was 80·3, being 3·4 *greater* than the average for the 20 years, 1849–1868.
The mean *Elastic Force of Vapour* for the month was 0in·241, being 0in·009 *less* than the average for the 20 years, 1849–1868.
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 2grs·8, being 0gr·1 *less* than the average for the 20 years, 1849–1868.
The mean *Weight of a Cubic Foot of Air* for the month was 544 grains, being *the same as* the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 7·5.
The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·21. The maximum daily amount of *Sunshine* was 9·3 hours on April 4.
The highest reading of the *Solar Radiation Thermometer* was 129°·1 on April 29; and the lowest reading of the *Terrestrial Radiation Thermometer* was 17°·9 on April 23.
The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 2·0; for the 6 hours ending 3 p.m., 1·0; and for the 6 hours ending 9 p.m., 0·5.
The *Proportions of Wind* referred to the cardinal points were N. 10, E. 10, S. 7, and W. 2. One day was calm.
The *Greatest Pressure of the Wind* in the month was 15lbs·0 on the square foot on April 17. The mean daily *Horizontal Movement of the Air* for the month was 246 miles; the greatest daily value was 522 miles on April 17 and 18; and the least daily value was 105 miles on April 29.
Rain fell on 15 days in the month, amounting to 1in·108, as measured by gauge No. 6 partly sunk below the ground; being 0in·560 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Lowest.	Daily Range.	Mean of 24 Hourly Values.	Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Greatest.	Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
May 1	..	29·663	57·0	35·6	21·4	47·4	− 1·3	43·8	39·8	7·6	16·4	0·0	76	103·6	29·8	49·1	47·0	0·010	1·8	mP : vP, vN
2	First Qr.	29·513	57·2	45·4	11·8	51·3	+ 2·4	48·1	44·8	6·5	15·2	1·4	79	120·0	40·0	49·7	48·0	0·025	7·5	vP
3	..	29·256	59·8	41·0	18·8	50·9	+ 1·8	48·1	45·2	5·7	14·1	2·2	81	118·7	37·0	52·1	49·5	0·128	12·2	wP, wN : vN, vP
4	..	29·216	58·3	40·3	18·0	48·5	− 0·9	44·7	40·6	7·9	13·7	3·5	74	117·0	36·2	52·1	48·8	0·012	5·5	wP : vP, vN
5	In Equator	29·328	58·7	38·8	19·9	46·6	− 3·1	43·9	40·8	5·8	15·2	0·9	82	120·0	34·8	51·6	49·4	0·204	3·0	wP : vP, vN
6	..	29·611	60·2	37·4	22·8	47·1	− 2·9	43·6	39·7	7·4	16·7	0·0	76	109·6	31·1	52·1	50·0	0·087	0·0	..
7	..	29·853	58·2	36·2	22·0	47·6	− 2·7	44·9	42·0	5·6	13·4	0·0	82	109·2	30·0	52·9	51·0	0·064	2·0	..
8	..	29·890	63·1	46·0	17·1	53·4	+ 2·8	50·9	48·4	5·0	10·6	1·7	83	114·7	42·0	52·1	50·4	0·000	13·8	..
9	..	30·020	68·3	46·5	21·8	55·3	+ 4·5	51·7	48·3	7·0	15·7	0·4	78	126·1	42·9	53·1	52·8	0·000	12·2	..
10	Full: Apogee.	30·045	75·0	44·5	30·5	59·6	+ 8·5	53·3	47·8	11·8	22·3	2·2	65	133·8	36·6	54·6	53·5	0·000	1·0	..
11	..	29·887	78·5	45·0	33·5	63·4	+12·0	54·9	47·7	15·7	31·1	0·4	57	136·4	37·0	56·1	56·0	0·000	7·0	..
12	..	29·781	78·1	48·3	29·8	61·3	+ 9·5	56·0	51·5	9·8	21·8	2·2	71	139·1	39·2	56·6	56·0	0·353	0·0	..
13	Greatest Declination S.	29·764	67·9	50·2	17·7	56·7	+ 4·6	53·7	50·9	5·8	13·9	1·4	81	127·4	45·9	58·4	57·0	0·000	2·2	..
14	..	29·710	65·8	45·2	20·6	54·1	+ 1·6	50·0	46·0	8·1	16·9	2·5	73	129·8	38·8	57·1	56·2	0·010	10·8	..
15	..	29·917	63·0	46·1	16·9	53·2	+ 0·3	50·3	47·4	5·8	10·4	1·6	81	102·7	38·2	57·9	57·2	0·000	12·0	..
16	..	29·858	72·1	52·7	19·4	58·8	+ 5·5	55·4	52·3	6·5	13·9	1·6	79	133·0	50·3	57·7	57·2	0·000	6·0	..
17	..	29·629	75·2	51·2	24·0	60·9	+ 7·2	54·6	49·1	11·8	27·4	1·4	65	136·4	50·8	58·1	57·6	0·000	6·0	..
18	Last Qr.	29·646	61·0	48·0	13·0	53·9	− 0·2	50·2	46·6	7·3	14·2	2·1	76	97·0	40·9	58·5	58·0	0·063	0·0	— : wP, wN
19	..	29·712	62·7	45·0	17·7	52·5	− 1·9	48·3	44·0	8·5	17·5	0·4	73	120·0	39·6	58·7	58·0	0·000	0·0	wP : mP
20	In Equator	29·919	66·4	42·9	23·5	52·9	− 1·8	48·1	43·3	9·6	21·1	2·9	70	125·7	34·5	59·6	58·0	0·000	0·0	mP : wN : vP
21	..	30·227	70·8	39·5	31·3	55·2	+ 0·2	48·7	42·5	12·7	22·7	0·0	63	131·4	30·2	59·5	58·0	0·000	0·0	vP
22	..	30·224	70·4	41·3	29·1	57·0	+ 1·7	50·6	44·7	12·3	21·6	2·0	63	132·7	30·7	59·6	59·4	0·000	0·0	mP : wP, wN : mP
23	..	30·027	76·7	44·2	32·5	61·9	+ 6·4	54·0	47·2	14·7	26·0	0·0	58	136·0	33·0	61·5	60·0	0·000	0·0	mP
24	Perigee: New.	29·864	80·5	47·4	33·1	62·8	+ 7·1	56·1	50·4	12·4	25·5	1·4	64	142·3	37·5	60·7	59·2	0·000	1·8	mP
25	..	29·923	56·9	48·5	8·4	52·8	− 3·1	49·7	46·6	6·2	12·2	2·1	80	76·5	43·8	60·9	60·4	0·003	5·8	wP : vP
26	Greatest Declination N.	30·066	68·7	44·2	24·5	55·9	− 0·2	49·9	44·3	11·6	22·7	2·7	65	134·4	34·5	60·5	60·0	0·000	1·5	wP : vP
27	..	30·090	69·5	39·8	29·7	54·7	− 1·6	49·1	43·7	11·0	22·3	1·8	66	138·0	30·0	60·1	59·5	0·000	1·0	vP
28	..	30·055	54·9	40·7	14·2	49·6	− 6·9	46·1	42·4	7·2	10·4	1·8	76	79·7	33·1	59·7	59·2	0·000	1·8	vP
29	..	29·999	55·1	42·7	12·4	49·9	− 6·9	45·7	41·3	8·6	11·4	3·5	73	83·0	33·5	58·8	58·5	0·000	11·2	mP : vP
30	..	29·866	69·0	41·9	27·1	54·8	− 2·2	49·5	44·4	10·4	20·3	1·5	67	138·4	33·4	58·1	58·0	0·000	0·0	wP : vP
31	First Qr.	29·883	59·1	40·7	18·4	51·0	− 6·3	46·9	42·6	8·4	13·5	1·5	73	111·0	35·4	58·1	58·0	0·000	1·0	vP
Means	..	29·821	65·7	43·8	22·0	54·2	+ 1·1	49·7	45·4	8·9	17·7	1·5	72·6	120·1	37·1	56·6	55·5	Sum 0·959	4·1	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers. The results on May 1 and 23 for Air and Evaporation Temperatures are deduced from eye-observations on account of failure of the photographic registers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29in·821, being 0in·044 *higher* than the average for the 20 years, 1854–1873.

Temperature of the Air.

The highest in the month was 80°·5 on May 24; the lowest in the month was 35°·6 on May 1; and the range was 44°·9.
The mean of all the highest daily readings in the month was 65°·7, being 1°·5 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 43°·8, being 0°·1 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 22°·0, being 1°·5 *greater* than the average for the 43 years, 1841–1883.
The mean for the month was 54°·2, being 1°·1 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
May 1	3·4	14·8	WSW : SW	SW : WSW	9·2	0·0	1·90	488	0 : 0 : 4,cu,cu.-s,th.-cl	10, th.-r, w : 10, fq.-r, w
2	0·7	14·8	WSW	WSW : SW	7·0	0·0	2·30	545	10 : 10	10, shs.-r : 10, th.-r, w
3	1·4	14·9	SW : WSW	WSW	11·3	0·0	2·92	651	10, w, shs.-r : 10, shs.-r, w	9,ci.-cu,cu,cu.-s,w,shs.-r : v, w
4	9·2	14·9	WSW	WSW : SW	16·3	0·0	2·93	651	v, w : 5, cu, cu.-s, w	4,ci.-cu,cu,cu.-s,shs.-r : v
5	4·9	15·0	WSW	W : SW : WSW	4·7	0·0	0·29	366	p.-cl : 2, ci.-cu, cu	9,cu,cu.-s,t.-sm,hl,sn,r : v, shs.-r
6	8·5	15·1	WSW : NW	NW : N : S	4·7	0·0	0·00	261	p.-cl : 5, ci.-cu, ci-s, m	6,cu,ci.-cu,ci.-s,cu.-s: 10, hy.-shs : v, cu.-s
7	2·1	15·1	SW : WSW	SSW	5·5	0·0	0·47	368	v : p.-cl, cu, th.-cl	10, slt.-r : 10, fq.-r
8	0·9	15·2	SW	SW	9·3	0·0	0·79	497	10 : 10	10, th.-cl : v, ci.-s, s, h, lu.-co
9	5·4	15·2	SW	WSW : SW	5·4	0·0	0·60	397	v, d : 10	6, ci.-cu, cu, th.-cl : 8, s, th.-cl, lu.-ha
10	12·2	15·3	SSW : SW	SSW : S	0·6	0·0	0·00	241	p.-cl : 3, li.-cl	1, ci, ci.-cu : 1, th.-cl : 0, d
11	13·4	15·3	E : SSE	SSW	0·0	0·0	0·00	168	0, slt.-f : 0	0 : 0
12	9·8	15·4	WSW : N : NE	NE : ESE	0·0	0·0	0·00	145	0 : 0, m	1, th.-cl : t.-sm, hy.-r : v, l
13	3·7	15·4	NNW : NNE : ENE	ESE : SSW	1·6	0·0	0·00	207	10 : 10	6,ci.-cu,cu,cu.-s: p.-cl : 1, th.-cl
14	5·4	15·5	SSW : SW	WSW : WNW	8·1	0·0	0·62	428	1, li.-cl, d : 10	9, cu, cu.-s, sh.-r : v, ci.-cu, cu, li.-cl
15	0·3	15·5	WSW	WSW	7·4	0·0	1·08	498	p.-cl : 10	10 : 10
16	6·7	15·6	WSW	WSW : SW	3·8	0·0	0·58	451	10 : 10	4, ci.-cu, cu : 4, ci.-cu : 10
17	10·2	15·6	SW : SSW	SW : WSW	2·2	0·0	0·12	313	10 : v, li.-cl	0 : 0, l
18	0·4	15·7	WNW : NW : NNW	NW : ENE : SSE	0·9	0·0	0·00	155	10, l : 10, r	9, ci.-cu : v, th.-cl
19	0·3	15·7	ESE : NE	E : ENE	0·0	0·0	0·00	158	p.-cl : 10	10, ci, ci.-s : v, th.-ci, m, d
20	6·0	15·8	NNE : WSW	W : SW	1·0	0·0	0·00	179	10 : 10, f, th.-cl, m	6, cu, cu.-s, h : 0, m
21	11·5	15·8	Calm : Variable	SW : S	0·0	0·0	0·00	129	0 : 0, slt.-f	1, ci.-cu : 0
22	12·1	15·9	ENE : E	E	3·2	0·0	0·17	233	0 : 0, slt.-m	0 : 0
23	11·9	15·9	ENE	ENE : E : ESE	2·0	0·0	0·07	213	0, d, slt.-m : 3, th.-cl	0 : 0
24	12·2	16·0	NE : ENE	ESE : E	1·5	0·0	0·03	210	0 : 0	0 : 0, l
25	0·0	16·0	ENE	E : ENE	3·2	0·0	0·15	330	v : 10, th.-r	10, oc.-slt.-r : 10
26	9·8	16·0	NNE : ENE	E : ENE	2·7	0·0	0·19	310	p.-cl : 4, cu, cu.-s	2, li.-cl : 0
27	11·7	16·1	NE : ENE	ESE : E	1·0	0·0	0·02	245	0 : 0	0 : 0
28	0·0	16·1	NE : ENE	NE : ENE	0·7	0·0	0·00	271	v : 10	10 : 10
29	0·0	16·1	NE	NE : ENE	1·4	0·0	0·00	288	10 : 10	10 : v : 0
30	7·9	16·2	NE : NNE	ENE : NE	2·2	0·0	0·05	299	0 : 5, ci.-cu, cu, cu.-s	5,ci.-cu,cu.-s: 3 : 0
31	1·7	16·2	NE : NNE	NNE	1·2	0·0	0·01	309	0 : v : 9, cu, cu.-s	10 : 10 : v
Means	5·9	15·6	...	...	..	..	0·49	323		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 49°·7, being 0°·8 *higher* than
The mean *Temperature of the Dew Point* for the month was 45°·4, being 0°·3 *higher* than
The mean *Degree of Humidity* for the month was 72·6, being 2·8 *less* than
The mean *Elastic Force of Vapour* for the month was $0^{in}\cdot304$, being $0^{in}\cdot003$ *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was $3^{grs}\cdot4$, being *the same as*
The mean *Weight of a Cubic Foot of Air* for the month was 537 grains, being 1 grain *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 5·5.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·38. The maximum daily amount of *Sunshine* was 13·4 hours on May 11.

The highest reading of the *Solar Radiation Thermometer* was 142°·3 on May 24; and the lowest reading of the *Terrestrial Radiation Thermometer* was 29°·8 on May 1.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 2·5; for the 6 hours ending 3 p.m., 1·1; and for the 6 hours ending 9 p.m., 0·5.

The *Proportions of Wind* referred to the cardinal points were N. 5, E. 9, S. 8, and W. 9.

The *Greatest Pressure of the Wind* in the month was $16^{lbs}\cdot3$ on the square foot on May 4. The mean daily *Horizontal Movement of the Air* for the month was 323 miles; the greatest daily value was 651 miles on May 3 and 4; and the least daily value was 129 miles on May 21.

Rain fell on 10 days in the month, amounting to $0^{in}\cdot959$, as measured by gauge No. 6 partly sunk below the ground; being $1^{in}\cdot037$ *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Difference. Greatest.	Difference. Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
June 1	In Equator	29·758	68·2	42·7	25·5	53·2	− 4·3	48·1	43·0	10·2	21·1	1·9	68	132·6	32·2	57·6	57·5	0·000	10·0	mP : vP
2	..	29·479	69·5	44·5	25·0	55·9	− 1·8	51·2	46·8	9·1	18·7	0·2	72	136·0	38·7	57·6	57·5	0·000	8·5	wP : wN, vP
3	..	29·411	64·2	47·4	16·8	55·5	− 2·4	51·7	48·1	7·4	16·5	1·5	77	115·0	39·7	57·6	57·3	0·000	4·5	wP
4	..	29·574	58·1	50·2	7·9	53·1	− 5·0	51·9	50·7	2·4	4·2	0·0	92	73·3	48·4	57·6	57·5	0·301	0·0	wP, wN : vP, vN
5	..	29·624	61·1	48·8	12·3	52·3	− 5·9	51·7	51·1	1·2	8·2	0·0	96	99·3	46·1	57·5	57·2	1·024	0·0	wP, wN : vN, vP
6	..	29·557	58·3	46·8	11·5	50·1	− 8·2	49·7	49·3	0·8	4·4	0·0	97	99·8	44·7	57·5	57·0	0·370	1·8	vP, vN
7	Apogee	29·409	59·0	46·0	13·0	51·1	− 7·3	49·0	46·8	4·3	11·2	0·0	85	109·8	44·4	57·6	56·8	0·264	12·2	vN, vP : mP
8	Full	29·595	60·3	45·9	14·4	52·5	− 6·0	50·1	47·7	4·8	12·0	0·0	84	96·6	38·8	57·1	57·0	0·076	0·0	wP : vP, vN
9	Greatest Declination S.	29·700	57·8	45·0	12·8	49·9	− 8·6	48·2	46·4	3·5	9·5	0·0	88	89·1	..	56·6	56·5	0·071	0·0	vP, vN
10	..	29·910	62·4	47·3	15·1	54·3	− 4·3	51·7	49·2	5·1	11·6	0·2	82	114·8	40·9	56·7	56·4	0·000	0·0	mP : wP, wN
11	..	30·001	70·2	47·3	22·9	58·8	+ 0·1	56·3	54·0	4·8	15·7	0·0	84	137·4	40·8	57·1	57·0	0·000	4·0	wP : vP
12	..	30·113	76·5	53·0	23·5	63·4	+ 4·6	58·9	55·1	8·3	18·2	0·0	75	127·4	46·1	58·0	57·6	0·000	0·0	vP : wP
13	..	30·081	76·6	49·5	27·1	63·3	+ 4·4	59·3	55·9	7·4	14·6	0·0	77	116·7	43·9	58·9	58·8	0·000	0·0	mP : wP, wN : mP
14	..	30·061	70·9	51·0	19·9	61·6	+ 2·5	55·7	50·6	11·0	22·7	2·3	68	133·6	42·5	59·9	59·8	0·000	0·0	vP
15	..	30·093	68·4	47·3	21·1	57·1	− 2·2	51·5	46·4	10·7	19·1	4·4	67	121·8	38·7	60·3	60·0	0·000	0·0	mP : vP
16	In Equator: Last Quarter.	30·013	65·4	48·1	17·3	55·0	− 4·5	50·9	47·0	8·0	15·8	2·4	74	118·0	38·9	60·5	60·2	0·000	4·0	vP, wN
17	..	29·991	65·1	46·5	18·6	55·4	− 4·3	50·8	46·5	8·9	14·2	2·4	72	129·3	38·5	60·6	60·0	0·000	0·0	vP
18	..	30·024	61·2	47·7	13·5	54·8	− 5·1	52·1	49·5	5·3	8·5	1·6	82	89·1	39·9	61·1	60·5	0·000	0·0	vP : vN, vP
19	..	30·049	69·1	52·6	16·5	59·4	− 0·8	55·5	52·0	7·4	13·5	0·9	77	112·4	48·0	61·6	60·4	0·000	0·0	vP, wN : vP
20	..	30·036	69·6	51·0	18·6	58·8	− 1·7	55·9	53·3	5·5	15·1	0·0	82	123·5	43·5	61·9	60·8	0·000	0·0	wP : vP, wN
21	..	30·017	70·3	50·7	19·6	59·3	− 1·5	54·8	50·8	8·5	18·9	0·2	73	132·5	43·1	61·5	61·2	0·000	0·0	vP
22	Perigee: Greatest Decl. N.	29·956	73·2	50·7	22·5	61·0	− 0·1	56·8	53·1	7·9	17·5	0·4	76	118·0	42·8	62·1	62·0	0·018	3·0	vP
23	New	29·860	73·1	52·7	20·4	61·2	− 0·2	55·9	51·4	9·8	18·4	0·4	71	134·0	43·5	62·9	62·4	0·000	4·0	vP, wN
24	..	29·796	77·0	49·3	27·7	61·5	− 0·2	56·2	51·7	9·8	23·4	0·8	71	135·7	39·1	63·1	62·8	0·000	0·0	vP, wN : vP
25	..	29·849	74·1	54·0	20·1	62·9	+ 1·0	58·8	55·3	7·6	18·2	0·4	76	119·5	45·0	63·4	63·0	0·004	0·0	vP, wN : vP, vN
26	..	29·977	81·2	47·1	34·1	64·3	+ 2·3	57·4	51·7	12·6	24·8	0·2	64	134·6	38·8	63·6	63·0	0·000	0·0	vP, wN
27	..	29·974	82·6	52·0	30·6	66·4	+ 4·4	60·2	55·2	11·2	22·9	1·8	67	142·9	44·1	64·1	63·5	0·000	0·0	vP, wN : mP
28	..	30·020	79·0	52·5	26·5	65·0	+ 3·1	60·0	55·9	9·1	20·2	0·8	73	136·3	43·9	64·1	63·6	0·000	3·0	wP : wN, mP
29	In Equator	29·846	77·1	54·1	23·0	62·6	+ 0·8	59·2	56·3	6·3	15·1	0·6	80	130·2	47·6	64·5	64·0	0·116	7·2	mP : vP, vN : mP
30	First Qr.	29·917	78·9	50·8	28·1	63·4	+ 1·7	58·4	54·2	9·2	19·2	0·0	72	133·7	40·8	65·1	64·0	0·000	3·8	mP : vP, wN
Means	..	29·856	69·3	49·1	20·2	58·1	− 1·6	54·3	50·8	7·3	15·8	0·8	77·4	119·8	(29 days) 42·2	60·3	59·8	Sum 2·244	2·2	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers. The results for June 11 for Air and Evaporation Temperatures are deduced from eye-observations on account of failure of the photographic registers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The mean reading of the *Barometer* for the month was 29in·856, being 0in·028 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 82°·6 on June 27; the lowest in the month was 42°·7 on June 1; and the range was 39°·9.

The mean of all the highest daily readings in the month was 69°·3, being 1°·6 *lower* than the average for the 43 years, 1841–1883.

The mean of all the lowest daily readings in the month was 49°·1, being 0°·8 *lower* than the average for the 43 years, 1841–1883.

The mean of the daily ranges was 20°·2, being 0°·8 *less* than the average for the 43 years, 1841–1883.

The mean for the month was 58°·1, being 1°·6 *lower* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	WIND AS DEDUCED FROM SELF-REGISTERING ANEMOMETERS. — OSLER'S. — General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	ROBINSON'S. Horizontal Movement of the Air.	CLOUDS AND WEATHER. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
June 1	5·3	16·2	NNE : N : SW	SW : S	1·0	0·0	0·00	189	p.-cl : 10	v, h : v
2	5·2	16·3	SSE : SE	SE : E : ENE	2·8	0·0	0·07	245	v : 10	8, ci.-cu, cu, cu.-s : 4, th.-cl
3	0·2	16·3	NE : ENE	ENE : E : NE	4·2	0·0	0·25	315	p.-cl : 8,ci.-cu,ci.-s,cu.-s	10, slt.-r : 10, slt.-r
4	0·0	16·3	NNE	WSW:SW:NW	0·6	0·0	0·02	173	10 : 10, r	10, f, r : 10, m, r
5	0·0	16·4	SW : N	S : SSW	1·2	0·0	0·02	145	10 : 10, glm, sh.-r	10, glm, hy.-r, l, t : 10, fq.-r
6	0·1	16·4	SSW : WSW	SW : SSE : S	2·0	0·0	0·11	202	10 : 10, r	10, hy.-r : 10, hy.-shs
7	0·5	16·4	SE : ENE	NE:NNE:NNW	1·4	0·0	0·15	200	10, hy.-r : 10, r	9, cu, cu.-s : 8,cu.-s,oc.-li. shs : v
8	0·4	16·4	NNW	NNW : NW	2·1	0·0	0·22	232	v : 10, sh.-r	10, oc.-r : 10, r
9	0·0	16·4	NW : NNW	NNW : N	2·9	0·0	0·31	270	10, r : 10, slt.-sh	10, slt.-r : 10, r
10	1·0	16·5	N	NNE: SSE: SSW	1·0	0·0	0·03	163	10 : 7,ci.-cu,cu,cu.-s	9, cu, cu.-s : 10
11	6·4	16·5	SW : WSW	SW: SSW: WSW	1·7	0·0	0·11	224	p.-cl : 3, th.-cl, ci.-cu	10, cu.-s : 10 : 7, li.-cl
12	8·6	16·5	WSW : N : NE	NE : ESE	0·8	0·0	0·01	149	v : 1, li.-cl, m	3, ci.-cu,cu : v : 1, m
13	10·4	16·5	Calm : SW	SSW: ESE: SSE	0·1	0·0	0·00	93	0 : 0, m	2, ci.-cu, h : v
14	8·0	16·5	N : NNE	NNE : NE	5·7	0·0	0·65	311	p.-cl : 5, ci.-cu	1, ci, ci.-cu : 0 : 0
15	7·2	16·5	NNE : N	N : NE	1·0	0·0	0·03	216	v : 5, ci.-cu, cu.-s	6, ci.-cu, cu, cu.-s : v, th.-cl
16	1·3	16·5	Calm : Variable	NNW : NNE	2·9	0·0	0·10	182	p.-cl : 10	v, ci.-cu, cu : 3, cu.-s
17	4·6	16·6	NNE : N	N	2·2	0·0	0·03	225	10, cu.-s, s : 10	7, ci.-cu, cu, cu.-s : v, ci.-cu,cu.-s, li.-cl
18	0·6	16·6	NNE	NNE : NE	0·3	0·0	0·00	164	p.-cl : 10	10 : 10
19	1·4	16·6	N : NNE	NNE : ENE : E	0·0	0·0	0·00	118	10 : 10	9,ci.-cu,cu.-s: p.-cl : v, d
20	1·3	16·6	ESE	NE : Calm	0·0	0·0	0·00	85	p.-cl : 10	10 : p.-cl, cu.-s, th.-cl
21	6·5	16·6	NE	N : NE	0·5	0·0	0·00	156	p.-cl : 10, ci.-cu	7, cu, cu.-s, ci.-cu : 10
22	5·9	16·6	WSW: N: NNE	N : SE : NW	1·0	0·0	0·00	149	10 : v, h	5, cu, h : v : 10, r
23	7·4	16·6	WSW : N	NW : NNW	1·4	0·0	0·10	210	10 : 8,ci.-cu,cu,cu.-s	5, ci.-cu, cu, cu.-s : 2, th.-cl
24	3·8	16·6	N : NW : WSW	WSW	2·2	0·0	0·04	212	p.-cl : v, so.-ha	4, li.-cl, ci.-cu, cu.-s : 9, slt.-r
25	3·6	16·6	WSW : N	NW : N : NE	0·8	0·0	0·04	194	10 : 10, th.-r	7, cu, cu.-s, ci.-cu : 0, m
26	11·4	16·5	Calm : WNW	WSW : SW	0·3	0·0	0·01	148	0 : 0, h, m	2, th.-cl : 0
27	10·4	16·5	Variable	ESE : E	1·3	0·0	0·03	160	1, li.-cl, d : 0, h, m	4, ci.-cu, cu, cu.-s : 2 : 0
28	9·0	16·5	ENE : E	E	3·4	0·0	0·40	253	0 : 2, ci.-cu	v : 0 : 0, l
29	4·5	16·5	ENE : E : WSW	WSW	2·0	0·0	0·08	215	v : 9, slt.-r	p.-cl : 3, th.-cl : 0
30	9·3	16·5	WSW : W	WSW : SW	0·5	0·0	0·00	194	0 : 2, ci.-cu, m, h	5, cu : 3, ci, s
Means	4·5	16·5	...	...	..	..	0·09	193		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 54°·3, being 0°·9 *lower* than
The mean *Temperature of the Dew Point* for the month was 50°·8, being 0°·4 *lower* than
The mean *Degree of Humidity* for the month was 77·4, being 4·1 *greater* than
The mean *Elastic Force of Vapour* for the month was 0$^{\text{in}}$·371, being 0$^{\text{in}}$·006 *less* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 4$^{\text{grs}}$·2, being *the same as*
The mean *Weight of a Cubic Foot of Air* for the month was 533 grains, being 2 grains *greater* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 6·7.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·27. The maximum daily amount of *Sunshine* was 11·4 hours on June 26.

The highest reading of the *Solar Radiation Thermometer* was 142°·9 on June 27; and the lowest reading of the *Terrestrial Radiation Thermometer* was 32°·2 on June 1.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 0·9; for the 6 hours ending 3 p.m., 0·7; and for the 6 hours ending 9 p.m., 0·6.

The *Proportions of Wind* referred to the cardinal points were N. 12, E. 6, S. 5, and W. 5. Two days were calm.

The *Greatest Pressure of the Wind* in the month was 5$^{\text{lbs}}$·7 on the square foot on June 14. The mean daily *Horizontal Movement of the Air* for the month was 193 miles; the greatest daily value was 315 miles on June 3; and the least daily value was 85 miles on June 20.

Rain fell on 8 days in the month, amounting to 2$^{\text{in}}$·244, as measured by gauge No. 6 partly sunk below the ground; being 0$^{\text{in}}$·207 *greater* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Greatest.	Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
July 1	..	30.019	79.9	54.3	25.6	65.5	+ 3.9	59.6	54.8	10.7	20.4	0.2	69	138.2	44.7	64.9	64.5	0.000	0.0	vP
2	..	29.964	77.0	51.5	25.5	65.2	+ 3.7	58.5	53.0	12.2	22.3	1.6	65	116.6	41.9	65.6	65.0	0.000	0.0	mP : vN : vN, vP
3	..	29.826	84.1	53.0	31.1	69.3	+ 7.9	61.1	54.8	14.5	27.4	1.4	59	139.4	45.5	66.9	66.4	0.000	0.0	vP : vP, wN
4	Apogee	29.736	88.1	56.6	31.5	71.1	+ 9.7	63.7	58.1	13.0	26.5	2.8	63	147.0	47.0	67.1	66.5	0.000	3.0	vP
5	..	29.751	80.4	58.1	22.3	66.8	+ 5.3	62.0	58.2	8.6	19.4	2.5	74	129.2	44.4	68.7	68.5	0.085	0.0	vP, vN
6	Greatest Declination S.	29.792	75.0	54.6	20.4	61.9	+ 0.2	58.9	56.4	5.5	16.6	0.6	82	138.4	38.3	69.0	68.0	0.140	9.0	mP : vP, vN : mP
7	..	29.804	78.4	55.3	23.1	64.9	+ 3.0	59.1	54.3	10.6	20.6	0.6	69	128.3	49.4	69.2	68.8	0.000	16.0	mP
8	Full	29.727	85.5	54.0	31.5	70.3	+ 8.1	61.5	54.7	15.6	29.1	3.2	58	148.0	45.3	68.7	68.5	0.000	0.0	vP
9	..	29.623	86.5	59.3	27.2	70.5	+ 8.0	63.3	57.8	12.7	25.7	4.3	64	144.3	51.0	70.0	69.5	0.000	6.2	vP
10	..	29.482	75.7	54.5	21.2	63.2	+ 0.5	60.0	57.3	5.9	16.7	1.3	81	127.0	49.5	69.7	68.0	0.372	12.5	vP, vN
11	..	29.594	73.8	52.4	21.4	61.6	− 1.3	57.1	53.2	8.4	20.3	1.0	74	140.4	46.0	69.0	68.5	0.032	13.0	wP : vP : sN, vP
12	..	29.702	69.3	56.7	12.6	61.9	− 1.2	59.9	58.2	3.7	11.0	0.9	88	104.8	51.0	69.0	68.5	0.148	6.8	wP : vP, vN
13	In Equator	29.718	83.6	56.6	27.0	68.1	+ 4.8	62.2	57.6	10.5	24.6	1.3	68	140.0	..	68.7	68.5	0.003	11.2	mP
14	..	29.786	76.1	53.9	22.2	63.9	+ 0.5	58.4	53.8	10.1	19.7	1.6	70	144.2	45.1	68.6	68.0	0.007	9.0	vP : wN, vP
15	Last Qr.	29.741	74.3	56.7	17.6	63.2	− 0.2	60.0	57.3	5.9	16.0	1.9	81	126.2	53.8	68.4	67.8	0.031	10.8	vP
16	..	29.548	72.2	54.6	17.6	63.8	+ 0.3	59.3	55.5	8.3	16.7	2.2	75	130.5	49.5	68.0	67.6	0.087	16.5	vP, vN : vP
17	..	29.625	76.0	53.0	23.0	61.4	− 2.1	57.2	53.6	7.8	20.7	1.2	76	142.0	47.9	67.4	66.8	0.040	13.8	vP : vP, sN
18	..	29.862	73.5	51.4	22.1	59.6	− 3.8	54.8	50.5	9.1	17.8	1.8	72	140.5	42.7	66.7	66.5	0.000	3.2	vP
19	..	29.946	68.8	48.5	20.3	58.0	− 5.3	52.5	47.6	10.4	20.0	1.5	68	132.4	40.1	66.1	65.6	0.003	0.0	vP, vN
20	Greatest DecN.: Perigee.	29.930	73.7	47.5	26.2	59.1	− 4.1	54.7	50.8	8.3	17.3	1.3	74	141.0	39.0	66.1	66.0	0.000	0.0	mP : wP
21	..	29.764	70.5	53.9	16.6	61.6	− 1.4	59.1	57.0	4.6	11.0	1.4	85	114.2	45.2	65.6	65.5	0.161	1.0	wP : vP, vN
22	New	29.819	75.6	54.1	21.5	63.6	+ 0.7	60.5	57.9	5.7	15.8	0.6	82	139.3	47.1	65.6	65.0	0.001	0.0	vP
23	..	29.689	72.5	53.5	19.0	63.1	+ 0.3	59.5	56.5	6.6	13.0	1.1	79	130.0	46.5	65.5	65.4	0.005	0.2	wP : vP
24	..	29.577	70.6	49.2	21.4	58.5	− 4.2	54.2	50.3	8.2	19.4	1.2	74	139.5	42.1	65.3	65.0	0.033	0.8	mP : vP, sN
25	..	29.781	70.0	48.0	22.0	56.9	− 5.8	52.2	47.9	9.0	19.3	0.8	72	139.9	39.8	64.6	64.0	0.000	0.0	vP : vP, vN
26	In Equator	29.908	66.2	42.3	23.9	54.8	− 7.9	50.7	46.8	8.0	15.8	0.6	74	110.3	30.7	..	..	0.420	0.0	vP : vP : vN
27	..	29.674	65.6	51.8	13.8	58.3	− 4.3	56.5	54.9	3.4	10.1	0.0	88	110.0	49.4	..	..	0.100	2.0	vP : vN
28	..	29.918	71.1	53.7	17.4	59.9	− 2.7	55.7	52.0	7.9	17.1	1.9	76	139.7	47.7	..	..	0.042	0.0	vP : vP, vN
29	First Qr.	29.894	69.4	55.1	14.3	62.0	− 0.6	60.0	58.3	3.7	7.2	0.6	88	96.1	53.3	..	..	0.061	0.0	vP, wN
30	..	30.007	72.0	59.3	12.7	63.6	+ 1.0	61.5	59.7	3.9	9.7	0.0	88	105.2	53.0	..	..	0.000	0.0	wP : wN, mP
31	..	30.002	80.4	55.6	24.8	67.0	+ 4.4	61.9	57.8	9.2	20.1	0.0	73	139.0	48.9	..	..	0.000	0.0	mP : wP, wN
Means	..	29.781	75.3	53.5	21.8	63.2	+ 0.6	58.6	54.7	8.5	18.3	1.3	74.5	131.0	(30 days) 45.9	(25 days) 67.4	(25 days) 66.9	Sum 1.771	4.4	....
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The observations of the temperature of the water of the Thames were suspended from July 26 till December 2.

The mean reading of the *Barometer* for the month was $29^{\text{in}}{\cdot}781$, being $0^{\text{in}}{\cdot}028$ *lower* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 88°·1 on July 4; the lowest in the month was 42°·3 on July 26; and the range was 45°·8.
The mean of all the highest daily readings in the month was 75°·3, being 1°·2 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 53°·5, being 0°·4 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 21°·8, being 0°·8 *greater* than the average for the 43 years, 1841–1883.
The mean for the month was 63°·2, being 0°·6 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	WIND AS DEDUCED FROM SELF-REGISTERING ANEMOMETERS. OSLER'S. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	ROBINSON'S. Horizontal Movement of the Air.	CLOUDS AND WEATHER. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
July 1	10·1	16·5	SW : SSW	SW : WSW	0·6	0·0	0·00	190	v, slt.-f : 6, cu, cu.-s	4,ci,cu,ci.-cu,cu.-s: 2 : 0, m
2	7·6	16·5	WSW	NE : Calm	0·0	0·0	0·00	101	0, m : 1, s, h, m : 0, h, m	0, h : 0, m
3	12·8	16·4	Calm : ENE	SE : SW	2·3	0·0	0·00	97	0, m : 1, li.-cl, h, m	2, li.-cl, ci.-cu, cu : 7, ci.-cu, cu.-s
4	10·8	16·4	ESE	S : SW	2·1	0·0	0·08	177	p.-cl : 1, li.-cl, slt.-m	3, ci.-cu, cu : v, li.-cl, l
5	4·0	16·4	Variable	SW : WSW : S	0·5	0·0	0·01	142	v, l, t, slt.-sh : 6, ci.-cu, cu.-s	10,ci.-cu,cu.-s,hy.-sh : v, li.-cl
6	2·6	16·4	S : SW	WSW:WNW:SSW	5·0	0·0	0·36	232	v : p.-cl, shs.-r, t	v,ci.-cu,cu,cu.-s,hy.-r,l,t : 1, li.-cl, s
7	6·2	16·3	SSW	SSW	1·5	0·0	0·07	224	v : 10	6, ci.-cu, cu, cu.-s : 1, li.-cl
8	10·9	16·3	SSE : NE	S : SW	1·5	0·0	0·11	163	p.-cl : 5, ci.-cu, li.-cl, m	7,ci.-cu,cu,cu.-s: 4 : p.-cl
9	3·7	16·3	NNE	SSW : S	3·9	0·0	0·14	153	p.-cl : 8, ci-cu, ci.-s, m	9,ci.-cu,cu,cu.-s,slt.-r : v, li.-cl
10	1·5	16·3	ESE : SW	SSW : SW	3·6	0·0	0·12	201	v, sh.-r : 10 hy.-sh	8, ci, cu, r : p.-cl, r
11	5·8	16·2	SSW	SSW : S : SSE	3·5	0·0	0·37	282	p.-cl : 6, ci.-cu, cu, cu.-s	8,ci.-cu,cu,cu.-s,slt.-r: 10, r : 10
12	1·9	16·2	SSW	SSW : SE	2·1	0·0	0·07	195	p.-cl : 9, r	10, r : v, l
13	4·0	16·2	SE : ESE	SSE : SW	4·0	0·0	0·37	252	v, lu.-ha : 10, slt.-r : 3, ci, ci.-s	7, ci, ci.-cu, sh.-r : 0, l
14	6·8	16·1	SW	SW	11·5	0·0	1·15	379	0, d : 5,cu,cu.-s,sh.-r,w	8,ci.-cu,cu,cu.-s,w,slt.-r : 10, slt.-r
15	1·0	16·1	SSW : SW	SW : S	5·5	0·0	0·49	305	v, li.-cl : 10, r	9, ci.-cu, cu, cu.-s : v, li.-cl, cu.-s
16	4·0	16·1	SSE : SW	SW	6·0	0·0	0·90	370	10 : 10, sc, r	9, cu, cu.-s, th.-cl : 1, s
17	2·4	16·0	SSW : SW	WSW	3·9	0·0	0·35	330	v : 10, m, slt.-r	7,ci.-cu,cu,cu.-s,sh.-r : 0, d
18	3·6	16·0	WSW	WNW : WSW	4·5	0·0	0·41	331	0, d : 6, cu, cu.-s	10, slt.-r : 8, th.-cl, slt.-r
19	4·9	16·0	WSW:NW:NNW	NW : NNE : SE	5·8	0·0	0·35	237	v : 9, ci.-cu,cu,cu.-s,m,sh.-r	6, cu, cu.-s : 3, cu
20	2·5	15·9	WSW : NNW	NE: SSE : SSW	0·2	0·0	0·00	127	v : 8, cu, cu.-s	8, ci.-cu, cu, cu.-s : 6, ci.-cu, cu.-s
21	0·3	15·9	SSW : SW	WSW : NNW	4·1	0·0	0·45	268	p.-cl : 10, r	10, slt.-r : v, hy.-sh : 1, th.-cl, l
22	0·3	15·8	WNW:WSW:N	WSW : SW	2·1	0·0	0·20	266	v : 10	9,ci,cu,ci.-cu,li.-shs : 10, li.-shs
23	1·6	15·8	SW	SW : WSW	4·0	0·0	0·85	357	10 : 10	9, cu,cu.-s, slt.-r : v, r, l
24	6·3	15·7	WSW	SW : WSW	5·6	0·0	0·78	373	0 : v, l, t, r	7, ci.-cu, cu, oc.-r : 7, cu.-s, oc.-r, l
25	2·4	15·7	WSW : NW : N	N : NW	4·9	0·0	0·33	233	v : 10	9, ci.-cu, cu.-s, li.-sh: 8
26	1·2	15·7	WSW	SW : S	3·8	0·0	0·38	253	p.-cl : 9, li.-cl	10, slt.-r : 10, hy.-r
27	0·6	15·6	SW : W	N	2·9	0·0	0·16	250	10, shs.-r : 10, r, t, m	v, m, oc.-slt.-r, l, t : v, ci.-cu, cu.-s, li.-cl
28	2·4	15·6	N	N : W : SW	1·4	0·0	0·10	220	p.-cl : 10, slt.-sh	8, ci.-cu, cu, cu.-s : 10, r
29	0·0	15·5	SW : W : NW	NW : N	1·5	0·0	0·03	195	10, shs.-r : 10, m, glm	10 : 10, slt.-r, m
30	0·1	15·5	Variable	SE : SW	0·0	0·0	0·00	99	10 : 10, m	10, ci.-cu, cu.-s, slt.-r: v, d
31	4·2	15·4	SW	SW	0·0	0·0	0·00	140	p.-cl, d : 3, li.-cl	8, ci, ci.-cu, cu, cu.-s: 5, th.-cl
Means	4·1	16·0	...	...	..	..	0·28	230		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 58°·6, being 0°·9 *higher* than
The mean *Temperature of the Dew Point* for the month was 54°·7, being 1°·0 *higher* than
The mean *Degree of Humidity* for the month was 74·5, being 1·5 *greater* than
The mean *Elastic Force of Vapour* for the month was 0in·428, being 0in·015 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 4grs·8, being 0gr·2 *greater* than
The mean *Weight of a Cubic Foot of Air* for the month was 526 grains, being 2 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 7·1.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·26. The maximum daily amount of *Sunshine* was 12·8 hours on July 3.

The highest reading of the *Solar Radiation Thermometer* was 148°·0 on July 8; and the lowest reading of the *Terrestrial Radiation Thermometer* was 30°·7 on July 26.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 2·1; for the 6 hours ending 3 p.m., 1·3; and for the 6 hours ending 9 p.m., 1·0.

The *Proportions of Wind* referred to the cardinal points were N. 4, E. 3, S. 13, and W. 10. One day was calm.

The *Greatest Pressure of the Wind* in the month was 11lbs·5 on the square foot on July 14. The mean daily *Horizontal Movement of the Air* for the month was 230 miles; the greatest daily value was 379 miles on July 14; and the least daily value was 97 miles on July 3.

Rain fell on 16 days in the month, amounting to 1in·771, as measured by gauge No. 6 partly sunk below the ground; being 0in·650 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Lowest.	Daily Range.	Mean of 24 Hourly Values.	Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Greatest.	Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Aug. 1	Apogee	29·899	81·1	55·5	25·6	67·9	+ 5·3	62·9	59·0	8·9	20·2	0·0	73	138·8	48·2	..	..	0·000	0·0	wP : mP
2	..	29·785	85·3	56·0	29·3	68·9	+ 6·2	62·6	57·7	11·2	22·6	2·1	66	144·1	48·8	..	..	0·000	1·0	vP
3	Greatest Declination S.	29·899	75·3	52·7	22·6	62·4	− 0·3	56·5	51·4	11·0	20·3	3·0	68	129·0	44·7	..	..	0·000	4·0	mP
4	..	30·036	75·3	49·0	26·3	61·6	− 1·1	55·1	49·5	12·1	24·1	1·4	65	134·4	38·4	..	..	0·000	0·0	sP : vP, vN
5	..	30·062	79·3	46·1	33·2	62·0	− 0·7	55·6	50·1	11·9	24·5	1·5	65	146·9	38·7	..	..	0·000	0·0	vP
6	Full	29·952	79·1	49·0	30·1	64·5	+ 1·8	59·1	54·6	9·9	22·8	0·8	70	142·7	38·9	..	..	0·000	0·0	mP
7	..	29·876	86·8	52·7	34·1	69·4	+ 6·7	63·5	58·9	10·5	23·2	0·4	69	139·8	44·0	..	..	0·000	0·0	vP : mP
8	..	29·885	88·5	59·2	29·3	72·8	+10·1	65·4	59·9	12·9	26·4	1·9	63	147·1	50·2	..	..	0·000	1·0	mP
9	..	29·834	87·0	58·6	28·4	71·0	+ 8·3	64·5	59·6	11·4	26·3	1·0	67	144·9	50·0	..	..	0·032	0·0	mP : vP
10	In Equator	29·800	83·1	59·2	23·9	70·2	+ 7·5	64·1	59·4	10·8	22·9	0·8	69	146·1	52·9	..	..	0·000	0·7	vP, vN : mP
11	..	29·756	94·2	58·5	35·7	75·8	+13·1	65·6	58·3	17·5	31·7	3·0	54	150·8	50·6	..	..	0·000	6·5	vP
12	..	29·769	84·0	63·2	20·8	70·4	+ 7·8	64·7	60·3	10·1	23·5	2·3	70	141·0	55·6	..	..	0·000	0·8	vP, vN : vP
13	..	29·812	81·9	58·7	23·2	68·0	+ 5·5	62·5	58·2	9·8	21·2	1·7	71	151·4	49·0	..	..	0·000	0·0	sP : mP : sP
14	Last Qr.	29·824	75·2	55·8	19·4	64·9	+ 2·5	58·9	53·9	11·0	19·7	1·3	68	132·0	48·0	..	..	0·024	0·0	vP : vP, wN
15	..	29·950	79·3	52·7	26·6	64·1	+ 1·8	57·2	51·5	12·6	25·3	3·6	63	132·0	44·6	..	..	0·000	0·0	vP, wN
16	Greatest Dec N.: Perigee.	29·937	83·1	51·6	31·5	66·0	+ 3·9	58·4	52·2	13·8	29·9	2·2	62	146·5	45·2	..	..	0·000	0·0	vP
17	..	29·821	87·1	53·7	33·4	68·9	+ 7·0	60·4	53·8	15·1	30·1	2·3	58	152·1	45·3	..	..	0·000	0·2	sP : mP
18	..	29·747	84·2	54·5	29·7	67·5	+ 5·7	60·8	55·5	12·0	24·8	2·3	65	151·1	46·8	..	..	0·000	1·5	vP
19	..	29·727	75·5	51·9	23·6	62·4	+ 0·8	58·2	54·6	7·8	19·6	0·0	76	133·4	43·2	..	..	0·081	2·3	vP : vP, vN
20	New	29·859	77·0	49·6	27·4	62·6	+ 1·2	57·6	53·4	9·2	21·6	0·0	72	135·2	39·8	..	..	0·000	0·0	vP : vP, wN
21	..	30·013	75·1	53·5	21·6	64·2	+ 2·9	59·1	54·8	9·4	18·4	1·6	72	119·4	44·2	..	..	0·000	0·0	vP, vN : wN, vP
22	In Equator	29·983	81·3	51·3	30·0	66·0	+ 4·7	59·1	53·5	12·5	30·1	0·8	64	138·8	44·0	..	..	0·000	0·0	vP
23	..	29·936	83·5	54·5	29·0	67·6	+ 6·4	61·1	56·0	11·6	35·7	0·2	65	143·8	44·6	..	..	0·000	0·0	vP : mP
24	..	29·879	88·1	53·6	34·5	70·4	+ 9·3	60·8	53·4	17·0	35·9	0·4	55	147·8	43·9	..	..	0·000	0·0	vP : mP
25	..	29·836	69·3	50·8	18·5	60·6	− 0·4	56·9	53·7	6·9	11·7	3·0	78	89·7	42·0	..	..	0·020	0·0	vP : wN, wP
26	..	29·922	63·7	45·8	17·9	54·1	− 6·8	49·1	44·2	9·9	17·9	4·0	69	118·9	37·1	..	..	0·000	0·0	wP : vP, wN
27	..	29·740	59·1	50·6	8·5	54·5	− 6·3	51·7	49·0	5·5	11·2	0·0	81	80·4	46·5	..	..	0·088	0·0	vP
28	First Qr.: Apogee.	29·506	71·5	52·3	19·2	59·8	− 0·9	56·8	54·2	5·6	19·4	0·0	83	131·1	48·0	..	..	0·320	0·0	vP : vP, vN
29	..	29·577	68·1	51·3	16·8	57·1	− 3·5	51·9	47·1	10·0	19·4	3·4	69	126·2	44·9	..	..	0·000	0·0	vP
30	Greatest Declination S.	29·700	68·7	51·6	17·1	60·1	− 0·3	57·4	55·0	5·1	9·9	0·4	84	100·2	44·6	..	..	0·086	0·5	vP
31	..	29·612	70·1	59·1	11·0	63·8	+ 3·5	61·6	59·8	4·0	7·9	0·9	88	99·0	58·4	..	..	0·016	6·0	mP
Means	..	29·837	78·7	53·6	25·1	65·1	+ 3·3	59·3	54·6	10·5	22·5	1·5	69·1	133·4	45·8	..	..	Sum 0·667	0·8	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, and 15 are derived from eye-readings of self-registering thermometers.

No observations of the temperature of the water of the Thames were made throughout the month.

The mean reading of the *Barometer* for the month was 29in·837, being 0in·038 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 94°·2 on August 11; the lowest in the month was 45°·8 on August 26; and the range was 48°·4.
The mean of all the highest daily readings in the month was 78°·7, being 5°·8 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 53°·6, being 0°·4 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 25°·1, being 5°·4 *greater* than the average for the 43 years, 1841–1883.
The mean for the month was 65°·1, being 3°·3 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-Registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Aug. 1	8·9	15·3	Variable	SE	1·8	0·0	0·08	117	0 : 3, li.-cl, m	3, ci.-cu, cu, li.-cl : 0
2	9·6	15·3	SE: SW	W: WNW	3·3	0·0	0·22	252	0 : 0	1, li.-cl : 7, th.-cl
3	4·7	15·2	WSW: W	W: WSW	2·5	0·0	0·12	241	p.-cl : 8, ci.-cu, cu, cu.-s	8, ci, cu, cu.-s : v, li.-cl
4	8·0	15·2	WSW: NW	N: NW: NNE	0·3	0·0	0·00	148	v : 7, ci.-cu, cu, m	6, ci.-cu, cu, h : 0
5	9·0	15·1	Variable	SE: ESE	2·6	0·0	0·08	125	0 : 3, li.-cl	4, ci.-cu, cu : 0
6	10·5	15·1	ENE: E	ESE: ENE	2·0	0·0	0·18	191	0, slt.-f : 2, li.-cl, cu	0 : 0
7	10·4	15·0	NNE: NE	ENE: ESE	0·4	0·0	0·00	126	0, m : 0, m	1, li.-cl : 0 : 0, h, d
8	10·4	15·0	NE	ESE	0·6	0·0	0·02	159	v, m : p.-cl, m : 3, ci.-cu	1, ci, ci.-cu : 1, li.-cl
9	6·5	14·9	NE: E	E: ESE	0·5	0·0	0·03	123	1, li.-cl, m : 2, li.-cl	v, ci, ci.-cu, ci.-s, th.-cl, t : 10, r
10	6·7	14·9	Variable	ESE: SE	1·7	0·0	0·14	160	10 : 10, slt.-r	7, ci, ci.-cu : 1, m
11	12·0	14·8	E: S: SW	SW: S	1·5	0·0	0·03	152	0 : 0	0 : 0 : v, li.-cl, s, l
12	5·5	14·7	WSW	N: SW: WSW	3·3	0·0	0·15	217	v, l, t, slt.-r : 5, ci.-cu, cu, m	7, ci.-cu, ci.-s, cu.-s : v : 0
13	3·6	14·7	SW	SW	2·6	0·0	0·49	269	2, th.-cl, d : p.-cl	7, cu, cu.-s : 10, slt.-r
14	3·4	14·6	WSW: NW	W: WNW	1·5	0·0	0·20	248	10, r : 6, th.-cl, m	8, cu, cu.-s : 1, h
15	9·4	14·6	WSW	WSW: SW	0·8	0·0	0·04	166	p.-cl, d : 5, th.-cl, h, m	2, ci.-cu, cu, slt.-h : 1, ci.-cu
16	12·3	14·5	SW	SW: S	0·0	0·0	0·00	153	0 : 2, li.-cl, ci.-cu	1, ci.-cu : 1, li.-cl
17	8·9	14·4	Calm: NE: SE	SSW: S	0·4	0·0	0·00	145	v : 3, ci.-cu, cu	7, cu : v, s, m
18	5·3	14·4	SW	WSW	1·0	0·0	0·06	190	v : p.-cl, ci.-cu, ci.-s	7, ci.-cu, cu : 0
19	2·4	14·3	WSW: SW	SW: WSW	3·0	0·0	0·18	241	0 : s, th.-cl : 8, cu, cu.-s	10, cu, cu.-s, th.-cl : 8, oc.-hy.-shs : 3, li.-cl, slt.-h
20	9·2	14·3	W: N	N: E: SE	0·5	0·0	0·01	145	0, slt.-m : 1, th.-cl	3, cu : 5, th.-cl
21	2·8	14·2	SW: W	NNE: S: SW	0·0	0·0	0·00	112	10, m : p.-cl, m : 4, li.-cl, m	9, ci.-cu, cu, cu.-s, m : p.-cl : 0, slt.-h
22	10·7	14·1	NE: E	E: ESE	1·0	0·0	0·03	157	0, h : 0	1, li.-cl : 0 : 0
23	8·6	14·1	ENE: NE	E: ESE	2·2	0·0	0·20	180	0, m, d : 0, f, h	0 : 0, d, m
24	11·1	14·0	Calm: NE: SE	SSW: S: SSE	0·9	0·0	0·01	147	0, m, d : 0, slt.-f : 0	0 : 0, l
25	0·1	13·9	W: N	N: NNE	6·6	0·0	0·30	239	p.-cl : 10, r : 10	10, slt.-r : th.-cl : 0, d
26	3·6	13·9	NNW: N	NNW: NW	2·2	0·0	0·18	245	0 : 0 : 3, li.-cl	10, slt.-r : 10
27	0·0	13·8	NW: W: WSW	WSW: SW	1·2	0·0	0·07	195	10 : 10, m	10, slt.-r : 10, r
28	2·0	13·8	SE: SW: W	WSW	2·9	0·0	0·17	277	10, r : 10, hy.-r	9, ci.-cu, cu.-s, hy.-sh : v, th.-cl
29	7·3	13·7	SW: WSW	WNW: WSW: SW	3·9	0·0	0·41	331	p.-cl : 7, s, cu.-s, cu	6, cu, cu.-s : v, ci.-cu, cu.-s
30	0·0	13·7	WSW: SW	SW	4·5	0·0	0·25	294	v : 10, slt.-r	10, slt.-r : 10, fq.-shs
31	0·5	13·6	SSW: SW	SW: SSW	5·7	0·0	0·67	370	10 : 10, slt.-r	10, slt.-r : 10, shs.-r
Means	6·6	14·5	...	...	..	..	0·14	197		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 59°·3, being 1°·4 *higher* than
The mean *Temperature of the Dew Point* for the month was 54°·6, being 0°·2 *higher* than
The mean *Degree of Humidity* for the month was 69·1, being 7·4 *greater* than
The mean *Elastic Force of Vapour* for the month was 0in·427, being 0in·003 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 4grs·7, being *the same as*
The mean *Weight of a Cubic Foot of Air* for the month was 525 grains, being 3 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 4·6.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·46. The maximum daily amount of *Sunshine* was 12·3 hours on August 16.

The highest reading of the *Solar Radiation Thermometer* was 152°·1 on August 17; and the lowest reading of the *Terrestrial Radiation Thermometer* was 37°·1 on August 26.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 0·5; for the 6 hours ending 3 p.m., 0·2; and for the 6 hours ending 9 p.m., 0·1.

The *Proportions of Wind* referred to the cardinal points were N. 5, E. 7, S. 8, and W. 10. One day was calm.

The *Greatest Pressure of the Wind* in the month was 6lbs·6 on the square foot on August 25. The mean daily *Horizontal Movement of the Air* for the month was 197 miles; the greatest daily value was 370 miles on August 31; and the least daily value was 112 miles on August 21.

Rain fell on 8 days in the month, amounting to 0in·667, as measured by gauge No. 6 partly sunk below the ground; being 1in·751 *less than the average fall for the* 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Greatest.	Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Sept. 1	..	29·499	72·0	55·4	16·6	60·1	0·0	58·4	56·9	3·2	8·1	0·0	90	112·8	52·5	..	..	0·452	7·3	wP : sP
2	..	29·571	70·0	51·5	18·5	59·0	− 1·0	55·4	52·2	6·8	16·0	0·8	78	130·9	46·0	..	..	0·072	2·2	vP : vN, sP
3	..	29·504	70·2	49·8	20·4	58·4	− 1·4	54·7	51·4	7·0	16·0	0·8	78	133·7	44·9	..	..	0·008	0·0	vP, wN
4	..	29·281	60·0	49·0	11·0	55·0	− 4·7	52·9	50·9	4·1	10·6	0·8	86	73·0	42·0	..	..	1·089	0·0	vN, vP
5	Full	29·439	66·4	46·6	19·8	54·8	− 4·7	50·6	46·6	8·2	17·5	1·0	74	122·2	39·1	..	..	0·000	0·0	vP
6	In Equator	29·444	62·1	43·9	18·2	55·2	− 4·1	53·8	52·4	2·8	8·2	0·8	91	86·0	35·8	..	..	0·214	1·8	sP : wP, wN
7	..	29·500	63·7	51·4	12·3	57·5	− 1·5	53·0	48·9	8·6	17·9	1·8	72	100·2	44·5	..	..	0·000	5·2	mP : sP
8	..	29·938	63·3	50·8	12·5	57·2	− 1·6	55·1	53·2	4·0	11·2	0·0	86	101·0	44·3	..	..	0·045	0·0	vP
9	..	30·008	69·6	58·3	11·3	63·2	+ 4·7	61·2	59·5	3·7	8·5	0·8	88	95·0	54·5	..	..	0·000	0·0	wP : wP, wN
10	Perigee	30·058	71·4	50·5	20·9	61·6	+ 3·3	58·6	56·1	5·5	17·3	0·0	83	128·1	41·0	..	..	0·000	0·0	wP : mP
11	..	30·126	75·0	49·7	25·3	61·0	+ 2·9	57·4	54·3	6·7	17·7	0·0	79	132·4	40·4	..	..	0·000	0·0	wP : mP
12	Last Qr.: Greatest Dec. N	30·111	73·6	53·8	19·8	61·7	+ 3·7	57·8	54·5	7·2	21·6	0·2	78	125·8	44·8	..	..	0·000	0·0	vP
13	..	30·024	75·1	53·5	21·6	63·3	+ 5·5	59·4	56·1	7·2	19·2	0·2	78	134·3	43·8	..	..	0·000	1·0	wP : mP
14	..	29·902	71·0	54·5	16·5	61·4	+ 3·8	59·1	57·2	4·2	13·9	0·0	86	101·8	45·0	..	..	0·000	0·0	wP : mP : wP
15	..	29·844	78·1	54·9	23·2	64·3	+ 6·9	61·5	59·2	5·1	15·1	0·0	83	130·6	45·5	..	..	0·000	1·5	wP : mP
16	..	29·940	78·6	61·4	17·2	67·5	+10·2	62·7	58·9	8·6	20·9	1·4	74	134·7	55·5	..	..	0·021	4·5	wP : mP
17	..	30·071	83·5	58·0	25·5	69·5	+12·4	65·1	61·7	7·8	21·8	0·2	76	133·4	50·3	..	..	0·000	0·0	mP
18	..	30·176	80·2	57·6	22·6	67·5	+10·6	62·7	58·9	8·6	21·9	0·2	74	132·7	48·9	..	..	0·000	0·0	v P
19	New: In Equator	30·092	68·3	53·8	14·5	60·2	+ 3·4	58·0	56·0	4·2	10·8	0·0	87	114·6	45·2	..	..	0·000	0·0	wP : vP
20	..	29·909	70·7	51·6	19·1	60·0	+ 3·4	56·9	54·2	5·8	14·4	0·0	81	128·7	42·1	..	..	0·000	0·0	vP : sP
21	..	29·583	72·7	50·2	22·5	60·5	+ 4·1	58·1	56·0	4·5	14·0	0·0	86	127·1	39·8	..	..	0·000	0·5	vP : mP
22	..	29·630	65·1	50·2	14·9	57·3	+ 1·1	53·4	49·8	7·5	17·3	1·7	76	119·0	42·1	..	..	0·030	1·5	vP : vP, vN
23	..	30·001	64·1	46·9	17·2	53·9	− 2·2	49·9	46·0	7·9	17·7	2·6	75	116·9	38·5	..	..	0·000	0·0	sP : vP
24	..	30·007	63·2	47·7	15·5	55·4	− 0·5	51·0	46·8	8·6	15·2	0·4	73	104·9	38·0	..	..	0·026	3·0	sP : vP
25	Apogee	29·968	67·0	48·0	19·0	55·0	− 0·8	51·8	48·7	6·3	16·0	0·6	80	129·2	39·8	..	..	0·000	0·0	vP
26	Greatest Declination S.	29·802	66·9	48·8	18·1	57·3	+ 1·6	54·6	52·2	5·1	11·7	1·3	83	116·2	40·4	..	..	0·006	0·0	mP : vP
27	First Qr.	29·788	61·9	46·4	15·5	55·5	0·0	53·5	51·6	3·9	9·1	0·4	87	88·0	37·8	..	..	0·024	1·0	vP
28	..	29·890	67·1	51·8	15·3	59·3	+ 3·9	57·0	55·0	4·3	9·0	1·2	86	113·6	44·4	..	..	0·000	7·8	vP
29	..	29·934	63·1	50·0	13·1	57·4	+ 2·2	56·1	54·9	2·5	5·7	0·8	91	93·1	40·0	..	..	0·099	5·2	wP : vP, wN
30	..	29·977	63·3	42·4	20·9	53·3	− 1·6	50·9	48·5	4·8	14·2	0·2	84	110·3	32·4	..	..	0·004	4·0	vP
Means	..	29·834	69·2	51·3	18·0	59·4	+ 2·0	56·4	53·6	5·8	14·6	0·6	81·4	115·7	43·3	..	..	Sum 2·090	1·6	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, and 15 are derived from eye-readings of self-registering thermometers.

No observations of the temperature of the water of the Thames were made throughout the month.

The mean reading of the *Barometer* for the month was 29^{in}·834, being 0^{in}·047 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 83°·5 on September 17; the lowest in the month was 42°·4 on September 30; and the range was 41°·1.

The mean of all the highest daily readings in the month was 69°·2, being 1°·8 *higher* than the average for the 43 years, 1841–1883.

The mean of all the lowest daily readings in the month was 51°·3, being 2°·2 *higher* than the average for the 43 years, 1841–1883.

The mean of the daily ranges was 18°·0, being 0°·3 *less* than the average for the 43 years, 1841–1883.

The mean for the month was 59°·4, being 2°·0 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Sept. 1	2·7	13·5	SSW : S	SW : SSW	4·3	0·0	0·41	298	10, hy.-r : 10, r	9, r : v, th.-cl, lu.-ha
2	4·7	13·4	S : SW	SW : SSW	2·3	0·0	0·20	249	p.-cl, sh.-r : 7, cu, cu.-s	7, cu, cu.-s, slt.-r, t : 8, th.-cl, lu.-ha
3	3·3	13·4	S	S : E : NE	0·0	0·0	0·00	138	p.-cl : 7,li.-cl,cu,cu.-s,slt.-r	v, ci.-cu, cu, so.-ha,slt.-r: 10, slt.-r
4	0·0	13·3	NNE: N: NNW	NW : WNW	7·8	0·0	1·39	431	10, r : 10, c.-r	10, r : v, li.-cl
5	7·6	13·2	WSW : W	W : WSW	2·9	0·0	0·30	341	li.-cl : 2, cu, cu.-s, m	4, ci.-cu, cu, cu.-s : o, d
6	0·0	13·2	SW : SE	SSW : SW	4·0	0·0	0·52	259	v : p.-cl : 10	10, slt.-r : 10, hy.-shs
7	2·2	13·1	SW : WSW	WNW : WSW	16·5	0·0	3·02	586	p.-cl : 10, st.-w	v, st.-w : v, li.-cl
8	0·0	13·0	WSW	SW : WSW	0·8	0·0	0·00	279	p.-cl : 8, ci.-s, cu.-s, m, slt.-r	10, slt.-r : 10
9	0·0	13·0	WSW : W	W : WNW	1·0	0·0	0·00	244	10 : 10, m, f	10 : v, th.-cl, m
10	8·0	12·9	E	ENE : E	0·2	0·0	0·00	182	10, m : 10 : 7, cu, cu.-s	2, ci.-cu, cu : o, hy.-d
11	7·0	12·9	NE	ENE : NE	1·6	0·0	0·00	205	f : 10, f : 10	3, cu : o : o, d
12	7·8	12·8	NNE : NE	ENE	3·0	0·0	0·27	280	o, hy.-d, m : p.-cl	2, ci, cu, ci.-cu : o, d
13	7·9	12·7	NE : ENE	ENE	4·6	0·0	0·19	285	o, d, m : 4, li.-cl	4, ci, ci.-cu, li.-cl : o, m, hy.-d
14	1·4	12·7	NE	NE : ENE	1·0	0·0	0·02	194	hy.-d, f : 7,ci.-cu,cu,cu.-s,m	10 : 1 : o,slt.-f,hy.-d
15	3·5	12·6	ENE	E	1·0	0·0	0·01	206	slt.-f : v,ci.-cu,th.-cl,li.-sh	7, ci.-cu, cu, cu.-s : 10, slt.-r
16	7·2	12·6	SE : SSW	SSE : E	0·0	0·0	0·00	163	p.-cl, sh.-r : v, ci.-cu, cu	3, li.-cl, so.-ha : 10
17	8·4	12·5	E : NE	Variable	0·0	0·0	0·00	113	v, m : 1, ci, m	1, cu : o, h, d
18	8·9	12·4	NE	ENE : ESE : E	0·0	0·0	0·00	136	o, slt.-f, d : o	o : 1, th.-cl ; o, d
19	4·2	12·3	NE : ENE	ENE : E	1·0	0·0	0·03	220	o, m : p.-cl : 10, f	5, li.-cl : vv, li.-cl : o, d
20	8·4	12·3	E	E	0·3	0·0	0·00	162	v : 5, cu	o : o, d, slt.-m
21	4·5	12·2	E : SE : SSW	SW : SSW	4·0	0·0	0·23	244	tk.-f : 10, m	8, cu, cu.-s : 3, li.-cl, s, l
22	5·4	12·2	SW : NW	W : WSW	4·5	0·0	0·05	318	10, slt.-r : 9, cu, cu.-s	6, cu, cu.-s, sh.-r : v
23	4·8	12·1	WSW	W : WSW	3·0	0·0	0·04	276	p.-cl : o, m, h	8, ci.-cu, cu, cu.-s : 9, li.-cl
24	1·1	12·0	SW : SSW	SW	5·9	0·0	0·41	330	10 : 9, ci.-cu, li.-cl	8, ci, ci.-cu, cu.-s : v, th.-r
25	6·3	11·9	WSW	WSW: SW: SSW	0·8	0·0	0·00	253	o : o, slt.-h, m	4,ci.-cu,cu,cu.-s,th.-cl: o, d
26	1·3	11·9	SSW	SW : WSW	2·8	0·0	0·26	302	o : 8, ci.-cu, cu.-s	8,ci.-cu,cu,cu.-s: v, slt.-r : 10, slt.-r
27	0·0	11·8	SW : SSW	SW	6·5	0·0	0·99	399	v : 10	10, oc.-r : v, li.-cl
28	0·7	11·7	SW	SW	3·0	0·0	0·05	330	v : 7, ci.-cu, ci.-s	10, slt.-r : v, li.-cl
29	0·0	11·7	SSW : SW	N : NNE	2·0	0·0	0·02	183	10,s, sh.-r : 10, oc.-r	10, gt.-glm, oc.-th.-r : v, h, m, d
30	1·8	11·6	Variable	SE : S : SW	0·0	0·0	0·00	114	o, f : 3, li.-cl, h, m	7,ci,ci.-cu,cu: 10 : v
Means	4·0	12·6	...	...	..	..	0·28	257		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 56°·4, being 2°·1 *higher* than
The mean *Temperature of the Dew Point* for the month was 53°·6, being 2°·2 *higher* than
The mean *Degree of Humidity* for the month was 81·4, being 1·3 *greater* than
The mean *Elastic Force of Vapour* for the month was 0in·412, being 0in·033 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 4grs·6, being 0gr·4 *greater* than
The mean *Weight of a Cubic Foot of Air* for the month was 531 grains, being 1 grain *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 5·9.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·32. The maximum daily amount of *Sunshine* was 8·9 hours on September 18.

The highest reading of the *Solar Radiation Thermometer* was 134°·7 on September 16; and the lowest reading of the *Terrestrial Radiation Thermometer* was 32°·4 on September 30.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 1·2; for the 6 hours ending 3 p.m., 0·4; and for the 6 hours ending 9 p.m., 0·0.

The *Proportions of Wind* referred to the cardinal points were N. 3, E. 8, S. 9, and W. 9. One day was calm.

The *Greatest Pressure of the Wind* in the month was 16lbs·5 on the square foot on September 7. The mean daily *Horizontal Movement of the Air* for the month was 257 miles; the greatest daily value was 586 miles on September 7; and the least daily value was 113 miles on September 17.

Rain fell on 12 days in the month, amounting to 2in·090, as measured by gauge No. 6 partly sunk below the ground; being 0in·240 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	BAROMETER. Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	TEMPERATURE. Of the Air. Highest.	Of the Air. Lowest.	Of the Air. Daily Range.	Of the Air. Mean of 24 Hourly Values.	Of the Air. Excess above Average of 20 Years.	Of Evaporation. Mean of 24 Hourly Values.	Of the Dew Point. Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature. Mean.	Greatest.	Least.	Degree of Humidity (Saturation = 100).	TEMPERATURE. Of Radiation. Highest in Sun's Rays.	Of Radiation. Lowest on the Grass.	Of the Water of the Thames at Deptford. Highest.	Of the Water of the Thames at Deptford. Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Nov. 1	..	29.944	54.1	47.0	7.1	50.4	+ 3.4	49.3	48.1	2.3	4.6	1.0	92	61.7	40.0	..	..	0.000	5.7	—: vP
2	..	29.751	61.2	43.8	17.4	53.0	+ 6.3	51.1	49.2	3.8	9.9	1.0	87	88.5	42.0	..	..	0.237	3.8	wP: vP, vN
3	Full	29.894	49.8	34.0	15.8	43.1	− 3.3	40.8	38.0	5.1	13.6	0.7	82	87.9	24.8	..	..	0.000	0.0	wN, vP: sP
4	Perigee	29.755	56.2	35.5	20.7	48.4	+ 2.4	46.8	45.1	3.3	10.0	0.0	89	89.0	27.0	..	..	0.007	2.0	vP
5	..	29.723	60.3	50.2	10.1	55.5	+ 9.9	52.0	48.6	6.9	14.2	2.7	78	100.9	44.9	..	..	0.000	15.0	mP: sP: mP
6	Greatest Declination N.	29.827	56.8	48.8	8.0	51.3	+ 6.1	50.6	49.9	1.4	4.7	0.0	95	63.0	43.5	..	..	0.330	1.5	wP
7	..	29.705	61.0	42.0	19.0	52.0	+ 7.3	50.3	48.6	3.4	8.0	1.0	88	101.1	35.0	..	..	0.085	4.5	wP: vP
8	..	30.131	53.9	37.1	16.8	45.4	+ 1.1	43.0	40.3	5.1	11.4	0.7	83	87.4	30.4	..	..	0.000	0.0	vP: sP
9	Last Qr.	30.120	56.1	44.1	12.0	50.3	+ 6.5	47.6	44.8	5.5	10.0	0.6	82	80.0	38.6	..	..	0.002	0.0	mP: sP
10	..	30.326	55.9	46.7	9.2	50.2	+ 6.8	48.5	46.7	3.5	11.6	0.0	88	96.1	37.5	..	..	0.014	0.0	wP: vP
11	..	30.234	50.3	39.8	10.5	45.6	+ 2.6	44.1	42.4	3.2	7.6	1.0	89	79.4	33.9	..	..	0.000	0.0	..
12	In Equator	30.123	49.2	44.2	5.0	45.9	+ 3.3	43.5	40.8	5.1	8.0	2.4	83	57.9	41.7	..	..	0.000	0.0	..
13	..	30.177	48.0	43.4	4.6	45.3	+ 3.0	43.3	41.0	4.3	5.9	2.4	85	54.9	42.3	..	..	0.000	0.0	..
14	..	30.276	46.3	35.0	11.3	40.9	− 1.1	39.5	37.8	3.1	9.0	0.2	89	63.0	27.5	..	..	0.000	0.0	..
15	..	30.248	43.3	32.3	11.0	37.0	− 4.8	35.5	33.4	3.6	7.9	0.6	87	68.2	25.0	..	..	0.000	0.0	..
16	..	30.144	39.9	31.3	8.6	37.1	− 4.5	35.8	34.0	3.1	6.7	0.6	89	45.0	23.4	..	..	0.000	0.0	..
17	New	30.088	44.0	32.4	11.6	38.8	− 2.7	37.1	34.8	4.0	9.2	1.4	86	71.9	25.8	..	..	0.000	0.0	..
18	..	30.138	44.3	34.6	9.7	39.8	− 1.7	38.5	36.8	3.0	6.2	0.7	90	58.2	27.2	..	..	0.021	0.0	—: vN, mP
19	..	30.271	44.7	35.7	9.0	39.9	− 1.5	38.4	36.5	3.4	8.1	0.7	88	73.1	30.0	..	..	0.008	0.0	vP
20	Apogee: Greatest Dec. S.	29.934	44.3	35.9	8.4	40.9	− 0.4	38.7	35.9	5.0	7.4	1.6	83	53.9	30.7	..	..	0.025	0.0	vP: vP, vN
21	..	29.668	42.2	35.0	7.2	38.4	− 2.8	36.4	33.7	4.7	8.3	1.0	84	44.7	28.2	..	..	0.030	0.0	vP, wN
22	..	29.935	42.0	30.7	11.3	37.1	− 4.0	35.3	32.8	4.3	6.7	0.8	85	58.8	24.3	..	..	0.000	0.8	mP: vP
23	..	29.949	41.2	28.7	12.5	36.9	− 4.1	35.4	33.3	3.6	6.2	0.0	87	59.3	23.0	..	..	0.000	2.2	mP: vP
24	..	29.955	37.4	27.2	10.2	33.8	− 7.2	33.0	31.6	2.2	3.8	0.0	91	41.0	22.5	..	..	0.008	0.0	vP
25	First Qr.	30.065	35.1	24.5	10.6	31.6	− 9.3	31.4	30.9	0.7	3.1	0.0	97	38.1	17.5	..	..	0.000	0.0	—: mP
26	..	30.084	42.3	31.3	11.0	37.1	− 3.7	36.3	35.2	1.9	5.5	0.0	93	46.3	27.3	..	..	0.003	0.0	mP: vP
27	In Equator	29.908	47.2	37.1	10.1	42.9	+ 2.1	40.7	38.1	4.8	8.0	1.4	84	60.7	32.0	..	..	0.009	0.0	mP: vP, wN
28	..	29.604	45.3	35.0	10.3	41.6	+ 0.7	39.3	36.4	5.2	8.4	2.0	83	53.3	29.0	..	..	0.000	0.0	vP
29	..	29.626	37.9	30.8	7.1	34.5	− 6.5	33.2	31.0	3.5	9.8	0.6	86	53.2	25.2	..	..	0.000	0.0	vP: sP
30	..	29.819	38.0	28.7	9.3	32.8	− 8.4	32.5	32.1	0.7	6.2	0.0	98	54.1	28.0	..	..	0.214	2.0	mP: vP, vN
Means	..	29.981	47.6	36.8	10.8	42.6	− 0.1	40.9	38.9	3.7	8.0	0.8	87.4	66.4	30.9	..	..	Sum 0.993	1.2	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers.

The values given in Columns 3, 4, 5, 14, and 15 are derived from eye-readings of self-registering thermometers.

No observations of the temperature of the water of the Thames were made throughout the month.

The mean reading of the *Barometer* for the month was 29in·981, being 0in·210 *higher* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 61°·2 on November 2; the lowest in the month was 24°·5 on November 25; and the range was 36°·7.
The mean of all the highest daily readings in the month was 47°·6, being 1°·2 *lower* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 36°·8, being 0°·6 *lower* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 10°·8, being 0°·6 *less* than the average for the 43 years, 1841–1883.
The mean for the month was 42°·6, being 0°·1 *lower* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Nov. 1	0·0	9·6	S	SSE: S	1·0	0·0	0·01	215	v, li.-cl : 10	10 : 10
2	0·3	9·5	SSE: S	SSW: N	3·5	0·0	0·08	250	10 : 9, ci.-cu, sc	10 : 10, r
3	5·3	9·5	N	NE: ENE	0·7	0·0	0·00	164	10 : v, li.-cl, m	0, slt.-h : v, ci.-s, slt.-f
4	1·3	9·4	ENE: SE: S	SW: SSW	5·5	0·0	0·28	286	10 : 10, m.-r	7, ci.-cu, cu : 10, m.-r : 10, slt.-r
5	6·2	9·4	SW	SW	8·8	0·0	1·08	560	v : 0	3, ci.-cu, cu : 10, slt.-r, w
6	0·0	9·3	Variable	S: SSE	2·5	0·0	0·05	165	10, r : 10, c.-r, m	9 : 1, li.-cl, lu.-ha
7	3·2	9·2	SSE: S	SSW: WSW	5·0	0·0	0·32	364	0 : 0	9,ci.-cu,ci,sc,slt.-r : 1, m, d
8	5·1	9·2	SW	SW: SSW	0·5	0·0	0·00	266	0, d : 0, m	2, ci, ci.-cu, th.-cl : 1, li.-cl
9	0·2	9·1	SSW	SW	1·0	0·0	0·00	280	10 : 10	9, ci.-cu, ci.-s : v, li.-cl, slt.-r
10	2·5	9·1	NW: NE: ENE	E	0·0	0·0	0·00	169	10 : 10	6, li.-cl, so.-ha : 10
11	3·6	9·0	E: ESE	SE	0·0	0·0	0·00	137	p.-cl : 0	5,ci-cu,cu,cu.-s: v : 10
12	0·0	9·0	ESE: SSE	SSW: S	0·0	0·0	0·00	97	10 : 10	10 : 10
13	0·0	8·9	SE: NE: N	NNE: NE	0·2	0·0	0·00	186	10 : 10, m	10 : 10
14	2·0	8·9	NE: E	E	0·9	0·0	0·01	206	p.-cl : 1, li.-cl :5,ci.-cu,slt.-m	7, ci, ci.-cu, th.-cl : 1, li.-cl, ho.-fr
15	1·3	8·8	ESE: E	ESE	1·2	0·0	0·03	208	0, ho.-fr : 10	7, ci, ci.-cu, li.-cl : 1, li.-cl
16	0·0	8·8	E	E	0·0	0·0	0·00	107	p.-cl : 10	10 : 10
17	0·2	8·7	NE: N	N: NNW	0·8	0·0	0·00	177	10 : 10	8,ci,ci.-cu,cu,cu.-s : v, li.-cl
18	0·8	8·7	NNW	N	4·6	0·0	0·48	321	0 : 3, ci, ci.-cu	10, slt.-r : v, slt.-r
19	2·1	8·6	NNW: N	NNE: N: NNW	3·2	0·0	0·12	321	v : 7, cu.-s	3, ci.-cu, cu, cu.-s : v, slt.-r
20	0·0	8·6	NNW: WNW: W	WNW: NNW	12·2	0·0	0·17	349	10 : p.-cl, h, m	10, slt.-r : 10, slt.-r, sq : 0
21	0·0	8·5	NW: NNW: NNE	NNE	11·0	0·0	2·57	548	v : 10, r, w	10,st.-w,slt.-r : 0, w : 0
22	0·4	8·5	NNE: N: NNW	NNW: NW: W	2·4	0·0	0·06	274	0, ho.-fr : 10, m	9,ci.-cu,cu.-s: 10, m : v
23	3·2	8·4	NNW	NNW: SW	0·6	0·0	0·00	229	v : 0, slt.-m, h	1, ci, ci.-cu, h : 0, f, h
24	0·0	8·4	SW	N	0·0	0·0	0·00	132	p.-cl,slt.-f,ho.-fr :10, f, ho.-fr	10, sl, m.-r : 2, li.-cl, ho.-fr
25	0·0	8·3	N: SW	WSW	0·0	0·0	0·00	152	0, tk.-f, ho.-fr : 0, tk.-f, h	v, slt.-f, h : 10,slt.-f : v, slt.-f
26	0·0	8·3	WSW	WNW: WSW	2·0	0·0	0·01	280	v : 10, f	4, li.-cl, h, slt.-f : 10, m
27	0·0	8·2	WSW	WSW	8·0	0·0	1·32	520	0 : p.-cl	10, slt.-r : 10, sc, r, w
28	0·0	8·2	W: WSW	WSW: WNW	3·0	0·0	0·24	367	10 : p.-cl, ci.-cu, ci.-s	v, ci.-s, li.-cl : v, li.-cl, h
29	0·9	8·2	WSW: NW: NNW	NNW: N	1·6	0·0	0·08	266	p.-cl, m : 10, glm, slt.-f	1, li.-cl, h : 9, li.-cl, cu.-s
30	0·0	8·1	N: NW: SW	S: SSE	0·7	0·0	0·02	192	10 :10,f,glm,fr : v, so.-ha	10, r, sn : 10,oc.-sn,c.-r:10,slt.-r,slt.-sn
Means	1·3	8·8	...	...	..	..	0·23	260		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 40°·9, being 0°·3 *lower* than the average for the 20 years, 1849–1868.
The mean *Temperature of the Dew Point* for the month was 38°·9, being 0°·4 *lower* than the average for the 20 years, 1849–1868.
The mean *Degree of Humidity* for the month was 87·4, being 0·1 *greater* than the average for the 20 years, 1849–1868.
The mean *Elastic Force of Vapour* for the month was 0in·237, being 0in·003 *less* than the average for the 20 years, 1849–1868.
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 2grs·7, being 0gr·1 *less* than the average for the 20 years, 1849–1868.
The mean *Weight of a Cubic Foot of Air* for the month was 553 grains, being 4 grains *greater* than the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 6·7.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·15. The maximum daily amount of *Sunshine* was 6·2 hours on November 5.

The highest reading of the *Solar Radiation Thermometer* was 101°·1 on November 7; and the lowest reading of the *Terrestrial Radiation Thermometer* was 17°·5 on November 25.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 1·0; for the 6 hours ending 3 p.m., 0·0; and for the 6 hours ending 9 p.m., 0·2.

The *Proportions of Wind* referred to the cardinal points were N. 9, E. 6, S. 8, and W. 6. One day was calm.

The *Greatest Pressure of the Wind* in the month was 12lbs·2 on the square foot on November 20. The mean daily *Horizontal Movement of the Air* for the month was 260 miles; the greatest daily value was 560 miles on November 5; and the least daily value was 97 miles on November 12.

Rain fell on 12 days in the month, amounting to 0in·993, as measured by gauge No. 6 partly sunk below the ground; being 1in·250 *less* than the average fall for the 43 years, 1841–1883.

MONTH and DAY, 1884.	Phases of the Moon.	Barometer: Mean of 24 Hourly Values (corrected and reduced to 32° Fahrenheit).	Temperature of the Air: Highest.	Temperature of the Air: Lowest.	Temperature of the Air: Daily Range.	Temperature of the Air: Mean of 24 Hourly Values	Temperature of the Air: Excess above Average of 20 Years.	Temperature of Evaporation: Mean of 24 Hourly Values.	Temperature of the Dew Point: Deduced Mean Daily Value.	Difference between the Air Temperature and Dew Point Temperature: Mean.	Difference: Greatest.	Difference: Least.	Degree of Humidity (Saturation = 100).	Temperature of Radiation: Highest in Sun's Rays.	Temperature of Radiation: Lowest on the Grass.	Temperature of the Water of the Thames at Deptford: Highest.	Temperature of the Water of the Thames at Deptford: Lowest.	Rain collected in Gauge No. 6, whose receiving surface is 5 inches above the Ground.	Daily Amount of Ozone.	Electricity.
		in.	°	°	°	°	°	°	°	°	°	°		°	°	°	°	in.		
Dec. 1	..	29·704	36·4	32·7	3·7	34·8	− 6·7	34·7	34·5	0·3	1·1	0·0	99	37·3	32·0	..	..	0·245	6·0	wN : vP
2	Full	29·582	49·3	32·3	17·0	40·2	− 1·6	40·0	39·8	0·4	3·1	0·0	98	49·3	32·3	..	..	0·091	1·2	vP
3	Perigee: Greatest Dec. N.	29·295	55·1	41·2	13·9	48·8	+ 6·7	47·3	45·6	3·2	8·4	0·6	89	61·0	36·9	40·5	40·4	0·244	11·5	vP
4	..	29·207	51·2	39·5	11·7	44·8	+ 2·4	42·2	39·2	5·6	12·3	0·0	81	62·2	33·0	40·9	40·9	0·048	2·2	vP
5	..	29·600	47·0	37·4	9·6	42·7	+ 0·1	40·4	37·6	5·1	9·2	1·8	83	64·6	33·5	40·9	40·4	0·080	1·8	mP : sP
6	..	29·539	54·2	47·0	7·2	51·5	+ 8·8	50·4	49·3	2·2	3·8	1·0	92	59·0	42·8	41·9	41·3	0·314	15·8	wP, wN : wP
7	..	29·668	54·1	46·3	7·8	50·3	+ 7·5	48·3	46·2	4·1	7·4	1·6	86	67·0	..	42·8	42·8	0·022	6·2	mP
8	..	29·640	54·7	42·2	12·5	48·7	+ 5·9	46·8	44·8	3·9	7·8	1·0	87	54·7	39·0	43·8	43·1	0·252	5·2	wP : vP
9	Last Qr.	29·788	43·0	34·6	8·4	39·7	− 3·1	38·6	37·2	2·5	5·5	0·5	91	43·0	30·9	44·8	44·2	0·149	0·0	wP, wN : vN, vP
10	In Equator	29·814	50·8	34·9	15·9	43·3	+ 0·6	41·9	40·2	3·1	4·6	1·0	89	51·1	30·2	45·2	43·9	0·126	1·0	wP : vP, wN
11	..	29·436	50·6	44·9	5·7	47·8	+ 5·3	45·7	43·4	4·4	6·3	0·2	86	58·6	40·0	45·4	45·4	0·129	3·0	mP : vP, wN
12	..	29·881	48·1	40·9	7·2	46·0	+ 3·8	43·8	41·3	4·7	7·6	2·3	85	57·0	32·6	45·3	45·3	0·004	0·0	mP
13	..	29·962	54·4	47·7	6·7	52·0	+10·2	49·7	47·4	4·6	6·2	2·1	84	67·6	46·7	45·3	43·9	0·000	1·5	wP : mP
14	..	29·795	52·5	41·1	11·4	49·5	+ 8·0	47·6	45·6	3·9	6·8	1·3	87	59·5	38·0	45·4	45·4	0·188	5·2	wP : vP, vN
15	..	29·642	49·4	35·3	14·1	43·3	+ 2·2	41·2	38·7	4·6	9·0	1·1	83	50·9	31·0	45·8	45·6	0·027	2·2	vP : sP
16	..	29·796	43·1	32·1	11·0	38·4	− 2·4	36·7	34·4	4·0	9·2	2·0	86	58·0	26·6	45·3	44·9	0·004	0·0	sP
17	Apogee: New: Greatest Dec. S.	29·521	42·8	32·6	10·2	38·3	− 2·2	36·3	33·6	4·7	8·3	1·0	84	53·2	27·8	45·3	44·9	0·096	0·0	vP, vN : vP
18	..	29·653	49·2	30·3	18·9	39·7	− 0·5	38·1	36·0	3·7	7·1	1·3	87	49·4	27·3	43·8	43·7	0·221	0·2	vP : vP, vN
19	..	29·335	45·6	37·9	7·7	41·9	+ 1·9	39·2	35·6	6·3	11·2	3·0	80	58·8	34·3	44·0	43·3	0·000	0·8	vP
20	..	28·967	46·2	36·5	9·7	40·9	+ 1·1	39·2	37·1	3·8	6·7	0·9	86	46·2	34·7	41·5	41·3	0·268	0·0	vP, vN : vN, mP
21	..	29·774	41·0	36·1	4·9	38·5	+ 1·1	36·3	33·3	5·2	6·9	2·2	82	58·1	32·1	41·9	41·7	0·000	0·0	vP
22	..	30·011	42·7	35·1	7·6	38·4	− 1·0	36·5	33·9	4·5	7·1	1·2	85	65·0	31·7	38·9	37·7	0·000	0·0	vP : mP
23	..	29·908	38·0	34·0	4·0	36·3	− 3·0	34·5	31·9	4·4	5·8	2·6	84	40·6	33·7	39·1	37·7	0·011	0·0	wP : vP
24	..	29·918	38·1	34·3	3·8	35·8	− 3·5	33·3	29·5	6·3	9·8	4·4	77	45·1	32·7	39·9	38·9	0·000	0·0	vP : sP
25	In Equator: First Quarter.	29·822	39·2	32·3	6·9	36·0	− 3·2	34·8	33·0	3·0	4·7	0·8	89	51·0	29·0	40·4	39·9	0·019	0·0	mP : vP
26	..	29·906	36·0	33·2	2·8	34·5	− 4·6	33·0	30·5	4·0	6·2	1·1	85	39·2	33·0	39·9	38·9	0·000	0·0	wP : mP
27	..	30·021	36·8	33·6	3·2	35·6	− 3·4	34·7	33·4	2·2	3·7	0·2	92	39·1	33·0	39·9	39·1	0·000	2·0	mP : wP
28	..	29·838	36·8	34·8	2·0	36·0	− 2·8	35·1	33·7	2·3	3·7	0·7	92	39·9	34·8	40·9	38·4	0·000	6·2	wP : mP
29	..	29·634	36·4	33·5	2·9	35·1	− 3·6	33·8	31·8	3·3	4·2	2·5	87	39·7	33·0	40·9	38·9	0·000	0·8	mP
30	..	29·757	35·1	29·7	5·4	33·8	− 4·7	33·0	31·6	2·2	4·3	0·0	91	38·1	24·0	40·9	38·3	0·000	0·0	vP
31	Greatest Dec. N.: Perigee.	30·025	40·9	26·7	14·2	33·8	− 4·5	33·3	32·5	1·3	5·1	0·0	95	54·5	20·9	40·9	37·5	0·000	0·0	wP : sP
Means	..	29·692	45·1	36·5	8·6	41·2	+ 0·5	39·6	37·5	3·7	6·6	1·2	87·2	52·2	(30 days) 32·9	(29 days) 42·5	(29 days) 41·6	Sum 2·538	2·4	..
Number of Column for Reference.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

The results apply to the civil day.

The mean reading of the Barometer (Column 2) and the mean temperatures of the Air and Evaporation (Columns 6 and 8) are deduced from the photographic records. The average temperature (Column 7) is that determined from the reduction of the photographic records from 1849 to 1868. The temperature of the Dew Point (Column 9) and the Degree of Humidity (Column 13) are deduced from the corresponding temperatures of the Air and Evaporation by means of Glaisher's Hygrometrical Tables. The mean difference between the Air and Dew Point Temperatures (Column 10) is the difference between the numbers in Columns 6 and 9, and the Greatest and Least Differences (Columns 11 and 12) are deduced from the 24 hourly photographic measures of the Dry-bulb and Wet-bulb Thermometers. The result for December 27 for Barometer has been deduced from eye-observations on account of failure of the photographic record.

The values given in Columns 3, 4, 5, 14, 15, 16, and 17 are derived from eye-readings of self-registering thermometers.

The observations of the temperature of the water of the Thames were resumed on December 3.

The mean reading of the *Barometer* for the month was 29in·692, being 0in·099 *lower* than the average for the 20 years, 1854–1873.

TEMPERATURE OF THE AIR.

The highest in the month was 55°·1 on December 3; the lowest in the month was 26°·7 on December 31; and the range was 28°·4.
The mean of all the highest daily readings in the month was 45°·1, being 0°·7 *higher* than the average for the 43 years, 1841–1883.
The mean of all the lowest daily readings in the month was 36°·5, being 1°·4 *higher* than the average for the 43 years, 1841–1883.
The mean of the daily ranges was 8°·6, being 0°·7 *less* than the average for the 43 years, 1841–1883.
The mean for the month was 41°·2, being 0°·5 *higher* than the average for the 20 years, 1849–1868.

MONTH and DAY, 1884.	Daily Duration of Sunshine.	Sun above Horizon.	Wind as deduced from Self-registering Anemometers. Osler's. General Direction. A.M.	P.M.	Pressure on the Square Foot. Greatest.	Least.	Mean of 24 Hourly Measures.	Robinson's. Horizontal Movement of the Air.	Clouds and Weather. A.M.	P.M.
	hours.	hours.			lbs.	lbs.	lbs.	miles.		
Dec. 1	0·0	8·1	SSE : SE	SE : E : N	2·8	0·0	0·02	212	10, sn : 10, glm, slt.-r	10, slt.-r : 10, slt.-r, slt.-f
2	0·0	8·1	SW : S	S : SW : W	4·3	0·0	0·11	280	10 : 10, r	10, sc, slt.-r : 10
3	0·0	8·0	SW	SW	9·4	0·0	0·70	477	10, shs.-r : 10, sc, sh.-r	10, r : v, li.-cl
4	0·8	8·0	S : SW	SW : WSW	18·5	0·0	2·20	695	v, li.-cl : v, sh.-r : v,sc,st.-w,hl	9, ci.-cu, cu.-s, st.-w: 0, w
5	2·8	8·0	SW : WSW	W : SW	5·2	0·0	0·47	478	0 : 1, ci	4, ci, cu, ci.-cu : 10, fq.-r
6	0·0	8·0	SW : WSW	SW : WSW	13·5	0·0	2·81	680	10, hy.-r : 10, sc, slt.-r	10, sc, w, r : v, w, oc.-r
7	0·8	7·9	SW	SW	15·0	0·0	2·20	637	v : 4, li.-cl	v, ci.-cu, th.-cl, th.-r: 10, slt.-r, w
8	0·0	7·9	WSW	SW : WSW	11·5	0·0	1·42	495	10, w, hy.-r : 10, hy.-r	10, oc.-slt.-r : v
9	0·0	7·9	SSW	WSW	1·9	0·0	0·00	245	v : 10, r	10, r : v : 0, ho.-fr
10	0·1	7·9	SW : SSW	SW	9·7	0·0	1·49	525	v, th.-cl : 7, ci.-cu, ci.-s	10, r : 10, fq.-r, sqs
11	0·0	7·8	WSW	SW : NW	7·6	0·0	1·18	446	10 : 8, ci.-s, s	10, r : v, m
12	0·0	7·8	NW : WSW	WSW : SW	3·5	0·0	0·26	388	v : 8, th.-cl, th.-f	8, ci.-s, th.-cl, slt.-r : 10
13	0·3	7·8	WSW	SW	6·1	0·0	1·03	498	10 : p.-cl : 8,ci.-cu,ci.-s	8,ci.-cu,th.-cl: 9 : 10
14	0·0	7·8	SW	SW : NNW	12·5	0·0	1·55	515	10 : 10, sc	10,sc,w,slt.-r : 10, sc, r : v
15	0·0	7·8	SW : WSW	W : WSW	4·2	0·0	0·39	429	p.-cl : 10, slt.-r	p.-cl, ci.-s : 0
16	2·5	7·8	WSW : SW	SSW	1·0	0·0	0·01	310	0 : 0, ho.-fr, slt.-m	v, th.-cl, ci : 10, slt.-r
17	0·7	7·7	SSW : WSW	WNW : W	4·2	0·0	0·43	429	10, hy.-sh : 1, ci, ci.-s, s	6, ci.-cu, cu, cu-.s : 0, fr
18	0·0	7·7	WSW: SW: SSW	SW : WSW	12·5	0·0	2·00	530	0, ho.-fr : p.-cl : 10, sc	10, sc, fq.-r : v, oc.-r, l
19	2·9	7·7	SW : WSW	WSW : SW	10·7	0·0	2·50	570	0, l : 3, li.-cl	4, ci.-cu, cu.-s : v, d
20	0·0	7·7	SSW: W: NW	NNW	15·0	0·0	3·48	610	10, fq.-r, w : 10, w	10, sc, w, r : 10, sc, w
21	1·5	7·7	NNW	N	11·0	0·2	1·76	527	p.-cl : 6, ci.-cu, li.-sc	v, li.-sc, slt.-r : 10, slt.-r
22	0·9	7·7	N : NNE	NNE	6·1	0·0	0·55	472	v : 2, ci, ci.-s, s	7, ci, ci.-s : 10
23	0·0	7·7	NNE	NNE	3·0	0·0	0·16	406	10 : 10, glm	10 : 10, sn, sl
24	0·0	7·7	NNE : N	N : NW	2·3	0·0	0·08	308	10 : 10	10 : 10
25	0·0	7·7	W : NNW	N : NE	5·0	0·0	0·39	344	10 : 9, th.-cl, sc, sn	v, oc.-shs : v
26	0·0	7·8	NE	NE	3·1	0·0	0·07	363	10 : 10, sn	10, slt.-sn : 10
27	0·0	7·8	NNE : ENE	ENE	2·8	0·0	0·14	307	10 : 10, glm	10 : 10
28	0·0	7·8	ENE	ENE	4·0	0·0	0·67	355	10 : 10, sc	10 : 10
29	0·0	7·8	ENE	E : NE	1·0	0·0	0·00	210	10 : 10, glm	10 : 10
30	0·0	7·8	NE : N	NE	0·0	0·0	0·00	82	10 : 10	10 : p.-cl, ho.-fr, slt.-f
31	0·0	7·8	SE	SE	0·0	0·0	0·00	118	10 : 10, ho.-fr, slt.-f	9 : v, li.-cl,lu.-ha,ho.-fr
Means	0·4	7·8	...	...	..	..	0·91	417		
Number of Column for Reference.	21	22	23	24	25	26	27	28	29	30

The mean *Temperature of Evaporation* for the month was 39°·6, being 0°·3 *higher* than
The mean *Temperature of the Dew Point* for the month was 37°·5, being 0°·1 *higher* than
The mean *Degree of Humidity* for the month was 87·2, being 0·6 *less* than
The mean *Elastic Force of Vapour* for the month was 0in·225, being 0in·001 *greater* than
The mean *Weight of Vapour in a Cubic Foot of Air* for the month was 2grs·6, being *the same as*
The mean *Weight of a Cubic Foot of Air* for the month was 549 grains, being 2 grains *less* than
} the average for the 20 years, 1849–1868.

The mean amount of *Cloud* for the month (a clear sky being represented by 0 and an overcast sky by 10) was 8·2.

The mean proportion of *Sunshine* for the month (constant sunshine being represented by 1) was 0·05. The maximum daily amount of *Sunshine* was 2·9 hours on December 19.

The highest reading of the *Solar Radiation Thermometer* was 67°·6 on December 13; and the lowest reading of the *Terrestrial Radiation Thermometer* was 20°·9 on December 31.

The mean daily distribution of *Ozone* was, for the 12 hours ending 9 a.m., 1·9; for the 6 hours ending 3 p.m., 0·2; and for the 6 hours ending 9 p.m., 0·3.

The *Proportions of Wind* referred to the cardinal points were N. 7, E. 5, S. 9, and W. 10.

The *Greatest Pressure of the Wind* in the month was 18lbs·5 on the square foot on December 4. The mean daily *Horizontal Movement of the Air* for the month was 417 miles; the greatest daily value was 695 miles on December 4; and the least daily value was 82 miles on December 30.

Rain fell on 18 days in the month, amounting to 2in·538, as measured by gauge No. 6 partly sunk below the ground; being 0in·755 *greater* than the average fall for the 43 years, 1841–1883.

HIGHEST and LOWEST READINGS of the BAROMETER, reduced to 32° Fahrenheit, as extracted from the PHOTOGRAPHIC RECORDS.

MAXIMA.

Approximate Greenwich Mean Solar Time, 1884.	d h m	Reading. in.
January	4. 9. 10	30·030
	7. 22. 20	30·021
	9. 20. 40	30·243
	12. 21. 0	30·311
	16. 8. 45	30·474
	18. 21. 40	30·448
	20. 23. 10	30·375
	24. 8. 0	29·792
	25. 21. 0	29·126
	28. 8. 25	29·735
	29. 10. 15	29·695
	30. 11. 25	29·857
February	2. 20. 57	30·299
	13. 23. 5	30·025
	15. 9. 0	29·984
	19. 23. 20	29·724
	26. 21. 0	29·848
March	2. 8. 40	29·903
	5. 11. 50	30·090
	9. 0. 0	29·394
	10. 9. 40	29·260
	13. 21. 10	29·982
	18. 21. 0	29·950
	24. 11. 0	30·006
	26. 22. 0	29·994
April	1. 11. 0	29·513
	3. 21. 0	29·386
	5. 21. 45	29·462
	13. 11. 0	29·925
	17. 11. 0	29·845
	22. 10. 25	29·855

MINIMA.

Approximate Greenwich Mean Solar Time, 1884.	d h m	Reading. in.
January	2. 17. 25	29·735
	6. 1. 45	29·623
	8. 3. 45	29·937
	11. 1. 30	29·820
	14. 3. 45	30·206
	18. 5. 10	30·373
	20. 16. 45	30·206
	23. 4. 0	29·120
	25. 17. 3	28·903
	26. 7. 35	28·340
	28. 19. 0	29·584
	29. 18. 35	29·616
February	1. 11. 0	29·211
	9. 8. 26	29·200
	14. 18. 5	29·897
	19. 8. 10	29·574
	23. 10. 50	29·290
	28. 3. 0	29·753
March	4. 4. 50	29·445
	8. 17. 15	29·315
	9. 18. 40	28·984
	10. 19. 15	29·026
	18. 4. 0	29·843
	20. 16. 0	29·670
	26. 4. 10	29·904
	31. 1. 0	29·325
April	3. 5. 0	29·285
	4. 12. 20	29·125
	5. 16. 35	29·256
	16. 3. 25	29·649
	18. 16. 50	29·658

MAXIMA.

Approximate Greenwich Mean Solar Time, 1884.	d h m	Reading. in.
April	25. 9. 15	29·708
	28. 11. 0	29·626
May	0. 18. 20	29·757
	1. 20. 30	29·595
	6. 22. 25	29·902
	9. 19. 30	30·095
	12. 20. 30	29·830
	14. 17. 55	29·955
	21. 20. 0	30·274
	26. 10. 30	30·153
	31. 11. 0	29·926
June	5. 4. 0	29·646
	12. 10. 30	30·164
	14. 12. 0	30·140
	18. 23. 0	30·065
	27. 22. 35	30·050
July	0. 23. 0	30·040
	6. 9. 45	29·845
	12. 18. 20	29·764
	14. 10. 30	29·806
	19. 11. 15	30·005
	21. 21. 0	29·840
	25. 18. 40	29·984
	27. 22. 0	29·956
	30. 10. 25	30·035
August	4. 10. 35	30·096
	15. 9. 0	29·989
	20. 21. 0	30·042
	25. 18. 20	29·969
	29. 14. 0	29·745
September	2. 10. 5	29·603

MINIMA.

Approximate Greenwich Mean Solar Time, 1884.	d h m	Reading. in.
April	24. 3. 45	29·615
	27. 3. 45	29·436
	30. 2. 55	29·550
May	1. 10. 50	29·518
	3. 7. 20	29·170
	7. 11. 50	29·796
	12. 6. 0	29·726
	13. 16. 0	29·644
	17. 7. 5	29·530
	24. 2. 0	29·835
	30. 3. 50	29·813
June	2. 17. 15	29·370
	6. 16. 50	29·346
	13. 12. 0	30·000
	16. 1. 55	29·975
	24. 14. 10	29·754
	29. 4. 45	29·804
July	4. 3. 40	29·695
	10. 3. 45	29·439
	13. 4. 0	29·647
	15. 21. 45	29·516
	21. 5. 20	29·675
	23. 23. 25	29·555
	26. 17. 50	29·626
	28. 16. 20	29·857
August	1. 19. 30	29·751
	10. 15. 55	29·740
	19. 5. 40	29·697
	24. 18. 45	29·776
	28. 16. 35	29·476
September	0. 16. 0	29·461

HIGHEST and LOWEST READINGS of the BAROMETER, reduced to 32° Fahrenheit, as extracted from the PHOTOGRAPHIC RECORDS—*continued.*

MAXIMA.		MINIMA.		MAXIMA.		MINIMA.	
Approximate Greenwich Mean Solar Time, 1884.	Reading.	Approximate Greenwich Mean Solar Time, 1884.	Reading.	Approximate Greenwich Mean Solar Time, 1884.	Reading.	Approximate Greenwich Mean Solar Time, 1884.	Reading.
d h m	in.	d h m	in.	d h m	in.	d h m	in.
September 5. 13. 45	29·560	September 3. 16. 30	29·213	November 18. 22. 0	30·296	November 17. 2. 30	30·063
11. 8. 15	30·156	6. 10. 30	29·255	25. 20. 20	30·104	20. 17. 10	29·546
17. 22. 0	30·206	15. 10. 45	29·830	29. 20. 30	29·881	28. 3. 50	29·527
23. 11. 0	30·088	21. 13. 30	29·466	December 1. 9. 20	29·755	December 0. 19. 0	29·680
24. 21. 30	30·020	24. 5. 0	29·941	3. 12. 0	29·290	3. 0. 50	29·215
29. 20. 0	30·035	26. 4. 30	29·755	5. 7. 40	29·703	4. 0. 30	29·025
October 1. 10. 50	29·976	October 0. 18. 25	29·810	6. 22. 25	29·766	5. 19. 5	29·480
4. 20. 30	30·485	2. 11. 40	29·727	8. 12. 15	29·819	7. 16. 30	29·539
17. 21. 45	30·208	9. 13. 50	29·182	9. 14. 45	30·014	9. 2. 15	29·702
20. 9. 45	30·212	19. 6. 40	30·104	12. 21. 50	29·986	11. 5. 30	29·326
24. 21. 40	29·936	23. 15. 57	29·700	14. 11. 5	29·764	14. 5. 35	29·660
27. 2. 10	29·735	25. 20. 35	29·375	15. 22. 0	29·904	14. 18. 45	29·535
30. 21. 30	30·135	27. 23. 45	29·335	17. 18. 10	29·849	16. 17. 50	29·385
November 3. 7. 45	29·941	November 2. 4. 10	29·691	18. 23. 25	29·408	18. 15. 45	29·283
5. 23. 10	29·876	4. 12. 30	29·630	22. 7. 0	30·046	19. 18. 15	28·659
7. 21. 55	30·201	7. 3. 15	29·594	24. 6. 0	29·959	23. 6. 40	29·854
9. 21. 55	30·383	8. 16. 0	30·082	26. 21. 0	30·048	25. 2. 45	29·757
13. 21. 30	30·305	12. 2. 25	30·097			29. 1. 35	29·597

The readings in the above table are accurate, but the times are occasionally liable to uncertainty, as the barometer will sometimes remain at its extreme reading without sensible change for a considerable interval of time. In such cases the time given is the middle of the stationary period. The readings at February 26d. 21h., February 28d. 3h., and December 26d. 21h. are derived from the eye-observations, on account of temporary interruption of photographic registration.

HIGHEST AND LOWEST READINGS OF THE BAROMETER in each Month for the YEAR 1884.
[Extracted from the preceding Table.]

1884, MONTH.	Readings of the Barometer.		Range.
	Highest.	Lowest.	
	in.	in.	in.
January	30·474	28·340	2·134
February	30·299	29·200	1·099
March	30·090	28·984	1·106
April	29·925	29·125	0·800
May	30·274	29·170	1·104
June	30·164	29·346	0·818
July	30·040	29·439	0·601
August	30·096	29·476	0·620
September	30·206	29·213	0·993
October	30·485	29·182	1·303
November	30·383	29·527	0·856
December	30·048	28·659	1·389

The highest reading in the year was $30^{in}\cdot485$ on October 5. The lowest reading in the year was $28^{in}\cdot340$ on January 26.
The range of reading in the year was $2^{in}\cdot145$.

MONTHLY RESULTS of METEOROLOGICAL ELEMENTS for the YEAR 1884.

1884, 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 of the Daily Ranges.	Monthly Mean.	Excess of Mean above Average of 20 Years.	Mean Temperature of Evaporation.	Mean Temperature of the Dew Point.	Mean Degree of Humidity. (Saturation = 100.)
	in.	°	°	°	°	°	°	°	°	°	°	
January ..	29·915	55·3	31·2	24·1	47·8	39·2	8·5	43·9	+ 5·2	42·6	40·9	89·9
February..	29·739	57·6	27·8	29·8	47·7	36·8	10·9	42·1	+ 2·4	40·2	37·8	85·2
March	29·760	68·8	27·3	41·5	52·7	37·4	15·3	44·4	+ 2·9	41·8	38·7	80·8
April	29·645	68·7	27·0	41·7	54·3	37·1	17·2	45·3	− 2·1	42·6	39·4	80·3
May	29·821	80·5	35·6	44·9	65·7	43·8	22·0	54·2	+ 1·1	49·7	45·4	72·6
June	29·856	82·6	42·7	39·9	69·3	49·1	20·2	58·1	− 1·6	54·3	50·8	77·4
July......	29·781	88·1	42·3	45·8	75·3	53·5	21·8	63·2	+ 0·6	58·6	54·7	74·5
August ...	29·837	94·2	45·8	48·4	78·7	53·6	25·1	65·1	+ 3·3	59·3	54·6	69·1
September.	29·834	83·5	42·4	41·1	69·2	51·3	18·0	59·4	+ 2·0	56·4	53·6	81·4
October ...	29·894	62·7	32·1	30·6	56·5	41·6	14·9	49·2	− 1·8	46·8	44·2	83·4
November .	29·981	61·2	24·5	36·7	47·6	36·8	10·8	42·6	− 0·1	40·9	38·9	87·4
December .	29·692	55·1	26·7	28·4	45·1	36·5	8·6	41·2	+ 0·5	39·6	37·5	87·2
Means	29·813	Highest. 94·2	Lowest. 24·5	Annual Range. 69·7	59·2	43·1	16·1	50·7	+ 1·0	47·7	44·7	80·8

1884, MONTH.	Mean Elastic Force of Vapour.	Mean Weight of Vapour in a Cubic Foot of Air.	Mean Weight of a Cubic Foot of Air.	Mean Amount of Ozone.	Mean Amount of Cloud. (0–10.)	Rain. Number of Rainy Days.	Rain. Amount collected in Gauge No. 6 whose receiving Surface is 5 Inches above the Ground.	Wind. From Osler's Anemometer. Number of Hours of Prevalence of each Wind, referred to different Points of Azimuth. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Number of Calm or nearly Calm Hours.	Mean Daily Pressure on the Square Foot.	From Robinson's Anemometer. Mean Daily Horizontal Movement of the Air.
	in.	grs.	grs.				in.	h	h	h	h	h	h	h	h	h	lbs.	miles.
January...	0·256	3·0	550	2·9	8·0	15	1·771	11	2	39	23	68	338	213	44	6	0·74*	404
February..	0·227	2·6	549	4·4	7·0	13	1·496	19	52	75	108	72	223	125	17	5	..	337
March	0·235	2·7	547	2·7	6·8	11	1·369	71	105	69	64	169	167	63	25	11	0·65	269
April.....	0·241	2·8	544	3·5	7·5	15	1·108	126	205	95	76	107	49	21	16	25	0·47	246
May.. ...	0·304	3·4	537	4·1	5·5	10	0·959	30	143	134	33	52	257	75	18	2	0·49	323
June......	0·371	4·2	533	2·2	6·7	8	2·244	205	104	79	38	38	108	60	43	45	0·09	193
July......	0·428	4·8	526	4·4	7·1	16	1·771	70	25	20	49	123	311	79	36	31	0·28	230
August ...	0·427	4·7	525	0·8	4·6	8	0·667	58	63	108	60	62	206	120	31	36	0·14	197
September.	0·412	4·6	531	1·6	5·9	12	2·090	24	105	126	32	89	216	87	24	17	0·28	257
October ...	0·290	3·3	544	1·0	6·7	12	1·041	103	47	38	35	49	181	156	103	32	0·44	294
November .	0·237	2·7	553	1·2	6·7	12	0·993	158	55	86	56	100	130	67	55	13	0·23	260
December .	0·225	2·6	549	2·4	8·2	18	2·538	85	109	52	30	46	286	100	30	6	0·91	417
Sums	..	..	..	..	..	150	18·047	960	1015	921	604	975	2472	1166	442	229	..	..
Means	0·304	3·4	541	2·6	6·7	..	..	..	..	..	..	..	..	..	..	..	..	286

The greatest recorded daily horizontal movement of the air in the year was 891 miles on January 23.
The least recorded daily horizontal movement of the air „ „ 78 miles on February 8.

* The mean daily pressure of the wind for January is derived from the results for 22 days only.

MONTHLY MEAN READING of the BAROMETER at every HOUR of the DAY, as deduced from the PHOTOGRAPHIC RECORDS.

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Means.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight	29·927	29·723	29·773	29·650	29·819	29·861	29·790	29·852	29·832	29·895	29·994	29·694	29·817
1h. a.m.	29·924	29·721	29·768	29·645	29·816	29·858	29·787	29·847	29·829	29·889	29·989	29·687	29·813
2 „	29·924	29·721	29·762	29·641	29·816	29·852	29·781	29·844	29·824	29·882	29·990	29·685	29·810
3 „	29·922	29·716	29·753	29·638	29·814	29·849	29·779	29·839	29·821	29·880	29·987	29·678	29·806
4 „	29·914	29·711	29·750	29·635	29·815	29·849	29·779	29·834	29·817	29·878	29·982	29·669	29·803
5 „	29·913	29·716	29·748	29·636	29·823	29·852	29·782	29·836	29·818	29·879	29·981	29·665	29·804
6 „	29·915	29·719	29·751	29·642	29·828	29·856	29·787	29·840	29·826	29·881	29·983	29·666	29·808
7 „	29·923	29·726	29·759	29·647	29·834	29·860	29·791	29·845	29·834	29·891	29·986	29·667	29·814
8 „	29·932	29·737	29·765	29·649	29·836	29·864	29·792	29·848	29·841	29·899	29·991	29·673	29·819
9 „	29·940	29·744	29·772	29·652	29·836	29·865	29·791	29·849	29·846	29·903	29·993	29·682	29·823
10 „	29·943	29·751	29·773	29·651	29·837	29·865	29·788	29·848	29·848	29·908	29·994	29·689	29·825
11 „	29·941	29·755	29·773	29·649	29·834	29·865	29·786	29·846	29·845	29·908	29·990	29·687	29·823
Noon	29·925	29·747	29·771	29·647	29·828	29·861	29·781	29·842	29·843	29·899	29·981	29·677	29·817
1h. p.m.	29·911	29·741	29·763	29·644	29·821	29·857	29·775	29·836	29·838	29·896	29·970	29·666	29·810
2 „	29·904	29·734	29·756	29·638	29·817	29·853	29·772	29·830	29·833	29·891	29·962	29·660	29·804
3 „	29·900	29·730	29·750	29·633	29·812	29·850	29·769	29·821	29·827	29·886	29·961	29·659	29·800
4 „	29·897	29·729	29·747	29·631	29·806	29·847	29·765	29·817	29·824	29·887	29·963	29·664	29·798
5 „	29·897	29·729	29·749	29·632	29·803	29·844	29·764	29·813	29·824	29·891	29·968	29·672	29·799
6 „	29·898	29·735	29·755	29·636	29·804	29·846	29·766	29·815	29·829	29·898	29·972	29·682	29·803
7 „	29·899	29·740	29·762	29·644	29·807	29·848	29·771	29·822	29·836	29·901	29·976	29·691	29·808
8 „	29·904	29·742	29·763	29·653	29·816	29·855	29·778	29·833	29·842	29·901	29·978	29·698	29·814
9 „	29·905	29·743	29·763	29·658	29·822	29·864	29·787	29·839	29·844	29·903	29·981	29·704	29·818
10 „	29·902	29·743	29·763	29·659	29·826	29·865	29·789	29·842	29·846	29·902	29·982	29·709	29·819
11 „	29·902	29·742	29·761	29·660	29·828	29·865	29·792	29·841	29·845	29·901	29·982	29·711	29·819
Means	29·915	29·733	29·760	29·645	29·821	29·856	29·781	29·837	29·834	29·894	29·981	29·681	29·811
Number of Days employed.	31	26	31	30	31	30	31	31	30	31	30	30	..

MONTHLY MEAN TEMPERATURE of the AIR at every HOUR of the DAY, as deduced from the PHOTOGRAPHIC RECORDS.

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Means.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight	42·8	41·1	41·5	41·5	48·4	52·7	57·5	58·7	55·8	46·6	41·7	40·4	47·4
1h. a.m.	42·7	41·0	41·3	41·2	47·9	52·2	56·9	58·1	55·4	46·4	41·4	40·4	47·1
2 „	42·4	40·7	41·0	40·7	47·4	51·8	56·4	57·5	55·1	46·2	41·3	40·5	46·8
3 „	42·2	40·6	40·8	40·4	46·7	51·7	56·1	56·9	54·7	46·1	41·0	40·6	46·5
4 „	42·0	40·4	40·5	40·2	46·5	51·3	55·9	56·5	54·6	46·0	40·7	40·6	46·3
5 „	42·2	40·3	40·2	40·0	46·9	51·8	56·5	56·4	54·4	46·1	40·5	40·4	46·3
6 „	42·2	40·0	39·8	40·4	48·6	53·2	58·3	57·5	54·4	46·0	40·4	40·4	46·8
7 „	42·3	39·9	40·0	42·3	51·1	55·1	60·5	60·2	55·7	46·2	40·2	40·4	47·8
8 „	42·5	40·1	41·3	44·9	54·0	57·3	63·4	64·2	57·7	47·3	40·5	40·3	49·5
9 „	43·1	41·2	43·6	47·4	56·9	59·1	65·9	67·7	60·5	49·1	41·6	40·5	51·4
10 „	44·2	42·7	46·3	48·8	58·7	60·6	68·2	70·7	63·0	51·1	43·0	41·1	53·2
11 „	45·0	44·4	48·5	49·9	60·5	62·6	69·0	72·6	64·3	52·6	44·5	42·1	54·7
Noon	45·8	45·2	49·7	51·2	62·0	63·9	70·2	74·3	65·6	54·0	45·9	42·6	55·9
1h. p.m.	46·4	45·4	50·2	51·2	62·3	64·8	71·0	74·8	66·1	54·3	46·5	42·9	56·3
2 „	46·3	45·4	50·6	51·3	62·7	65·7	71·3	75·1	66·3	54·4	46·4	43·1	56·5
3 „	46·3	45·2	50·3	50·7	62·0	65·6	70·4	74·9	66·0	54·1	45·7	42·9	56·2
4 „	46·0	44·7	49·3	50·1	61·3	65·1	69·5	73·7	64·8	52·7	44·8	42·3	55·4
5 „	45·3	43·3	48·1	49·2	59·6	64·0	68·0	71·9	63·1	51·6	43·8	42·0	54·2
6 „	44·8	42·5	46·5	47·7	57·7	62·3	66·4	69·0	61·2	50·3	43·1	41·6	52·8
7 „	44·5	42·0	45·1	45·8	55·6	60·0	64·7	66·4	59·3	49·4	42·4	41·1	51·4
8 „	44·1	41·6	44·2	44·6	53·0	57·9	62·3	63·9	58·3	48·6	42·1	40·8	50·1
9 „	44·0	41·3	43·3	43·5	51·2	56·1	60·6	61·9	57·4	47·9	41·7	40·6	49·1
10 „	43·8	41·1	42·5	42·7	50·1	55·0	59·2	60·9	56·7	47·3	41·5	40·3	48·4
11 „	43·5	40·9	42·1	42·0	49·0	53·8	58·3	59·7	56·1	46·8	41·3	40·4	47·8
Means	43·9	42·1	44·4	45·3	54·2	58·1	63·2	65·1	59·4	49·2	42·6	41·2	50·7
Number of Days employed.	31	29	31	30	29	29	31	31	30	31	30	31	..

MONTHLY MEAN TEMPERATURE of EVAPORATION at every HOUR of the DAY, as deduced from the PHOTOGRAPHIC RECORDS.

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Means.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight	41·7	39·9	40·0	40·3	46·7	51·5	55·8	56·5	54·9	45·2	40·5	39·1	46·0
1h. a.m.	41·5	39·7	40·0	40·1	46·3	51·2	55·3	56·0	54·5	45·0	40·2	39·0	45·7
2 „	41·3	39·6	39·8	39·6	46·0	50·9	55·0	55·8	54·2	45·0	40·1	39·2	45·5
3 „	41·1	39·5	39·7	39·4	45·6	50·8	55·0	55·4	53·9	44·9	39·9	39·2	45·4
4 „	41·1	39·4	39·4	39·4	45·3	50·5	54·8	55·2	53·7	44·8	39·7	39·2	45·2
5 „	41·2	39·3	39·1	39·3	45·7	50·7	55·3	55·3	53·6	45·0	39·5	39·1	45·3
6 „	41·3	39·1	38·9	39·7	46·9	51·7	56·5	56·1	53·5	44·9	39·5	39·0	45·6
7 „	41·3	38·9	38·9	40·9	48·6	52·7	58·0	57·9	54·3	45·1	39·3	39·0	46·2
8 „	41·5	39·1	40·0	42·4	50·1	54·0	59·4	60·1	55·7	45·9	39·6	38·9	47·2
9 „	42·0	39·8	41·5	44·1	51·6	54·9	60·5	61·5	57·2	47·1	40·3	39·0	48·3
10 „	42·7	40·8	43·2	44·8	52·4	55·7	61·2	62·3	58·4	48·1	41·3	39·5	49·2
11 „	43·3	41·7	44·4	45·3	53·3	56·6	61·4	62·5	58·7	48·8	42·2	40·1	49·9
Noon	43·8	42·1	44·9	45·9	53·8	57·2	61·4	62·8	59·2	49·4	43·0	40·4	50·3
1h. p.m.	44·2	42·0	45·1	45·9	54·1	57·5	61·7	62·8	59·3	49·5	43·3	40·7	50·5
2 „	44·1	42·1	45·1	46·1	54·0	57·7	62·1	63·0	59·3	49·5	43·2	40·8	50·6
3 „	44·3	41·9	44·8	45·8	53·7	57·7	61·8	63·0	59·1	49·4	42·8	40·7	50·4
4 „	44·1	41·5	44·4	45·4	53·1	57·6	61·5	62·5	58·5	48·7	42·4	40·5	50·0
5 „	43·7	40·7	43·8	45·1	52·6	56·9	60·9	61·8	58·2	48·2	41·8	40·2	49·5
6 „	43·4	40·2	43·0	44·2	51·7	56·3	60·2	61·2	57·3	47·6	41·4	39·9	48·9
7 „	43·1	39·9	42·1	43·1	50·7	55·3	59·2	60·1	56·5	47·1	40·9	39·5	48·1
8 „	42·9	39·7	41·7	42·3	49·4	54·4	58·2	59·0	56·2	46·6	40·6	39·4	47·5
9 „	42·8	39·6	41·1	41·6	48·3	53·6	57·4	58·2	55·8	46·1	40·4	39·2	47·0
10 „	42·6	39·5	40·6	41·0	47·5	53·0	56·8	57·7	55·4	45·7	40·2	39·0	46·6
11 „	42·4	39·5	40·5	40·6	46·8	52·4	56·3	57·0	55·1	45·3	40·1	39·0	46·3
Means	42·6	40·2	41·8	42·6	49·8	54·2	58·6	59·3	56·4	46·8	40·9	39·6	47·7
Number of Days employed.	31	29	31	30	29	29	31	31	30	31	30	31	..

MONTHLY MEAN TEMPERATURE of the DEW POINT at every HOUR of the DAY, as deduced by GLAISHER'S TABLES from the corresponding AIR and EVAPORATION TEMPERATURES.

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Means.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight	40·4	38·4	38·1	38·8	44·9	50·3	54·3	54·5	54·1	43·7	39·0	37·4	44·5
1h. a.m.	40·1	38·0	38·3	38·7	44·5	50·2	53·9	54·1	53·6	43·5	38·7	37·2	44·2
2 „	40·0	38·2	38·3	38·2	44·5	50·0	53·7	54·3	53·3	43·7	38·6	37·6	44·2
3 „	39·8	38·1	38·3	38·1	44·4	49·9	54·0	54·0	53·1	43·6	38·5	37·4	44·1
4 „	40·0	38·1	38·0	38·4	44·0	49·7	53·8	54·0	52·8	43·5	38·5	37·4	44·0
5 „	40·0	38·0	37·7	38·4	44·4	49·6	54·2	54·3	52·8	43·8	38·3	37·4	44·1
6 „	40·2	37·9	37·7	38·8	45·1	50·2	54·9	54·8	52·6	43·7	38·4	37·2	44·3
7 „	40·1	37·6	37·5	39·2	46·0	50·4	55·8	55·9	53·0	43·9	38·2	37·2	44·6
8 „	40·3	37·8	38·3	39·5	46·3	51·0	56·0	56·7	53·9	44·4	38·5	37·1	45·0
9 „	40·7	38·0	39·0	40·4	46·7	51·1	56·1	56·6	54·4	44·9	38·7	37·1	45·3
10 „	40·9	38·6	39·7	40·5	46·8	51·5	55·7	55·9	54·5	45·0	39·3	37·5	45·5
11 „	41·3	38·5	39·9	40·4	47·0	51·5	55·0	55·0	54·0	45·0	39·5	37·6	45·4
Noon	41·5	38·5	39·8	40·4	46·7	51·6	54·6	54·5	54·0	44·9	39·7	37·8	45·3
1h. p.m.	41·7	38·1	39·7	40·4	47·0	51·5	54·7	54·2	53·8	44·8	39·7	38·1	45·3
2 „	41·6	38·3	39·4	40·7	46·5	51·2	55·2	54·3	53·6	44·7	39·6	38·1	45·3
3 „	42·0	38·1	39·0	40·7	46·6	51·3	55·2	54·5	53·5	44·8	39·5	38·1	45·3
4 „	41·9	37·8	39·1	40·5	46·0	51·5	55·3	54·3	53·3	44·7	39·6	38·3	45·2
5 „	41·8	37·6	39·1	40·7	46·5	51·0	55·3	54·2	54·1	44·8	39·5	38·0	45·2
6 „	41·8	37·4	39·1	40·3	46·3	51·1	55·2	55·1	53·9	44·8	39·4	37·8	45·2
7 „	41·5	37·3	38·6	40·0	46·1	51·2	54·6	55·0	54·0	44·6	39·1	37·5	45·0
8 „	41·5	37·3	38·8	39·6	45·8	51·3	54·7	54·9	54·3	44·5	38·8	37·7	44·9
9 „	41·4	37·5	38·5	39·3	45·3	51·3	54·6	55·1	54·4	44·1	38·8	37·4	44·8
10 „	41·2	37·5	38·3	39·0	44·7	51·1	54·7	54·9	54·2	43·9	38·3	37·3	44·6
11 „	41·1	37·8	38·5	38·9	44·4	51·0	54·5	54·6	54·2	43·6	38·6	37·2	44·5
Means	40·9	37·9	38·7	39·6	45·7	50·9	54·8	54·8	53·7	44·3	38·9	37·6	44·8

MONTHLY MEAN DEGREE of HUMIDITY (Saturation = 100) at every HOUR of the DAY, as deduced by GLAISHER'S TABLES from the corresponding AIR and EVAPORATION TEMPERATURES.

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884.												Yearly Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Midnight	91	90	89	91	88	92	89	86	94	90	91	90	90
1h. a.m.	90	90	90	91	89	93	90	86	94	90	91	89	90
2 "	91	91	90	91	90	94	91	89	94	92	91	90	91
3 "	91	91	91	92	92	94	92	90	94	92	91	89	92
4 "	93	92	91	94	92	94	93	91	94	92	92	89	92
5 "	92	92	91	94	92	92	92	93	94	92	92	90	92
6 "	93	93	93	94	88	90	88	91	94	92	93	89	91
7 "	92	92	91	89	83	85	85	86	91	92	93	89	89
8 "	92	92	90	82	75	79	77	77	87	90	93	89	85
9 "	91	89	84	77	69	75	71	67	81	86	90	88	81
10 "	88	85	79	73	65	72	64	59	74	80	86	87	76
11 "	87	79	72	70	61	67	62	54	69	76	83	85	72
Noon	85	77	69	67	57	64	58	50	67	71	80	84	69
1h. p.m.	85	76	68	67	57	62	56	49	65	70	78	83	68
2 "	85	76	66	67	55	59	57	49	64	70	78	82	67
3 "	86	76	65	69	57	59	59	49	64	71	79	83	68
4 "	87	76	68	70	57	61	60	50	66	75	82	86	70
5 "	88	80	71	73	62	63	64	54	73	78	84	86	73
6 "	90	83	76	76	66	67	67	61	77	82	87	87	77
7 "	89	84	78	81	71	72	70	67	83	84	88	87	80
8 "	91	86	81	83	76	79	76	73	86	86	89	89	83
9 "	90	87	83	85	81	84	81	79	89	87	90	89	85
10 "	90	87	86	86	82	87	86	82	92	90	90	90	87
11 "	91	89	88	89	85	90	87	84	93	89	91	89	89
Means	90	86	81	81	75	78	76	71	82	84	88	87	82

TOTAL AMOUNT of SUNSHINE registered in each HOUR of the DAY in each MONTH, as derived from the Records of CAMPBELL'S SELF-REGISTERING INSTRUMENT, for the YEAR 1884.

1884, Month.	Registered Duration of Sunshine in the Hour ending																Total registered Duration of Sunshine in each Month.	Corresponding aggregate Period during which the Sun was above Horizon.	Mean Altitude of the Sun at Noon.
	5h. a.m.	6h. a.m.	7h. a.m.	8h. a.m.	9h. a.m.	10h. a.m.	11h. a.m.	Noon.	1h. p.m.	2h. p.m.	3h. p.m.	4h. p.m.	5h. p.m.	6h. p.m.	7h. p.m.	8h. p.m.			
	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	°
January ..	..	..	..	..	..	1·5	3·1	3·9	4·3	3·3	0·5	..	..	..	..	..	16·6	259·1	18
February .	..	..	..	0·1	3·7	6·1	9·0	7·4	6·0	7·0	5·1	1·9	..	..	..	..	46·3	288·7	26
March ...	..	..	..	0·9	5·2	9·9	12·2	13·9	11·5	11·4	9·5	7·7	3·6	..	..	..	85·8	366·9	37
April	..	..	0·8	6·1	10·7	10·0	10·2	9·7	9·0	8·5	6·7	6·1	7·5	2·6	..	..	87·9	414·9	48
May	..	0·9	10·1	12·6	15·1	15·7	16·1	18·0	16·6	17·2	16·4	16·0	13·1	12·6	3·3	..	183·7	482·1	57
June	..	2·1	5·1	8·4	8·9	11·4	11·8	11·2	11·1	13·5	13·2	12·3	10·7	12·0	2·6	..	134·3	494·5	62
July	0·1	2·0	6·5	10·8	11·0	13·6	10·2	11·0	11·7	11·8	10·7	9·0	8·5	6·3	3·2	0·1	126·5	496·8	60
August ..	..	0·5	7·6	17·2	17·8	18·9	19·2	18·9	19·3	17·8	18·8	17·9	17·0	12·2	0·3	..	203·4	449·1	52
September	..	..	..	1·4	7·3	13·1	14·8	13·2	14·8	15·1	14·3	13·3	10·9	0·9	..	..	119·1	376·9	41
October ..	..	..	..	..	2·0	8·1	8·2	10·4	11·4	8·4	7·9	2·8	0·1	..	..	..	59·3	328·7	30
November	..	..	..	..	0·4	4·2	7·8	7·4	8·1	6·4	3·9	0·4	..	..	..	..	38·6	264·4	20
December	..	..	..	..	..	0·6	2·7	5·8	3·0	1·2	..	..	..	..	..	..	13·3	242·7	16

The hours are reckoned from apparent noon.

The total registered duration of sunshine during the year was 1114·8 hours; the corresponding aggregate period during which the Sun was above the horizon was 4464·8 hours; the mean proportion for the year (constant sunshine = 1) was therefore 0·250.

(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 of the Year.

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	52·15	51·49	50·77	50·15	49·70	49·50	49·72	50·33	51·21	52·15	52·86	53·04
2	52·15	51·45	50·76	50·13	49·68	49·52	49·73	50·35	51·24	52·17	52·90	53·06
3	52·15	51·43	50·73	50·12	49·67	49·52	49·75	50·36	51·28	52·20	52·88	53·09
4	52·13	51·42	50·71	50·08	49·67	49·50	49·76	50·40	51·28	52·23	52·91	53·07
5	52·10	51·39	50·70	50·07	49·65	49·51	49·78	50·43	51·33	52·26	52·94	53·07
6	52·10	51·36	50·68	50·05	49·65	49·50	49·78	50·45	51·36	52·29	52·95	53·08
7	52·06	51·32	50·65	50·01	49·64	49·50	49·80	50·50	51·39	52·32	52·98	53·08
8	52·05	51·30	50·63	50·02	49·63	49·51	49·83	50·53	51·45	52·34	52·98	53·06
9	52·02	51·28	50·60	50·00	49·64	49·50	49·84	50·55	51·47	52·35	52·99	53·04
10	52·01	51·27	50·58	49·97	49·63	49·51	49·84	50·57	51·51	52·35	52·99	53·05
11	51·98	51·24	50·55	49·96	49·63	49·53	49·87	50·62	51·55	52·38	52·99	53·04
12	51·94	51·22	50·55	49·93	49·63	49·54	49·87	50·63	51·58	52·43	53·00	53·04
13	51·94	51·21	50·54	49·91	49·60	49·55	49·90	50·67	51·62	52·44	53·02	53·06
14	51·91	51·17	50·53	49·90	49·58	49·55	49·93	50·68	51·64	52·47	53·02	53·04
15	51·89	51·13	50·50	49·88	49·58	49·54	49·93	50·71	51·69	52·51	53·01	53·02
16	51·85	51·10	50·49	49·86	49·60	49·55	49·95	50·75	51·74	52·55	53·01	52·98
17	51·84	51·08	50·46	49·85	49·58	49·56	49·97	50·79	51·76	52·57	53·04	52·98
18	51·83	51·06	50·44	49·83	49·57	49·56	49·99	50·80	51·81	52·60	53·04	52·97
19	51·80	51·04	50·42	49·82	49·57	49·58	50·00	50·83	51·80	52·62	53·04	52·97
20	51·78	51·03	50·37	49·82	49·57	49·58	50·03	50·86	51·84	52·64	53·07	52·93
21	51·77	51·00	50·35	49·80	49·57	49·58	50·05	50·89	51·87	52·65	53·05	52·93
22	51·74	50·99	50·34	49·79	49·57	49·60	50·07	50·93	51·88	52·67	53·08	52·93
23	51·72	50·96	50·32	49·78	49·56	49·63	50·09	50·97	51·92	52·68	53·05	52·90
24	51·67	50·93	50·29	49·76	49·56	49·62	50·10	51·00	51·95	52·70	53·04	52·89
25	51·66	50·90	50·27	49·75	49·53	49·63	50·14	51·02	51·98	52·72	53·03	52·87
26	51·63	50·87	50·24	49·73	49·55	49·65	50·15	51·03	52·01	52·76	53·05	52·85
27	51·57	50·85	50·21	49·72	49·55	49·67	50·17	51·05	52·04	52·76	53·07	52·84
28	51·57	50·82	50·20	49·71	49·53	49·68	50·21	51·09	52·07	52·82	53·06	52·83
29	51·56	50·79	50·17	49·70	49·52	49·68	50·23	51·11	52·10	52·81	53·04	52·80
30	51·55		50·17	49·70	49·52	49·70	50·26	51·15	52·12	52·84	53·04	52·78
31	51·53		50·15		49·52		50·29	51·17		52·86		52·77
Means.	51·86	51·14	50·46	49·89	49·60	49·57	49·97	50·75	51·68	52·52	53·00	52·97

The mean of the twelve monthly values is 51°·20.

(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 Noon on every Day of the Year.

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	50·32	48·92	48·04	47·70	48·21	49·56	51·81	54·63	56·56	57·13	55·98	53·81
2	50·28	48·82	48·05	47·70	48·21	49·66	51·89	54·72	56·63	57·13	55·96	53·73
3	50·27	48·80	48·00	47·73	48·20	49·74	52·00	54·70	56·67	57·13	55·91	53·70
4	50·19	48·78	47·99	47·71	48·21	49·81	52·10	54·75	56·65	57·12	55·78	53·56
5	50·10	48·72	47·96	47·70	48·20	49·92	52·17	54·82	56·73	57·11	55·76	53·44
6	50·06	48·70	47·97	47·72	48·19	49·99	52·22	54·89	56·78	57·13	55·73	53·38
7	49·99	48·66	47·90	47·71	48·20	50·10	52·32	54·98	56·80	57·15	55·65	53·27
8	49·91	48·61	47·89	47·73	48·22	50·16	52·48	55·04	56·85	57·11	55·52	53·12

(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 Noon on every Day of the Year—*concluded.*

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
9	49·88	48·61	47·83	47·74	48·24	50·22	52·59	55·08	56·91	57·07	55·48	52·98
10	49·81	48·60	47·82	47·76	48·27	50·34	52·61	55·10	56·94	56·99	55·40	52·90
11	49·77	48·53	47·78	47·79	48·29	50·44	52·72	55·24	56·99	56·98	55·32	52·80
12	49·69	48·52	47·76	47·81	48·30	50·52	52·80	55·24	57·00	57·00	55·25	52·69
13	49·64	48·52	47·71	47·82	48·30	50·60	53·00	55·31	57·01	56·96	55·19	52·62
14	49·60	48·48	47·70	47·87	48·30	50·65	53·06	55·32	56·98	56·98	55·11	52·52
15	49·54	48·45	47·66	47·91	48·32	50·70	53·14	55·39	57·03	56·95	55·04	52·43
16	49·50	48·40	47·64	47·92	48·40	50·73	53·24	55·49	57·05	56·93	54·98	52·32
17	49·47	48·38	47·60	47·95	48·43	50·80	53·34	55·59	57·06	56·90	54·92	52·23
18	49·41	48·37	47·59	47·98	48·44	50·83	53·44	55·64	57·10	56·83	54·89	52·17
19	49·39	48·36	47·57	48·02	48·50	50·91	53·51	55·69	56·99	56·80	54·82	52·11
20	49·37	48·33	47·51	48·07	48·58	50·98	53·63	55·76	57·01	56·68	54·76	52·01
21	49·31	48·29	47·51	48·09	48·65	51·05	53·73	55·82	57·02	56·62	54·70	51·93
22	49·28	48·29	47·53	48·11	48·72	51·06	53·87	55·97	56·98	56·60	54·60	51·90
23	49·27	48·27	47·53	48·12	48·80	51·20	53·91	56·06	56·98	56·50	54·52	51·80
24	49·18	48·20	47·52	48·16	48·90	51·27	54·00	56·14	57·00	56·42	54·44	51·75
25	49·16	48·19	47·52	48·16	48·92	51·31	54·09	56·12	57·01	56·35	54·33	51·69
26	49·08	48·18	47·57	48·18	49·04	51·41	54·15	56·19	57·07	56·33	54·30	51·60
27	49·02	48·12	47·55	48·18	49·12	51·51	54·20	56·22	57·08	56·23	54·27	51·53
28	49·02	48·10	47·59	48·19	49·18	51·59	54·31	56·33	57·11	56·17	54·15	51·46
29	49·01	48·07	47·61	48·20	49·28	51·63	54·38	56·40	57·11	56·12	54·02	51·39
30	48·98		47·63	48·21	49·39	51·71	54·48	56·47	57·11	56·10	53·90	51·30
31	48·93		47·65		49·46		54·56	56·55		56·07		51·21
Means.	49·56	48·46	47·72	47·93	48·56	50·68	53·22	55·54	56·94	56·76	55·02	52·43

The mean of the twelve monthly values is 51°·90.

(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 Noon on every Day of the Year.

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	47·90	47·08	46·73	47·60	48·40	53·60	56·80	59·51	61·53	60·35	55·60	50·86
2	47·82	47·01	46·68	47·60	48·43	53·69	56·99	59·58	61·50	60·21	55·50	50·69
3	47·79	47·08	46·53	47·62	48·46	53·74	57·22	59·51	61·41	60·10	55·31	50·54
4	47·67	47·13	46·44	47·68	48·52	53·78	57·45	59·61	61·25	59·99	55·27	50·31
5	47·58	47·18	46·33	47·80	48·60	53·90	57·60	59·79	61·25	59·83	55·22	50·16
6	47·55	47·11	46·29	47·98	48·69	53·91	57·76	59·91	61·18	59·70	55·09	50·06
7	47·56	47·10	46·24	48·16	48·79	54·00	58·02	60·06	61·03	59·54	55·07	49·96
8	47·60	47·09	46·22	48·32	48·88	54·03	58·28	60·19	61·00	59·38	54·94	49·88
9	47·54	47·09	46·20	48·50	48·95	54·00	58·47	60·29	60·82	59·16	54·90	49·81
10	47·67	47·08	46·22	48·58	49·08	54·03	58·52	60·36	60·70	58·92	54·83	49·85
11	47·68	47·06	46·10	48·68	49·19	54·06	58·72	60·62	60·59	58·80	54·72	49·90
12	47·68	47·07	46·17	48·76	49·34	54·05	58·88	60·71	60·52	58·67	54·64	49·85
13	47·69	47·04	46·19	48·81	49·57	54·02	59·13	60·94	60·51	58·42	54·54	49·89
14	47·65	47·02	46·23	48·88	49·85	54·05	59·18	61·08	60·47	58·21	54·47	49·84
15	47·58	46·99	46·30	48·93	50·16	54·13	59·22	61·26	60·52	57·94	54·33	49·82

(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 Noon on every Day of the Year—*concluded.*

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
16	47·49	46·98	46·40	48·91	50·50	54·29	59·29	61·44	60·58	57·70	54·21	49·83
17	47·44	47·01	46·51	48·90	50·78	54·50	59·37	61·61	60·61	57·46	54·10	49·85
18	47·42	47·03	46·70	48·90	50·97	54·69	59·46	61·69	60·71	57·28	53·90	49·86
19	47·40	46·99	46·88	48·89	51·25	54·88	59·48	61·70	60·63	57·13	53·69	49·78
20	47·38	46·92	47·08	48·87	51·50	55·00	59·54	61·80	60·76	57·00	53·48	49·59
21	47·36	46·83	47·27	48·80	51·79	55·11	59·56	61·85	60·88	56·92	53·22	49·42
22	47·35	46·80	47·47	48·76	51·99	55·25	59·61	61·98	60·86	56·91	53·00	49·31
23	47·35	46·80	47·50	48·70	52·16	55·38	59·56	62·01	60·90	56·79	52·79	49·19
24	47·31	46·80	47·64	48·66	52·32	55·50	59·52	62·03	60·92	56·70	52·52	49·06
25	47·39	46·85	47·68	48·60	52·40	55·63	59·54	61·90	60·90	56·58	52·29	48·91
26	47·49	46·90	47·73	48·53	52·68	55·83	59·58	61·90	60·89	56·50	52·05	48·79
27	47·36	46·87	47·71	48·47	52·88	56·07	59·54	61·90	60·79	56·31	51·81	48·64
28	47·33	46·84	47·72	48·42	53·03	56·20	59·57	61·88	60·70	56·26	51·54	48·50
29	47·30	46·80	47·70	48·40	53·21	56·36	59·51	61·88	60·59	56·02	51·27	48·34
30	47·20		47·68	48·41	53·40	56·58	59·51	61·80	60·44	55·91	51·01	48·20
31	47·10		47·62		53·60		59·51	61·70		55·78		48·03
Means	47·50	46·98	46·84	48·47	50·62	54·68	58·85	61·05	60·85	57·95	53·84	49·57

The mean of the twelve monthly values is 53°·10.

(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 Noon on every Day of the Year.

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	44·00	44·63	43·26	45·80	47·04	55·86	61·29	61·93	62·93	60·27	52·78	45·29
2	43·70	44·90	43·03	46·23	47·26	55·90	61·61	62·51	62·99	60·00	52·90	45·00
3	43·52	44·80	42·90	46·97	47·51	56·03	62·00	62·92	62·80	59·62	52·95	44·92
4	43·70	44·30	42·71	47·62	47·93	56·11	62·29	63·27	62·49	59·31	52·90	45·30
5	44·12	44·21	42·99	48·11	48·13	56·15	62·73	63·35	62·20	58·82	52·65	45·62
6	44·54	44·39	43·22	48·52	48·32	55·80	63·12	63·35	61·62	58·42	52·70	45·57
7	44·82	44·49	43·23	48·60	48·33	55·40	63·12	63·60	61·20	58·20	52·96	45·93
8	44·92	44·30	43·31	48·65	48·49	55·10	63·19	64·01	60·93	58·04	52·90	46·37
9	44·72	44·26	43·41	48·60	48·74	54·90	63·41	64·58	60·81	57·87	52·61	46·78
10	44·83	44·43	43·53	48·62	49·41	54·81	63·67	64·98	60·91	57·31	52·38	46·73
11	44·96	44·51	43·69	48·69	50·29	54·80	63·89	65·51	61·29	56·82	52·34	46·89
12	44·81	44·28	43·77	48·61	51·23	55·01	63·56	65·78	61·51	55·92	52·22	46·41
13	44·41	44·19	43·84	48·53	52·20	55·60	63·50	66·22	61·78	55·31	52·00	46·51
14	44·07	44·32	44·23	48·27	52·91	56·30	63·23	66·27	61·86	54·81	51·82	46·81
15	44·09	44·58	44·81	48·08	53·20	57·04	63·25	66·19	62·10	54·42	51·50	47·20
16	44·27	44·76	45·48	47·99	53·38	57·50	63·30	66·05	62·26	54·42	50·81	47·14
17	44·29	44·37	46·10	47·90	53·74	57·69	63·28	65·91	62·62	54·68	50·27	46·62
18	44·21	44·02	46·60	47·62	54·25	57·59	63·19	65·99	63·19	54·90	49·70	46·18
19	44·20	43·72	47·10	47·30	54·68	57·60	62·89	66·00	63·24	55·16	49·27	45·58
20	44·26	43·62	47·40	47·10	54·70	57·61	62·66	65·90	63·40	55·18	48·92	45·19

(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 Noon on every Day of the Year—*concluded.*

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
21	44·31	43·91	47·40	46·99	54·64	57·89	62·45	65·49	63·30	55·13	48·60	45·01
22	44·51	44·34	47·18	46·97	54·69	58·22	62·44	65·40	63·03	55·04	48·20	44·87
23	44·73	44·59	47·00	46·81	55·00	58·57	62·33	65·21	62·82	54·81	47·71	44·61
24	45·10	44·64	46·81	46·72	55·50	58·90	62·40	65·38	62·40	54·50	47·27	44·40
25	45·03	44·63	46·72	46·60	55·87	59·20	62·30	65·39	61·92	54·20	46·75	44·13
26	44·70	44·47	46·49	46·54	56·32	59·62	62·05	65·31	61·56	53·85	46·20	43·86
27	44·34	44·18	46·20	46·43	56·35	59·88	61·70	64·59	61·23	53·65	45·81	43·60
28	44·09	43·90	45·92	46·59	56·36	60·32	61·49	64·00	61·00	53·42	45·73	43·40
29	43·70	43·52	45·70	46·72	56·38	60·70	61·34	63·50	60·72	53·28	45·78	43·23
30	43·68		45·57	46·80	56·19	61·06	61·45	63·23	60·60	52·97	45·61	43·11
31	44·21		45·59		55·90		61·64	63·05		52·71		42·99
Means.	44·35	44·32	45·01	47·50	52·42	57·24	62·61	64·67	62·02	55·90	50·14	45·33
The mean of the twelve monthly values is 52°·63.												

(V.)—Reading of a Thermometer whose bulb is sunk to the depth of 1 inch below the surface of the soil, at Noon on every Day of the Year.

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	38·0	45·7	38·0	49·3	48·1	55·9	67·8	67·5	62·2	57·2	50·0	36·8
2	39·2	43·0	39·8	52·3	49·5	59·4	67·0	70·0	62·0	56·0	53·6	39·0
3	43·2	38·0	38·8	53·7	51·0	59·2	68·2	65·9	58·0	55·4	49·0	47·1
4	45·0	43·1	43·1	51·9	49·3	57·1	71·2	64·3	57·0	54·0	49·0	45·0
5	45·0	44·0	42·2	51·3	50·0	57·8	71·4	65·6	57·0	53·1	52·0	42·1
6	46·4	43·9	41·7	51·7	48·1	52·8	66·8	66·3	57·0	55·3	51·8	47·2
7	44·1	40·8	41·5	49·0	49·2	53·9	66·8	69·0	57·8	56·0	53·6	47·0
8	41·7	41·8	42·2	49·0	52·2	55·3	70·1	72·0	59·3	55·2	48·0	48·0
9	44·7	45·1	42·2	50·0	53·1	52·2	72·6	72·3	61·9	51·2	50·0	43·0
10	45·1	43·9	43·3	48·3	56·1	55·4	67·9	70·0	62·9	48·2	50·6	43·0
11	44·0	41·8	41·9	47·8	59·6	58·9	66·0	73·7	62·7	46·0	49·1	45·9
12	40·1	43·6	43·2	48·3	60·0	61·1	65·4	72·9	63·3	48·2	48·3	43·6
13	40·9	45·0	46·0	45·9	58·0	62·2	67·9	71·6	63·0	45·9	47·9	48·1
14	42·1	46·0	48·3	46·2	57·3	63·0	66·7	68·1	64·0	48·8	46·3	49·0
15	44·0	44·0	50·0	46·8	55·8	62·0	66·2	65·9	64·9	50·9	43·2	45·8
16	40·7	39·9	50·5	46·7	59·0	61·2	65·8	68·0	66·5	54·2	42·0	41·2
17	41·3	40·0	51·0	44·1	60·5	59·9	65·1	69·8	68·0	55·0	42·6	40·8
18	42·1	39·7	51·9	43·8	58·2	58·8	64·0	68·8	70·3	55·0	43·1	39·3
19	43·1	42·1	50·2	43·9	58·0	60·9	61·2	67·4	64·3	54·2	42·3	41·3
20	43·0	45·1	47·8	44·5	55·9	61·0	63·2	64·9	64·1	52·0	42·1	40·9
21	44·5	44·1	45·8	45·2	57·9	62·1	64·2	65·9	64·0	51·8	42·1	39·2
22	45·9	45·7	45·1	44·3	59·0	62·9	65·0	66·2	61·1	52·0	39·6	39·7
23	48·7	44·3	45·0	44·0	60·9	63·4	64·0	68·1	59·3	49·5	40·0	39·1
24	42·1	44·0	46·0	44·0	62·9	63·0	63·0	69·2	59·0	49·9	38·0	39·0
25	42·9	42·1	44·1	44·2	58·9	63·0	61·2	67·6	58·1	47·4	35·3	38·1

(V.)—Reading of a Thermometer whose bulb is sunk to the depth of ·1 inch below the surface of the soil, at Noon on every Day of the Year—*concluded.*

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
26	41·8	41·3	43·7	48·2	60·0	63·4	60·6	60·8	59·8	50·4	37·7	37·4
27	39·1	40·1	42·3	45·8	59·9	66·8	60·0	60·0	58·5	46·8	42·1	37·9
28	39·3	39·5	43·1	47·9	56·9	67·9	61·8	62·4	60·1	54·7	42·1	38·2
29	43·8	39·1	43·1	46·4	55·5	66·0	62·7	60·1	60·9	46·0	38·7	38·1
30	48·1		44·3	49·0	57·2	65·1	64·7	62·3	55·9	49·4	36·7	37·0
31	47·1		47·1		56·4		65·9	65·0		52·8		35·9
Means.	43·1	42·6	44·6	47·5	55·9	60·4	65·6	67·1	61·4	51·7	44·9	41·7

The mean of the twelve monthly values is 52°·21.

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

1884.												
Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	35·3	47·3	41·2	60·1	56·4	59·3	75·2	77·8	61·4	60·6	52·1	35·5
2	39·4	39·2	44·2	64·5	55·6	67·3	72·7	83·3	66·5	58·9	58·2	42·0
3	49·2	36·6	40·3	63·7	55·9	61·3	80·1	69·1	65·6	57·2	49·9	54·0
4	47·8	47·2	46·4	59·1	55·9	57·0	83·0	69·0	55·1	59·6	53·5	45·9
5	47·1	44·9	47·8	55·3	55·5	60·3	77·9	73·8	61·0	54·8	59·4	45·1
6	50·4	44·0	48·1	58·6	53·8	52·0	69·4	74·9	60·8	58·0	51·2	53·0
7	44·8	40·4	48·2	49·3	57·0	55·9	73·5	81·1	58·4	58·9	60·4	51·8
8	42·6	42·0	47·8	51·9	61·3	57·9	81·6	85·1	63·8	58·8	51·8	48·2
9	47·6	50·0	44·9	55·4	60·9	51·2	83·1	83·5	67·5	52·1	54·6	40·1
10	49·3	46·7	45·8	49·6	69·2	61·0	69·7	75·6	68·4	42·1	52·8	45·1
11	46·8	44·8	42·5	48·8	74·1	69·0	70·9	87·8	70·5	44·2	50·1	48·5
12	40·6	48·1	50·2	50·3	72·9	72·0	66·3	79·4	70·7	48·4	48·5	45·4
13	43·4	52·9	53·5	47·6	62·1	72·8	79·4	78·8	73·2	49·2	47·5	52·8
14	44·6	48·7	58·2	49·3	61·4	69·6	73·4	73·6	68·5	54·3	45·8	51·5
15	47·5	43·0	64·2	47·9	57·5	65·5	68·9	71·6	74·6	54·2	43·4	45·3
16	42·0	39·2	64·7	47·1	67·6	60·0	68·9	78·0	74·1	58·4	39·9	40·9
17	40·2	40·9	65·5	45·0	71·3	64·2	68·1	79·1	78·4	58·3	42·6	38·8
18	43·7	43·3	61·9	44·0	60·1	59·0	68·2	74·8	80·1	58·0	44·0	39·9
19	46·2	48·2	56·2	45·3	63·4	67·5	62·2	70·8	67·0	59·6	44·4	43·3
20	46·3	51·6	50·2	46·7	62·8	65·1	68·4	70·9	70·5	51·7	42·2	38·1
21	49·2	46·9	50·1	47·6	69·8	68·4	67·8	69·5	70·7	52·5	42·0	40·1
22	49·7	50·7	49·7	48·2	70·8	69·6	73·3	76·3	62·0	56·7	38·5	40·1
23	51·9	48·1	48·5	49·5	74·3	68·7	67·2	79·0	59·9	53·6	40·5	37·7
24	41·2	46·2	49·5	49·3	77·2	69·3	65·1	81·7	61·8	50·9	36·6	38·6
25	45·9	45·7	46·3	48·1	55·8	64·7	63·8	67·3	60·9	49·3	31·4	39·3
26	42·0	44·1	42·0	56·4	67·8	71·9	64·2	62·3	63·3	53·3	36·9	36·0
27	38·2	43·2	41·4	48·6	69·8	75·9	61·1	59·8	61·4	49·7	45·2	37·0
28	41·8	40·2	42·5	50·0	56·4	78·4	67·5	66·3	65·4	60·6	43·3	37·1
29	52·3	40·6	44·2	56·6	54·7	69·1	65·7	62·5	63·9	49·1	37·4	36·2
30	54·2		48·2	60·1	65·9	70·8	69·9	66·4	59·3	55·0	34·8	34·9
31	50·8		51·4		58·3		74·7	68·9		58·0		35·3
Means.	45·5	45·0	49·5	51·8	63·1	65·2	71·0	74·1	66·2	54·4	46·0	42·5

The mean of the twelve monthly values is 56°·19.

ABSTRACT of the CHANGES of the DIRECTION of the WIND, as derived from the Records of OSLER'S ANEMOMETER in the Year 1884.

(It is to be understood that the direction of the wind was nearly constant in the intervals between the times given in the second column and those next following in the first column.)

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
				°	°
January.					
d h	d h				
	0. 12		E.		
1. 21	2. 8	E.	S.E.	45	
2. 15	2. 22	S.E.	S.W.	90	
3. 15	3. 18	S.W.	S.S.E.		67½
3. 19	3. 21	S.S.E.	S.S.W.	45	
4. 6½	4. 7	S.S.W.	S.S.E.		45
4. 22	5. 13	S.S.E.	W.S.W.	90	
7. 6	7. 7	W.S.W.	N.N.W.	90	
7. 7½	7. 23½	N.N.W.	S.S.W.		135
8. 3	8. 6	S.S.W.	W.S.W.	45	
9. 4	9. 19	W.S.W.	S.S.W.		45
9. 20	9. 23	S.S.W.	W.S.W.	45	
10. 0	10. 5	W.S.W.	S.S.W.		45
10. 9	11. 3	S.S.W.	W.	67½	
11. 16	11. 19	W.	N.W.	45	
12. 3	12. 10½	N.W.	W.S.W.		67½
14. 4	14. 12	W.S.W.	N.N.W.	90	
14. 16	14. 21	N.N.W.	W.S.W.		90
14. 23	15. 4	W.S.W.	N.N.W.	90	
15. 14	15. 16	N.N.W.	W.		67½
15. 23	16. 6	W.	S.W.		45
16. 20	17. 15	S.W.	N.N.W.	112½	
17. 16	17. 18	N.N.W.	S.S.W.	225	
18. 8	18. 12	S.S.W.	W.S.W.	45	
18. 15	19. 10	W.S.W.	S.		67½
19. 12	19. 17	S.	S.W.	45	
23. 3	23. 12	S.W.	W.	45	
24. 1	24. 7	W.	S.W.		45
25. 15	25. 19	S.W.	W.N.W.	67½	
25. 20	25. 23	W.N.W.	S.W.		67½
26. 7½	26. 8	S.W.	W.	45	
28. 6	28. 11	W.	S.W.		45
28. 12	28. 16	S.W.	E.		135
28. 16	28. 20	E.	W.	180	
30. 6	30. 17	W.	S.S.E.		112½
30. 18	30. 19	S.S.E.	S.W.	67½	
			Sums	1575	1080
February.					
1. 9	1. 18	S.W.	N.E.		180
2. 3	2. 16	N.E.	N.		45
2. 16	2. 19	N.	W.S.W.		112½
6. 3	6. 9	W.S.W.	S.S.W.		45
6. 18	6. 21	S.S.W.	E.		112½
7. 0	7. 1	E.	S.	90	
7. 1¾	7. 3	S.	E.N.E.		112½
7. 4	7. 6	E.N.E.	E.S.E.	45	
7. 9	7. 11	E.S.E.	E.N.E.		45
7. 15	7. 19	E.N.E.	S.	112½	
8. 11¾	8. 14	S.	S.W.	45	
9. 6	9. 12	S.W.	W.	45	
9. 17	9. 20	W.	S.W.		45

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
				°	°
Feb.—*cont.*					
d h	d h				
12. 2	12. 6	S.W.	S.		45
13. 14	14. 1	S.	N.E.	225	
14. 10	14. 20	N.E.	E.S.E.	67½	
18. 19	19. 0	E.S.E.	S.W.	112½	
22. 4	22. 8	S.W.	S.S.E.		67½
22. 11	22. 13	S.S.E.	W.S.W.	90	
23. 17	24. 2	W.S.W.	N.N.W.	90	
24. 4	24. 11	N.N.W.	W.S.W.		90
24. 15	24. 23	W.S.W.	N.W.	67½	
25. 3	25. 14	N.W.	W.S.W.		67½
25. 20¾	25. 21	W.S.W.	N.	112½	
26. 3	26. 10	N.	S.	180	
26. 11½	26. 12	S.	N.E.		135
26. 17	27. 0	N.E.	S.E.	90	
27. 3	27. 4	S.E.	E.S.E.		22½
28. 2	28. 10	E.S.E.	N.E.		67½
28. 23	29. 4	N.E.	E.S.E.	67½	
29. 10	29. 11	E.S.E.	N.E.		67½
			Sums	1440	1260
March.					
1. 6	1. 11	N.E.	N.		45
2. 8	2. 9	N.	S.S.E.	157½	
4. 3	4. 11	S.S.E.	W.S.W.	90	
4. 19	5. 0	W.S.W.	N.W.	67½	
5. 7½	5. 8½	N.W.	S.W.		90
5. 21	6. 5	S.W.	S.W.	360	
7. 5	7. 14	S.W.	S.W	360	
7. 14¼	7. 14¾	S.W.	S.S.E.		67½
7. 21	7. 23	S.S.E.	S.S.W.	45	
8. 17	8. 22	S.S.W.	W.N.W.	90	
9. 1	9. 12	W.N.W.	S.E.		157½
9. 12	9. 14	S.E.	S.S.E.	22½	
9. 17	9. 19	S.S.E.	S.W.	67½	
10. 5	10. 14½	S.W.	E.N.E.		157½
10. 16¾	10. 17	E.N.E.	N.		67½
11. 4	11. 4½	N.	S.S.E.	157½	
11. 20	11. 22	S.S.E.	S.S.W.	45	
14. 4	14. 9	S.S.W.	S.S.E.		45
15. 12	15. 13	S.S.E.	E.N.E.		90
15. 19¾	15. 23	E.N.E.	S.	112½	
16. 6	16. 9	S.	E.N.E.		112½
16. 10	16. 12	E.N.E.	S.S.E.	90	
16. 21	17. 5	S.S.E.	S.W.	67½	
19. 13	19. 23	S.W.	W.	45	
20. 16	20. 22	W.	N.N.W.	67½	
21. 2	21. 6	N.N.W.	W.N.W.		45
21. 14	21. 15	W.N.W.	W.S.W.		45
22. 15	22. 21	W.S.W.	N.	112½	
23. 5	23. 12	N.	N.	360	
23. 21	24. 2	N.	N.E.	45	

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
				°	°
Mar.—*cont.*					
d h	d h				
24. 5	24. 6	N.E.	E.S.E.	67½	
24. 9½	24. 17	E.S.E.	N.N.E.		90
24. 20	24. 23	N.N.E.	E.N.E.	45	
27. 23	28. 0	E.N.E.	S.E.	67½	
28. 0	28. 11	S.E.	E.N.E.		67½
29. 11	29. 14	E.N.E.	N.		67½
30. 5	30. 7	N.	S.	180	
30. 23	31. 1	S.	S.W.	45	
31. 6	31. 12	S.W.	S.S.E.		67½
			Sums	2767½	1215
April					
0. 14	0. 22	S.S.E.	S.S.W.	45	
1. 3	1. 18	S.S.W.	S.E.		67½
1. 19	2. 0	S.E.	S.	45	
2. 11	2. 18	S.	N.E.		135
2. 19	2. 22	N.E.	S.E.	90	
3. 3	3. 9	S.E.	S.W.	90	
3. 13	3. 17	S.W.	S.S.E.		67½
4. 1	4. 7	S.S.E.	E.S.E.		45
4. 8	4. 13	E.S.E.	S.	67½	
4. 22	5. 1	S.	S.E.		45
5. 3	5. 5	S.E.	S.S.W.	67½	
6. 4	6. 8	S.S.W.	N.		202½
6. 17	6. 21	N.	N.W.		45
7. 7	7. 9	N.W.	S.W.		90
7. 9	7. 11	S.W.	W.	45	
7. 23	8. 3	W.	S.S.E.	247½	
8. 5	8. 17	S.S.E.	N.E.		112½
8. 19	9. 5	N.E.	E.S.E.	67½	
9. 7	9. 12	E.S.E.	N.		112½
9. 21	10. 21	N.	N.E.	45	
11. 4	11. 13	N.E.	S.E.	90	
11. 15	11. 18	S.E.	N.E.	270	
12. 12	12. 15	N.E.	N.		45
12. 22	13. 5	N.	E.	90	
13. 8	13. 11	E.	N.N.E.		67½
15. 19	16. 4	N.N.E.	E.S.E.	90	
16. 5	16. 11	E.S.E.	N.E.		67½
19. 3	19. 7	N.E.	E.	45	
19. 8	19. 10	E.	N.E.		45
20. 7	20. 8	N.E.	E.N.E.	22½	
20. 10	20. 19	E.N.E.	N.		67½
20. 21	20. 23	N.	E.N.E.	67½	
21. 7	21. 13	E.N.E.	N.N.E.		45
21. 18	22. 0	N.N.E.	E.N.E.	45	
22. 10	22. 17	E.N.E.	N.N.W.		90
22, 18	23. 0	N.N.W.	E.N.E.	90	
23. 10	23. 15	E.N.E.	N.N.E.		45
24. 19	25. 10	N.N.E.	S.E.	112½	
25. 20	26. 0	S.E.	W.S.W.	112½	

ABSTRACT of the CHANGES of the DIRECTION of the WIND—*continued.*

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
				°	°
April—*cont.*					
d h	d h				
26. 2	26. 8	W.S.W.	S.		67½
26. 17	26. 19	S.	E.		90
27. 2	27. 6	E.	S.W.	135	
27. 8	27. 16	S.W.	S.E.		90
27. 23	28. 0	S.E.	S.W.	90	
28. 3	28. 9	S.W.	S.		45
28. 17	28. 19	S.	N.N.E.		157½
28. 20	28. 23½	N.N.E.	S.S.E.	135	
29. 0½	29. 5¼	S.S.E.	E.S.E.	315	
29. 8	29. 14	E.S.E.	W.S.W.	135	
30. 6	30. 7½	W.S.W.	N.N.W.	90	
30. 9	30. 12	N.N.W.	W.S.W.		90
			Sums	2745	1935
May.					
0. 19	1. 1	W.S.W.	S.W.		22½
1. 9	1. 19	S.W.	W.	45	
1. 21	2. 2	W.	S.W.		45
5. 6	5. 20	S.W.	N.W.	90	
6. 4	6. 6	N.W.	N.N.E.	67½	
6. 8	6. 9	N.N.E.	E.		292½
6. 9	6. 13	E.	S.W.	135	
10. 7	10. 12	S.W.	E.N.E.		157½
10. 13	10. 20	E.N.E.	S.	112½	
11. 4	11. 13	S.	W.S.W.	67½	
11. 17	11. 18	W.S.W.	N.	112½	
11. 22	12. 1	N.	E.N.E.	67½	
12. 2	12. 6	E.N.E.	E.S.E.	45	
12. 7	12. 12	E.S.E.	N.N.W.		135
12. 14	13. 0	N.N.W.	E.S.E.	135	
13. 6	13. 7	E.S.E.	S.S.W.	90	
13. 18	14. 5	S.S.W.	W.N.W.	90	
14. 11	14. 12	W.N.W.	W.S.W.		45
16. 13	16. 17	W.S.W.	S.S.W.		45
16. 23	17. 20	S.S.W.	N.N.W.	135	
18. 1	18. 2	N.N.W.	W.		67½
18. 2	18. 8	W.	S.S.E.	247½	
18. 10	18. 12	S.S.E.	E.		67½
18. 13	18. 14	E.	S.E.	45	
18. 16	18. 18	S.E.	N.E.		90
18. 22	19. 0	N.E.	E.	45	
19. 11	19. 15	E.	N.N.E.		67½
19. 19	19. 22	N.N.E.	W.	247½	
20. 5	20. 6	W.	S.W.		45
20. 12	20. 15	S.W.	E.S.E.	247½	
20. 21	20. 22	E.S.E.	S.S.W.	90	
21. 2	21. 2¼	S.S.W.	S.S.E.	315	
21. 12	21. 14	S.S.E.	E.N.E.		90
21. 22	21. 23	E.N.E.	E.	22½	
22. 5	22. 6	E.	E.N.E.		22½
23. 3	23. 4	E.N.E.	E.S.E.	45	
23. 7	23. 14	E.S.E.	N.E.		67½
23. 20	23. 23	N.E.	E.	45	
24. 12	24. 13	E.	E.N.E.		22½
May—*cont.*					
d h	d h				
25. 11	25. 16	E.N.E.	N.N.E.		45
25. 17	26. 0	N.N.E.	E.S.E.	90	
26. 1	26. 12	E.S.E.	N.E.		67½
26. 19	27. 3½	N.E.	E.S.E.	67½	
27. 8	27. 14	E.S.E.	N.E.		67½
30. 21	31. 12	N.E.	N.		45
			Sums	2700	1507½
June.					
0. 18	0. 21	N.	S.E.		225
0. 23	0. 23½	S.E.	S.W.	90	
1. 5	1. 22	S.W.	S.E.		90
2. 3	2. 16	S.E.	N.E.		90
2. 17	3. 4	N.E.	E.	45	
3. 9	3. 12	E.	N.N.E.		67½
3. 23	4. 4	N.N.E.	S.W.		157½
4. 19	4. 21	S.W.	N.	135	
5. 1	5. 6	N.	S.S.W.	202½	
5. 16	5. 19	S.S.W.	W.N.W.	90	
5. 20	6. 1	W.N.W.	S.S.W.		90
6. 4	6. 6	S.S.W.	S.E.	292½	
6. 6	6. 8	S.E.	S.	45	
6. 11	6. 14	S.	E.N.E.		112½
7. 1	7. 9	E.N.E.	N.N.W.		90
9. 2	9. 4	N.N.W.	N.	22½	
10. 2	10. 13	N.	W.S.W.	247½	
11. 2	11. 8	W.S.W.	S.S.W.		45
11. 10	11. 13	S.S.W.	W.S.W.	45	
11. 19	11. 21	W.S.W.	N.E.	157½	
12. 5	12. 7	N.E.	E.S.E.	67½	
12. 10	12. 11	E.S.E.	E.		22½
12. 19	12. 21	E.	S.S.W.	112½	
13. 1	13. 1¾	S.S.W.	E.N.E.		135
13. 2	13. 6	E.N.E.	S.S.E.	90	
13. 10	13. 11¼	S.S.E.	N.	202½	
13. 19	14. 7	N.	N.E.	45	
14. 11	14. 18	N.E.	N.		45
15. 4	15. 8	N.	N.E.	45	
15. 12	15. 14	N.E.	N.		45
15. 16	15. 17	N.	W.S.W.	247½	
15. 22	16. 3	W.S.W.	N.N.E.	135	
16. 14	16. 17	N.N.E.	N.		22½
17. 11	17. 12	N.	N.N.E.	22½	
18. 3	18. 4	N.N.E.	N.E.	22½	
18. 12	18. 13	N.E.	N.		45
19. 2	19. 8	N.	E.	90	
19. 18	19. 22	E.	S.E.	45	
19. 23	20. 0	S.E.	N.E.	270	
20. 3¾	20. 4¼	N.E.	E.S.E.		292½
20. 12	20. 13	E.S.E.	N.E.		67½
21. 1	21. 2	N.E.	N.		45
21. 5	21. 7	N.	N.E.	45	
21. 10	21. 13	N.E.	W.S.W.	202½	
21. 18	21. 20	W.S.W.	N.	112½	
June—*cont.*					
d h	d h				
22. 6¾	22. 11	N.	N.	360	
22. 13¾	22. 14	N.	W.S.W.		112½
22. 16	22. 19	W.S.W.	N.	112½	
23. 0	23. 1	N.	N.W.		45
23. 6	23. 12	N.W.	N.	45	
23. 20	23. 23	N.	S.W.		135
24. 18	24. 22	S.W.	N.	135	
25. 9	25. 11	N.	N.E.	45	
25. 22	26. 3	N.E.	S.W.		180
26. 18	26. 20	S.W.	N.N.E.	157½	
26. 22½	27. 0	N.N.E.	E.S.E.	90	
27. 4	27. 10	E.S.E.	E.N.E.		45
28. 18	28. 21	E.N.E.	W.S.W.	180	
29. 21	29. 22	W.S.W.	W.	22½	
30. 3	30. 7	W.	S.W.		45
			Sums	4275	2250
July.					
0. 20	0. 21	S.W.	S.S.W.		22½
1. 2	1. 4	S.S.W.	W.S.W.	45	
2. 0	2. 1	W.S.W.	E.N.E.	180	
2. 9	2. 10	E.N.E.	W.S.W.	180	
2. 16	2. 17	W.S.W.	E.S.E.	225	
2. 18½	2. 19	E.S.E.	E.N.E.		45
2. 23	2. 23½	E.N.E.	E.S.E.	45	
3. 4	3. 5	E.S.E.	S.S.W.	90	
3. 6	3. 7	S.S.W.	W.	67½	
3. 7	3. 8	W.	S.E.		135
3. 11	3. 13	S.E.	S.E.	360	
3. 23	4. 12	S.E.	W.S.W.	112½	
4. 14	4. 17	W.S.W.	N.N.W.		270
4. 18½	4. 19	N.N.W.	S.S.E.		180
4. 21½	4. 22	S.S.E.	S.S.W.	45	
5. 4	5. 7	S.S.W.	W.S.W.	45	
5. 8	5. 10	W.S.W.	S.		67½
5. 19	5. 20	S.	S.W.	45	
6. 2	6. 4	S.W.	W.N.W.	67½	
6. 5	6. 9	W.N.W.	S.S.W.		90
7. 9	7. 11	S.S.W.	S.S.E.		45
7. 13	7. 15	S.S.E.	E.		67½
7. 15½	7. 17	E.	N.E.	315	
7. 22	8. 5	N.E.	S.W.	180	
8. 14	8. 15	S.W.	N.N.E.		202½
8. 21	9. 0	N.N.E.	S.S.W.		180
9. 10	9. 14	S.S.W.	E.S.E.		90
9. 20	9. 21	E.S.E.	S.S.W.	90	
11. 3	11. 8	S.S.W.	S.E.		67½
11. 8	11. 14	S.E.	S.S.W.	67½	
12. 6	12. 16	S.S.W.	E.S.E.		90
12. 23	13. 5	E.S.E.	S.W.	112½	
14. 10	14. 11	S.W.	S.S.W.		22½
15. 6	15. 11	S.S.W.	S.S.E.		45
15. 14	15. 22	S.S.E.	S.W.	67½	
16. 23	17. 0	S.W.	W.S.W.	22½	

ABSTRACT of the CHANGES of the DIRECTION of the WIND—*continued.*

Greenwich Mean Solar Time. From	To	Change of Direction. From	To	Amount of Motion. Direct.	Retrograde.
d h	d h			°	°
July—*cont.*					
18.18	18.23	W.S.W.	N.	112½	
19. 5	19.13	N.	W.S.W.	247½	
19.19	19.20	W.S.W.	N.N.W.	90	
20. 0	20. 8	N.N.W.	S.S.W.	225	
20.20	21. 7	S.S.W.	N.N.W.	135	
21.11	21.15	N.N.W.	W.S.W.		90
21.17	21.20	W.S.W.	N.	112½	
22. 3	22. 5	N.	S.W.		135
23. 5	23. 9	S.W.	W.S.W.	22½	
24.18	24.21	W.S.W.	N.	112½	
25.11	25.14	N.	W.S.W.		112½
26. 1	26. 8	W.S.W.	S.S.W.		45
26.13	26.19	S.S.W.	W.	67½	
26.23	27. 0	W.	N.	90	
28. 3	28. 5	N.	W.N.W.		67½
28. 8	28.14	W.N.W.	S.S.W.		90
28.15	29. 4	S.S.W.	N.	157½	
29.11	29.14	N.	E.N.E.	67½	
29.19¾	29.21	E.N.E.	S.W.	157½	
29.23	30. 4	S.W.	S.E.	270	
30. 8	30.12	S.E.	S.W.	90	
31.10	31.12	S.W.	N.W.	90	
			Sums	4410	2160
August.					
0.13	0.15	N.W.	S.W.		90
0.16	0.20	S.W.	E.S.E.	247½	
1.18	2. 5	E.S.E.	W.N.W.	180	
2.12	2.13	W.N.W.	W.S.W.		45
3.20	4.11	W.S.W.	N.E.	157½	
4.16	4.20	N.E.	S.W.	180	
4.23	5. 3	S.W.	E.S.E.		112½
5.11	5.13	E.S.E.	E.N.E.		45
5.18	5.22	E.N.E.	E.S.E.	45	
6. 7	6.13	E.S.E.	N.E.		67½
7. 0	7. 7	N.E.	E.S.E.	67½	
7.10	7.14	E.S.E.	N.E.		67½
7.21	7.23	N.E.	E.S.E.	67½	
8.13	8.14½	E.S.E.	N.E.		67½
8.21	8.23	N.E.	E.	45	
9.19	9.20	E.	W.N.W.	202½	
9.21	9.23	W.N.W.	E.N.E.	135	
10. 1	10. 9	E.N.E.	S.E.	67½	
10.11	10.12	S.E.	E.		45
10.18	10.22	E.	S.S.W.	112½	
11.14	11.18	S.S.W.	W.S.W.	45	
12. 0¾	12. 2	W.S.W.	N.N.E.	135	
12. 2	12. 3	N.N.E.	S.W.		157½
13.12	13.19	S.W.	W.N.W.	67½	
14. 9	14.12	W.N.W.	W.S.W.		45
15. 4	15. 7	W.S.W.	S.W.		22½
16. 2	16. 3	S.W.	S.		45
16.14	16.15	S.	N.E.		135
16.20½	16.21	N.E.	S.E.	90	

Greenwich Mean Solar Time. From	To	Change of Direction. From	To	Amount of Motion. Direct.	Retrograde.
d h	d h			°	°
Aug.—*cont.*					
16.21¾	16.22½	S.E.	S.S.W.		292½
17.11	17.14	S.S.W.	W.S.W.	45	
18.16	18.18	W.S.W.	S.S.W.		45
18.19	18.20	S.S.W.	S.W.	22½	
19. 7	19. 9	S.W.	W.S.W.	22½	
19.17	19.18	W.S.W.	N.	112½	
20. 5	20. 8	N.	S.E.	135	
20.13	20.17	S.E.	W.S.W.	112½	
21. 0	21. 3	W.S.W.	N.N.E.	135	
21. 5	21. 8	N.N.E.	S.S.W.	180	
21.12	21.18	S.S.W.	N.N.E.		180
21.20	21.21	N.N.E.	E.	67½	
22.12	22.21	E.	N.E.		45
22.22	22.23	N.E.	E.	45	
23.19	23.20	E.	N.E.		45
23.21	23.21½	N.E.	S.	135	
24.10	24.14	S.	W.S.W.		292½
24.18	24.19	W.S.W.	N.	112½	
26. 7	26.17	N.	W.		90
26.23	27.12	W.	S.E.		135
27.14	27.22	S.E.	W.	135	
28. 3	28. 5	W.	S.W.		45
28.17	28.21	S.W.	W.	45	
29. 4	29. 8	W.	S.W.		45
31. 5	31.12	S.W.	S.S.W.		22½
			Sums	3150	2182½
September.					
0.23	1. 0	S.S.W.	S.W.	22½	
1. 3	1.14	S.W.	S.		45
1.17	1.19	S.	S.W.	45	
2. 6	2.12	S.W.	S.		45
2.23	3. 0	S.	N.W.	135	
3. 0	3. 2	N.W.	S.		135
3. 6	4. 0	S.	N.W.		225
4. 6	4.14	N.W.	W.S.W.		67½
4.17	4.20	W.S.W.	W.	22½	
5. 5	5.20	W.	S.E.		135
5.21	6.10	S.E.	S.W.	90	
6.16	7. 1	S.W.	W.N.W.	67½	
7. 5	7.10	W.N.W.	W.S.W.		45
8. 1	8. 4	W.S.W.	S.W.		22½
8. 7	8.18	S.W.	W.	45	
9.11	9.13	W.	E.	180	
10.10	10.14	E.	N.N.E.		67½
10.21	11. 6	N.N.E.	E.	67½	
11. 8	11.11	E.	N.N.E.		67½
11.20	12. 0	N.N.E.	E.N.E.	45	
14.21	15.14	E.N.E.	S.E.	67½	
15.16	15.18	S.E.	S.	45	
16. 2	16. 7	S.	E.		90
16.21	16.22	E.	N.E.		45
16.23	17. 0	N.E.	S.S.E.	112½	
17. 9	17.13	S.S.E.	N.N.E.	225	

Greenwich Mean Solar Time. From	To	Change of Direction. From	To	Amount of Motion. Direct.	Retrograde.
d h	d h			°	°
Sept.—*cont.*					
17.18	18. 0	N.N.E.	E.	67½	
18. 4	18. 6	E.	S.E.	45	
18. 7	18. 9	S.E.	E.		45
18.12	18.14	E.	N.E.		45
18.18	19. 3	N.E.	E.	45	
20.17	20.22	E.	S.S.W.	112½	
21.13	21.18	S.S.W.	N.N.W.	135	
21.19	22. 7	N.N.W.	W.S.W.		90
23. 6	23.16	W.S.W.	S.		67½
23.18	24.11	S.	W.S.W.	67½	
25. 4	25.17	W.S.W.	S.S.W.		45
25.20	26.12	S.S.W.	W.	67½	
26.12	26.14	W.	S.W.		45
28.22	29. 5	S.W.	N.E.	180	
29.10	29.16	N.E.	N.N.W.		67½
29.17	29.22	N.N.W.	S.E.		562½
30. 2	30.12	S.E.	S.S.W.	67½	
			Sums	1957½	1957½
October.					
0.14	1. 0	S.S.W.	W.N.W.	90	
1. 6	1. 7	W.N.W.	N.N.W.	45	
1. 7¾	1.10	N.N.W.	S.S.W.		135
1.14	1.17	S.S.W.	E.S.E.		90
1.20	1.21	E.S.E.	S.S.E.	45	
2. 2	2. 5	S.S.E.	S.W.	67½	
2.12	2.23	S.W.	N.W.	90	
3. 7	3. 8	N.W.	W.N.W.		22½
3.19	3.21	W.N.W.	N.	67½	
4.19	5. 0	N.	N.E.	45	
6. 0	6.10	N.E.	N.		45
7.12	7.13	N.	N.N.W.		22½
7.19	7.22	N.N.W.	S.S.W.		135
8. 8	8. 9	S.S.W.	W.N.W.	90	
8.10	8.18	W.N.W.	S.S.E.		135
8.21	8.22	S.S.E.	S.S.W.	45	
8.22	9. 0	S.S.W.	S.E.		67½
9. 3	9. 3½	S.E.	S.S.W.	67½	
9. 4	9.16	S.S.W.	N.N.W.		225
10. 0	10. 8	N.N.W.	W.N.W.		45
10. 9	10.11	W.N.W.	N.W.	22½	
11. 4	11. 8	N.W.	W.S.W.		67½
11.11	11.20	W.S.W.	N.	112½	
12. 1	12. 4	N.	N.N.W.		22½
12.23	13.10	N.N.W.	S.W.		112½
13.19	14. 7	S.W.	N.N.W.	112½	
14.15	14.18	N.N.W.	S.W.		112½
14.20	14.23	S.W.	W.S.W.	22½	
15.19	15.22	W.S.W.	W.N.W.	45	
16. 3	16. 6	W.N.W.	W.S.W.		45
16.23	17. 0	W.S.W.	W.	22½	
17.10	17.12	W.	N.W.	45	
17.12	17.13	N.W.	W.		45
18. 4	18. 6	W.	S.W.		45

ABSTRACT of the CHANGES of the DIRECTION of the WIND—*continued*.

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
d h	d h			°	°
Oct.—cont.					
18.18	19. 3	S.W.	W.N.W.	67½	
19. 5	19. 6	W.N.W.	W.S.W.		45
19. 7	19.10	W.S.W.	N.N.W.	90	
19.13	19.18	N.N.W.	W.S.W.		90
19.19	20. 0	W.S.W.	N.N.W.	90	
20.10	20.13	N.N.W.	W.	292½	
20.20	20.22	W.	E.		180
20.22	21. 0	E.	S.S.W.	112½	
21. 4	21.13	S.S.W.	E.N.E.		135
21.16	22. 0	E.N.E.	S.E.	67½	
22. 3	22. 4	S.E.	E.S.E.		22½
22.18	22.20	E.S.E.	N.E.		67½
22.21	22.23	N.E.	E.S.E.	67½	
23.10	23.12	E.S.E.	E.N.E.		45
24. 1	24. 2	E.N.E.	E.S.E.	45	
24. 5	24. 9	E.S.E.	N.E.		67½
24.11	24.15	N.E.	S.W.	180	
25.20	25.22	S.W.	W.N.W.	67½	
26. 5	26. 7	W.N.W.	W.		22½
26.22	26.23	W.	W.N.W.	22½	
27. 1	27. 8	W.N.W.	S.W.		67½
27.21	28. 1	S.W.	W.N.W.	67½	
28. 6	28.13	W.N.W.	S.W.		67½
28.21	28.23	S.W.	W.S.W.	22½	
29. 3	29. 5	W.S.W.	S.S.W.		45
29.21	29.23	S.S.W.	S.W.	22½	
30. 8	30.12	S.W.	S.S.W.		22½
31. 7	31.12	S.S.W.	S.		22½
			Sums	2250	2272½
November.					
1. 3	1. 5½	S.	S.E.		45
1.10	1.17	S.E.	S.	45	
2. 6¾	2. 7	S.	N.	180	
2.23	3. 5	N.	E.N.E.	67½	
3.17	4. 0	E.N.E.	S.W.	157½	
4. 2	4. 5	S.W.	S.S.W.		22½
4.10	4.12	S.S.W.	S.W.	22½	
5.13	5.14	S.W.	N.	135	
5.15½	5.17½	N.	W.	270	
5.20	5.22	W.	E.N.E.		202½
6. 1	6. 3	E.N.E.	S.	112½	
6. 5	6. 6	S.	S.S.E.		22½
6.16	7. 5	S.S.E.	W.S.W.	90	
7.14	7.20	W.S.W.	S.S.W.		45
9. 8	9.18	S.S.W.	E.N.E.	225	
10. 0	10. 1	E.N.E.	E.	22½	
10.15	10.20	E.	E.S.E.	22½	
11.20	12. 1	E.S.E.	S.S.W.	90	
12. 5	12.21	S.S.W.	N.N.E.		180
13.14	13.22	N.N.E.	E.	67½	
15. 0	15. 2	E.	E.S.E.	22½	
15.12¾	15.13¼	E.S.E.	N.E.		67½
15.14	15.15½	N.E.	E.	45	

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
d h	d h			°	°
Nov.—cont.					
16.10	16.11	E.	S.E.	45	
16.13	16.20	S.E.	N.		135
17. 3	17.16	N.	N.W.		45
17.18	18. 0	N.W.	N.	45	
19. 6	19.17	N.	W.N.W.		67½
20. 4	20. 6½	W.N.W.	N.N.W.	45	
20. 9	20.11	N.N.W.	N.W.		22½
20.16	20.22	N.W.	N.N.E.	67½	
21.14	21.22	N.N.E.	N.N.W.		45
22. 4	22. 8	N.N.W.	W.		67½
22. 9½	22.12	W.	N.N.W.	67½	
23. 7	23. 8	N.N.W.	S.W.		112½
23.22	23.23½	S.W.	N.	135	
24.17	24.21	N.	S.		180
24.22½	24.23½	S.	W.S.W.	67½	
26. 0	26. 2	W.S.W.	W.N.W.	45	
26. 5	26. 7	W.N.W.	W.S.W.		45
28. 3	28. 6	W.S.W.	N.W.	67½	
28. 9	28.16	N.W.	W.S.W.		67½
28.18	29. 5	W.S.W.	N.	112½	
29.13	29.21	N.	S.		180
30. 6	30.12	S.	S.S.E.		22½
			Sums	2272½	1575
December.					
0.15	0.20	S.S.E.	E.S.E.		45
0.21	1. 0	E.S.E.	S.E.	22½	
1. 5	1.11	S.E.	N.		135
1.12	1.13	N.	S.W.		135
1.18	1.20	S.W.	S.S.E.		67½
1.21	1.23	S.S.E.	S.	22½	
2. 1	2. 7	S.	W.	90	
2. 8	2.14	W.	S.S.W.		67½
2.16	2.23	S.S.W.	W.S.W.	45	
3. 7	3.16	W.S.W.	S.S.E.		90
3.17½	3.19	S.S.E.	S.W.	67½	
4.21	5. 0	S.W.	W.	45	
5. 3	5.10	W.	S.S.W.		67½
5.11	5.14	S.S.W.	S.W.	22½	
8.13	8.17	S.W.	S.		45
8.18	9. 4	S.	W.	90	
9. 5	9.17	W.	S.S.W.		67½
9.23	10.12	S.S.W.	W.S.W.	45	
10.23	11. 0	W.S.W.	S.W.		22½
11. 5	11. 6	S.W.	N.	135	
11. 6	11.10	N.	W.N.W.		67½
11.12	11.13	W.N.W.	N.W.	22½	
11.19	12. 4	N.W.	S.W.		90
14. 6¾	14. 7	S.W.	N.N.W.	112½	
14. 7¾	14. 9	N.N.W.	S.W.		112½
14.19	14.20	S.W.	W.S.W.	22½	
15.20	16. 2	W.S.W.	S.S.W.		45
16.15	16.18	S.S.W.	W.S.W.	45	
16.23	17. 5	W.S.W.	W.N.W.	45	

Greenwich Mean Solar Time. From	Greenwich Mean Solar Time. To	Change of Direction. From	Change of Direction. To	Amount of Motion. Direct.	Amount of Motion. Retrograde.
d h	d h			°	°
Dec.—cont.					
17. 6	17.15	W.N.W.	S.W.		67½
18.15	18.17	S.W.	W.	45	
18.17	18.18	W.	W.S.W.		22½
19. 5	19.11	W.S.W.	S.S.W.		45
19.15	19.23	S.S.W.	N.N.W.	135	
20.22	21. 0	N.N.W.	N.	22½	
21.14	22. 0	N.	N.E.	45	
23.11	23.23	N.E.	N.		45
24. 9	24.11	N.	W.		90
24.14½	24.15	W.	N.N.W.	67½	
24.19	25. 8	N.N.W.	N.E.	67½	
26.15	26.16	N.E.	E.N.E.	22½	
28.14	28.22	E.N.E.	E.	22½	
29. 8	29.18	E.	N.		90
30. 0	30. 1½	N.	N.E.	45	
30.14	30.15	N.E.	S.E.	90	
31. 7	31.12	S.E.	E.S.E.		22½
			Sums	1395	1440

ABSTRACT of the CHANGES of the DIRECTION of the WIND—*concluded.*

EXCESS of MOTION in each MONTH.

	Direct.	Retrograde.		Direct.	Retrograde.
	°	°		°	°
January	495		July	2250	
February	180		August	967½	
March	1552½		September	0	
April	810		October		22½
May	1192½		November	697½	
June	2025		December		45

The whole excess of direct motion for the year was 10102½°.

MEAN HOURLY MEASURES of the HORIZONTAL MOVEMENT of the AIR in each Month, and GREATEST and LEAST HOURLY MEASURES, as derived from the Records of ROBINSON'S ANEMOMETER.

Hour ending	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean for the Year.
h	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1 a.m.	15·2	12·4	9·5	8·4	10·8	6·2	8·8	6·4	8·5	11·4	10·5	15·9	10·3
2 a.m.	15·8	12·5	9·8	8·2	11·0	6·5	8·3	6·4	9·5	11·4	9·7	16·5	10·5
3 a.m.	15·8	12·7	9·2	8·3	11·2	6·7	7·3	5·7	9·6	10·7	9·1	17·1	10·3
4 a.m.	16·3	13·0	10·1	8·5	11·3	6·7	7·5	6·2	9·7	11·2	9·4	17·4	10·6
5 a.m.	15·5	12·6	9·6	8·3	10·5	6·5	7·1	5·8	9·1	11·6	8·9	17·0	10·2
6 a.m.	15·8	12·0	10·5	8·3	10·8	7·0	7·4	5·8	8·5	11·4	8·8	17·2	10·3
7 a.m.	16·5	12·6	10·2	8·5	10·8	7·1	7·5	5·4	9·3	11·2	8·7	17·0	10·4
8 a.m.	15·8	13·1	10·3	9·9	12·8	7·5	8·3	5·8	9·5	11·6	9·1	16·7	10·9
9 a.m.	15·7	13·5	10·6	11·9	14·0	7·6	9·2	6·8	10·5	12·2	9·9	17·2	11·6
10 a.m.	16·7	14·2	11·3	12·1	14·1	8·0	9·3	8·3	11·7	13·1	10·3	16·5	12·1
11 a.m.	17·7	15·6	12·3	11·8	15·3	8·4	10·8	9·5	12·5	13·7	11·1	17·6	13·0
Noon.	18·3	16·7	12·6	11·9	16·2	8·5	11·1	10·1	12·9	14·6	11·6	18·2	13·6
1 p.m.	18·5	17·3	12·9	11·9	16·5	8·5	11·3	10·1	12·8	14·2	12·2	18·7	13·7
2 p.m.	19·1	17·8	14·3	12·5	16·6	9·5	12·2	10·8	14·0	14·3	13·1	19·4	14·5
3 p.m.	19·5	17·0	14·5	13·2	17·2	10·3	12·8	10·9	14·2	14·5	13·2	20·0	14·8
4 p.m.	17·9	16·4	14·2	13·1	16·4	10·5	12·8	11·1	13·9	13·3	12·8	18·8	14·3
5 p.m.	18·8	15·1	13·5	12·1	16·5	10·3	12·6	11·5	12·3	12·4	12·4	19·4	13·9
6 p.m.	17·6	14·7	12·2	11·2	15·6	10·9	11·7	10·5	11·0	11·7	11·8	19·2	13·2
7 p.m.	16·9	14·1	10·4	10·1	14·0	9·1	10·1	9·2	9·8	11·3	10·9	16·6	11·9
8 p.m.	17·9	14·4	10·9	9·5	13·9	9·4	10·6	9·9	10·3	12·3	12·4	17·5	12·4
9 p.m.	16·0	12·9	9·9	9·6	12·9	7·6	9·0	8·8	10·0	11·3	11·9	16·4	11·4
10 p.m.	15·6	12·3	10·1	9·4	12·0	6·8	8·3	8·1	9·5	12·0	11·2	16·4	11·0
11 p.m.	16·2	11·9	9·7	8·7	11·4	6·7	8·3	7·8	8·8	11·5	10·6	15·3	10·6
Midnight.	15·3	11·8	10·3	8·7	10·7	6·8	8·1	6·5	9·1	10·9	10·3	15·4	10·3
Means	16·9	14·0	11·2	10·3	13·4	8·0	9·6	8·2	10·7	12·2	10·8	17·4	11·9
Greatest Hourly Measures	63	35	34	31	34	21	25	22	37	46	37	47	..
Least Hourly Measures	1	0	0	0	0	0	0	0	1	0	0	0	..

MEAN ELECTRICAL POTENTIAL of the ATMOSPHERE, from THOMSON'S ELECTROMETER, for each CIVIL DAY.

(Each result is the Mean of Twenty-four Hourly Ordinates from the Photographic Register. The scale employed is arbitrary : the sign + indicates positive potential.)

1884.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d												
1	+ 262	+ 8	+ 556	+ 300	+ 299	+ 339	+ 230	+ 197	+ 223	+ 335	..	+ 75
2	+ 264	+ 199	+ 600	+ 135	+ 212	+ 22	− 47	+ 286	+ 339	+ 164	+ 126	+ 361
3	+ 72	+ 575	+ 92	+ 114	+ 79	+ 111	+ 195	+ 397	+ 283	+ 215	+ 395	+ 270
4	+ 82	+ 220	+ 21	+ 57	− 7	− 296	+ 318	+ 212	− 257	+ 432	+ 202	+ 379
5	+ 65	+ 249	+ 302	+ 212	− 299	− 434	+ 219	+ 281	+ 373	+ 351	+ 285	+ 442
6	+ 192	+ 325	+ 477	− 24	..	− 500	+ 26	+ 350	+ 260	+ 103	+ 137	+ 89
7	+ 215	+ 324	+ 390	+ 65	..	+ 4	+ 274	+ 358	+ 363	+ 298	+ 126	+ 167
8	+ 297	+ 144	+ 355	+ 139	..	− 128	+ 245	+ 308	+ 251	+ 206	+ 420	..
9	+ 237	+ 42	+ 158	+ 262	..	− 224	+ 290	+ 281	+ 70	+ 76	+ 317	+ 53
10	+ 377	+ 121	+ 134	+ 283	..	+ 199	+ 57	+ 198	+ 223	− 28	+ 103	+ 164
11	+ 370	+ 142	− 401	+ 283	..	+ 236	+ 106	+ 301	+ 217	+ 235	..	+ 176
12	+ 432	+ 261	+ 420	+ 279	..	+ 268	+ 110	+ 205	+ 200	+ 90	..	+ 374
13	+ 388	+ 177	+ 258	+ 357	..	+ 167	+ 286	+ 415	+ 98	+ 450	..	+ 244
14	+ 270	+ 162	+ 330	+ 189	..	+ 179	+ 169	+ 239	+ 157	+ 355	..	+ 167
15	+ 102	+ 347	+ 210	+ 327	..	+ 333	+ 252	+ 247	+ 208	+ 368	..	+ 436
16	+ 179	+ 376	+ 282	+ 405	..	+ 196	+ 200	+ 397	+ 269	+ 164	..	+ 473
17	+ 278	+ 465	+ 276	+ 226	..	+ 334	+ 196	+ 343	+ 277	+ 221	..	+ 335
18	+ 298	+ 524	+ 319	+ 307	..	+ 236	+ 263	+ 257	+ 212	+ 210	..	+ 98
19	+ 424	+ 15	+ 282	+ 469	+ 253	+ 167	+ 176	+ 177	+ 187	+ 377	+ 279	+ 317
20	+ 254	+ 227	+ 219	+ 497	+ 95	+ 118	+ 210	+ 275	+ 352	+ 274	+ 156	− 30
21	+ 234	+ 123	+ 27	+ 470	+ 281	+ 141	+ 97	+ 111	+ 321	+ 364	+ 161	+ 273
22	+ 71	+ 112	+ 393	+ 457	+ 244	+ 150	+ 227	+ 246	+ 264	+ 430	+ 266	+ 294
23	+ 47	+ 232	+ 350	+ 508	+ 352	+ 144	+ 244	+ 342	+ 504	+ 416	+ 324	+ 181
24	+ 342	+ 253	+ 415	+ 478	+ 355	+ 175	− 61	+ 203	+ 419	+ 216	+ 273	+ 358
25	+ 246	+ 288	+ 353	+ 413	+ 136	+ 76	+ 173	+ 102	+ 412	+ 254	..	+ 384
26	+ 53	+ 422	+ 243	+ 231	+ 147	+ 216	+ 145	..	+ 423	+ 348	+ 242	+ 245
27	+ 282	+ 346	+ 380	− 78	+ 283	+ 252	− 150	..	+ 388	+ 444	+ 238	+ 179
28	+ 449	+ 334	+ 355	+ 237	+ 422	+ 157	+ 128	+ 242	+ 267	+ 280	+ 260	+ 257
29	+ 182	+ 444	+ 396	+ 290	+ 354	+ 174	+ 48	+ 316	+ 140	+ 620	+ 360	+ 335
30	+ 143		+ 298	+ 236	+ 198	+ 228	+ 124	+ 241	+ 406	+ 549	+ 217	+ 251
31	+ 68		+ 269		+ 349		+ 145	+ 211		+ 347		+ 398
Means -	+ 231	+ 257	+ 283	+ 271	+ 209	+ 101	+ 158	+ 267	+ 262	+ 296	+ 244	+ 258

The mean of the twelve monthly values is + 236.

MONTHLY MEAN ELECTRICAL POTENTIAL of the ATMOSPHERE, from THOMSON'S ELECTROMETER, at every HOUR of the DAY.

(The results depend on the Photographic Register, using all days of complete record. The scale employed is arbitrary: the sign + indicates positive potential.)

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884.												Yearly Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Midnight	+ 267	+ 243	+ 373	+ 348	+ 301	+ 160	+ 310	+ 370	+ 318	+ 330	+ 199	+ 250	+ 289
1h. a.m.	+ 217	+ 181	+ 289	+ 318	+ 307	+ 233	+ 300	+ 349	+ 266	+ 306	+ 215	+ 207	+ 266
2 „	+ 195	+ 206	+ 208	+ 292	+ 280	+ 266	+ 281	+ 347	+ 230	+ 298	+ 209	+ 176	+ 249
3 „	+ 145	+ 167	+ 170	+ 258	+ 267	+ 244	+ 262	+ 334	+ 219	+ 285	+ 215	+ 169	+ 228
4 „	+ 168	+ 169	+ 140	+ 248	+ 263	+ 177	+ 278	+ 304	+ 204	+ 272	+ 211	+ 108	+ 212
5 „	+ 178	+ 176	+ 109	+ 251	+ 248	+ 209	+ 267	+ 222	+ 171	+ 271	+ 189	+ 112	+ 200
6 „	+ 175	+ 172	+ 144	+ 275	+ 278	+ 250	+ 257	+ 312	+ 175	+ 254	+ 183	+ 167	+ 220
7 „	+ 185	+ 220	+ 200	+ 295	+ 252	+ 171	+ 230	+ 305	+ 177	+ 244	+ 197	+ 191	+ 222
8 „	+ 202	+ 252	+ 267	+ 268	+ 231	+ 147	+ 297	+ 306	+ 228	+ 258	+ 220	+ 210	+ 240
9 „	+ 202	+ 264	+ 287	+ 297	+ 224	+ 44	+ 153	+ 277	+ 264	+ 280	+ 243	+ 256	+ 233
10 „	+ 215	+ 210	+ 283	+ 211	+ 132	− 56	+ 48	+ 139	+ 224	+ 250	+ 288	+ 269	+ 184
11 „	+ 178	+ 249	+ 269	+ 76	+ 149	− 39	+ 40	+ 187	+ 150	+ 215	+ 294	+ 229	+ 166
Noon	+ 246	+ 268	+ 234	+ 82	+ 135	− 25	+ 12	+ 171	+ 143	+ 281	+ 321	+ 220	+ 174
1h. p.m.	+ 282	+ 239	+ 221	+ 165	+ 174	+ 23	− 6	+ 180	+ 221	+ 233	+ 376	+ 258	+ 197
2 „	+ 254	+ 206	+ 242	+ 227	+ 136	+ 38	+ 84	+ 167	+ 231	+ 305	+ 318	+ 342	+ 213
3 „	+ 271	+ 191	+ 242	+ 278	+ 22	− 44	− 77	+ 158	+ 264	+ 321	+ 284	+ 329	+ 187
4 „	+ 285	+ 352	+ 201	+ 237	+ 50	+ 60	− 60	+ 165	+ 315	+ 246	+ 271	+ 342	+ 205
5 „	+ 234	+ 345	+ 277	+ 316	+ 47	+ 34	− 44	+ 191	+ 340	+ 273	+ 275	+ 313	+ 217
6 „	+ 233	+ 371	+ 321	+ 358	+ 177	− 99	+ 22	+ 136	+ 336	+ 298	+ 284	+ 347	+ 232
7 „	+ 269	+ 341	+ 435	+ 319	+ 238	− 45	+ 135	+ 264	+ 371	+ 396	+ 261	+ 362	+ 279
8 „	+ 289	+ 350	+ 473	+ 341	+ 286	+ 68	+ 159	+ 341	+ 391	+ 375	+ 238	+ 376	+ 307
9 „	+ 288	+ 348	+ 483	+ 399	+ 278	+ 185	+ 268	+ 388	+ 372	+ 361	+ 216	+ 342	+ 327
10 „	+ 295	+ 331	+ 506	+ 361	+ 248	+ 244	+ 266	+ 409	+ 332	+ 381	+ 182	+ 316	+ 323
11 „	+ 279	+ 323	+ 411	+ 280	+ 284	+ 189	+ 306	+ 384	+ 335	+ 361	+ 176	+ 306	+ 303
Means -	+ 231	+ 257	+ 283	+ 271	+ 209	+ 101	+ 158	+ 267	+ 262	+ 296	+ 244	+ 258	+ 236
Number of Days employed -	31	29	31	30	18	30	31	29	30	31	20	30	..

MONTHLY MEAN ELECTRICAL POTENTIAL of the ATMOSPHERE, from THOMSON'S ELECTROMETER, on RAINY DAYS, at every HOUR of the DAY.

(The results depend on the Photographic Register, using all days on which the rainfall amounted to or exceeded 0in·020. The scale employed is arbitrary: the sign + indicates positive potential.)

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Means.
Midnight	+ 255	+ 122	+ 275	+ 252	+ 73	− 307	+ 291	+ 345	+ 358	+ 266	+ 163	+ 267	+ 197
1h. a.m.	+ 187	+ 38	− 43	+ 265	+ 150	− 27	+ 266	+ 295	+ 290	+ 224	+ 210	+ 189	+ 170
2 "	+ 164	+ 111	− 285	+ 285	+ 120	+ 144	+ 257	+ 273	+ 233	+ 221	+ 215	+ 186	+ 160
3 "	+ 67	+ 38	− 402	+ 245	+ 103	+ 26	+ 207	+ 290	+ 221	+ 187	+ 213	+ 148	+ 112
4 "	+ 129	+ 81	− 442	+ 270	+ 137	− 140	+ 242	+ 280	+ 195	+ 181	+ 197	+ 29	+ 97
5 "	+ 160	+ 82	− 505	+ 238	+ 120	+ 19	+ 211	+ 277	+ 129	+ 168	+ 153	+ 17	+ 89
6 "	+ 173	+ 57	− 318	+ 300	+ 130	+ 80	+ 176	+ 222	+ 172	+ 146	+ 140	+ 113	+ 116
7 "	+ 166	+ 142	− 188	+ 295	+ 153	− 20	+ 100	+ 202	+ 195	+ 158	+ 192	+ 153	+ 129
8 "	+ 181	+ 169	+ 22	+ 231	+ 210	− 83	+ 245	+ 243	+ 237	+ 163	+ 167	+ 167	+ 163
9 "	+ 157	+ 174	+ 65	+ 292	+ 180	− 293	+ 36	+ 292	+ 250	+ 144	+ 177	+ 216	+ 141
10 "	+ 166	+ 23	+ 220	+ 130	+ 117	− 489	− 38	+ 192	+ 165	+ 50	+ 228	+ 223	+ 82
11 "	+ 146	+ 99	+ 108	0	+ 147	− 284	+ 14	+ 168	− 44	− 23	+ 120	+ 147	+ 50
Noon	+ 161	+ 168	+ 55	− 213	+ 260	− 271	− 96	+ 118	− 20	+ 194	+ 122	+ 101	+ 48
1h. p.m.	+ 181	+ 81	+ 143	+ 15	+ 163	− 30	− 54	+ 228	+ 67	+ 51	+ 202	+ 127	+ 98
2 "	+ 109	− 7	+ 82	+ 57	− 260	− 64	+ 94	+ 165	+ 129	+ 209	+ 110	+ 264	+ 74
3 "	+ 154	− 78	+ 95	+ 230	− 380	− 294	− 229	+ 103	+ 172	+ 278	+ 132	+ 256	+ 37
4 "	+ 164	+ 268	− 17	+ 123	− 557	− 110	− 148	+ 125	+ 261	− 36	+ 75	+ 311	+ 38
5 "	+ 58	+ 228	+ 113	+ 255	− 310	− 300	− 126	+ 210	+ 339	+ 40	+ 127	+ 245	+ 73
6 "	+ 65	+ 269	+ 248	+ 315	− 217	− 959	− 46	− 320	+ 291	+ 140	+ 117	+ 287	+ 16
7 "	+ 119	+ 239	+ 305	+ 75	+ 7	− 739	+ 129	+ 195	+ 361	+ 280	+ 137	+ 316	+ 119
8 "	+ 167	+ 263	+ 340	+ 155	− 143	− 463	+ 106	+ 248	+ 400	+ 289	+ 173	+ 371	+ 159
9 "	+ 191	+ 247	+ 355	+ 260	− 110	− 47	+ 266	+ 303	+ 393	+ 308	+ 193	+ 333	+ 224
10 "	+ 214	+ 203	+ 365	+ 365	− 157	+ 13	+ 191	+ 338	+ 345	+ 307	+ 80	+ 311	+ 215
11 "	+ 192	+ 223	+ 298	+ 160	− 7	− 177	+ 259	+ 333	+ 371	+ 306	+ 55	+ 315	+ 194
Means -	+ 155	+ 135	+ 37	+ 192	− 3	− 201	+ 98	+ 214	+ 230	+ 177	+ 154	+ 212	+ 117
Number of Days employed -	14	12	6	11	3	7	14	6	10	9	6	15	..

MONTHLY MEAN ELECTRICAL POTENTIAL of the ATMOSPHERE, from THOMSON'S ELECTROMETER, on NON-RAINY DAYS, at every HOUR of the DAY.

(The results depend on the Photographic Register, using only those days on which no rainfall was recorded. The scale employed is arbitrary: the sign + indicates positive potential.)

Hour, Greenwich Mean Solar Time (Civil reckoning).	1884.												Yearly Means.
	January.	February.	March.	April.	May.	June	July.	August.	September.	October.	November.	December.	
Midnight	+ 272	+ 350	+ 415	+ 382	+ 326	+ 317	+ 330	+ 383	+ 248	+ 414	+ 144	+ 206	+ 316
1h. a.m.	+ 252	+ 303	+ 378	+ 349	+ 335	+ 322	+ 342	+ 370	+ 214	+ 393	+ 180	+ 180	+ 301
2 "	+ 231	+ 305	+ 328	+ 316	+ 314	+ 308	+ 310	+ 375	+ 192	+ 369	+ 197	+ 118	+ 280
3 "	+ 219	+ 292	+ 311	+ 301	+ 323	+ 311	+ 316	+ 353	+ 198	+ 356	+ 229	+ 154	+ 280
4 "	+ 211	+ 279	+ 290	+ 281	+ 309	+ 274	+ 311	+ 320	+ 191	+ 337	+ 233	+ 160	+ 266
5 "	+ 205	+ 282	+ 280	+ 287	+ 292	+ 274	+ 313	+ 212	+ 177	+ 338	+ 221	+ 189	+ 256
6 "	+ 182	+ 295	+ 272	+ 293	+ 328	+ 312	+ 325	+ 346	+ 166	+ 320	+ 216	+ 198	+ 271
7 "	+ 220	+ 315	+ 306	+ 315	+ 282	+ 230	+ 352	+ 339	+ 148	+ 289	+ 223	+ 196	+ 268
8 "	+ 228	+ 342	+ 338	+ 327	+ 231	+ 216	+ 346	+ 328	+ 195	+ 291	+ 271	+ 218	+ 278
9 "	+ 244	+ 359	+ 359	+ 336	+ 223	+ 159	+ 263	+ 275	+ 229	+ 344	+ 320	+ 265	+ 281
10 "	+ 267	+ 386	+ 327	+ 284	+ 132	+ 90	+ 182	+ 124	+ 213	+ 352	+ 384	+ 285	+ 252
11 "	+ 198	+ 393	+ 331	+ 255	+ 168	+ 42	+ 92	+ 192	+ 228	+ 313	+ 446	+ 295	+ 246
Noon	+ 338	+ 374	+ 298	+ 273	+ 159	+ 62	+ 110	+ 185	+ 236	+ 327	+ 486	+ 305	+ 263
1h. p.m.	+ 382	+ 384	+ 227	+ 257	+ 199	+ 57	+ 41	+ 166	+ 275	+ 317	+ 506	+ 360	+ 264
2 "	+ 399	+ 388	+ 319	+ 330	+ 214	+ 81	+ 73	+ 165	+ 251	+ 364	+ 474	+ 405	+ 289
3 "	+ 389	+ 399	+ 313	+ 315	+ 184	+ 43	+ 8	+ 168	+ 303	+ 360	+ 449	+ 378	+ 276
4 "	+ 405	+ 425	+ 321	+ 293	+ 190	+ 124	− 52	+ 171	+ 332	+ 375	+ 457	+ 351	+ 283
5 "	+ 393	+ 433	+ 355	+ 377	+ 230	+ 147	− 43	+ 182	+ 331	+ 382	+ 430	+ 386	+ 300
6 "	+ 382	+ 452	+ 433	+ 393	+ 279	+ 169	+ 36	+ 251	+ 364	+ 372	+ 463	+ 412	+ 334
7 "	+ 422	+ 435	+ 494	+ 457	+ 376	+ 173	+ 82	+ 280	+ 384	+ 446	+ 407	+ 401	+ 363
8 "	+ 428	+ 444	+ 536	+ 484	+ 409	+ 229	+ 163	+ 368	+ 385	+ 421	+ 334	+ 385	+ 382
9 "	+ 405	+ 449	+ 533	+ 491	+ 400	+ 263	+ 268	+ 413	+ 344	+ 387	+ 273	+ 358	+ 382
10 "	+ 414	+ 445	+ 557	+ 316	+ 382	+ 319	+ 330	+ 440	+ 334	+ 408	+ 289	+ 343	+ 381
11 "	+ 400	+ 415	+ 493	+ 314	+ 382	+ 298	+ 342	+ 410	+ 324	+ 374	+ 286	+ 325	+ 364
Means -	+ 312	+ 373	+ 367	+ 334	+ 278	+ 201	+ 202	+ 284	+ 261	+ 360	+ 330	+ 286	+ 299
Number of Days employed -	13	13	20	15	12	21	12	22	16	18	7	11	..

AMOUNT OF RAIN COLLECTED IN EACH MONTH OF THE YEAR 1884.

1884, MONTH.	Number of Rainy Days.	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 Magnetic Observatory.	On the Roof of the Photographic Thermometer Shed.	Gauges partly sunk in the ground.		
		No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.
		in.	in.	in.	in.	in.	in.	in.	in.
January	15	0·869	0·831	1·165	1·452	1·714	1·771	1·677	1·740
February	13	0·841	0·841	1·165	1·245	1·391	1·496	1·413	1·457
March	11	0·942	0·951	1·023	1·175	1·332	1·369	1·252	1·334
April	15	0·770	0·794	0·936	1·009	1·103	1·108	1·007	1·050
May	10	0·614	0·565	0·685	0·843	0·942	0·959	0·890	0·941
June	8	1·938	1·896	2·060	2·160	2·235	2·244	2·200	2·210
July	16	1·285	1·059	1·360	1·593	1·705	1·771	1·678	1·720
August	8	0·468	0·413	0·582	0·630	0·655	0·667	0·647	0·656
September	12	1·178	1·151	1·620	1·992	2·081	2·090	2·076	2·085
October	12	0·544	0·519	0·669	0·961	1·025	1·041	1·019	1·020
November	12	0·562	0·543	0·751	0·906	0·988	0·993	0·990	1·003
December	18	1·280	1·258	1·823	2·085	2·350	2·538	2·495	2·511
Sums	150	11·291	10·821	13·839	16·051	17·521	18·047	17·344	17·727
Height of receiving Surface above the ground.	..	ft. in. 50. 8	ft. in. 50. 8	ft. in. 38. 4	ft. in. 21. 9	ft. in. 10. 0	ft. in. 0. 5	ft. in. 0. 5	ft. in. 0. 5
Height of receiving Surface above mean sea level.	..	ft. in. 205. 6	ft. in. 205. 6	ft. in. 193. 2	ft. in. 176. 7	ft. in. 164. 10	ft. in. 155. 3	ft. in. 155. 3	ft. in. 155. 3

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS

OF

LUMINOUS METEORS.

1884.

Month and Day, 1884.		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				s		°	
March	12	11. 15. 0	H.	Venus	Yellowish	2	. .	40	1
	18	9. 42. 30	H.	3	Bluish-white	. .	None	10	2
May	10	9. 15. 0	H.	Venus	. .	. .	. .	. .	3
August	7	10. 4. 40	H.	1	Yellowish	0·5	None	10	4
	"	10. 36. 10	H.	2	Bluish-white	0·5	None	5	5
	"	10. 54. 42	H.	1	Yellowish	0·8	None	5	6
	"	11. 8. 11	H.	2	Bluish-white	1	. .	10	7
	10	9. 29. 43	M.	2	Bluish-white	0·4	Slight	10	8
	"	9. 38. 49	M.	2	Bluish-white	0·3	None	8	9
	"	9. 51. 58	M.	2	Bluish-white	0·3	None	10	10
	"	9. 58. 46	M.	2	Bluish-white	0·5	None	20	11
	"	10. 7. 6	M.	1	Bluish-white	0·7	Train	15	12
	"	10. 24. 3	M.	1	Bluish-white	0·6	Slight	15	13
	"	10. 43. 39	M.	1	Bluish-white	0·8	Train	20	14
	11	9. 27. 9	H.	2	Bluish-white	1	. .	15	15
	"	9. 33. 37	H.	1	Bluish-white	0·8	Train	10	16
	"	9. 57. 21	H.	1	Bluish-white	0·5	None	10	17
	"	10. 0. 50	H.	1	Bluish-white	0·5	None	10	18
	12	12. 26. 36	N.	2	White	0·5	. .	7	19
	"	12. 27. 36	N.	3	. .	. .	None	8	20
	"	12. 32. 26	N.	1	Bluish-white	. .	Train	10	21
December	8	8. 37. 46	H.	1	Bluish-white	1	None	30	22
	"	9. 36. 51	H.	> 1	Bluish-white	1	. .	. .	23
	9	10. 52. 22	M.	1	Bluish-white	0·6	None	10	24
	"	11. 0. 45	M.	2	Bluish-white	0·5	Train	15	25
	"	11. 9. 54	M.	2	Bluish-white	0·5	Slight	10	26
	"	11. 18. 2	M.	3	White	0·3	None	5	27
	"	11. 42. 7	M.	1	Bluish-white	1	Fine	20	28
	"	12. 3. 4	M.	2	Bluish-white	0·5	None	8	29
	"	12. 8. 3	M.	2	Bluish-white	0·5	Train	12	30
	"	12. 10. 50	M.	3	Bluish-white	0·4	None	5	31
	"	12. 28. 9	M.	3	Bluish-white	0·5	None	7	32
	"	12. 50. 28	M.	3	Bluish-white	0·4	None	8	33
	"	12. 55. 21	M.	3	Bluish-white	0·5	None	5	34
	"	13. 7. 5	M.	1	Bluish-white	0·8	Fine	15	35
	11	8. 28. 0	H.	1 increasing to 1 × 4	Yellow	1	None	20	36
	"	9. 24. 3	H.	2	Bluish-white	0·5	None	10	37
	"	9. 36. 51	H.	3	Bluish-white	0·4	None	8	38
	"	9. 56. 18	H.	2	Bluish-white	0·5	None	3	39

No. for Reference.	Path of Meteor through the Stars.
1	Appeared near ζ Ursæ Majoris shot towards γ Draconis.
2	Shot from ζ Leonis towards ν Ursæ Majoris.
3	A large meteor travelling N.E. from direction of Ursa Major. At its disappearance it broke into three large pieces.
4	From direction of a point 2° below γ Persei passed 10° above β Andromedæ.
5	From direction of α Persei passed midway between δ and ε Cassiopeiæ.
6	From direction of β Ursæ Minoris towards Capella.
7	Disappeared near a point midway between α and β Ursæ Majoris moving from direction of a point near α Persei (curved path).
8	From direction of Polaris towards γ Cephei.
9	From near γ Ursæ Minoris towards α Draconis.
10	From direction of δ Cassiopeiæ towards η Persei.
11	From near η Ursæ Majoris disappeared near ε Böotis.
12	Appeared near ι Cephei disappeared beyond α Cassiopeiæ.
13	From direction of α Draconis passed between and disappeared beyond ζ and ε Ursæ Majoris.
14	From direction of γ Persei towards Capella.
15	From direction of a point about 8° above γ Andromedæ towards a point midway between β Pegasi and α Andromedæ.
16	Appeared midway between α and β Cassiopeiæ and moved towards η Pegasi.
17	Appeared midway between α and β Cassiopeiæ and shot towards a point 10° above η Pegasi.
18	From direction of a point between ε and δ Cassiopeiæ shot across Polaris towards β Ursæ Minoris.
19	From a point 2° or 3° below γ Andromedæ towards a point 7° or 8° below β Andromedæ.
20	Passed midway between γ Pegasi and α Andromedæ moving to left.
21	Passed a few degrees above α Andromedæ moving towards α Pegasi.
22	From direction of a point 2° above β Ursæ Minoris shot towards α Lyræ.
23	From Capella shot nearly perpendicularly downwards.
24	From a few degrees to right of γ Ursæ Majoris disappeared near η Ursæ Majoris.
25	From direction of γ Ursæ Minoris towards δ Draconis.
26	From a point a little to left of γ Ursæ Minoris disappeared beyond η Draconis.
27	From direction of α Persei towards η Persei.
28	Appeared near Saturn and disappeared near β Canis Minoris.
29	From near α Ursæ Majoris disappeared beyond δ Ursæ Majoris.
30	From direction of Polaris passed across and disappeared beyond γ Ursæ Minoris.
31	Appeared near θ Cassiopeiæ and disappeared near κ Cassiopeiæ.
32	From near ζ Ursæ Majoris disappeared a little below η Ursæ Majoris.
33	From near ζ Draconis moved perpendicularly downwards.
34	Shot from α Ursæ Majoris towards κ Draconis.
35	From direction of Capella towards the Pleiades.
36	Appeared near ι Geminorum disappeared about 10° below γ Geminorum.
37	From about midway between α and β Ursæ Majoris across a point 5° above δ Ursæ Majoris.
38	From direction of Castor across a point 10° below Aldebaran.
39	From direction of a point 2° above Castor passed a few degrees below Saturn.