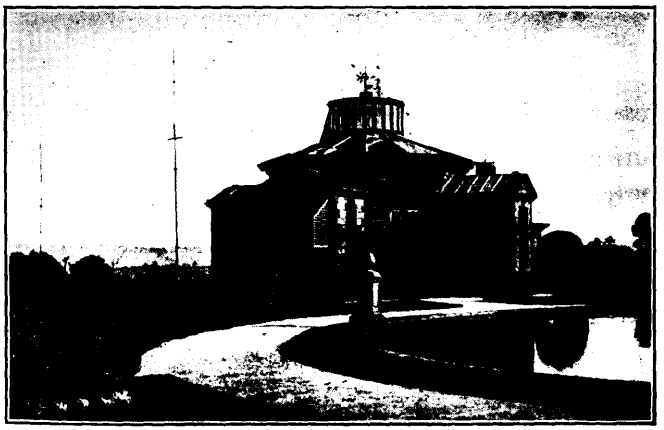
STONYHURST COLLEGE OBSERVATORY.

Lat. 53° 50′ 40″ N. Long. 9m. 52s. .68 W.
Height of the Barometer above the Sea, 381 feet.



(FOUNDED 1838.)

Results of Meteorological, Magnetical, AND Seismological Observations, 1914.

With Report and Notes of the Director,

REV. W. SIDGREAVES, S.J., F.R.A.S.

BLACKBURN:
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1915.

REPORT AND NOTES.

Meteorological.—Our connection with the Meteorological Office, as one of the secondary stations, ceased, as stated in our last Report, on March 25th, 1913. But the automatic recorders, which belong to the Office, still remain with us. They have been working satisfactorily during the year, and the weekly reports have been sent regularly to the Office. The several instruments have been fully described in our previous Reports.

The year has been, on the whole, remarkably mild and cloudy. There has been no excessive heat, and no great cold. The highest shade temperature was 82·5, on July 21, and the lowest 21·1°, on November 21. But on 25 days the thermometer reached 70° and over : 8 in June, 6 in July, 6 in August, and 5 in September. May was the only month showing a mean temperature below its average.

The excessive cloudiness of the year is shown by the sunshine recorder, which registered 328 hours less than the annual average of 34 years.

The total fall of rain shows an excess of 3 inches on the annual average.

The prevailing wind has been, as usual, from the West. The total length of air crossing the Observatory in the twelve months was 2,386 miles less than the annual

average of 86,533. The strongest gale reached only 44 miles in the hour, on February 22 ; and ten gales in all at 37 miles and more were recorded : four in February, and six in December. Of these, five were from the South, and the rest from between South and South-West.

Fine dry periods of the year are noted as follows :— January 10—24 ; February 1—9 ; April 10—30 ; May 12—22 ; June 1—6 ; 9—20 ; July 2—16 ; August 2—6 ; 9—24 ; September 1—8 ; 19—30 ; October 2—25 ; November 15—24.

Heavy rains of one inch and more fell on January 8, July 16, 24, September 9, 16, and November 11.

Magnetical. — The Differential Photo-Magnetographs, are of the same pattern as those at the Kew Observatory, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are somewhat shorter. Time marks on the curves are now made at all the even numbered hours by automatic interruptions of the pencils of light. The interruptions are worked by a relay, which is controlled by a separate clock. This arrangement has the advantage of freeing the time-indications from the errors of any irregular running of the motor-clock.

The scale values of the instruments are as follows :

For the Unifilar	...	11·28	per Cm. of Ordinate
For the Bifilar	...	·00050y	,, ,,

In connection with these, absolute measures of Horizontal Direction and Force have been made regularly ; of the former four times, and of the latter once in

each month. These have been corrected by the difference between the curve ordinate at the time of observation and the monthly mean of the four daily readings, according to the rule stated on page xii. of our Report, 1908 ; but the month means are now taken from the readings on the ten quietest days of the month. This change has been made in order to free the means from the chance-balancing of disturbed extremes.

The Inclination or Dip has been observed once each month by two needles with Dover's circle No. 159.

The Vertical and Total Forces are deduced from the measures of the Horizontal Force, and the Angle of Inclination or Dip.

On the table of magnetic disturbances (page 38) the following remarks may be of service. There is often some embarrassment in assigning the proper note of magnetic condition to the date. Overlapping of indications cannot be wholly avoided ; and some allowance must be made for the subjective impressions of the Recorder. But the general intention of the table is that a *calm* (c) shall mean a smooth curve ; *small* (s) a disturbance noteworthy only as opposed to a calm ; *moderate* (m) a disturbance not to be neglected for any comparison with other phenomena, solar or terrestrial, and worth a reference to the original curve ; *greater* (g) a marked disturbance ; and *very great* (v.g.) a decided storm.

Corresponding tabulations are sent quarterly to the Meteorological Institute at De Bilt (Holland), for the International Committee on Terrestrial Magnetism. In these the significant notes are restricted to three—0, 1, 2. The general returns from the Bureau show considerable

discordance between the interpretations of different authorities ; and it may be well to state the rule followed at this Observatory. The two important notes are held to be 0 and 2 : the former meaning a true calm, and the latter a disturbance not less than our note (m) ; and the intervening note comprises all the rest.

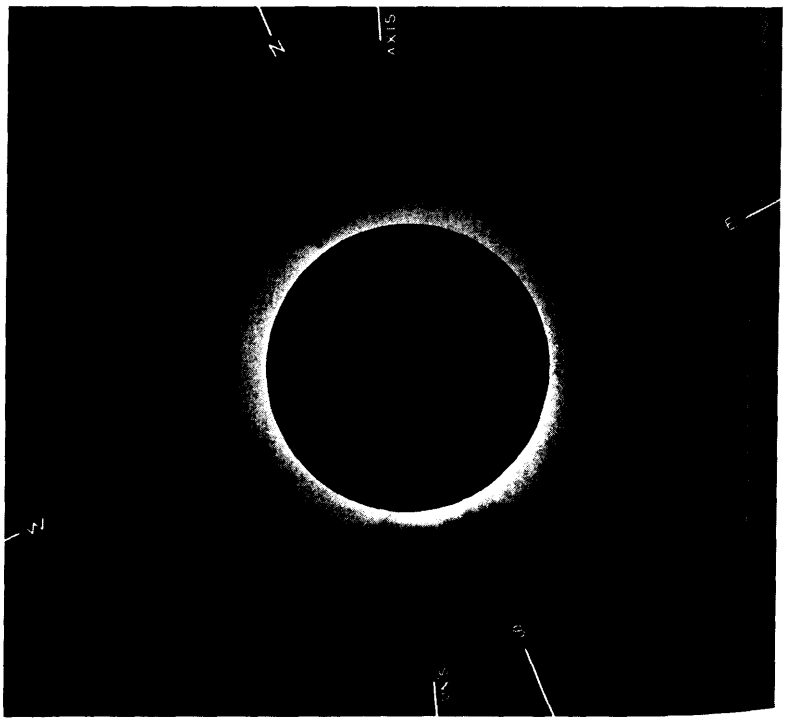
On this list the notes are quoted for the civil day, and may therefore be found occasionally at variance with our own quotations, which are given for the Astronomical day (from noon to noon). It has not been thought well to make any change here ; because the convenience for tabulation is very great, when the curve, started at noon, stands for one day ; and the risk of clerical errors is notably less.

The magnetic conditions during the year have been remarkably quiet. The mean daily range of the Declination magnet appears at $10'\cdot2$

Solar and Astro-physical.—The Solar surface has been observed on 217 days, and 133 drawings have been made. Of these there are 114 showing spots and faculæ, and 19 showing faculæ only ; or, omitting the faculæ, we have 103, or 47·5 % of the observing days on which the surface was seen to be free from spots.

The mean disc area of the spots (in units of $\frac{1}{5000}$th of the visible surface) appears at 0·82 ; and the mean daily range of magnetic Declination (in minutes of arc) at 10·2. These are included in the following table for comparison with the corresponding *means* of the past five years :—

Year.....	1909	1910	1911	1912	1913	1914
Spot Area	3·8	1·8	0·33	0·22	0·04	0·82
Declination range	13·5	14·5	12·6	8·1	9·7	10·2



The Solar Corona by the 20-ft. Coronagraph.
Exposure, 10 secs.

This illustration is 7/10ths size of original photograph.

The Eclipse Expedition to Hernösand, Sweden, 1914, August 21.

The expedition was one of those organised by the Joint Permanent Eclipse Committee of the Royal and the Royal Astronomical Societies. It was the seventh total solar eclipse expedition conducted from the Stonyhurst Observatory, four under the leadership of Father Perry, namely those at Cadiz, in 1870, Carriacou, W. Indies 1886, Moscow 1887, and Salut Islands, French Guiana 1889, where his devotion to duty cost him his life; and three under that of Father Cortie, at Vinaroz, Spain, 1905, Vavau, Tonga Islands, 1911, and Hernösand, Sweden, 1914. With the exception of the expedition of 1905, all these were official Government expeditions. It had been originally settled that Professor Fowler and Father Cortie, with Major Hills, and Father O'Connor as volunteer observers, and Mr. Curtis as assistant to Professor Fowler, should form a party to observe the eclipse at Kiev, in Russia. But the refusal of the Russian Government, through the British Foreign Office, to allow the Jesuit Fathers to proceed to Kiev, necessitated the division of the original expedition, and it was arranged that we should form a separate expedition to Hernösand, a station which had not been originally selected owing to its inferior chances of good weather conditions. The permission which was ultimately granted for our entrance into Russia, through the intervention of Dr. Backlund, the Imperial astronomer at Pulkova, was fortunately not communicated to us. Had we accompanied Professor Fowler,

with him we should have had to abandon our expedition at Riga, on account of the impossibility of proceeding to Kiev, owing to the incidence of the war and the mobilization of troops, and had we reached Kiev, we should have shared the ill-fortune of Professor Campbell and the party from the Lick Observatory, on account of clouds.

Owing to the kind offices of Professor B. Hasselberg, of the Academy of Sciences at Stockholm, the chief of the Swedish Commission for the observation of the eclipse, and the exceeding courtesy of Herr Rektor Tham, we secured an excellent site at Hernösand in a field at the back of the Technical School. The school buildings, containing physical laboratories, mechanics' and carpenter's shops, dark room, and a complete electrical plant was placed unreservedly at our disposal. Our instruments were also expedited through the Customs House after merely formal inspection.

A considerable amount of time had been expended by the staff of the observatory in the remote preparations for the eclipse, and two cœlostats and a long focus and short focus camera had been set up and adjusted in the observatory grounds. The party ultimately consisted of Father Cortie, Father O'Connor, Mr. G. J. Gibbs, of Preston, and Mr. E. T. Whitelow, of Birkdale, a great benefactor of the observatory. We left Hull on July 28th, arrived at Gothenburg on July 30th, and at Stockholm the same evening. There we were welcomed by Father Wulf and Father Rodés, who were proceeding to Hernösand on an expedition from St. Ignatius' College, Valkenburg. We journeyed together from Stockholm by boat, leaving on the morning of August 2nd, and arriving at Hernösand on the afternoon of the

following day. We at once commenced with the erection of the instruments, the determination of the meridians and azimuths being made by theodolite by Father O'Connor. We were fortunate in having with us so skilled an engineer as Mr. Gibbs, who undertook the whole charge of setting up the instruments. The co-ordinates of the station chosen are latitude 62°, 38′ 8·8″ N., and longitude 17°, 57′ 32·25″ E. of Greenwich, as determined by an officer of the Swedish survey staff at the request of Professor Hasselberg.

Our instrumental equipment included a 16-inch cœlostat, belonging to the Royal Astronomical Society, and an 8-inch "Grubb" cœlostat, kindly lent by the Royal Irish Academy. These two instruments gave much trouble in adjustment for smooth running, especially so the former, but all the difficulties were successfully overcome by Mr. Gibbs. The details of the erection of the instruments are fully described in the preliminary report of the Eclipse Expedition communicated to the Royal Astronomical Society (Monthly Notices R.A.S., Vol. LXXV., No. 3., January, 1915.) The 16-inch cœlostat supplied light to three coronagraphs, and a horizontal telescope for projecting an enlarged image of the sun on to a circularly graduated screen of ground glass. To obtain large scale pictures of the corona, 2½ inch to the solar diameter, we employed a 4-inch photographic lens, also kindly lent by the Royal Irish Academy, having a focal length of 20 feet. This was mounted in a strongly built wooden camera in sections, designed by Mr. Gibbs. The camera bellows carried plate-holders 10 × 8 inches. Six exposures were made on the corona of 2, 4, 10, 25, 7, 3 seconds duration, and five of these were most successful. For photographing the

extension of the filmy streamers of the corona we employed two cameras, one with a 4-inch Dallmeyer lens, focal length 34 inches, the "Abney" camera used so frequently in former eclipse expeditions, and a Ross lens 3·5 inches aperture and 12 inches focal length, belonging to Mr. Whitelow. These two cameras were mounted one on top of the other, and in front of the 20-foot camera. Four exposures were made of 10, 50, 15, and 5 seconds with the "Abney" camera, and one long exposure of 95 seconds with the Ross lens. These exposures were made on plates especially bathed to render them impervious to solarization, so as to obtain the inner as well as the outer corona. In addition to these cameras, Mr. Whitelow had mounted on a wedge-head cut to the latitude of Hernösand, a Zeiss lens of 14 inches focus, with which he successfully photographed the moon projected on the corona, 30 seconds, and one minute after totality. The function of the 3 inch Cooke telescope, mounted on top of the long camera, was to enable Father O'Connor to give signals, 10 minutes, 5 minutes, and 10 seconds before totality, by observation on the graduated glass screen of the angles subtended by the cusps of the moon at the centre of the sun's projected image.

The 8-inch cœlostat was employed to supply light to a 5-inch Alvan Clarke lens, focal length seven feet, which threw an image of the sun on the slit plate of the spectrograph. This spectrograph was designed in conjunction with Professor Fowler, and was constructed under his supervision at the Imperial College of Science, South Kensington. It was probably the most powerful slit spectrograph so far used in eclipse observations, and gave an exceedingly bright spectrum, covering

about 4 inches between λ 6700 and λ 4800. It was of the Littrow type. The slit belongs to the Royal Astronomical Society, the diagonal prism to the Imperial College of Science, the O.G. to the Greenwich Observatory, the mirror to the Joint Permanent Committee, and the plate-holders to the Cambridge Observatory. The constants of the instrument were :—

Length of slit, $\frac{7}{8}$-inch.
Width of slit, ·0017-inch.
Aperture of O.G., 6 inches.
Focal length of O.G., 98 inches.
Edge of prism, 7 inches.
Refracting angle of prism, 40°.
Deviation of prism at Hβ, 28·5°.
Diameter of plane mirror, 6·5-inches.
Purity of the spectrum, 6400.

A novel feature in eclipse expeditions was the placing of a comparison iron-arc spectrum on the plate exposed for the spectrum of the corona during the eclipse. Through the kindness of Herr Helenius, the town electrician, long leads were conveyed from the electric mains of the Technical School, and connected through a variable resistance, with an arc having solid iron pointed poles. The pressure was 110 volts and the current 12 amperes. By means of a single lens and a diagonal the image of the arc was formed on the slit. The diagonal could be pushed forwards and backwards by means of a slotted groove. The lens was adjusted so that the solid angle of the beam of light from the arc formed on the slit was equal to that also subtended by the O.G. from the slit. This adjustment is necessary in order to fill the O.G. with light from the arc. A zinc

shield with a horizontal slot, $\frac{1}{10}$ inch wide, was employed to cover the slit plate during the exposure on the corona. The slot covered the position of the dark image of the moon. The slit had been placed almost tangential to the limb of the sun on the E. side. The exposure had been in progress about 40 seconds on the corona, when the slotted shield was placed in position, the diagonal pushed forward, and the arc was struck. An exposure of four seconds was given to the arc, the diagonal was pushed back, the slotted shield removed, and the exposure was continued on the coronal spectrum until the end of totality. Wratten and Wainwright's Orthochromatic B plates were used, so that the red end of the coronal spectrum might be photographed. The operations connected with the photographing of the arc spectrum took about 20 seconds.

Drills commenced on Monday, August 17th, and we were assisted by seven students of the Technical School, under the direction of Herr Askling, the master of mechanical science. Four of these students were trained to make a composite drawing of the corona, each taking one quadrant, on graduated discs. They practised on a drawing of the corona of 1901.

Had the eclipse occurred on any other day during our stay at Hernösand, except one, August 9th, we should have been baulked by clouds. A persistent N.W. wind was accompanied by a considerable amount of cloud. Otherwise the atmosphere was of extraordinary transparency. On the evening of August 20th the wind shifted to the S.E., and brought with it a beautiful clear sky, though clouds appeared about one hour after the eclipse was over. A considerable number of

spectators assembled in the field, and watched the progress of the partial phase through dark glasses. To prevent any inadvertent intrusion we roped off an enclosure for the instruments. At 10 minutes before totality, as indicated by the cusps on the ground glass screen, Father O'Connor blew three blasts on a whistle. The observers and their assistants stood to their stations, the clocks were wound up, and lamps were lit. At this time the illumination of the distant mountains was weird but beautiful. The temperature was decidedly colder, with a cold rush of wind from the S.E. The total drop of temperature during the eclipse was 7·4° F. At five minutes before totality, at the signal of two blasts on the whistle, the slides were drawn, and silence was called. At ten seconds nominally, but really at twelve seconds before totality, a single blast was the warning for exposures on the "flash" spectrum. At the signal "Go," when totality was reached, Father O'Connor pulled a cord, releasing the mechanism of the eclipse clock, the hand of which commenced to make a circuit of a two-foot dial in the computed duration of totality—129 seconds. It really was 125 seconds. The whole scene was most impressive, the silence being only broken by the clicking of the camera slides. The sight of the corona in a perfectly pure sky was indeed magnificent. On the W. of the eclipsed sun was a long fish-tail streamer, while on the E. there were bright winged streamers, a very bright one N.E., a larger, though less bright one, S.E., and a faint bayonet-like streamer of great length almost on the equator. To the N.W. blazed the planet Mercury, while Venus was shining brightly on the E. horizon.

As we were uncertain when a boat might come from the north to take us homewards, we commenced the dis-

mantling and packing of the apparatus, and the development of the plates immediately after the eclipse was over. We were quite ready for departure by the morning of August 23rd, though a boat did not come to take us to Stockholm until August 25th. On account of the war not only was our return journey hastened, but the route had to be changed. We had already traversed two Swedish mine fields under the escort of armed vessels between Sundsval and Stockholm, where we arrived on August 26th. The British Minister, Sir Esmé Howard, very kindly took charge of our instruments, and subsequently transmitted them to the Vice-Consul, at Bergen, whence they were safely shipped to Hull. On the morning of August 28th we left Stockholm for Christiana and thence to Bergen, where we arrived on the afternoon of August 29th, and took a Norwegian steamer across the North Sea for Newcastle. We were stopped on the early morning of August 30th by a British cruiser and warned of the existence of a German mine field some fifty miles from the mouth of the Tyne. A second repeated the warning the same afternoon. Accordingly we changed our course for Peterhead, and came down the coast inside the mine field. Finally we were escorted into Newcastle, after this adventurous passage, by three torpedo boats, and arrived safely on the morning of August 31st.

The general form of the corona of 1914 was rather of the "minimum" than of any other type. The open spaces at the poles full of beautiful rays extending over an arc of 75° about the N. pole, and of 65° about the S. pole, and the long fish-tail on the W. side, the roots of which covered an arc of 65° are characteristic of this type. But on the E. side it is rather of the "intermediate" type, the spreading of the streamers being a character-

istic feature. It is interesting from the fact that it is a corona associated with a rising sun-spot curve after a protracted minimum. The N.E. streamer is noteworthy as lying over the background of continuous corona by projection and consisting of a sheaf or bundle of very bright rays, which can be traced 26′ from the sun's limb. The filamentous nature of the other streamers is also marked. These filaments are superposed upon a bright continuous ring, representing the lower corona. This bright ring, between 1′ and 2′ of arc in height all round the sun is seen on both the large scale and the smaller scale photographs. A considerable extent of the chromosphere on the W. limb is shown on the last exposed of the larger scale photographs, as the slide was only just closed before the end of totality. The southern boundary of the S.E. streamer extends further from the sun than other feature of the corona. It has a double curvature, and on one of the smaller scale photographs can be traced as far as two diameters from the sun. Although the composite drawing made by the Swedish students is a faithful representation of what was seen by the unaided eye, the extent to which the corona was traced is not so great as has been photographed. Eight prominences in all appear on the plates, a fine one between position angles 143°—153°, rising in the form of an arch with a bright detached keystone, to a height of 85″. At position angle 353° is a bright prominence, 80″ in height, and near this is a remarkably bright filament, which can be traced as far as 7′ from the sun, of a different character from the polar rays. It curves over towards the equator. Immediately below this, on the W. limb of the sun, are two bright streamers, which are superposed on the background of what may be termed the continuous mass of streamers.

Continuing the curvature of these two streamers and the bright filament as projected, on to the sun's disk, they meet near the large sun-spot at position heliographic longitude 67° 12′, latitude 18° 18′ on the day of the eclipse. Plotting five points on each of these bright rays, and taking the centre of the spot itself as a sixth point, it appears by an application of Pascal's theorem, that each set of five points with the spot lie upon a conic section. It is highly probable, therefore, that these bright rays are the projections on a plane of streamers of particles emanating from the spot, for three projected conics meet near the spot. Similarly the bright rays which were selected from the sheaf on the N.E. are projections of conic sections meeting near the spot, so that this feature may also be reasonably attributed to the action of the large sun-spot.

The spectrum of the corona photographed on each side of the spectrum of the iron-arc, though extremely weak, is yet measurable. It appears to be unique. In the first place, although the corona was a bright one, the characteristic coronal radiation at w.l. 5303 is only just discernable on the plate. This result agrees with that obtained by other observers. Secondly the intenser radiations are in the red end of the spectrum, and other observers have called attention to a bright radiation at w.l. 6374. This line is well marked on the negative, but it is not an isolated radiation. It occurs as a strong member of a band, or fluting, there being also two other well marked flutings in the red. The wavelengths of their terminal lines are as follows :—

1. 6643·9 / 6630·5 } Three Lines.

2. 6530·9 / 6502·8 } Six Lines.

3. 6384·3 / 6363·0 } Seven Lines.

The line 6374·3 is probably the most prominent of all the lines. Two other bands occur at:

4. 5118·1, 5114·3 } Two Lines. 5. 5315·3, 5302·7 } Four Lines.

this last band covering the well-known green coronal radiation. All the lines in these bands are sharp, though very faint. There are also probably lines about the following wave-lengths: 5662, 5588, 5544, 5512, 5476, 5227, and 4997, though all these numbers are subject to revision. The general character of the coronal spectrum as photographed is undoubtedly that of a series of bands, or flutings. From a study of the position of the slit relatively to the corona, it appears that the spectrum is not that of the upper chromosphere, nor of the lower corona, but of the roots of the streamers on the E. side of the sun.

Astronomical.—All the fine nights up to July have been employed in experimental work with the transit instrument in preparation for the rectification of our Longtitude by the radio-telegraphic time signals from the Paris Observatory, *via* the Eiffel Tower.

The instrument is a very old one, and has a very extraordinary fault. When the middle wire in the focal plane is set to zero of collimation by the South collimator, it is found to be completely wrong by the North collimator. I can account for this only on the supposition of a considerable pivot inequality, together with an indenture on one of the faces of one of the V supports, so that in one position of the axle one of the pivots rests in a lateral hollow, while in the reversed position the hollow is avoided. The result of this is an azimuthal error, appearing as a collimation error. But a large number of

level readings showed also a very uncertain pivot error, so that both the errors, of collimation and pivot, had to be treated as unknown quantities to be eliminated from all the time observations.

For this end the working plan for each night has been to select pairs of clock stars of nearly the same altitude, one to be observed with circle East, the other with circle West. The mean of the two clock errors is the error by the mean star, and is free from the collimation and pivot errors. For Azimuth, the instrument has always been reversed after the transits over the first two wires, and whenever possible circumpolar stars have been selected, one at least at high declination. For level error the readings have been taken in both positions of the instrument; the mean of the two indicated errors being the true error free from pivot error.

The work was progressing favourably when the order came shutting down our radio-installation; and we have to await better times for confirmation of the experimental trials, which give our accepted longtitude nearly 0·4 sec too great westerly.

Seismological.—A short account of the Seismograph is given on page xiii. of our Annual, 1909. It is of the Milne photographic pattern, and is mounted with horizontal pendulum, or boom, in the astronomical meridian. A copy of its register is sent monthly to the Secretary of the Seismological Committee of the British Association for the Advancement of Science. This contains many small disturbances of uncertain origin, which do not appear in our occasional bulletins distributed amongst the Seismic stations at home and abroad; they have to await confirmation by other Observatories.

The following papers have been published during the year :—

1. "Solar Surface Disturbances" Knowledge, Vol. 37, No. 546, pp. 1—5. Plates 1, 2. January, 1914.

2. "The Origin of the Sun and Stars" Journal Manchester Astronomical Society, 1914, pp. 1—15. Plates 1—3.

3. "Solar and Terrestrial Magnetic Disturbances," Report British Association, 1914, p. 395.

4. "An area of long-continued Solar Disturbance, and the Associated Magnetic Storms." Monthly Notices R.A.S., 74, pp. 670—678. Plates 14—15. June, 1914.

5. "On counting the Stars." The Month, Oct., 1914. pp. 1—11. Plate 1.

6. "The Transit of Mercury," 1914, November, 6—7. Monthly Notices R.A.S., 75 p. 66. December, 1914.

METEOROLOGICAL REPORT.

JANUARY, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·707	29·492
Highest ,, ,, on the 12th... ,,	30·231	30·130
Lowest ,, ,, on the 5th... ,,	29·050	28·591
Range of Barometer Readings..... ,,	1·181	1·539
Highest Reading of a Max. Therm. on the 31st...	53·3	51·2
Lowest Reading of a Min. Therm. on 23rd and 24th	26·1	21·1
Range of Thermometer Readings	27·2	30·1
Mean of Highest Daily Readings	42·6	42·3
Mean of Lowest Daily Readings	34·8	32·9
Mean Daily Range	7·8	9·4
Deduced Mean Temp. (from mean of Max. and Min.)	38·5	37·3
Mean Temperature from Dry Bulb	39·1	37·5
Adopted Mean Temperature	38·8	37·4
Mean Temperature of Evaporation	36·7	36·2
Mean Temperature of Dew Point	33·9	34·0
Mean elastic force of Vapour.....inches	0·195	0·198
Mean weight of Vapour in a cub. ft. of air, grains	2·3	2·4
Mean additional weight required for saturation ,,	0·5	0·4
Mean degree of Humidity (saturation 100)	84	87
Mean weight of a cubic foot of air ..... grains	552·4	549·8
Mean amount of Cloud (0—10)	7·2	7·8
Fall of Rain ..... inches	4·734	4·176
Greatest Rainfall in one day (8th) ..... ,,	2·074	0·810
No. of days on which ·005 in. or more Rain fell...	17	19·1

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	3	5	1	3	6	8	2
Mean Velocity in miles per hr.	5·5	6·5	8·1	5·3	6·3	14·3	14·0	12·4
Total No. of miles for each Direction	397	470	973	126	450	2066	2681	595

		Mean*
Total No. of miles registered	7758	8159·9
Greatest hourly velocity (25th. 9 p.m. Dir. S.W.)	33	41·5

* *For the last* 47 *years.*

JANUARY, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·215 in.
Monthly range ,, ...	—	0·358 in.
Mean of highest daily temperatures	+	0·3°
Mean of lowest ,, ,, ...	+	1·9°
Mean daily range	—	1·6°
Adopted mean temperature	+	1·4°
Total rainfall	+	0·558 in.

Ground frost on 1st—3rd, 5th—8th, 11th—25th, 27th and 28th. Snow on 5th and 14th. Hail on 5th. Heavy rain on 8th and 9th. Solar halo on 28th.

Dry weather prevailed from the 10th to the 24th, yet Sunshine was only half the average amount.

EXTREME READINGS FOR JANUARY, During 67 Years.

Highest reading of Barometer ...	1896 (9th)	30·597 in.
Lowest ,, ,, ...	1884 (26th)	27·803 in.
Highest temperature	1877 (7th)	59·9°
Lowest ,, ...	1881 (15th)	4·6°
Highest adopted mean temperature	1898	43·7°
Lowest ,, ,,	1881	29·2°
Greatest fall of rain	1910	8·403 in.
Least ,, ...	1881	0·472 in.
Greatest fall of rain in one day ...	1914 (8th)	2·074 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1890	30
Least ,, ,, ,,	†1850	8
*Greatest hourly velocity of wind	1899 (12th)	63 mls.
*Greatest No. of miles registered ...	1890	11661
*Least ,, ,, ,, ...	1881	4352

* *Since* 1867 *only.* † *And in other years.*

FEBRUARY, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·163	29·496
Highest ,, ,, on the 27th... ,,	29·700	30·096
Lowest ,, ,, on the 22nd... ,,	27·992	28·644
Range of Barometer Readings..... ,,	1·708	1·452
Highest Reading of a Max. Therm. on the 1st ...	54·2	52·0
Lowest Reading of a Min. Therm. on the 25th...	27·3	22·2
Range of Thermometer Readings	26·9	29·8
Mean of Highest Daily Readings	48·4	44·1
Mean of Lowest Daily Readings	39·0	33·5
Mean Daily Range	9·4	10·6
Deduced Mean Temp. (from mean of Max. & Min.)	43·3	38·2
Mean Temperature from Dry Bulb	44·1	38·4
Adopted Mean Temperature	43·7	38·3
Mean Temperature of Evaporation	41·2	36·8
Mean Temperature of Dew Point	38·3	34·5
Mean elastic force of Vapour ..... inches	0·231	0·195
Mean weight of Vapour in a cub. ft. of air, grains	2·7	2·4
Mean additional weight required for saturation ,,	0·6	0·4
Mean degree of Humidity (saturation 100).....	81	86
Mean weight of a cubic foot of air ..... grains	536·6	548·7
Mean amount of Cloud (0—10)	5·6	7·5
Fall of Rain ..... inches	3·218	3·497
Greatest Rainfall in one day (18th) ..... ,,	0·455	0·761
No. of days on which ·005 in. or more Rain fell...	18	16·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	2	1	1	9	8	7	0
Mean Velocity in miles per hr.	0	3·5	4·8	14·4	16·7	17·0	13·9	0
Total No. of miles for each Direction	0	167	116	346	3616	3268	2341	0

		Mean*
Total No. of Miles registered	9854	7663·9
Greatest hourly velocity (22nd. 11 a.m. Dir. S.S.E.)	44	42·6

* *For the last* 47 *years.*

FEBRUARY, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	—	0·333 in.
Monthly range ,, ...	+	0·256 in.
Mean of highest daily temperatures	+	4·3°
Mean of lowest ,, ,, ...	+	5·5°
Mean daily range	—	1·2°
Adopted mean temperature	+	5·4°
Total rainfall	—	0·279 in.

Ground frost on 5th—9th, 12th, 13th, 16th—20th, 22nd, and 24th—26th. Hoar frost on 25th and 26th. Snow and hail on 18th. Gales of wind on 7th, 8th, 11th, and 22nd. Fog on 25th. Lunar halo on 4th. Solar halo on 9th and 16th.

An exceptionally warm February. Once only in the 67 years was the mean temperature of the month higher: 43·7° (1914), against 44·0° (1869).

EXTREME READINGS FOR FEBRUARY, During 67 Years.

Highest reading of Barometer ...	1902 (1st)	30·476 in.
Lowest ,, ,, ...	1900 (19th)	27·870 in.
Highest temperature	1877 (8th)	58·3°
Lowest ,, ...	1902 (11th)	5·0°
Highest adopted mean temperature	1869	44·0°
Lowest ,, ,,	1855	28·6°
Greatest fall of rain	1848	8·882 in.
Least ,, ...	1858	0·306 in.
Greatest fall of rain in one day ...	1909 (3rd)	2·000 in.
Greatest No. of days on which ·005 or more rain fell	1910	27
Least ,, ,, ,,	1855	4
*Greatest hourly velocity of wind ...	1903 (27th)	60 mls.
*Greatest No. of miles registered ...	1868	12577
*Least ,, ,, ,, ...	1886	4251

* *Since* 1867 *only.*

MARCH, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·108	29·446
Highest ,, ,, on the 31st ... ,,	29·662	30·041
Lowest ,, ,, on the 20th ... ,,	28·493	28·635
Range of Barometer Readings ..... ,,	1·169	1·406
Highest Reading of a Max. Therm. on the 30th...	58·2	56·9
Lowest Reading of a Min. Therm. on the 10th...	26·6	23·2
Range of Thermometer Readings	31·6	33·7
Mean of Highest Daily Readings	46·6	47·1
Mean of Lowest Daily Readings	36·5	34·3
Mean Daily Range	10·1	12·8
Deduced Mean Temp. (from mean of Max. & Min.)	40·6	39·8
Mean Temperature from Dry Bulb	42·4	40·3
Adopted Mean Temperature	41·5	40·0
Mean Temperature of Evaporation	39·8	38·1
Mean Temperature of Dew Point	37·7	35·7
Mean elastic force of Vapour ..... inches	0·227	0·209
Mean weight of Vapour in a cub. ft. of air, grains	2·6	2·4
Mean additional weight required for saturation ,,	0·4	0·5
Mean degree of Humidity (saturation 100).....	87	85
Mean weight of a cubic foot of air ..... grains	538·0	546·0
Mean amount of Cloud (0—10)	8·1	7·5
Fall of Rain ..... inches	5·376	3·425
Greatest Rainfall in one day (5th) ..... ,,	0·840	0·780
No. of days on which ·005 or more Rain fell...	28	16·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	5	0	2	6	2	15	1
Mean Velocity in miles per hr.	0	4·4	0	9·9	12·4	12·5	14·5	14·3
Total No. of miles for each Direction	0	524	0	474	1792	598	5221	343

		Mean*
Total No. of Miles registered	8952	8601·9
Greatest hourly velocity (6th. 3-30 p.m. Dir.W.S.W.)	35	41·6

* *For the last* 47 *years.*

MARCH, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	—	0·338 in.
Monthly range ,, ...	—	0·237 in.
Mean of highest daily temperatures	—	0·5°
Mean of lowest ,, ,, ...	+	2·2°
Mean daily range	—	2·7°
Adopted mean temperature	+	1·5°
Total rainfall	+	1·951 in.

Ground frost on 2nd, 7th—13th, 17th—23rd, and 26th—28th. Snow on 2nd, 10th, 11th, 18th, and 27th. Hail on 1st, 2nd, 18th, and 27th. Heavy rain on 5th and 15th. Thunder and lightning on 18th. Lunar halo on 9th. Solar halo on 9th and 28th.

Throughout the month cloud and rain were the prevailing features.

EXTREME READINGS FOR MARCH,
During 67 Years.

Highest reading of Barometer ...	1854 (4th)	30·452 in.
Lowest ,, ,, ...	1876 (10th)	28·100 in.
Highest temperature	1871 (25th)	68·0°
Lowest ,, ...	1874 (10th)	11·1°
Highest adopted mean temperature	1871	44·0°
Lowest ,, ,,	1883	34·4°
Greatest fall of rain	1912	7·205 in.
Least ,, ...	1852	0·352 in.
Greatest fall of rain in one day ...	1898 (17th)	1·540 in.
Greatest No. of days on which ·005 in. or more rain fell ...	†1861	28
Least ,, ,, ,,	1852	3
*Greatest hourly velocity of wind ...	1905 (15th)	57 mls.
*Greatest No. of miles registered ...	1903	12773
*Least ,, ,, ,, ...	1892	5725

* *Since* 1867 *only.* † *And* 1914.

APRIL, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·604	29·488
Highest ,, ,, on the 26th ... ,,	30·152	29·951
Lowest ,, ,, on the 7th ... ,,	28·801	28·809
Range of Barometer Readings ..... ,,	1·351	1·142
Highest Reading of a Max. Therm. on the 21st...	67·6	65·1
Lowest Reading of a Min. Therm. on the 15th...	30·7	28·1
Range of Thermometer Readings	36·9	37·0
Mean of Highest Daily Readings	56·2	54·9
Mean of Lowest Daily Readings	40·3	37·8
Mean Daily Range	15·9	17·1
Deduced Mean Temp. (from mean of Max. & Min.)	46·8	44·1
Mean Temperature from Dry Bulb	48·3	44·7
Adopted Mean Temperature	47·6	44·4
Mean Temperature of Evaporation	44·6	41·7
Mean Temperature of Dew Point	41·3	38·3
Mean elastic force of Vapour ..... inches	0·260	0·235
Mean weight of Vapour in a cub. ft. of air, grains	3·0	2·7
Mean additional weight required for saturation ,,	0·7	0·7
Mean degree of Humidity (saturation 100).....	80	80
Mean weight of a cubic foot of air ..... grains	540·4	542·1
Mean amount of Cloud (0—10)	3·9	6·7
Fall of Rain ..... inches	1·470	2·520
Greatest Rainfall in one day (4th) ..... ,,	0·400	0·582
No. of days on which ·005 in. or more Rain fell...	12	14·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	3	3	1	1	10	9	0
Mean Velocity in miles per hr.	3·9	6·6	10·8	6·1	14·9	11·4	12·2	0
Total No. of miles for each Direction	280	474	780	146	357	2741	2635	0

		Mean*
Total No. of Miles registered	7413	7593·8
Greatest hourly velocity (6th. 3-30 p.m. Dir.W.S.W.)	33	37·2

* *For the last* 47 *years.*

APRIL, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·116 in.
Monthly range ,, ...	+	0·209 in.
Mean of highest daily temperatures	+	1·3°
Mean of lowest ,, ,, ...	+	2·5°
Mean daily range	—	1·2°
Adopted mean temperature	+	3·2°
Total rainfall	—	1·050 in.

Ground frost on 2nd, 4th, 5th, 8th, 9th, 12th, 14th—17th, 19th—21st, 23rd, and 26th—30th. Hail on 7th—10th, 13th and 14th. Lightning on 30th. Solar halo on the 1st.

The month was remarkable for prolonged fine warm weather and bright sunshine.

EXTREME READINGS FOR APRIL, During 67 Years.

Highest reading of Barometer ...	1906 (8th)	30·317 in.
Lowest ,, ,, ...	1868 (20th)	28·358 in.
Highest temperature	1852 (14th)	74·1°
Lowest ,, ...	1892 (13th)	20·8°
Highest adopted mean temperature	1865	48·5°
Lowest ,, ,, ...	1879	40·7°
Greatest fall of rain	1867	5·672 in.
Least ,, ...	1852	0·478 in.
Greatest fall of rain in one day ...	1913 (26th)	1·180 in.
Greatest No. of days on which ·005 in. or more rain fell	1867	24
Least ,, ,, ,,	1852	4
*Greatest hourly velocity of wind ...	1911 (19th)	53 mls.
*Greatest No. of miles registered	1904	11016
*Least ,, ,, ,, ...	1884	5047

* *Since* 1867 *only.*

MAY, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·646	29·538
Highest ,, ,, on the 19th ... ,,	30·020	29·990
Lowest ,, ,, on the 7th ... ,,	28·904	28·946
Range of Barometer Readings ..... ,,	1·116	1·044
Highest Reading of a Max. Therm. on the 17th...	66·6	71·7
Lowest Reading of a Min. Therm. on the 26th...	33·6	31·8
Range of Thermometer Readings	33·0	39·9
Mean of Highest Daily Readings	56·1	59·4
Mean of Lowest Daily Readings	42·7	42·3
Mean Daily Range	13·4	17·1
Deduced Mean Temp. (from mean of Max. & Min.)	47·7	49·1
Mean Temperature from Dry Bulb	49·4	49·8
Adopted Mean Temperature	48·6	49·5
Mean Temperature of Evaporation	45·9	46·3
Mean Temperature of Dew Point	43·0	42·7
Mean elastic force of Vapour ..... inches	0·278	0·278
Mean weight of Vapour in a cub. ft. of air, grains	3·2	3·1
Mean additional weigh required for saturation ,,	0·7	0·9
Mean degree of Humidity (saturation 100).....	82	77
Mean weight of a cubic foot of air ..... grains	539·9	537·1
Mean amount of Cloud (0—10).....	6·8	7·1
Fall of Rain ..... inches	2·894	2·690
Greatest Rainfall in one day (3rd) ..... ,,	0·640	0·632
No. of days on which ·005 in. or more Rain fell...	18	14·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	2	3	1	2	1	8	12	2
Mean Velocity in miles per hr.	5·3	4·5	6·1	11·1	7·4	9·6	9·2	11·6
Total No. of miles for each Direction	256	325	147	534	178	1851	2649	556

		Mean*
Total No. of Miles registered	6496	7086·2
Greatest hourly velocity (5th. 3 p.m. Dir. S.W. by W.)	23	33·6

* *For the last 47 years.*

MAY, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·108 in.
Monthly range ,, ...	+	0·072 in.
Mean of highest daily temperatures	—	3·3°
Mean of lowest ,, ,, ...	+	0·4°
Mean daily range	—	3·7°
Adopted mean temperature	—	0·9°
Total rainfall	+	0·204 in.

Ground frost on 1st—3rd, 8th, 10th—12th, 15th, and 24th—28th. Hail on 8th. Heavy rain on 3rd. Lunar halo on the 2nd. Solar halo on the 28th.

Fine dry weather prevailed from the 12th to the 22nd.

EXTREME READINGS FOR MAY,

During 67 Years.

Highest reading of Barometer ...	1881 (10th)	30·332 in.
Lowest ,, ,, ...	1877 (28th)	28·559 in.
Highest temperature	1864 (19th)	82·5°
Lowest ,, ...	1855 (4th)	23·5°
Highest adopted mean temperature	1848	55·1°
Lowest ,, ,,	1855	45·0°
Greatest fall of rain	1886	6·178 in.
Least ,, ...	1859	0·249 in.
Greatest fall of rain in one day ...	1881 (5th)	1·647 in.
Greatest No. of days on which ·005 in. or more rain fell	†1860	22
Least ,, ,, ,,	†1848	4
*Greatest hourly velocity of wind	1888 (2nd)	49 mls.
*Greatest No. of miles registered ...	1888	9648
*Least ,, ,, ,, ...	1889	5396

* *Since 1867 only.* † *And in other years.*

JUNE, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·634	29·553
Highest ,, ,, on the 26th ... ,,	30·002	29·931
Lowest ,, ,, on the 7th ... ,,	29·234	29·032
Range of Barometer Readings ..... ,,	0·768	0·899
Highest Reading of a Max. Therm. on the 17th...	76·0	77·1
Lowest Reading of a Min. Therm. on the 1st ...	39·4	39·1
Range of Thermometer Readings	36·6	38·0
Mean of Highest Daily Readings	64·6	65·5
Mean of Lowest Daily Readings	49·0	48·1
Mean Daily Range	15·6	17·4
Deduced Mean Temp. (from mean of Max. & Min.)	55·0	55·0
Mean Temperature from Dry Bulb	57·3	55·3
Adopted Mean Temperature	56·2	55·2
Mean Temperature of Evaporation	52·1	52·0
Mean Temperature of Dew Point	48·2	48·5
Mean elastic force of Vapour ..... inches	0·340	0·350
Mean weight of Vapour in a cub. ft. of air, grains	3·8	3·9
Mean additional weight required for saturation ,,	1·2	1·0
Mean degree of Humidity (saturation 100)	75	78
Mean weight of a cubic foot of air ..... grains	531·4	531·1
Mean Amount of Cloud (0—10).....	6·1	7·3
Fall of Rain ..... inches	1·960	3·457
Greatest Rainfall in one day (9th) ..... ,,	0·650	0·827
No. of days on which ·005 in. or more Rain fell...	15	15·4

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	7	1	0	0	2	14	3
Mean Velocity in miles per hr.	9·6	6·4	11·8	0	0	6·5	7·2	9·9
Total No. of miles for each Direction	694	1071	284	0	0	312	2432	713

		Mean*
Total No. of Miles registered	5506	6218·9
Greatest hourly velocity (1st & 7th Noon. Dir. W.)	18	29·9

* *For the last* 47 *years.*

JUNE, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·081 in.
Monthly range ,, ...	—	0·131 in.
Mean of highest daily temperatures	—	0·9°
Mean of lowest ,, ,, ...	+	0·9°
Mean daily range	—	1·8°
Adopted mean temperature	+	1·0°
Total rainfall	—	1·497 in.

Ground frost on 1st, 3rd, 8th, and 26th. Heavy rain on 9th. Thunder on 14th and 17th—20th. Lightning on 17th. Solar halo on the 11th.

EXTREME READINGS FOR JUNE,

During 67 Years.

Highest reading of the Barometer	1874	(15th)	30·219 in.
Lowest ,, ,,	1862	(12th)	28·632 in.
Highest temperature	1893	(18th)	88·7°
Lowest ,, ...	1902	(9th)	32·0°
Highest adopted mean temperature	1896	.....	59·3°
Lowest ,, ,,	1907	.....	51·5°
Greatest fall of rain	1907	.....	8·705 in.
Least ,, ...	1887	.....	0·525 ,,
Greatest fall of rain in one day ...	1857	(8th)	2·093 ,,
Greatest No. of days on which ·005 in. or more rain fell	†1907	.....	27
Least ,, ,, ,,	1887	.....	4
*Greatest hourly velocity of wind	1897	(16th)	45 mls.
*Greatest No. of miles registered...	1877	.....	8384
*Least ,, ,, ,,	1884	.....	4507

* *Since* 1867 *only.* † *And* 1912.

JULY, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·421	29·525
Highest ,, ,, on the 10th ... ,,	29·808	29·903
Lowest ,, ,, on the 25th ... ,,	29·078	29·021
Range of Barometer Readings ..... ,,	0·730	0·882
Highest Reading of a Max. Therm. on the 21st...	82·5	78·8
Lowest Reading of a Min. Therm. on the 4th...	43·7	42·4
Range of Thermometer Readings	38·8	36·4
Mean of Highest Daily Readings	66·5	67·6
Mean of Lowest Daily Readings	52·8	51·0
Mean Daily Range	13·7	16·6
Deduced Mean Temp. (from mean of Max. & Min.)	57·8	57·7
Mean Temperature from Dry Bulb	60·0	57·9
Adopted Mean Temperature	58·9	57·8
Mean Temperature of Evaporation	55·8	54·8
Mean Temperature of Dew Point	53·0	52·0
Mean elastic force of Vapour ..... inches	0·404	0·389
Mean weight of Vapour in a cub. ft. of air, grains	4·5	4·4
Mean additional weight required for saturation ,,	1·1	1·1
Mean degree of Humidity (saturation 100)	81	81
Mean weight of a cubic foot of air ..... grains	524·4	527·5
Mean amount of Cloud (0—10)	7·9	7·4
Fall of Rain ..... inches	4·995	4·009
Greatest Rainfall in one day (16th)..... ,,	1·450	0·873
No. of days on which ·005 in. or more Rain fell...	19	16·5

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	4	2	1	3	5	4	8	4
Mean Velocity in miles per hr.	4·0	9·5	6·1	6·5	6·9	6·2	9·0	14·5
Total No. of miles for each Direction	386	458	147	469	823	595	1733	1393

		Mean*
Total No. of Miles registered	6004	6470·0
Greatest hourly velocity (25th, 2-30 p.m. Dir N.W. by W.)	30	29·0

* *For the last 47 years.*

JULY, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	—	0·104 in.
Monthly range ,, ...	—	0·152 in.
Mean of highest daily temperatures	—	1·1°
Mean of lowest ,, ,, ...	+	1·8°
Mean daily range	—	2·9°
Adopted Mean temperature	+	1·1°
Total rainfall	+	0·986 in.

Hail on 21st, 25th, and 26th. Heavy rain on 16th and 24th. Thunder on 1st, 11th, 12th, 20th, and 21st. Lightning on 1st, 11th, and 21st. Solar halo on the 15th.

EXTREME READINGS FOR JULY,

During 67 Years.

Highest reading of Barometer ...	1911	(10th)	30·203 in.
Lowest ,, ,, ...	1877	(15th)	28·564 in.
Highest temperature	1901	(20th)	89·0°
Lowest ,, ...	1857	(1st)	36·0°
Highest adopted mean temperature	1901	.....	63·2°
Lowest ,, ,,	1862	.....	54·3°
Greatest fall of rain	1888	.....	8·475 in.
Least ,, ...	1868	.....	0·669 in.
Greatest fall of rain in one day ...	1888	(2nd)	2·482 in.
Greatest No. of days on which ·005 in. or more rain fell	†1861	.....	27
Least ,, ,, ,,	†1863	.....	8
*Greatest hourly velocity of wind	1892	(8th)	44 mls.
*Greatest No. of miles registered ...	1877	.....	8288
*Least ,, ,, ,,	1913	.....	4577

* *Since* 1867 *only.* † *And in other years.*

AUGUST, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·558	29·494
Highest ,, ,, on the 31st ... ,,	29·940	29·888
Lowest ,, ,, on the 2nd ... ,,	29·046	28·954
Range of Barometer Readings ..... ,,	0·894	0·934
Highest Reading of a Max. Therm. on the 14th...	78·1	76·6
Lowest Reading of a Min. Therm. on the 12th...	43·4	41·7
Range of Thermometer Readings	34·7	34·9
Mean of Highest Daily Readings	67·2	66·7
Mean of Lowest Daily Readings	51·9	50·6
Mean Daily Range	15·3	16·1
Deduced Mean. Temp. (from Mean of Max. & Min.)	57·9	57·0
Mean Temperature from Dry Bulb	59·8	57·7
Adopted Mean Temperature	58·9	57·4
Mean Temperature of Evaporation	55·8	54·5
Mean Temperature of Dew Point	53·0	51·7
Mean elastic force of Vapour ..... inches	0·404	0·386
Mean weight of Vapour in a cub. ft. of air, grains	4·5	4·3
Mean additional weight required for saturation ,,	1·1	0·9
Mean degree of Humidity (saturation 100)	81	82
Mean weight of a cubic foot of air ..... grains	526·8	527·5
Mean amount of Cloud (0—10).....	5·4	7·3
Fall of Rain ..... inches	2·640	4·999
Greatest Rainfall in one day (1st) ..... ,,	0·750	1·060
No. of days on which ·005 in. or more Rain fell...	14	18·3

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	2	5	2	1	2	12	7	0
Mean Velocity in miles per hr.	5·6	4·4	8·2	4·9	10·9	7·3	6·5	0
Total No. of miles for each Direction	268	529	393	118	525	2106	1088	0

		Mean*
Total No. of Miles registered	5027	6452·2
Greatest hourly velocity (8th, Noon. Dir. S.) ...	28	31·6

* *For the last* 47 *years.*

AUGUST, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·064 in.
Monthly range ,, ...	—	0·040 in.
Mean of highest daily temperatures	+	0·5°
Mean of lowest ,, ,, ...	+	1·3°
Mean daily range	—	0·8°
Adopted mean temperature	+	1·5°
Total rainfall	—	2·359 in.

Heavy rain on the 1st and 8th. Lightning on the 9th and 24th.

The month on the whole was exceptionally fine, dry, and sunny.

EXTREME READINGS FOR AUGUST,

During 67 Years.

Highest reading of Barometer ...	1874 (21st)	30·114 in.
Lowest ,, ,, ...	1903 (15th)	28·492 in.
Highest temperature	1868 (2nd)	88·0°
Lowest ,, ...	1887 (13th)	33·4°
Highest adopted mean temperature	1911	62·1°
Lowest ,, ,,	1848	52·5°
Greatest fall of rain	1891	9·869 in.
Least ,, ...	1871	2·085 in.
Greatest fall of rain in one day ...	1857 (7th)	2·333 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1891	27
Least ,, ,, ,,	1880	6
*Greatest hourly velocity of wind	1903 (31st)	45 mls.
*Greatest No. of miles registered...	1903	8486
*Least ,, ,, ,,	1884	4060

* *Since* 1867 *only*.

SEPTEMBER, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·600	29·545
Highest ,, ,, on the 29th ... ,,	29·998	30·015
Lowest ,, ,, on the 14th ... ,,	28·876	28·890
Range of Barometer Readings	1·122	1·125
Highest Reading of a Max. Therm. on the 2nd...	72·8	72·2
Lowest Reading of a Min. Therm. on the 30th...	36·1	36·4
Range of Thermometer Readings	36·7	35·8
Mean of Highest Daily Readings	61·8	62·1
Mean of Lowest Daily Readings	47·4	47·1
Mean Daily Range	14·4	15·0
Deduced Mean Temp. (from mean of Max. & Min.)	53·3	53·4
Mean Temperature from Dry Bulb	55·0	54·2
Adopted Mean Temperature	54·2	53·8
Mean Temperature of Evaporation	50·6	51·0
Mean Temperature of Dew Point	47·1	48·3
Mean elastic force of Vapour ..... inches	0·323	0·339
Mean weight of Vapour in a cub. ft. of air, grains	3·7	3·9
Mean additional weight required for saturation ,,	1·1	0·9
Mean degree of Humidity (saturation 100).....	77	81
Mean weight of a cubic foot of air.....grains	532·9	532·6
Mean amount of Cloud (0—10)	5·0	6·7
Fall of Rain ..... inches	5·775	4·285
Greatest Rainfall in one day (16th)..... ,,	1·500	0·960
No. of days on which ·005 in. or more Rain fell...	13	16·4

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	4	5	2	1	2	9	6	1
Mean Velocity in miles per hr.	5·5	6·4	7·6	5·2	5·6	9·5	14·0	10·9
Total No. of miles for each Direction	528	768	367	124	270	2055	2016	262

		Mean*
Total No. of Miles registered	6390	6096·5
Greatest hourly velocity (14th and 16th, 9 p.m. Dir. W. & S.W. respectively).....	30	33·0

* *For the last* 47 *years.*

SEPTEMBER, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	+	0·055 in.
Monthly range ,, ...	—	0·003 in.
Mean of highest daily temperatures	—	0·3°
Mean of lowest ,, ,, ...	+	0·3°
Mean daily range	—	0·6°
Adopted mean temperature	+	0·4°
Total rainfall	+	1·490 in.

Ground frost on the 19th, 21st—25th, 29th, and 30th. Heavy rain on 8th, 9th, 12th, and 16th. Thunder on 8th, 9th, 10th, and 12th. Lightning on 8th, 9th, 12th, and 26th. Solar halo on 7th and 12th.

The total sunshine, 176½ hours, exceeded by one hour the previous record of September, 1906. Rainfall, amounting to 5¾ inches, was confined to the 12 days, 8th—19th.

EXTREME READINGS FOR SEPTEMBER, During 67 Years.

Highest reading of Barometer ...	1851	(15th)	30·247 in.
Lowest ,, ,, ...	1896	(25th)	28·314 in.
Highest temperature	1868	(6th)	85·0°
Lowest ,, ...	†1885	(25th)	29·8°
Highest adopted mean temperature	1865	.....	59·1°
Lowest ,, ,,	1863	.....	50·9°
Greatest fall of rain	1869	.....	9·539 in.
Least ,, ...	1910	.....	0·652 in.
Greatest fall of rain in one day ...	1889	(26th)	2·060 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1866	.....	27
Least ,, ,, ,,	†1851	.....	6
*Greatest hourly velocity of wind	1875	(26th)	53 mls.
*Greatest No. of miles registered ...	1869	.....	9053
*Least ,, ,, ,, ...	1888	.....	3261

* *Since* 1867 *only.* † *And in other years.*

OCTOBER, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·577	29·439
Highest ,, ,, on the 4th & 5th ,,	29·996	30·022
Lowest ,, ,, on the 31st ,,	28·956	28·673
Range of Barometer Readings..... ,,	1·040	1·349
Highest Reading of a Max. Therm. on the 3rd ...	60·3	64·0
Lowest Reading of a Min. Therm. on the 24th ...	35·8	29·5
Range of Thermometer Readings	24·5	34·5
Mean of Highest Daily Readings	54·9	54·6
Mean of Lowest Daily Readings	45·1	41·9
Mean Daily Range	9·8	12·7
Deduced Mean Temp. (from Mean. of Max. and Min.)	49·0	47·3
Mean Temperature from Dry Bulb	50·3	48·0
Adopted Mean Temperature	49·7	47·6
Mean Temperature of Evaporation	47·0	45·4
Mean Temperature of Dew Point	44·1	43·0
Mean elastic force of Vapour.....inches	0·290	0·279
Mean weight of vapour in a cub. ft. of air, grains	3·3	3·2
Mean additional weight required for saturation ,,	0·7	0·6
Mean degree of Humidity (saturation 100).....	82	84
Mean weight of a cubic foot of air .....grains	537·5	537·5
Mean amount of Cloud (0—10)	6·6	7·3
Fall of Rain ..... inches	2·655	4·938
Greatest Rainfall in one day (27th) ..... ,,	0·800	0·986
No. of days on which ·005 in. or more Rain fell...	16	18·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	5	9	3	1	1	6	5	1
Mean Velocity in miles per hr.	3·5	7·4	6·4	5·8	2·7	5·1	10·4	1·9
Total No. of miles for each Direction	414	1595	460	140	65	736	1245	46

		Mean*
Total No. of miles registered	4701	6962·6
Greatest hourly velocity (4th, 11 a.m. Dir. W.N.W.	28	38·0

* *For the last* 47 *years.*

OCTOBER, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometic pressure	+	0·138 in.
Monthly range ,, ...	—	0·309 in.
Mean of highest daily temperatures	+	0·3°
Mean of lowest ,, ,, ...	+	3·2°
Mean daily range ,, ...	—	2·9°
Adopted Mean temperature	+	2·1°
Total rainfall	—	2·283 in.

Ground frost on 7th, 8th, 10th, 11th, 20th, 22nd, 24th, 28th, and 29th. Heavy rain on 25th and 27th. Fog on the 19th. Lightning on the 27th. Solar halo on the 24th.

The weather was unusually mild and fine. Temperatures were high and remarkably uniform, the extreme range for the month being 10 degrees below the average.

EXTREME READINGS FOR OCTOBER, During 67 Years.

Highest reading of Barometer ...	1884 (5th)	30·306 in.
Lowest ,, ,, ...	1862 (19th)	28·139 in.
Highest temperature	1890 (12th)	74·0°
Lowest ,, ...	1895 (28th)	17·8°
Highest adopted mean temperature	1908	52·5°
Lowest ,, ,,	1895	42·8*
Greatest fall of rain	1870	13·437 in.
Least ,, ...	1856	1·328 in.
Greatest fall of rain in one day ...	1870 (8th)	2·529 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1903	29
Least ,, ,, ,,	1864	10
*Greatest hourly velocity of wind	1877 (15th)	52 mls.
*Greatest No. of miles registered...	1874	9818
*Least ,, ,, ,, ...	1908	4569

* *Since* 1867 *only.*

NOVEMBER, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·366	29·461
Highest ,, ,, on the 18th ... ,,	30·187	30·060
Lowest ,, ,, on the 15th ... ,,	28·597	28·571
Range of Barometer Readings..... ,,	1·590	1·489
Highest Reading of a Max. Therm. on the 30th...	56·6	55·8
Lowest Reading of a Min. Therm. on the 21st ...	21·1	25·5
Range of Thermometer Readings	35·5	30·3
Mean of Highest Daily Readings	48·2	47·3
Mean of Lowest Daily Readings	38·2	36·7
Mean Daily Range	10·0	10·6
Deduced Mean. Temp. (from Mean of Max. and Min.)	42·8	41·7
Mean Temperature from Dry Bulb.....	44·0	42·1
Adopted Mean Temperature	43·4	41·9
Mean Temperature of Evaporation	41·8	39·8
Mean Temperature of Dew Point	39·9	38·3
Mean elastic force of Vapour.....inches	0·247	0·232
Mean weight of Vapour in a cub. ft. of air, grains	2·8	2·7
Mean additional weight required for saturation ,,	0·4	0·4
Mean degree of Humidity (saturation 100)	88	87
Mean weight of a cubic foot of air ..... grains	540·7	544·5
Mean amount of Cloud (0—10)	7·3	7·4
Fall of Rain ..... inches	8·045	4·472
Greatest Rainfall in one day (11th)..... ,,	1·260	0·977
No. of days on which ·005 in. or more Rain fell...	23	18·1

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	8	3	1	1	4	8	4	1
Mean Velocity in miles per hr.	4·3	8·4	10·4	7·8	13·6	13·3	14·1	8·0
Total No. of miles for each Direction	825	606	249	186	1303	2553	1353	192

		Mean*
Total No. of miles registered	7267	7324·6
Greatest hourly velocity (28th & 30th, 1 a.m. Dir. S.	35	41·8

* *For the last* 47 *years.*

NOVEMBER, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometic pressure	—	0·095 in.
Monthly range ,, ...	+	0·101 in.
Mean of highest daily temperatures	+	0·9°
Mean of lowest ,, ,, ...	+	1·5°
Mean daily range ,, ...	—	0·6°
Adopted mean temperature	+	1·5°
Total rainfall	+	3·573 in.

Ground frost on 4th, 11th, 12th, 14th—26th, and 28th. Hoar frost on 20th, and 21st. Snow on 15th. Hail on 11th, 12th, 13th, 27th, and 28th. Heavy rain on 9th, 10th, 11th, 12th, 15th, 26th and 27th. Thunder on 13th and 27th. Lightning on 11th and 13th. Solar halo on the 7th.

EXTREME READINGS FOR NOVEMBER, During 67 Years.

Highest reading of Barometer ...	1857	(12th)	30·350 in.
Lowest ,, ,, ...	1891	(11th)	27·938 in.
Highest temperature	1900	(1st)	62·4°
Lowest ,, ...	1901	(15th)	17·5°
Highest adopted mean temperature	†1881	.....	47·0°
Lowest ,, ,,	1851	.....	36·7°
Greatest fall of rain	1866	.....	9·026 in.
Least ,, ...	1855	.....	1·158 in.
Greatest fall of rain in one day ...	1866	(16th)	3·700 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1913	.....	28
Least ,, ,, ,,	1848	.....	6
*Greatest hourly velocity of wind...	1887	(1st)	62 mls.
*Greatest No. of miles registered ...	1888	.....	12813
*Least ,, ,, ,, ...	1870	.....	4951

* *Since* 1867 *only.* † *And in other years.*

DECEMBER, 1914.

Results of Observations taken during the Month.		Mean for the last 67 years.
Mean Reading of the Barometer ..... inches	29·040	29·435
Highest ,, ,, on the 24th ,,	29·817	30·068
Lowest ,, ,, on the 14th ,,	28·350	28·521
Range of Barometer Readings..... ,,	1·467	1·547
Highest Reading of a Max. Therm. on the 2nd...	51·5	53·0
Lowest Reading of a Min. Therm. on the 25th...	27·1	20·9
Range of Thermometer Readings.....	24·4	32·1
Mean of Highest Daily Readings	43·5	43·4
Mean of Lowest Daily Readings	35·2	33·5
Mean Daily Range	8·3	9·9
Deduced Mean Temp. (from Mean. of Max. and Min.)	39·4	38·5
Mean Temperature from Dry Bulb	39·8	39·1
Adopted Mean Temperature	39·6	38·8
Mean Temperature of Evaporation	37·7	37·2
Mean Temperature of Dew Point	35·2	35·3
Mean elastic force of Vapour ..... inches	0·206	0·207
Mean weight of Vapour in a cub. ft. of air, grains	2·4	2·4
Mean additional weight required for saturation ,,	0·5	0·4
Mean degree of Humidity (saturation 100)	85	87
Mean weight of a cubic foot of air ..... grains	538·8	547·2
Mean amount of Cloud (0—10)	7·5	7·6
Fall of Rain ..... inches	6·415	4·596
Greatest Rainfall in one day (17th)..... ,,	0·940	0·851
No. of days on which ·005 in. or more Rain fell...	25	19·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	2	5	1	5	9	6	0
Mean Velocity in miles per hr.	3·7	2·7	9·5	21·0	19·3	13·3	10·8	0
Total No. of miles for each Direction	265	128	1145	503	2311	2873	1554	0

		*Mean
Total No. of miles registered	8779	7902·9
Greatest hourly velocity (2nd, 6 p.m. Dir. S.S.E.	43	42·8

* *For the last 47 years.*

DECEMBER, 1914.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

Mean barometric pressure	—	0·395 in.
Monthly range ,, ...	—	0·080 in.
Mean of highest daily temperatures	+	0·1°
Mean of lowest ,, ,, ...	+	1·7°
Mean daily range ,, ...	—	1·6°
Adopted mean temperature	+	0·8°
Total rainfall	+	1·819 in.

Ground frost on 1st, 2nd, 4th—11th, 14th—17th, 19th—31st. Hoar frost on 10th, 28th. Snow on 20th, 28th, and 29th. Hail on 1st, 2nd, 5th, 19th, and 29th. Heavy rain on 3rd, 17th, and 27th. Gales of wind on 2nd, 4th, 5th, 6th, 27th and 30th. Thunder on 1st, 5th, 6th, and 11th. Lightning on 1st, 5th, 7th, and 8th.

EXTREME READINGS FOR DECEMBER, During 67 Years.

Highest reading of Barometer ...	1905	(12th)	30·484 in.
Lowest ,, ,, ...	1886	(8th)	27·350 in.
Highest temperature	1876	(9th)	58·1°
Lowest ,, ...	1860	(24th)	6·7°
Highest adopted mean temperature	1857	.....	44·6°
Lowest ,, ,,	1878	.....	30·3°
Greatest fall of rain	1880	.....	9·211 in.
Least ,, ...	1890	.....	0·550 in.
Greatest fall of rain in one day ...	1870	(19th)	1·962 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1868	.....	28
Least ,, ,, ,,	†1853	.....	8
*Greatest hourly velocity of wind...	1894	(22nd)	72 mls.
*Greatest No. of miles registered ...	1898	.....	11265
*Least ,, ,, ,, ...	1878	.....	4885

* *Since* 1867 *only.* † *And in other years.*

Summary of Observations, 1914.

Results of Observations taken during the Year.		Mean for the last 67 Years.
Readings of Barometer in inches.		
Mean of the Year	29·452	29·493
Highest Monthly Mean (January)	29·707	29·748
Lowest ,, ,, (December)	29·040	29·223
Highest Reading (January)	30·231	30·294
Lowest ,, (February)	27·992	28·206
Range	2·239	2·088
Thermometer, Fahrenheit.		
Highest Monthly Mean Temperature (July & Aug.)	58·9	58·6
Lowest ,, ,, ,, (January)	38·8	35·5
Highest Reading of a Max. Therm. (July 21st)	82·5	81·7
Lowest ,, Min. ,, (Nov. 21st)	21·1	15·8
Range of Thermometer Readings	61·4	65·9
Mean of Highest Daily ,,	54·7	54·6
Mean of Lowest Daily ,,	42·7	40·9
Mean Daily Range	12·0	13·7
Deduced Mean Temp. (from mean of Max. and Min.)	47·7	46·8
Mean Temperature from Dry Bulb	49·1	47·0
Adopted Mean Temperature of the Year	48·4	46·9
Mean Temperature of Evaporation	45·8	44·6
Mean Temperature of Dew Point	42·9	42·1
Mean elastic force of Vapour ..... inches	0·284	0·274
Mean weight of Vapour in a cub. ft. of air...grns.	3·2	3·2
Mean additional weight required for saturation ,,	0·8	0·7
Mean degree of Humidity (saturation 100)	82	83
Mean weight of a cubic foot of air.....grns.	536·7	539·1
Mean amount of Cloud (0—10)	6·5	7·3
Total fall of Rain ..... inches	50·177	47·064
Greatest Monthly Rainfall (November)	8·045	7·488
Least ,, ,, (April)	1·470	1·224
Greatest Rainfall in one day (January 8th) ,,	2·074	1·630
No. of days per Month on which ·005 inch or more Rain fell	18·2	17·1

SUMMARY OF WIND, 1914.

Prevailing Direction	N	NE	E	SE	S	SW	W	NW
No. of days for each	37	49	25	15	39	84	101	15
Mean Velocity in miles per hour...	4·9	6·1	8·4	8·8	12·5	10·8	11·1	11·4
Total No. of miles for each Direction	4313	7115	5061	3166	11690	21754	26948	4100

		Mean for the last 47 years.
Total No. of miles registered	84147	86533·2
Greatest Monthly Total (February)	9854	10050·1
Least ,, ,, (October)	4701	5065·2
Greatest hourly velocity (February 22nd) ...	44	51·8
Prevailing Direction of Wind	W	W

DIFFERENCES, 1914.

The signs + and — mean respectively above and below the YEARLY average.

Mean barometric pressure...	—	0·041 in.
Yearly range ,, ...	+	0·151 in.
Mean of highest daily temperatures	+	0·1°
Mean of lowest ,, ,, ...	+	1·8°
Mean daily range	—	1·7°
Adopted mean temperature	+	1·5°
Total rainfall	+	3·113 in.

ABSOLUTE EXTREMES

FOR THE LAST 67 YEARS.

Readings of Barometer, in inches.

Highest monthly mean	1891 (Feb.)	29·997
Lowest ,, ,, ...	1868 (Dec.)	28·984
Highest yearly ,, ...	1896	29·584
Lowest ,, ,, ...	1872	29·319
Greatest monthly range	1886 (Dec.)	2·795
Least ,, ,, ...	1852 (July)	0·505
Highest reading	1896 (Jan. 9th)	30·597
Lowest ,, ...	1886 (Dec. 8th)	27·350
Extreme range		3·247

Thermometer, Fahrenheit.

Highest monthly mean temperature ...	1901 (July)	63·2
Lowest ,, ,, ,, ...	1855 (Feb.)	28·6
Highest yearly ,, ,, ...	1868	49·1
Lowest ,, ,, ,, ...	1879	44·1
Highest reading ,, ...	1901 (July 20th)	89·0
Lowest ,, ,, ...	1881 (Jan. 15th.)	4·6

Weight of Vapour in a cubic foot of air (grains).

Greatest monthly mean	1852 (July)	5·1
Least ,, ,, ...	†1855 (Feb.)	1·4

† *And on other dates.*

ABSOLUTE EXTREMES

FOR THE LAST 67 YEARS—*Continued.*

Rainfall, in inches.

Greatest Rainfall in one day	1866 (Nov. 16) ..	3·700
Greatest ,, ,, month	1870 (Oct.)	13·437
Least ,, ,, ,, ...	1859 (May)	0·249
Greatest ,, ,, year	1866	62·093
Least ,, ,, ,, ...	1887	31·250
Days on which ·005 in. or more Rain fell:		
Greatest No. in one month	1890 (Jan.)	30
Least ,, ,, ...	1852 (Mar.)	3
Greatest ,, year	1872	281
Least ,, ,, ...	1855	135

* *Wind.*

Greatest hourly velocity, in miles	1894 (Dec. 22)...	72
Greatest No. of miles registered in a month	1888 (Nov.)	12813
Least ,, ,, ...	1888 (Sep.) ...	3261
Greatest Mean No. ,, ,, ...	March	8602
Least ,, ,, ,, ...	September	6097
Greatest No. ,, ,, year .	1868	102395
Least ,, ,, ,, ,, ...	1909	77165

* *Record dates from* 1867 *only.*

DATES OF OCCASIONAL PHENOMENA.

1914	Frost	Hoar Frost	Snow	Hail	Heavy Rain
January	1-3, 5-8, 11-25, 27, 28		5, 14	5	8, 9
February	5-9, 12, 13, 16-20, 22, 24-26	25, 26	18	18	
March	2, 7-13, 17-23, 26-28		2, 10, 11, 18, 27	1, 2, 18, 27	5, 15
April	2, 4, 5, 8, 9, 12, 14-17, 19-21, 23, 26-30			7-10, 13, 14	
May	1-3, 8, 10-12, 15, 24-28			8	3
June	1, 3, 8, 26				9
July				21, 25, 26	16, 24
August					1, 8
September	19, 21-25, 29, 30				8, 9, 12, 16
October	7,8, 10, 11, 20, 22, 24, 28, 29				25, 27
November	4, 11, 12, 14-26, 28	20, 21	15	11, 12, 13, 27, 28	9, 10, 11, 12, 15, 26, 27
December	1, 2, 4-11, 14-17, 19-31	10, 28	20, 28, 29	1, 2, 5, 19, 29	3, 17, 27

1914	Gales of Wind	Fog	Thunder	Lightning	*Lunar Halo	*Solar Halo	Aurora Borealis
January						28	
February	7, 8, 11, 22	25			4	9, 16	
March			18	18	9	9, 28	
April				30		1	
May					2	28	
June			14, 17-20	17		11	
July			1, 11, 12, 20, 21	1, 11, 21		15	
August				9, 24			
September			8, 9, 10, 12	8, 9, 12, 26		7, 12	
October		19		27		24	
November			13, 27	11, 13		7	
December	2, 4, 5, 6, 27, 30		1, 5, 6, 11	1, 5, 7, 8			

*22° *Radius.*

MONTHLY TOTALS FOR EACH HOUR OF RECORDED SUNSHINE.

1914. Local apparent time	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9
January ...	...	...	...	...	...	1·7	2·7	3·4	3·2	3·4	1·3	0·1	...	...	...	...	...
February ...	...	...	...	...	1·8	7·3	9·8	9·6	9·1	6·6	5·8	2·0	0·1	...	...	...	...
March ...	...	...	...	2·5	9·7	11·2	9·7	10·1	8·7	8·1	7·1	6·5	4·4	0·9	...	...	...
April ...	...	1·2	5·0	12·2	17·7	18·0	18·7	18·7	18·8	19·7	18·5	17·3	12·9	11·9	4·2	...	...
May ...	0·2	2·5	5·6	8·3	10·1	9·1	8·9	10·4	11·2	12·3	12·7	11·0	10·5	9·0	5·4	2·0	...
June ...	1·4	9·1	13·2	13·9	14·6	14·9	12·8	11·0	12·6	13·7	14·5	15·9	14·2	14·2	12·3	7·7	...
July ...	0.3	4·3	7·8	10·8	10·5	9·2	8·7	6·8	7·0	7·8	6·5	8·2	9·6	9·9	7·1	3·6	...
August ...	...	1·1	8·1	12·7	14·3	13·2	13·4	16·1	17·5	16·4	16·7	18·6	18·2	14·6	9·3	0·5	...
September ..	...	...	1·8	8·1	15·3	18·4	17·0	20·6	19·6	20·8	18·4	17·9	14·4	4·1	0·1	...	...
October ...	...	...	...	...	1·9	7·3	8·8	8·7	8·6	9·5	8·5	7·4	2·4	0·3	...	...	...
November...	...	...	...	...	1·9	5·3	9·2	9·1	8·5	8·8	7·2	3·2	...	...	...	...	...
December ...	...	...	...	...	...	1·6	6·2	7·2	7·1	2·6	0·7	...	...	...	...	...	...
Sums ...	1·9	18·2	41·5	68·5	97·8	117·2	125·9	131·7	131·9	129·7	117·9	108·1	86·7	64·9	38·4	13·8	...

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

1914	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January ...	...	...	...	...	1·7	4·5	...	...	...	0·1	2·4	...	...	0·8	0·1	...	...
February ...	...	...	...	...	5·1	1·6	2·1	2·9	...	3·5	4·8	3·6	1·1	0·1	0·6	1·0	0·7
March ...	3·9	1·7	...	...	...	1·6	2·4	...	0·2	6·6	7·1	4·0	...	4·8	0·7	3·9	2·9
April ...	4·0	5·9	6·3	0·3	0·3	1·7	5·6	2·4	0·8	6·3	5·7	7·7	2·0	9·5	11·5	7·1	12·1
May ...	0·8	12·5	...	1·6	5·4	1·8	...	2·9	1·8	0·5	6·5	9·1	0·3	4·2	6·7	6·8	10·5
June ...	5·6	0·1	13·0	3·9	...	3·6	5·7	1·5	0·1	10·0	11·6	1·2	11·6	15·3	14·0	8·1	5·8
July ...	6·7	3·1	0·4	14·1	...	1·5	4·0	2·3	8·6	10·1	7·0	0·1	4·9	0·2	5·1	...	...
August ...	0·2	3·0	10·4	7·2	10·5	0·4	7·7	...	0·5	11·5	8·9	11·7	11·6	11·6	7·4	12·6	12·4
September ..	9·7	9·1	9·7	9·2	5·2	10·8	5·7	3·5	0·4	3·9	2·9	1·2	3·3	2·4	6·8	0·5	4·1
October ...	0·6	4·2	3·6	6·2	0·1	2·3	6·3	...	5·9	2·6	1·9	0·1	...	1·9	0·9	...	0·1
November...	4·2	0·3	2·3	...	...	...	3·2	...	...	4·2	...	1·7	1·9	7·7	...	6·6	6·8
December ...	0·6	...	1·4	...	0·5	...	1·3	0·5	...	...	...	...	...	...	...	3·7	...

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY—*(continued)*.

1914	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTHLY Total	MONTHLY Percen.
January ...	...	0·1	...	...	0·4	0·6	...	...	4·2	0·9	...	...	...	...	15·8	5·1
February ...	2·2	...	0·5	4·7	4·4	2·9	2·4	4·5	...	3·4	...				52·1	19·2
March ...	4·4	2·8	2·6	3·2	6·1	...	0·1	0·4	3·7	7·3	3·0	...	5·5	...	78·9	21·6
April ...	10·5	12·0	10·4	9·0	7·7	9·4	...	4·5	8·6	13·1	11·0	6·4	3·0		194·8	46·5
May ...	10·6	0·3	2·2	3·7	3·1	...	3·0	6·9	5·0	13·4	2·2	...	4·0	3·4	129·2	26·2
June ...	3·5	14·4	9·8	3·2	4·6	5·7	3·2	9·4	8·5	5·4	2·6	0·6	14·0		196·0	38·6
July ...	1·5	1·3	3·0	11·1	3·8	...	6·4	1·1	5·8	4·8	4·1	1·7	5·4	...	118·1	23·2
August ...	2·3	5·5	2·5	4·5	3·5	5·2	...	9·7	6·2	10·1	10·6	0·1	2·9	...	190·7	41·7
September ..	7·9	7·4	8·2	7·2	6·5	7·1	7·3	8·9	0·3	7·2	1·7	9·7	8·7		176·5	46·6
October ...	0·3	...	2·8	1·6	0·1	4·7	0·8	...	2·3	6·0	3·5	3·6	1·0	...	63·4	19·4
November...	3·7	...	1·9	4·8	...	1·1	...	...	...	...	0·8	...	2·0		53·2	20·8
December ..	3·3	...	0·5	...	3·5	2·4	2·8	...	1·0	1·3	...	1·6	...	1·0	25·4	11·0

SUMMARY OF SUNSHINE.

	Bright Sunshine Recorded					
	1914			Mean for the last 34 years		
	Number of		Percentage of Possible Sunshine	Number of		Percentage of Possible Sunshine
	Days	Hours		Days	Hours	
January ...	11	15·8	5·1	13·9	32·9	13·2
February ...	20	52·1	19·2	17·7	58·9	21·5
March ...	23	78·9	21·6	24·2	104·9	28·7
April ...	29	194·8	46·5	26·4	150·1	35·8
May ...	27	129·2	26·2	27·5	185·4	37·6
June ...	29	196·0	38·6	27·9	185·1	36·4
July ...	26	118·1	23·2	28·5	176·3	34·6
August ...	28	190·7	41·7	27·5	152·1	33·3
September ..	30	176·5	46·6	25·7	125·4	33·1
October ...	25	63·4	19·4	23·3	85·0	26·1
November ..	16	53·2	20·8	17·4	45·9	17·9
December ...	15	25·4	11·0	13·0	25·0	10·8
Year ...	279	1294·1	29·0	272·9	1326·9	29·7

SUMMARY OF SUNSHINE—*Continued.*

EXTREMES FOR THE LAST 34 YEARS.

Month	Number of Days on which Sunshine was recorded				Number of Hours				Percentage of Possible Sunshine			
	Greatest		Least		Greatest		Least		Greatest		Least	
Jan.	21	1881	8	1898	64·2	1881	12·3	1913	25·9	1881	5·0	1913
Feb.	24	1895	11	1882	89·3	1887	29·6	1882	32·8	1887	10·9	1882
Mar.	28	*1894	17	1904	168·6	1907	56·8	1912	46·1	1907	15·5	1912
Aprl.	30	1909	22	1905	223·7	1893	94·0	1913	53·4	1893	22·3	1913
May	30	*1880	22	1886	266·6	1881	79·7	1906	54·1	1881	16·2	1906
June	30	*1896	24	*1888	272·5	1887	85·2	1912	53·6	1887	16·8	1912
July	31	*1882	25	1888	263·4	1911	98·0	1888	51·7	1911	19·3	1888
Aug.	31	*1886	23	1894	235·2	1899	74·1	1912	51·5	1899	16·2	1912
Sept.	30	1914	21	1897	176·5	1914	62·9	1896	46·6	1914	16·6	1896
Oct.	28	1891	17	1889	134·9	1899	50·0	1889	41·4	1899	15·3	1889
Nov.	23	1883	9	1897	73·5	1909	18·5	1891	28·7	1909	7·2	1891
Dec.	18	*1886	6	1882	60·1	1885	7·4	1912	26·0	1886	3·2	1912
Year	300	1905	251	1903	1613·7	1887	927·6	1912	36·1	1887	20·7	1912

*And in other years.

HORIZONTAL MAGNETIC DIRECTION.

Horizontal Magnetic Direction, West of North (from daily measures of the continuous curves).

1914	MEANS OF †				Mean for the month	Mean daily range ‡	Highest reading of the month	Lowest reading of the month	Monthly range
	Highest readings	Lowest readings	4 p.m. readings	4 a.m. readings*					
	16° +						16° +	16° +	
	′	′	′	′	′	′	′	′	′
January ...	54·3	51·9	53·2	52·6	53·0	5·4	57·0	42·0	15·0
February ...	54·3	49·7	52·5	50·8	51·8	7·1	60·5	40·5	20·0
March	54·7	46·8	51·8	49·8	50·8	11·0	57·0	34·0	23·0
April	53·9	44·3	51·2	47·6	49·3	12·9	68·5	25·5	43·0
May	51·5	42·8	49·4	45·9	47·5	11·3	59·5	29·5	30·0
June	50·5	41·3	48·8	43·9	46·2	11·6	57·5	26·5	31·0
July	49·2	40·5	47·9	43·7	45·4	12·5	62·5	27·5	35·0
August ...	49·2	39·4	45·7	42·5	44·2	13·3	57·5	28·0	29·5
September ...	48·0	39·4	43·5	41·6	43·1	11·6	54·0	26·5	27·5
October ...	46·4	38·1	43·7	41·6	42·5	10·8	58·5	22·5	36·0
November ...	45·6	41·1	44·8	43·4	43·7	8·1	53·5	29·5	24·0
December ...	45·4	42·1	43·8	43·4	43·7	6·3	51·5	25·5	26·0
Means	50·3	43·1	48·0	45·6	46·8	10·2	58·1	29·8	28·3

Mean for the year ... ... 16° 46·8 W.

† *For the 10 quietest days.* * *Of the following day.* ‡ *Includes all days.*

HORIZONTAL MAGNETIC FORCE.

Horizontal Magnetic Force in C. G. S. Units (from daily measures of the continuous curves).

The figures in the columns are entered to the unit 10^{-5} C.G.S.

1914	MEANS OF †				Mean for the month	Mean daily range ‡	Highest reading of the month	Lowest reading of the month	Monthly range
	Highest readings	Lowest readings	4 p.m. readings	4 a.m. readings*					
	1700 +				0 +		17000 +		0 +
January ...	396	381	386	387	388	26	434	355	79
February ...	396	375	381	383	383	28	403	328	75
March ...	390	361	380	382	378	40	412	328	84
April	382	341	370	364	364	59	465	245	220
May	382	340	365	364	363	55	421	289	132
June	379	330	358	355	356	59	425	311	114
July	372	324	359	352	352	68	456	282	174
August ...	356	308	342	338	336	66	389	271	118
September ...	337	300	325	325	322	50	368	262	106
October ...	341	306	327	328	326	48	394	258	136
November ...	339	316	332	332	330	39	386	258	128
December ...	342	324	335	335	334	30	372	262	110
Means	368	334	355	354	353	47	410	287	123

Mean for the year ... ... 0·17353 C. G. S. Units.

† *For the* 10 *quietest days.* **Of the following days.* ‡ *Includes all days.*

ABSOLUTE MEASURES—SUMMARY.

DIRECTION					FORCE.		
1914	Declination Corrected		Inclination		Horizontal	Vertical	Total
	°	′	°	′	C. G. S. UNITS.		
January ...	16	51·1	68	39·5	0·17379	0·44479	0·47753
February ...	16	51·2	68	38·0	0·17364	0·44384	0·47660
March ...	16	50·9	68	37·0	0·17353	0·44317	0·47593
April	16	51·0	68	41·6	0·17348	0·44481	0·47745
May	16	46·3	68	40·2	0·17359	0·44454	0·47724
June	16	47·0	68	38·2	0·17358	0·44377	0·47651
July	16	46·7	68	40·3	0·17358	0·44456	0·47725
August ...	16	44·4	68	39·3	0·17374	0·44460	0·47734
September ...	16	44·8	68	40·4	0·17343	0·44422	0·47687
October ...	16	44·2	68	41·2	0·17338	0·44440	0·47703
November ...	16	42·3	68	41·0	0·17338	0·44432	0·47695
December ...	16	41·9	68	38·8	0·17316	0·44292	0·47557
Means ...	16	46·8	68	39·6	0·17352	0·44416	0·47686

DATES OF MAGNETIC DISTURBANCES.

The disturbances are divided generally into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter c denotes *calm*. Very great disturbances are marked vg. The days are reckoned astronomically from noon to noon.

1914	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1914
D.													D.
1	c	c	s	m	s	s	c	m	s	s	m	c	1
2	s	s	s	s	c	s	c	m	s	s	s	c	2
3	c	s	s	c	c	s	c	m	s	s	m	s	3
4	c	c	s	c	s	s	m	s	s	c	m	s	4
5	*	c	s	g	s	s	m	s	s	s	s	s	5
6	*	s	m	g	s	c	s	s	s	s	s	s	6
7	*	s	s	s	s	s	s	s	s	s	s	s	7
8	*	c	c	s	s	s	c	s	s	s	c	s	8
9	c	c	c	s	c	s	s	c	s	s	c	s	9
10	c	c	s	s	c	s	s	c	s	s	s	s	10
11	s	c	s	s	s	s	c	s	s	s	m	c	11
12	s	c	s	s	c	c	s	c	s	c	s	s	12
13	s	c	s	s	c	c	c	s	s	c	c	c	13
14	s	s	s	s	c	s	s	s	s	c	s	s	14
15	s	s	s	s	s	s	s	c	s	s	s	c	15
16	s	s	c	s	s	c	s	c	s	s	s	s	16
17	c	s	m	s	s	c	s	c	s	s	s	c	17
18	c	c	s	s	c	s	s	s	s	s	s	s	18
19	c	c	s	s	c	s	s	s	s	s	c	s	19
20	c	c	s	c	c	s	s	s	s	s	c	c	20
21	s	c	s	c	s	s	s	s	c	s	c	c	21
22	s	s	c	c	c	c	s	s	m	s	c	s	22
23	c	s	s	c	c	c	s	s	m	c	c	c	23
24	c	c	c	s	c	s	s	s	c	c	c	s	24
25	c	c	s	c	s	m	s	s	c	c	c	c	25
26	c	c	s	c	s	m	s	s	c	s	m	c	26
27	c	c	s	s	c	m	s	c	g	m	s	s	27
28	s	s	c	s	s	s	s	c	s	m	c	m	28
29	c		c	c	c	*	m	s	s	s	s	c	29
30	c		c	c	c	s	m	s	s	s	s	s	30
31	c		s		m		m	s		c		s	31
TOTAL c	17	17	8	9	16	7	6	7	4	8	11	12	
TOTAL s	10	11	21	18	14	19	20	21	23	21	14	18	
TOTAL m	...	...	2	1	1	3	5	3	2	2	5	1	
TOTAL g	...	...	...	2	...	...	...	...	1	...	...	...	
TOTAL vg	...	...	...	...	...	...	...	...	...	...	...	...	

* *No record.*

DATES OF SOLAR OBSERVATIONS, AND DISC AREAS OF SPOTS AS MEASURED FROM THE DRAWINGS.

The unit is $\frac{1}{5000}$th of the visible surface.
The letter "f" to a date means a record of faculæ but no spot.
Dots mean an absolutely clean disc.

1914	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1914
D.													D.
1			...	1·8	2·0		0·1		...		1·0	3·5	1
2			...	2·0	2·2		...		...	0·3			2
3				1·0		f			...	...		3·3	3
4					...	f	0·4		...	...			4
5	0·2	0·6		1·3	...		0·3		...				5
6	f	0·2	f	2·7		...			...	...			6
7		f	...	2·2		f	0·5		...	f	2·2	2·0	7
8		...		1·3	f				0·3			1·4	8
9							0·4			0·4			9
10		...	...	0·9		0·8	0·3	...		0·3	2·1		10
11	f	...	...	f	...	0·6	0·8	...	3·0				11
12		...	...	...	...		0·2				1·0		12
13		...				1·2	f	0·7	4·4	...	0·4		13
14	...	...	0·1	0·2	...	2·5		1·5		...	0·8		14
15			0·4	...	...	4·0	...	1·6	6·4	...			15
16		...	0·8	0·1	...	3·8		3·0			...	1·0	16
17		...	0·4	0·1	...	4·7		5·2	4·5	...	...		17
18		...	...	0·4	...	5·1	...	5·2	4·5	...	...	0·9	18
19			...	1·0		4·0	...	5·4	2·6				19
20		...	...	0·2		2·4	...	6·5	2·5	1·0	0·7	0·3	20
21		0·1	...	0·1	...	0·5	...	5·5	1·2	0·2	1·1		21
22		...	0·2	0·3	...	...	...	6·5	0·7			0·2	22
23	...	f		0·4		...		3·0		0·8	0·8		23
24		f			0·3	...	...		0·2			0·2	24
25		...		0·1	f	...		1·5	0·3				25
26	...		...	0·4	f	...	...	...		f		0·3	26
27	0·2	f	f	3·8	f	...	...		0·3	1·6		0·3	27
28			...			...		...	0·4	1·5	1·1		28
29				4·0					0·4	0·6		0·2	29
30			0·5	2·8	...	...		...	0·6				30
31					...			...					31
Daily Means	0·06	0·05	0·12	1·1	0·23	1·3	0·16	2·7	1·4	0·35	0·86	1·1	

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An Asterisk (*) denotes the work is an excerpt.

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