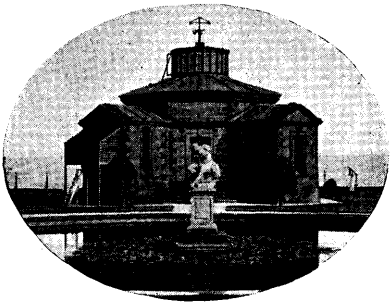
STONYHURST COLLEGE OBSERVATORY.

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



(FOUNDED 1838.)

Results of Meteorological, Magnetical, AND Seismological Observations.

1913.

With Report and Notes of the Director,

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

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1914.

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REPORT AND NOTES.

Meteorological. — The meteorological continuous records have been uninterrupted during the year.

The wind is recorded by a Robinson's Anemograph at about 45 feet above the ground. A velocity of 37 miles per hour and over is called a gale.

Bright sunshine is recorded by a Campbell-Stokes Recorder.

The Rain Gauge is a Beckley Self Recorder. Its receiving surface is 22 inches above the ground, and 377 feet above sea-level. The daily measures are taken at 10 a.m. for the preceding 24 hours. *Heavy rain*, noted in the monthly tabulations, signifies a fall of ½ inch or more during the day.

The Barometer is a standard barometer of the pattern approved by the Meteorological Office. It is now mounted, with the photo-barograph, in the underground Magnetic chamber. Its cup is 363 feet above the sea-level. Its readings in the monthly tables are quoted for the density of mercury at 32° Fahr., and for the original position of the barometer at 381 feet above sea-level; and the mean pressures are corrected for diurnal range.

The Thermometers are the property of the Meteorological Office. They are mounted at 7 feet above the ground on the north side of the Observatory, enclosed in a Stevenson-Screen. All the readings are corrected for index errors, as determined by the Office-standards.

The *monthly mean temperature* is derived in two ways: 1st, from the mean of the highest and lowest daily readings corrected by the average difference between this mean and the true mean of the hourly tabulations; and 2nd, from the mean of the readings at 9 a.m. and 9 p.m. corrected in the same manner. Both corrections have been furnished by the Greenwich records, and are taken from the well-known Glaisher's tables. The *Adopted mean temperature* is the mean of these two results.

Our connection with the Meteorological Office, as one of the "Secondary Stations," ceased on March 25. But the automatic recorders remain with us; and we continue the weekly reports gratis.

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 only 76°, on August 3, and the lowest 21°, on December 31. But on 16 days the thermometer reached 70° and over: 2 in May, 4 in June, 3 in July, 5 in August, and 2 in September.

The excessive cloudiness of the year is shown by the sunshine recorder, which registered 300 hours less than the annual average of 33 years. August and December were the only months favoured with something above their average duration of bright sunshine. August was the finest month of the year, with less than half its average rainfall, at a mean temperature close upon its average. And March was the wettest, with not much less than double its average.

The total fall of rain shows a deficit of 5 inches on the annual average. And distributed throughout the

year we find an excess of $6\frac{1}{2}$ inches in the three months March, April, May; and a deficit of $10\frac{1}{2}$ inches in the four months July—October.

The prevailing wind has been, as usual, from the West. The total length of air crossing the Observatory in the twelve months was 1,232 miles less than the annual average of 86,585 miles. The strongest gale reached only 50 miles in the hour, on April 26; and ten gales in all at 37 miles and more were recorded: one in January, two in February, three in March, three in April, and one in December. Of these, six were from the South, and the rest from between South and South-West.

Fine dry periods of the year are noted as follows:—January 6—9; 15—17; 25—27. February 10—28. March 24—28. April 1—9; 20—24; 30—May 2. May 10—16; 24—28. June 12—18; 24—July 4. July 7—16; 22—August 7. August 13—20; 25—September 12. September 14—22; 27—October 7. October 8—12; 15—19; 21—27. December 16—24; 27—31.

Heavy rains of one inch and more fell on March 13, April 26, and May 23.

Magnetical.— Absolute measures of Horizontal Magnetic Force have been made once each month, by the method of Vibration and Deflection.

In these observations the same Magnet has been employed from the beginning of the series in March, 1863. The weight of the Magnet with its stirrup is 825 grains, and its length 3·94 inches nearly. Its moment of inertia, measured by the method of vibrations, with and without

a known increase of the moment, is 5·27303 to the English foot-second-grain units, at the temperature 35° Fahr., and its rate of increase is 0·00073 for increase of 10°.

The temperature corrections have been obtained from the formula $q\ (t°-32°) + q'\ (t°-32°)^2$ where t° is the observed temperature and 32° Fahr. the adopted standard temperature. The values of the co-efficient q and q' are respectively 0·0001128 and 0·000000436.

The induction co-efficient μ is 0·000244.

The correction for error of graduation of the Deflection bar at 1·0 foot is + 0·00004 ft. at 1·3 + 0·000064 ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained in each month by two double measures of the time of 200 vibrations.

The angles of deflection are at distances 1·0 and 1·3 foot between the magnets.

In deducing from these observations the ratio and product of the magnetic moment m of the magnet, and the earth's horizontal magnetic intensity X, the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread, and for rate of chronometer; but no correction has been required for the arc of vibration.

In the calculations of the ratio $\frac{m}{X}$, the third and subsequent terms of the series $1 + \frac{P}{r^2} + \frac{Q}{r^4} +$ &c., have always been omitted.

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

All the computations are in English foot-second-grain units; but in the final table the results are given only in C. G. S. units.

Absolute measures of horizontal force and inclination are made once each month, as soon after the 14th day as weather and other circumstances permit. The Inclination is measured with Dover's Circle, No. 159.

The horizontal direction, or Declination, is observed 4 times each month, at approximately equal intervals, and always, when possible, at 4 p.m. These measures 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 Differential Instruments, or 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 value of the Unifilar Declination Magnet is 11′·28 arc per centimetre.

The scale value of the Bifilar torsion balance has been kept at ·0005 C.G.S. for one centimetre.

Four daily readings are taken from the unifilar and bifilar curves, the highest and lowest, and at the hours 4 and 16; but the V.F. balance has not yet given results sufficiently reliable for any other quotation than greater or less disturbance. Its base-line value has been continuously changing throughout the year.

On the table of magnetic disturbances (page 40) 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 9′·7.

Solar and Astro-physical.—The Solar surface has been observed on 200 days, and 44 drawings have been made. Of these there are 25 showing spots and faculæ, and 19 showing faculæ only; or, omitting the faculæ, we have the record number of 175, or 87·5 % 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 0·04; and the mean daily range of magnetic Declination (in minutes of arc) at 9·7. These are included in the following table for comparison with the corresponding *means* of the past five years:—

Year	1908	1909	1910	1911	1912	1913
Spot area	4·6	3·8	1·8	0·33	0·22	0·04
Declination range	14·1	13·5	14·5	12·6	8·1	9·7

The table shows a record minimum of Solar activity in 1913, by the smallest mean disc area observed since the year 1898, when these tabulations were commenced.

The high latitude group of small spots observed on February 19 failed as a fore-runner of increasing solar activity. It was followed by seven months of solar calm, broken only by three small spots of 0·1 magnitude of one day's duration, on April 7, July 30, and August 23. And this period has been without doubt the calmest in our history of the solar surface. The small spot seen on August 23 was in South latitude 23°; and since then six other spots in high latitudes have been recorded, two in October, one in November, and three in December. One of these, on December 29, was in South latitude 41°.

Cloudy weather has been greatly against progress with our solar and stellar spectrographs. No sun-spots within the reach of the grating spectrometer have been observed; and the instrument has been employed only for comparative photographs of the red end spectra of the sun's centre and limbs.

Clear moonless nights have seldom lasted long enough for a satisfactory spectroscopic exposure on nebulæ. But 6 plates of the spectrum of Nova$_2$ Geminorum were obtained with the Whitelow camera, between February 27 and April 5.

The Observatory has been recently provided with a very efficient Radio-telegraphic receiver, including a Brown's Relay, of his improved "W. type." And it is impossible to speak too highly of its sensibility and general behaviour. With it we may expect to obtain the correction to our Longitude as closely as our Transit instrument can give us our local time. For, with the phones resting on the table, the co-incident beats of the chronometer with those of the Paris time-vernier signals are more easily pointed than with the phones on the ears.

In preparation for these observations, all the fair nights of the summer and autumn have been devoted to the Transit instrument and its clock.

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.

In the following table the frequency of earthquakes in the several months is set out in two divisions: the first (1) containing those of double amplitudes, 2 A, greater than 1 mm; and the second (2) containing the same between 0·1 and 1·0 mm. The double amplitude is the complete swing of the boom from side to side of its position of rest; and 1 mm swing = 220″ arc, produced by, approximately, 0·45 vertical swing of the pillar.

1913.

	Ja.	Fe.	Ma.	Ap.	My.	Ju.	Jl.	Au.	Se.	Oc.	No.	De.
(1)	4	–	2	4	3	3	3	2	–	4	2	1
(2)	6	3	7	17	11	4	10	6	7	11	4	3

And in the following line the mean daily displacement of the boom is shown for each month: viz., the ratio of half the sum of the 2 A millimetres to the number of days in the month:—

0·19	0·01	0·18	0·20	0·15	0·33	0·12	0·29	0·03	0·11	0·06	0·05

And the annual mean monthly displacements for the past three years appear as :—

0.50 in 1911, 0.27 in 1912, and 0.14 in 1913.

The following papers have been published during the year :—

1. Sun-Spots and Terrestrial Magnetic Phenomena, 1898-1911. The Greater Magnetic Storms. Monthly Notices, R.A.S., 73.3. 1913, January.

2. Sun-Spots and Terrestrial Magnetic Phenomena, 1898-1911. Sun-Spot Areas, Magnetic Storms, and the Sun's Corona. *Ibid*, 73.6. 1913, April.

3. The Mode of the Propagation of the Sun's Influence in Magnetic Storms. *Ibid*, 73.7. 1913, May.

4. The Spectrum of Nova Germinorum 2. 1912, April ; and 1913, February—April. *Ibid*, 73.8. 1913, June.

5. A Simple Method of Measuring the Heights of Solar Prominences. The Journal, B.A.A., 24.1. 1913, October.

WALTER SIDGREAVES, S.J.,
DIRECTOR.

February, 1914.

METEOROLOGICAL REPORT.

JANUARY, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·285	29·488
Highest ,, ,, on the 26th ... ,,	29·965	30·129
Lowest ,, ,, on the 30th ... ,,	28·559	28·584
Range of Barometer Readings ..... ,,	1·406	1·545
Highest Reading of a Max. Therm. on the 7th ...	51·0	51·2
Lowest Reading of a Min. Therm. on the 13th...	25·0	21·0
Range of Thermometer Readings.....	26·0	30·2
Mean of Highest Daily Readings	42·1	42·3
Mean of Lowest Daily Readings	35·4	32·8
Mean Daily Range	6·7	9·5
Deduced Mean Temp. (from mean of Max. and Min.)	38·6	37·3
Mean Temperature from Dry Bulb	39·5	37·5
Adopted Mean Temperature	39·1	37·4
Mean Temperature of Evaporation	37·4	36·2
Mean Temperature of Dew Point.....	35·2	34·0
Mean elastic force of Vapour .....inches	0·206	0·198
Mean weight of Vapour in a cub. ft. of air, grains	2·4	2·4
Mean additional weight required for saturation ,,	0·4	0·4
Mean degree of Humidity (saturation 100).....	86	87
Mean weight of a cubic foot of air.....grains	544·0	549·8
Mean amount of Cloud (0—10)	8·3	7·8
Fall of Rain .....inches	4·805	4·168
Greatest Rainfall in one day (30th) ..... ,,	0·850	0·791
No. of days on which ·005 in. or more Rain fell...	20	19·1

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	2	8	6	6	3	2	0
Mean Velocity in miles per hour	6·8	6·9	9·9	9·7	13·0	11·0	16·7	0
Total No. of miles for each Direction	650	333	1898	1390	1879	794	800	0

		Mean.*
Total No. of miles registered	7744	8168·7
Greatest hourly velocity (30th, 10 p.m. Dir. S.)	43	41·7

** For the last 46 years.*

JANUARY, 1913.

DIFFERENCES.

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

Mean barometric pressure	— 0·203 in.
Monthly range ,, ...	— 0·139 ,,
Mean of highest temperatures	— 0·2°
Mean of lowest ,, ...	+ 2·6°
Mean daily range ,, ...	— 2·8°
Adopted mean temperature	+ 1·7°
Total rainfall	+ 0·637 in.

Ground frost on 2nd, 5th, 6th, 11th—20th, 22nd, 23rd, 25th—28th, 30th and 31st. Hoar frost on 6th and 26th. Snow on 10th—12th, 14th, 22nd and 31st. Hail on 18th, 25th, 28th and 31st. Heavy rain on 22nd, 23rd and 30th. Gale of wind on 30th. Thunder and lightning on 31st. Lunar halo on 19th.

The total duration of sunshine, 12·3 hours, makes a record for January. This is 21 hours, or 63·2 per cent., below the month's average, and 2h. 36m. less than the previous minimum in 1885.

EXTREME READINGS FOR JANUARY, During 66 Years.

Highest reading of Barometer	1896 (9th)	30·597 in.
Lowest ,, ,, ...	1884 (26th).....	27·803 ,,
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 ,,
Greatest fall of rain in one day.....	1910 (15th)	2·070 ,,
Greatest No. of days on which ·005 in. or more rain fell	1890	30
Least ,, ,, ,,	†1850	8
*Greatest hourly velocity of the wind ...	1899 (12th).....	63 mls.
*Greatest No. of miles registered	1890	11661
*Least ,, ,, ,, ...	1881	4352

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

FEBRUARY, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·702	29·501
Highest ,, ,, on the 12th... ,,	30·266	30·102
Lowest ,, ,, on the 7th ... ,,	28·870	28·654
Range of Barometer Readings ..... ,,	1·396	1·448
Highest Reading of a Max. Therm. on 7th	51·0	52·0
Lowest Reading of a Min. Therm. on the 19th...	30·0	22·2
Range of Thermometer Readings.....	21·0	29·8
Mean of Highest Daily Readings..	44·7	44·0
Mean of Lowest Daily Readings	36·8	33·4
Mean Daily Range	7·9	10·6
Deduced Mean Temp. (from mean of Max. and Min.)	40·4	38·2
Mean Temperature from Dry Bulb	40·9	38·3
Adopted Mean Temperature.....	40·7	38·3
Mean Temperature of Evaporation	38·4	36·8
Mean Temperature of Dew Point.....	35·5	34·5
Mean elastic force of Vapour.....inches	0·208	0·194
Mean weight of Vapour in a cub. ft. of air, grains	2·4	2·4
Mean additional weight required for saturation ,,	0·6	0·4
Mean degree of Humidity (saturation 100).....	82	86
Mean weight of a cubic foot of air .....grains	550·1	548·9
Mean amount of Cloud (0—10)	7·0	7·6
Fall of Rain .....inches	1·885	3·501
Greatest Rainfall in one day (6th) ..... ,,	0·350	0·765
No. of days on which ·005 in. or more Rain fell...	13	16·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	3	5	1	7	3	5	0
Mean Velocity in miles per hour	4·5	6·1	9·6	9·0	13·8	12·5	13·8	0
Total No. of miles for each Direction	428	441	1157	214	2325	903	1656	0

		Mean.*
Total No. of miles registered	7124	7616·3
Greatest hourly velocity (7th, mid. Dir. W.S.W.)	48	42·6

* *For the last 46 years.*

FEBRUARY, 1913.

DIFFERENCES.

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

Mean barometric pressure	+ 0·201 in.
Monthly range ,, ...	— 0·052 ,,
Mean of highest temperatures	+ 0·7°
Mean of lowest ,, ...	+ 3·4°
Mean daily range ,, ...	— 2·7°
Adopted mean temperature	+ 2·4°
Total rainfall	— 1·616 in.

Ground frost on 1st—3rd, 6th, 7th, 10th, 13th, 14th, 16th—25th, 27th and 28th. Hoar frost on 13th. Hail on 1st. Gales of wind on 7th and 8th. Fog on 11th and 14th.

Very fine weather prevailed during the latter half of the month.

EXTREME READINGS FOR FEBRUARY, During 66 Years.

Highest reading of Barometer	1902 (1st)	30·476 in.
Lowest ,, ,, ...	1900 (19th)	27·870 ,,
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 ,,
Greatest fall of rain in one day..... ...	1909 (3rd)	2·000 ,,
Greatest No. of days on which ·005 in. or more rain fell	1910	27
Least ,, ,, ,,	1855	4
*Greatest hourly velocity of the wind ...	1903 (27th)	60 mls.
*Greatest No. of miles registered	1868	12577
*Least ,, ,, ,, ...	1886	4251

* *Since 1867 only.*

MARCH, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·322	29·451
Highest ,, ,, on the 25th... ,,	29·907	30·047
Lowest ,, ,, on the 18th... ,,	28·247	28·637
Range of Barometer Readings ..... ,,	1·660	1·410
Highest Reading of a Max. Therm. on the 4th ...	54·0	56·9
Lowest Reading of a Min. Therm. on the 18th...	25·0	23·1
Range of Thermometer Readings.....	29·0	33·8
Mean of Highest Daily Readings.....	46·5	47·1
Mean of Lowest Daily Readings	36·1	34·3
Mean Daily Range	10·4	12·8
Deduced Mean Temp. (from mean of Max. and Min.)	40·3	39·8
Mean Temperature from Dry Bulb	42·3	40·2
Adopted Mean Temperature.....	41·3	40·0
Mean Temperature of Evaporation	39·3	38·1
Mean Temperature of Dew Point.....	36·8	35·7
Mean elastic force of Vapour.....inches	0·219	0·208
Mean weight of Vapour in a cub. ft. of air, grains	2·5	2·4
Mean additional weight required for saturation ,,	0·5	0·5
Mean degree of Humidity (saturation 100).....	85	85
Mean weight of a cubic foot of air .....grains	542·4	546·2
Mean amount of Cloud (0—10)	7·6	7·5
Fall of Rain .....inches	6·090	3·395
Greatest Rainfall in one day (13th) ..... ,,	1·160	0·779
No. of days on which ·005 in. or more Rain fell...	26	16·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	1	2	2	1	4	10	10	1
Mean Velocity in miles per hour	10·0	7·5	10·0	7·4	14·0	14·9	17·6	4·7
Total No. of miles for each Direction	241	362	478	178	1343	3567	4212	112

		Mean.*
Total No. of miles registered	10493	8594·3
Greatest hourly velocity (19th, 1 a.m. Dir. S.)...	44	41·7

* *For the last 46 years.*

MARCH, 1913.

DIFFERENCES.

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

Mean barometric pressure	— 0·129 in.
Monthly range ,, ...	+ 0·250 ,,
Mean of highest temperatures	— 0·6°
Mean of lowest ,, ...	+ 1·8°
Mean daily range ,, ...	— 2·4°
Adopted mean temperature	+ 1·3°
Total rainfall	+ 2·695 in.

Ground frost on 8th, 9th, 12th, 13th, 15th—18th, 21st—26th, 28th, 29th and 31st. Hoar frost on the 12th. Snow on 8th, 15th—17th. Hail on 5th—8th, 15th—17th and 19th. Heavy rain on 13th and 22nd. Gales of wind on 4th, 6th and 19th. Fog on 30th. Thunder on 15th and 28th. Lightning on 28th.

EXTREME READINGS FOR MARCH, During 66 Years.

Highest reading of Barometer	1854 (4th).....	30·452 in.
Lowest ,, ,, ...	1876 (10th)	28·100 ,,
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 ,,
Greatest fall of rain in one day.....	1898 (17th)	1·540 ,,
Greatest No. of days on which ·005 in. or more rain fell	1861	28
Least ,, ,, ,,	1852	3
*Greatest hourly velocity of the wind ...	1905 (15th).....	57 mls.
*Greatest No. of miles registered	1903	12773
*Least ,, ,, ,, ...	1892	5725

** Since 1867 only.*

APRIL, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·394	29·486
Highest ,, ,, on the 3rd ,,	29·905	29·947
Lowest ,, ,, on the 26th ,,	28·669	28·809
Range of Barometer Readings .. .. ,,	1·236	1·138
Highest Reading of a Max. Therm. on 24th.....	62·0	65·0
Lowest Reading of a Min. Therm. on 13th	33·0	28·1
Range of Thermometer Readings.....	29·0	36·9
Mean of Highest Daily Readings.....	51·2	54·9
Mean of Lowest Daily Readings	40·0	37·8
Mean Daily Range	11·2	17·1
Deduced Mean Temp. (from mean of Max. and Min.)	44·1	44·1
Mean Temperature from Dry Bulb	46·0	44·7
Adopted Mean Temperature.....	45·1	44·5
Mean Temperature of Evaporation	42·2	41·7
Mean Temperature of Dew Point.....	38·8	38·2
Mean elastic force of Vapour.....inches	0·236	0·235
Mean weight of Vapour in a cub. ft. of air, grains	2·7	2·7
Mean additional weight required for saturation ,,	0·7	0·7
Mean degree of Humidity (saturation 100).....	79	80
Mean weight of a cubic foot of air .....grains	539·4	542·1
Mean amount of Cloud (0—10)	7·4	6·8
Fall of Rain .....inches	4·970	2·536
Greatest Rainfall in one day (26th) ..... ,,	1·180	0·585
No. of days on which ·005 in. or more Rain fell...	19	14·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	0	8	3	0	5	5	8	1
Mean Velocity in miles per hour	0	9·7	6·9	0	15·1	12·3	11·9	10·8
Total No. of miles for each Direction	0	1869	495	0	1809	1479	2290	259

		Mean.*
Total No. of miles registered	8201	7597·7
Greatest hourly velocity (26th, 7 p.m. Dir. S.)...	50	37·3

* *For the last 46 years.*

APRIL, 1913.

DIFFERENCES.

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

Mean barometric pressure	— 0·092 in.
Monthly range ,, ...	+ 0·098 ,,
Mean of highest temperatures	— 3·7°
Mean of lowest ,, ...	+ 2·2°
Mean daily range ,, ...	— 5·9°
Adopted mean temperature	+ 0·6°
Total rainfall	+ 2·434 in.

Ground frost on 2nd, 4th, 6th, 8th, 11th—13th, 17th, 18th, 21st and 26th. Snow on 11th, 12th and 17th. Hail on 15th, 17th, 18th and 19th. Heavy rain on 15th, 26th and 29th. Gales of wind on 15th, 16th and 26th. Thunder on 19th and 29th. Lightning on 25th and 29th.

The amount of sunshine, 94 hours, is the lowest on record for April, being 1h. 42m. less than the previous minimum of 1889.

EXTREME READINGS FOR APRIL, During 66 Years.

Highest reading of Barometer	1906 (8th)	30·317 in.
Lowest ,, ,, ...	1868 (20th)	28·358 ,,
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 ,,
Greatest fall of rain in one day.....	1913 (26th)	1·180 ,,
Greatest No. of days on which ·005 in. or more rain fell	1867	24
Least ,, ,, ,,	1852	4
*Greatest hourly velocity of the wind ...	1911 (19th)	53 mls.
*Greatest No. of miles registered	1904	11016
*Least ,, ,, ,, ...	1884	5047

* *Since 1867 only.*

MAY, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·464	29·537
Highest ,, ,, on the 14th ... ,,	29·903	29·989
Lowest ,, ,, on the 4th ... ,,	29·006	28·947
Range of Barometer Readings ..... ,,	0·897	1·042
Highest Reading of a Max. Therm. on the 30th...	74·0	71·7
Lowest Reading of a Min. Therm. on 7th and 16th	36·0	31·8
Range of Thermometer Readings.....	38·0	39·9
Mean of Highest Daily Readings.....	58·0	59·5
Mean of Lowest Daily Readings	44·5	42·3
Mean Daily Range	13·5	17·2
Deduced Mean Temp. (from mean of Max. and Min.)	49·6	49·1
Mean Temperature from Dry Bulb	51·1	49·8
Adopted Mean Temperature.....	50·4	49·5
Mean Temperature of Evaporation	47·4	46·3
Mean Temperature of Dew Point...	44·2	42·7
Mean elastic force of Vapour.....inches	0·291	0·278
Mean weight of Vapour in a cub. ft. of air, grains	3·3	3·1
Mean additional weight required for saturation ,,	0·8	0·9
Mean degree of Humidity (saturation 100).....	80	77
Mean weight of a cubic foot of air .....grains	534·8	537·1
Mean amount of Cloud (0—10).....	7·0	7·1
Fall of Rain ....inches	4·045	2·687
Greatest Rainfall in one day (23rd) ..... ,,	1·050	0·632
No. of days on which ·005 in. or more Rain fell...	20	14·6

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	1	3	6	2	4	5	9	1
Mean Velocity in miles per hour	3·8	6·9	8·9	15·1	10·1	8·9	8·5	19·3
Total No. of miles for each Direction	91	494	1278	725	967	1065	1838	464

		Mean.*
Total No. of miles registered	6922	7099·0
Greatest hourly velocity (8th, Noon. Dir. S.E.)...	34	33·8

* *For the last 46 years.*

MAY, 1913.

DIFFERENCES.

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

Mean barometric pressure	—	0·073 in.
Monthly range ,, ...	—	0·145 ,,
Mean of highest temperatures	—	1·5°
Mean of lowest ,, ...	+	2·2°
Mean daily range ,, ...	—	3·7°
Adopted mean temperature	+	0·9°
Total rainfall	+	1·358 in.

Ground frost on 1st—3rd, 7th, 16th and 20th. Hail on 19th. Heavy rain on 3rd, 6th and 23rd. Thunder on 10th, 23rd and 30th. Lightning on 10th.

Sunshine 52 hours below the average.

EXTREME READINGS FOR MAY, During 66 Years.

Highest reading of Barometer	1881	(10th)	30·332 in.
Lowest ,, ,, ...	1877	(28th)	28·559 ,,
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 ,,
Greatest fall of rain in one day.....	1881	(5th).....	1·647 ,,
Greatest No. of days on which ·005 in. or more rain fell .....†	1860	.....	22
Least ,, ,, ,,	†1848	.....	4
*Greatest hourly velocity of the wind ...	1888	(2nd).....	49 mls.
*Greatest No. of miles registered	1888	.....	9648
*Least ,, ,, ,, ...	1889	.....	5396

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

JUNE, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer ..... inches	29·619	29·552
Highest ,, ,, on the 29th... ,,	29·957	29·930
Lowest ,, ,, on the 10th... ,,	29·047	29·051
Range of Barometer Readings ..... ,,	0·910	0·879
Highest Reading of a Max. Therm. on the 16th	75·0	77·1
Lowest Reading of a Min. Therm. on the 2nd ...	42·0	39·1
Range of Thermometer Readings.....	33·0	38·0
Mean of Highest Daily Readings.....	61·6	65·5
Mean of Lowest Daily Readings	49·8	48·1
Mean Daily Range	11·8	17·4
Deduced Mean Temp. (from mean of Max. and Min.)	53·9	55·0
Mean Temperature from Dry Bulb	55·4	55·3
Adopted Mean Temperature.....	54·7	55·1
Mean Temperature of Evaporation	51·2	52·0
Mean Temperature of Dew Point.....	47·9	48·5
Mean elastic force of Vapour.....inches	0·332	0·350
Mean weight of Vapour in a cub. ft. of air, grains	3·8	3·9
Mean additional weight required for saturation ,,	1·1	1·0
Mean degree of Humidity (saturation 100).....	77	78
Mean weight of a cubic foot of air .....grains	532·8	531·1
Mean amount of Cloud (0—10).....	7·7	7·3
Fall of Rain .....inches	2·470	3·480
Greatest Rainfall in one day (9th) ..... ,,	0·810	0·830
No. of days on which ·005 in. or more Rain fell...	17	15·4

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	2	1	2	0	5	1	18	1
Mean Velocity in miles per hour	6·2	2·3	5·5	0	8·5	3·1	12·2	4·0
Total No. of miles for each Direction	298	55	262	0	1021	75	5286	96

		Mean.*
Total No. of miles registered	7093	6234·3
Greatest hourly velocity (7th, 2 p.m. Dir. W.S.W.)	31	30·2

* *For the last 46 years.*

JUNE, 1913.

DIFFERENCES.

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

Mean barometric pressure	+ 0·067 in.
Monthly range ,, ...	+ 0·031 ,,
Mean of highest temperatures	— 3·9°
Mean of lowest ,, ...	+ 1·7°
Mean daily range ,, ...	— 5·6°
Adopted mean temperature	— 0·4°
Total rainfall	— 1·010 in.

Heavy rain on 9th. Thunder on 5th, 16th, 17th and 19th. Lightning on 16th.

From the 9th to the 14th the weather was extremely cold for June. The sunshine of the month was 67 hours below the average.

EXTREME READINGS FOR JUNE, During 66 Years.

Highest reading of the Barometer	1874 (15th)	30·219 in.
Lowest ,, ,, ...	1862 (12th)	28·632 ,,
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 the wind ...	1897 (16th)	45 mls.
*Greatest No. of miles registered	1877	8384
*Least ,, ,, ,, ...	1884	4507

* *Since 1867 only.* † *And 1912.*

JULY, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·645	29·527
Highest ,, ,, on the 1st ... ,,	29·970	29·905
Lowest ,, ,, on the 6th ... ,,	29·298	29·020
Range of Barometer Readings ..... ,,	0·672	0·885
Highest Reading of a Max. Therm. on the 27th	73·0	78·7
Lowest Reading of a Min. Therm. on the 8th ...	43·0	42·4
Range of Thermometer Readings.....	30·0	36·3
Mean of Highest Daily Readings.....	64·6	67·7
Mean of Lowest Daily Readings	51·2	50·9
Mean Daily Range	13·4	16·8
Deduced Mean Temp. (from mean of Max. and Min.)	56·0	57·7
Mean Temperature from Dry Bulb	57·7	57·9
Adopted Mean Temperature.....	56·9	57·9
Mean Temperature of Evaporation	53·4	54·8
Mean Temperature of Dew Point...	50·2	52·0
Mean elastic force of Vapour.....inches	0·363	0·389
Mean weight of Vapour in a cub. ft. of air, grains	4·0	4·4
Mean additional weight required for saturation ,,	1·1	1·1
Mean degree of Humidity (saturation 100)	78	81
Mean weight of a cubic foot of air .....grains	530·7	527·6
Mean amount of Cloud (0—10)	6·6	7·4
Fall of Rain ....inches	1·485	3·994
Greatest Rainfall in one day (17th) ..... ,,	0·520	0·864
No. of days on which ·005 in. or more Rain fell...	11	16·5

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	8	1	0	1	0	15	2
Mean Velocity in miles per hour	5·7	5·5	4·9	0	3·2	0	7·0	5·1
Total No. of miles for each Direction	543	1056	118	0	76	0	2537	247

		Mean.*
Total No. of miles registered	4577	6480·1
Greatest hourly velocity (19th, 10 p.m. Dir. W.N.W.).....	21	29·0

** For the last 46 years.*

JULY, 1913.

DIFFERENCES.

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

Mean barometric pressure	+ 0·118 in.
Monthly range ,, ...	— 0·213 ,,
Mean of highest temperatures	— 3·1°
Mean of lowest ,, ...	+ 0·3°
Mean daily range ,, ...	— 3·4°
Adopted mean temperature	— 1·0°
Total rainfall	— 2·509 in.

Heavy rain on the 17th. Thunder on the 5th. Solar halo on the 18th.

EXTREME READINGS FOR JULY, During 66 Years.

Highest reading of Barometer	1911 (10th)	30·203 in.
Lowest ,, ,, ...	1877 (15th)	28·564 ,,
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 ,,
Greatest fall of rain in one day.....	1888 (2nd).....	2·482 ,,
Greatest No. of days on which ·005 in. or more rain fell ....†	1861	27
Least ,, ,, ,,	†1863	8
*Greatest hourly velocity of the wind ...	1892 (8th).....	44 mls.
*Greatest No. of miles registered	1877	8288
*Least ,, ,, ,, ...	1913	4577

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

AUGUST, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·632	29·493
Highest ,, ,, on 17th & 26th ,,	29·900	29·888
Lowest ,, ,, on the 23rd... ,,	29·301	28·953
Range of Barometer Readings ..... ,,	0·599	0·935
Highest Reading of a Max. Therm. on the 3rd ...	76·0	76·6
Lowest Reading of a Min. Therm. on the 5th ...	41·0	41·7
Range of Thermometer Readings.....	35·0	34·9
Mean of Highest Daily Readings.....	65·4	66·7
Mean of Lowest Daily Readings	50·5	50·6
Mean Daily Range	14·9	16·1
Deduced Mean Temp. (from Mean of Max. and Min.)	56·3	57·0
Mean Temperature from Dry Bulb	58·9	57·7
Adopted Mean Temperature.....	57·6	57·3
Mean Temperature of Evaporation	54·3	54·4
Mean Temperature of Dew Point.....	51·3	51·7
Mean elastic force of Vapour.....inches	0·379	0·386
Mean weight of Vapour in a cub. ft. of air, grains	4·2	4·3
Mean additional weight required for saturation ,,	1·1	0·9
Mean degree of Humidity (saturation 100).....	80	82
Mean weight of a cubic foot of air.....grains	529·6	527·5
Mean amount of Cloud (0—10).....	5·4	7·3
Fall of Rain .....inches	2·285	5·034
Greatest Rainfall in one day (22nd) ..... ,,	0·730	1·065
No. of days on which ·005 in. or more Rain fell...	11	18·4

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	4	3	0	0	4	15	1
Mean Velocity in miles per hour	4·3	5·6	5·0	0	0	4·6	6·4	12·4
Total No. of miles for each Direction	417	542	360	0	0	445	2308	298

		Mean.*
Total No. of miles registered	4370	6483·2
Greatest hourly velocity (13th, 8 p.m. Dir. N.W.)	22	31·7

** For the last 46 years.*

AUGUST, 1913.

DIFFERENCES.

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

Mean barometric pressure	+ 0·139 in.
Monthly range ,, ...	— 0·336 ,,
Mean of highest temperatures	— 1·3°
Mean of lowest ,, ...	— 0·1°
Mean daily range ,, ...	— 1·2°
Adopted mean temperature	+ 0·3°
Total rainfall	— 2·749 in.

Ground frost on the 5th. Heavy rain on 22nd. Fog on 16th and 19th. Lightning on 29th.

EXTREME READINGS FOR AUGUST, During 66 Years.

Highest reading of Barometer	1874 (21st)	.....30·114 in.
Lowest ,, ,, ...	1903 (15th)	.....28·492 ,,
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 ,,
Greatest fall of rain in one day.....	1857 (7th)	..... 2·333 ,,
Greatest No. of days on which ·005 in. or more rain fell	1891	 27
Least ,, ,, ,,	1880	 6
*Greatest hourly velocity of the wind ...	1903 (31st)	..... 45 mls.
*Greatest No. of miles registered	1903	 8486
*Least ,, ,, ,, ...	1884	 4060

* *Since 1867 only.*

SEPTEMBER, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer ..... inches	29·553	29·545
Highest ,, ,, on the 7th ... ,,	30·051	30·015
Lowest ,, ,, on the 14th... ,,	28·746	28·890
Range of Barometer Readings ..... ,,	1·305	1·125
Highest Reading of a Max. Therm. on the 27th...	73·0	72·2
Lowest Reading of a Min. Therm. on the 8th ...	40·0	36·4
Range of Thermometer Readings.....	33·0	35·8
Mean of Highest Daily Readings.....	62·9	62·1
Mean of Lowest Daily Readings	50·4	47·1
Mean Daily Range	12·5	15·0
Deduced Mean Temp. (from mean of Max. and Min.)	55·4	53·4
Mean Temperature from Dry Bulb	57·1	54·2
Adopted Mean Temperature	56·3	53·8
Mean Temperature of Evaporation	52·7	51·0
Mean Temperature of Dew Point.....	49·4	48·3
Mean elastic force of Vapour.....inches	0·354	0·339
Mean weight of Vapour in a cub. ft. of air, grains	4·0	3·9
Mean additional weight required for saturation ,,	1·1	0·8
Mean degree of Humidity (saturation 100).....	78	82
Mean weight of a cubic foot of air.....grains	529·8	532·6
Mean amount of Cloud (0—10)	5·6	6·7
Fall of Rain .....inches	1·955	4·263
Greatest Rainfall in one day (25th) ..... ,,	0·650	0·952
No. of days on which ·005 in. or more Rain fell...	12	16·5

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	5	6	7	3	3	2	4	0
Mean Velocity in miles per hour	5·1	6·0	7·6	8·9	9·9	6·3	6·2	0
Total No. of miles for each Direction	610	871	1272	641	716	302	593	0

		Mean.*
Total No. of miles registered	5005	6090·1
Greatest hourly velocity (14th, 2 p.m. Dir. S.S.E.)	29	33·0

** For the last 46 years.*

SEPTEMBER, 1913.

DIFFERENCES.

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

Mean barometric pressure	+	0·008 in.
Monthly range ,, ...	+	0·180 ,,
Mean of highest temperatures	+	0·8°
Mean of lowest ,, ...	+	3·3°
Mean daily range ,, ...	—	2·5°
Adopted mean temperature	+	2·5°
Total rainfall	—	2·308 in.

Heavy rain on the 25th.

EXTREME READINGS FOR SEPTEMBER, During 66 Years.

Highest reading of Barometer	1851 (15th)...	30·247 in.
Lowest ,, ,, ...	1896 (25th).....	28·314 ,,
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 ,,
Greatest fall of rain in one day.....	1889 (26th).....	2·060 ,,
Greatest No. of days on which ·005 in. or more rain fell	1866	27 ,,
Least ,, ,, ,,	†1851	6
*Greatest hourly velocity of the wind ...	1875 (26th).....	53 mls.
*Greatest No. of miles registered	1869	9053
*Least ,, ,, ,, ...	1888	3261

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

OCTOBER, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer ....inches	29·386	29·437
Highest ,, ,, on the 13th... ,,	29·952	30·023
Lowest ,, ,, on the 29th ,,	28·692	28·669
Range of Barometer Readings ..... ,,	1·260	1·354
Highest Reading of a Max. Therm. on the 1st...	63·0	64·1
Lowest Reading of a Min. Therm. on the 24th...	32·0	29·4
Range of Thermometer Readings.....	31·0	34·7
Mean of Highest Daily Readings	55·8	54·6
Mean of Lowest Daily Readings	45·9	41·9
Mean Daily Range	9·9	12·7
Deduced Mean Temp. (from mean of Max. and Min.)	49·9	47·3
Mean Temperature from Dry Bulb	50·7	47·9
Adopted Mean Temperature	50·3	47·6
Mean Temperature of Evaporation	47·6	45·4
Mean Temperature of Dew Point.....	44·8	43·0
Mean elastic force of Vapour.....inches	0·297	0·279
Mean weight of vapour in a cub. ft. of air, grains	3·4	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	533·3	537·5
Mean amount of Cloud (0—10)	6·8	7·4
Fall of Rain ....inches	2·075	4·973
Greatest Rainfall in one day (7th) ..... ,,	0·620	0·989
No. of days on which ·005 in. or more Rain fell...	12	18·8

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	5	6	2	1	10	4	2	1
Mean Velocity in miles per hour	6·1	8·1	11·7	12·4	10·5	7·3	4·4	9·1
Total No. of miles for each Direction	726	1160	563	298	2523	699	213	218

		Mean.*
Total No. of miles registered	6400	7011·7
Greatest hourly velocity (30th, 6 a.m. Dir. S.)...	30	38·3

* *For the last 46 years.*

OCTOBER, 1913.

DIFFERENCES.

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

Mean barometric pressure	—	0·051 in.
Monthly range ,, ...	—	0·094 ,,
Mean of highest temperatures	+	1·2°
Mean of lowest ,, ...	+	4·0°
Mean daily range ,, ...	—	2·8°
Adopted mean temperature	+	2·7°
Total rainfall	—	2·898 in.

Ground frost on 1st, 18th, 22nd—25th. Hoar frost on 18th. Heavy rain on 7th. Thunder on 27th. Lightning on 21st, 27th and 28th. Lunar halo on the 13th.

EXTREME READINGS FOR OCTOBER, During 66 Years.

Highest reading of Barometer	1884 (5th)	30·306 in.
Lowest ,, ,, ...	1862 (19th).....	28·139 ,,
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 ,,
Greatest fall of rain in one day.....	1870 (8th)	2·529 ,,
Greatest No. of days on which ·005 in. or more rain fell	1903	29
Least ,, ,, ,,	1864	10
*Greatest hourly velocity of the wind ...	1877 (15th).....	52 mls.
*Greatest No. of miles registered	1874	9818
*Least ,, ,, ,, ...	1908	4569

* *Since 1867 only.*

NOVEMBER, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·359	29·463
Highest ,, ,, on the 28th... ,,	29·954	30·058
Lowest ,, ,, on the 12th... ,,	28·614	28·570
Range of Barometer Readings ..... ,,	1·340	1·488
Highest Reading of a Max. Therm. on the 2nd...	55·0	55·8
Lowest Reading of a Min. Therm. on the 23rd...	34·0	25·5
Range of Thermometer Readings.....	21·0	30·3
Mean of Highest Daily Readings.....	50·3	47·3
Mean of Lowest Daily Readings	41·8	36·7
Mean Daily Range	8·5	10·6
Deduced Mean Temp. (from mean of Max. and Min.)	45·7	41·7
Mean Temperature from Dry Bulb	47·0	42·0
Adopted Mean Temperature	46·4	41·9
Mean Temperature of Evaporation	44·2	39·8
Mean Temperature of Dew Point.....	41·7	38·3
Mean elastic force of Vapour.....inches	0·265	0·232
Mean weight of Vapour in a cub. ft. of air, grains	3·1	2·7
Mean additional weight required for saturation ,,	0·6	0·4
Mean degree of Humidity (saturation 100).....	85	87
Mean weight of a cubic foot of air.....grains	537·2	544·6
Mean amount of Cloud (0—10)	6·8	7·4
Fall of Rain ..... inches	5·670	4·417
Greatest Rainfall in one day (20th) ..... ,,	0·860	0·973
No. of days on which ·005 in. or more Rain fell...	28	18·0

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	3	0	1	0	7	3	14	2
Mean Velocity in miles per hour	4·7	0	7·3	0	8·0	19·1	16·0	7·5
Total No. of miles for each Direction	336	0	174	0	1346	1377	5362	362

		Mean.*
Total No. of miles registered	8957	7325·9
Greatest hourly velocity (2nd, 9 p.m. Dir. S.)...	36	42·0

** For the last 46 years.*

NOVEMBER, 1913.

DIFFERENCES.

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

Mean barometric pressure	— 0·014 in.
Monthly range ,, ...	— 0·148 ,,
Mean of highest temperatures	+ 3·0°
Mean of lowest ,, ...	+ 5.1°
Mean daily range ,, ...	— 2·1°
Adopted mean temperature	+ 4·5°
Total rainfall	+ 1·253 in.

Ground frost on 4th, 6th—10th, 22nd, 23rd, 25th. Hoar frost on 22nd. Hail on 3rd and 14th. Heavy rain on 19th and 20th. Lunar Halo on 14th. Solar halo on 21st.

EXTREME READINGS FOR NOVEMBER, During 66 Years.

Highest reading of Barometer	1857 (12th).....	30·350 in.
Lowest ,, ,, ...	1891 (11th).....	27·938 ,,
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 ,,
Greatest fall of rain in one day.....	1866 (16th).....	3·700 ,,
Greatest No. of days on which ·005 in. or more rain fell	1913	28
Least ,, ,, ,,	1848.....	6
*Greatest hourly velocity of the wind ...	1887 (1st)	62 mls
*Greatest No. of miles registered	1888.....	12813
*Least ,, ,, ,, ...	1870.....	4951

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

DECEMBER, 1913.

Results of Observations taken during the Month.		Mean for the last 66 years.
Mean Reading of the Barometer .....inches	29·604	29·441
Highest ,, ,, on the 31st... ,,	30·182	30·072
Lowest ,, ,, on the 3rd ... ,,	28·486	28·524
Range of Barometer Readings ..... ,,	1·696	1·548
Highest Reading of a Max. Therm. on 3rd and 4th	51·0	52·8
Lowest Reading of a Min. Therm. on the 31st ...	21·0	20·8
Range of Thermometer Readings.....	30·0	32·0
Mean of Highest Daily Readings.....	44·5	43·4
Mean of Lowest Daily Readings	37·5	33·5
Mean Daily Range	7·0	9·9
Deduced Mean Temp. (from mean of Max. and Min.)	41·0	38·4
Mean Temperature from Dry Bulb	40·9	39·1
Adopted Mean Temperature	41·0	38·8
Mean Temperature of Evaporation	38·1	37·2
Mean Temperature of Dew Point.....	34·4	35·3
Mean elastic force of Vapour.....inches	0·199	0·207
Mean weight of Vapour in a cub. ft. of air, grains	2·3	2·4
Mean additional weight required for saturation ,,	0·7	0·4
Mean degree of Humidity (saturation 100).....	78	87
Mean weight of a cubic foot of air.....grains	548·0	547·4
Mean amount of Cloud (0—10)	7·8	7·6
Fall of Rain .....inches	4·210	4·568
Greatest Rainfall in one day (4th) ..... ,,	0·940	0·849
No. of days on which ·005 in. or more Rain fell...	16	19·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	9	2	0	0	0	4	15	1
Mean Velocity in miles per hour	5·2	3·0	0	0	0	16·4	15·4	2·9
Total No. of miles for each Direction	1125	142	0	0	0	1572	5558	70

		Mean.*
Total No. of miles registered	8467	7883·8
Greatest hourly velocity (3rd, 8 p.m. Dir. S.)...	45	42·8

* *For the last 46 years.*

DECEMBER, 1913.

DIFFERENCES.

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

Mean barometric pressure	+ 0·163 in.
Monthly range ,, ...	+ 0·148 ,,
Mean of highest temperatures	+ 1·1°
Mean of lowest ,, ...	+ 4·0°
Mean daily range ,, ...	— 2·9°
Adopted mean temperature	+ 2·2°
Total rainfall	— 0·358 in.

Ground frost on 4th—8th, 13th, 17th, 21st—25th, 27th—31st. Hoar frost on 25th. Snow on 4th, 6th, 24th, 28th. Hail on 4th and 27th. Heavy rain on 3rd, 4th and 26th. Gale of wind on 3rd. Fog on 7th. Lightning on 28th. Solar halo on the 5th.

EXTREME READINGS FOR DECEMBER.
During 66 Years.

Highest reading of Barometer	1905 (12th).....	30·484 in.
Lowest ,, ,, ...	1886 (8th)	27·350 ,,
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 ,,
Greatest fall of rain in one day.....	1870 (19th).....	1·962 ,,
Greatest No. of days on which ·005 in. or more rain fell	1868.....	28
Least ,, ,, ,,	†1853.....	8
*Greatest hourly velocity of the 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, 1913.

Results of Observations taken during the Year.		Mean for the last 66 years.
Readings of Barometer in inches.		
Mean of the Year	29·497	29·494
Highest Monthly Mean (February)	29·702	29·749
Lowest ,, ,, (January)	29·285	29·226
Highest Reading (February)	30·266	30·295
Lowest ,, (March)	28·247	28·209
Range	2·019	2·086
Thermometer, Fahrenheit.		
Highest Monthly Mean Temperature (August)	57·6	58·6
Lowest ,, ,, ,, (January)	39·1	35·4
Highest Reading of a Max. Therm. (Aug. 3rd)	76·0	81·7
Lowest ,, Min. ,, (Dec. 31st)	21·0	15·8
Range of Thermometer Readings	55·0	65·9
Mean of Highest Daily ,,	54·0	54·6
Mean of Lowest Daily ,,	43·3	40·8
Mean Daily Range	10·7	13·8
Deduced Mean Temp. (from mean of Max. and Min.)	47·6	46·8
Mean Temperature from Dry Bulb	49·0	47·0
Adopted Mean Temperature of the Year	48·3	46·9
Mean Temperature of Evaporation	45·5	44·6
Mean Temperature of Dew Point	42·5	42·1
Mean elastic force of Vapour ....inches	0·279	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)	81	83
Mean weight of a cubic foot of air ....grns.	537·7	539·2
Mean amount of Cloud (0—10)	7·0	7·3
Total fall of Rain ....inches	41·945	47·017
Greatest Monthly Rainfall (March) ,,	6·090	7·479
Least ,, ,, (July) ,,	1·485	1·221
Greatest Rainfall in one day (April 26th) ,,	1·180	1·624
No. of days per Month on which ·005 inch or more Rain fell	17·1	17·1

SUMMARY OF WIND, 1913.

	N	NE	E	SE	S	SW	W	NW
No. of days in the year on which the prevailing Wind was	42	45	40	14	52	44	117	11
Mean Velocity in miles per hour	5·4	6·8	8·4	10·3	11·2	11·6	11·6	8·1
Total No. of miles for each Direction	5465	7325	8055	3446	14005	12278	32653	2126

		Mean for the last 46 years.
Total No. of miles registered	85353	86585·1
Greatest Monthly Total (March)	10493	10054·4
Least ,, ,, (August)	4370	5073·1
Greatest hourly velocity (April 26th)	50	52·0
Prevailing Direction of Wind	W	W

DIFFERENCES, 1913.

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

Mean barometric pressure	+ 0·003 in.
Yearly range ,, ...	— 0·067 ,,
Mean of highest daily temperatures	— 0·6°
Mean of lowest ,, ,, ...	+ 2·5°
Mean daily range	— 3·1°
Adopted mean temperature	+ 1·4°
Total rainfall	— 5·072 in.

ABSOLUTE EXTREMES

FOR THE LAST 66 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. 9)	30·597
Lowest ,,	1886 (Dec. 8)	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 20)	89·0
Lowest ,, ,,	1881 (Jan. 15)	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 66 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	8594
Least ,, ,, ,,	September	6090
Greatest No. ,, ,, year	1868	102395
Least ,, ,, ,, ,,	1909	77165

* *Record dates from 1867 only.*

DATES OF OCCASIONAL PHENOMENA.

1913.	Frost.	Hoar Frost.	Snow.	Hail.	Heavy Rain.
January	2, 5, 6, 11—20, 22, 23, 25—28, 30, 31	6, 26	10—12, 14, 22, 31	18, 25, 28, 31	22, 23, 30
February	1—3, 6, 7, 10, 13, 14, 16—25, 27, 28	13		1	
March	8, 9, 12, 13, 15-18, 21-26, 28, 29, 31	12	8, 15—17	5—8, 15—17, 19	13, 22
April	2, 4, 6, 8, 11—13, 17, 18, 21, 26		11, 12, 17	15, 17, 18, 19	15, 26, 29
May	1—3, 7, 16, 20			19	3, 6, 23
June					9
July					17
August	5				22
September					25
October	1, 18, 22—25	18			7
November	4, 6—10, 22, 23, 25	22		3, 14	19, 20
December	4—8, 13, 17, 21—25, 27—31	25	4, 6, 24, 28	4, 27	3, 4, 26

1913.	Gales of Wind.	Fog.	Thunder.	Lightning.	*Lunar Halo.	*Solar Halo.	Aurora Borealis.
January	30		31	31	19		
February	7, 8	11, 14					
March	4, 6, 19	30	15, 28	28			
April	15, 16, 26		19, 29	25, 29			
May			10, 23, 30	10			
June			5, 16, 17, 19	16			
July			5			18	
August		16, 19		29			
September							
October			27	21, 27, 28	13		
November					14	21	
December	3	7		28		5	

* *22° Radius.*

MONTHLY TOTALS FOR EACH HOUR OF RECORDED SUNSHINE.

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	...	...	...	...	...	0·2	2·2	4·0	3·1	2·1	0·6	0·1	...	...	...	...	...
February	...	...	...	...	2·2	5·6	7·4	10·5	8·6	6·0	6·8	3·1	...	...	...	...	...
March	...	...	0·2	4·4	10·4	8·9	12·4	13·9	12·0	11·4	6·6	5·8	2·2	...	...	...	...
April	...	...	2·5	7·6	10·0	8·1	7·8	7·4	7·8	9·7	10·1	9·5	9·0	4·5	...	...	...
May	...	1·9	6·6	9·5	8·5	8·6	8·9	10·2	10·5	11·2	11·3	12·1	12·2	12·7	9·5	1·7	...
June	0·2	3·6	6·2	8·4	10·1	10·3	9·1	7·7	7·1	8·2	9·5	11·3	9·9	8·2	6·4	1·5	...
July	0·2	2·6	6·0	7·7	10·2	11·7	10·2	11·4	12·9	13·6	12·0	13·2	10·9	10·1	8·0	1·9	...
August	...	1·8	5·1	10·3	13·0	14·0	14·8	14·7	12·6	14·2	15·2	15·1	15·6	12·5	4·3	0·1	...
September	...	...	0·1	3·3	9·5	10·0	11·0	11·7	10·8	10·9	9·2	9·0	5·4	0·8	...	...	...
October	...	...	...	...	0·8	6·5	12·7	11·8	12·4	10·3	7·7	5·0	1·9	...	...	...	...
November	...	...	...	...	...	4·0	6·9	8.3	6.0	5·9	3·8	1·2	...	...	...	...	...
December	...	...	...	...	...	2·5	6·0	5·9	6·2	4·7	2·2	0·1	...	...	...	...	...
Sums	0·4	9·9	26·7	51·2	74·7	90·4	109·4	117·5	110·0	108·2	95·0	85·5	67·1	48·8	28·2	5·2	...

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

1913.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January	...	0·2	0·2	...	...	1·0	...	0·9	1·7	...	...	0·3	...	...	...	1·6	...
February	1·3	...	...	...	...	...	...	4·0	...	...	2·1	1·5	4·9	...	...	5·6	...
March	...	3·7	...	1·2	5·2	2·0	4·6	6·7	...	4·8	6·8	5·3	3·0	...	3·6	3·0	2·5
April	3·8	1·3	7·4	3·5	7·6	3·8	3·5	4·2	0·7	0·4	...	4·0	4·8	...	1·1	5·0	4·8
May	2·5	9·5	0·2	0·8	2·4	...	4·8	...	0·8	6·7	7·6	2·0	3·2	5·5	10·6	13·1	5·3
June	13·5	10·7	9·6	6·5	2·3	1·1	9·9	6·1	...	6·8	1·3	10·8	0·1	0·6	7·0	7·6	1·1
July	6·8	0·6	1·3	...	3·3	0·5	3·1	5·7	...	0·8	3·1	1·5	2·9	6·0	5·1	2·8	...
August	2·8	8·5	11·0	4·6	3·6	6·0	5·8	8·5	4·3	3·3	2·0	6·0	...	...	0·8	7·2	...
September	1·7	5·8	...	2·9	4·7	1·3	1·8	...	7·2	1·3	...	...	5·7	0·5	7·5	...	7·2
October	6·4	...	3·2	0·1	...	0·1	...	1·8	2·6	4·0	...	4·0	0·5	...	1·5	2·5	6·1
November	3·8	0·9	1·8	2.3	1·2	...	5·3	...	2·5	..	1·4	0·8	0·5	3·4	1·3	...	...
December	4·5	...	...	...	4·1	..	...	...	...	...	0·7	1·0	...	...	...	...	1·5

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

1913.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly. Total.	Monthly. Percentage.
January ...	...	...	...	0·9	...	...	...	2·6	1·9	...	...	...	...	1·0	12·3	5·0
February ..	6·4	5·1	0·4	5·0	6·2	1·5	2·4	1·8	0·2	1·8	...				50·2	18·5
March ...	4·9	1·9	2·0	4·1	0·5	...	3·9	6·9	0·6	...	...	...	5·7	5·3	88·2	24·1
April... ...	2·0	4·0	10·7	...	5·5	1·8	6·7	2·1	0·6	0·2	0·5	1·6	2·4		94·0	22·3
May	8·6	5·2	0·7	1·5	1·0	...	3·1	8·7	11·4	6·4	...	...	10·5	3·3	135·4	27·5
June	2·9	0·5	1·2	1·4	0·5	0·1	0·1	4·1	1·3	6·6	...	4·0	...		117·7	23·2
July	2·7	7·1	10·3	..	4·2	7·6	6·0	4·8	13·4	10·1	11·3	4·3	8·5	8·8	142·6	28·0
August ...	12·5	10·3	10·7	0·6	...	6·9	7·1	9·3	8·8	2·1	6·2	6·7	5·1	2·6	163·3	35·7
September ...	5·7	1·1	...	8·1	9·1	6·0	1·1	0·5	0·5	8·1	1·0	0·4	2·5		91·7	24·2
October ...	...	5·5	1·2	1·3	4·9	2·8	3·0	3·2	...	1·2	1·1	4·0	3·3	4·8	69·1	21·2
November ...	0·3	1·2	...	0·1	4·5	3·7	0·7	...	0·1	...	...	...	0·3		36·1	14·1
December ...	...	...	...	1·4	...	...	2·6	...	...	...	...	3·3	3·9	4·6	27·6	11·9

SUMMARY OF SUNSHINE.

	Bright Sunshine Recorded.					
	1913.			Mean for the last 33 years.		
	Number of		Percentage of Possible Sunshine.	Number of		Percentage of Possible Sunshine.
	Days.	Hours.		Days.	Hours.	
January ...	11	12·3	5·0	13·9	33·4	13·5
February ...	16	50·2	18·5	17·7	59·1	21·6
March ...	23	88·2	24·1	24·2	105·7	28·9
April ...	27	94·0	22·3	26·3	148·7	35·5
May... ...	26	135·4	27·5	27·5	187·1	37·9
June ...	27	117·7	23·2	27·8	184·8	36·4
July ...	27	142·6	28·0	28·6	178·0	35·0
August ...	27	163·3	35·7	27·5	150·9	33·0
September ...	24	91·7	24·2	25·6	123·9	32·7
October ...	24	69·1	21·2	23·3	85·6	26·3
November ...	20	36·1	14·1	17·5	45·7	17·8
December ...	10	27·6	11·9	12·9	24·9	10·8
Year ...	262	1028·2	23·0	272·7	1327·9	29·8

SUMMARY OF SUNSHINE—*Continued.*

EXTREMES FOR THE LAST 33 YEARS.

Month.	Number of Days on which Sunshine was recorded.				Number of Hours				Percentage of Possible Sunshine.			
	Greatest		Least		Greatest		Least		Greatest		Least	
	No.	Year	No.	Year	No.	Year	No.	Year	%	Year	%	Year
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
Apr.	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.	29	*1895	21	1897	175·6	1906	62·9	1896	46·3	1906	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	1886	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.*

MAGNETIC DECLINATION, WEST.

1913.	G. M. T. Civil Day.	Observed.	Corrected.	1913.	G. M. T. Civil Day.	Observed.	Corrected.
	D. H. M.	° ′	° ′		D. H. M.	° ′	° ′
Jan.	4 16 0	16 59·5	16 56·5	July	4 16 0	16 56·7	16 53·3
,,	13 ,, ,,	17 1·5	17 1·5	,,	12 ,, ,,	,, 55·8	,, 50·9
,,	20 ,, ,,	,, 2·7	,, 1·2	,,	19 ,, 2	,, 58·6	,, 56·2
,,	27 ,, ,,	16 59·7	,, 0·7	,,	28 ,, 3	,, 56·4	,, 54·0
Feb.	3 16 0	16 59·5	16 59·6	Aug.	4 16 0	16 56·0	16 54·1
,,	10 ,, ,,	,, 56·6	,, 55·7	,,	11 17 5	,, 56·4	,, 54·5
,,	18 ,, ,,	,, 55·7	,, 54·3	,,	19 16 0	17 2·8	17 0·9
,,	25 ,, 30	17 3·2	,, 58·3	,,	27 18 0	16 56·2	16 57·3
Mar.	4 16 0	16 58·4	16 56·4	Sept.	4 16 1	16 57·8	16 57·3
,,	11 ,, ,,	,, 56·5	,, 55·5	,,	12 ,, 0	,, 57·8	,, 59·3
,,	20 ,, 15	,, 57·2	,, 56·2	,,	20 ,, 0	,, 57·5	,, 56·0
,,	27 ,, 0	,, 57·9	,, 57·9	,,	27 ,, 5	,, 53·3	,, 53·8
April	4 16 0	16 57·3	16 55·2	Oct.	6 16 0	16 54·7	16 53·7
,,	12 ,, ,,	,, 58·1	,, 57·0	,,	13 17 3	,, 48·2	,, 54·2
,,	19 ,, ,,	,, 55·2	,, 54·6	,,	20 16 0	,, 53·4	,, 53·4
,,	27 11 50	,, 54·2	,, 53·1	,,	27 ,, ,,	,, 50·0	,, 51·0
May	5 16 30	16 55·9	16 59·2	Nov.	5 16 0	16 51·8	16 51·9
,,	12 ,, 0	,, 59·5	,, 56·8	,,	13 ,, ,,	,, 52·8	,, 52·9
,,	19 ,, 30	17 0·4	,, 58·7	,,	19 ,, 2	,, 53·7	,, 53·8
,,	27 18 0	16 55·3	,, 54·6	,,	27 ,, ,,	,, 54·5	,, 52·6
June	4 16 0	17 2·8	16 59·5	Dec.	4 16 9	16 54·2	16 52·4
,,	12 17 0	16 58·2	,, 55·9	,,	12 ,, 0	,, 50·3	,, 49·5
,,	19 16 0	,, 56·8	,, 55·5	,,	24 ,, ,,	,, 46·6	,, 46·8
,,	27 ,, 10	,, 57·7	,, 56·9	,,	29 ,, ,,	,, 48·8	,, 50·0

HORIZONTAL MAGNETIC FORCE.

1913.	G. M. T. Civil Day.	Observed Time of one Vibration.	Temp.	Observed Deflection $\frac{\text{at 1·0 ft.}}{\text{at 1·3 ft.}}$	Temp.	Deduced Horizontal Force.	Horizontal Force Corrected.
	D. H. M.	S.	°	° ′	°	C.G.S. UNITS.	
Jan.	16 8 45	6·1037	38	11 15·4 / 5 6 0	39 / 41	0·17367	0·17370
Feb.	15 8 45	6·1069	43	11 14·9 / 5 6·1	43 / 43	0·17364	0·17370
Mar.	15 8 50	6·1060	38	11 15·3 / 5 6·6	43 / 44	0·17354	0·17367
April	15 8 40	6·1075	52	11 15·1 / 5 6·3	58 / 60	0·17352	0·17383
May	15 9 0	6·1112	59	11 14·1 / 5 5·6	59 / 59	0·17354	0·17376
June	16 11 10	6·1130	78	11 13·0 / 5 6·0	71 / 72	0·17378	0·17378
July	16 10 30	6·1188	70	11 13·7 / 5 4·9	70 / 69	0·17342	0·17350
Aug.	18 9 30	6·1209	71	11 13·4 / 5 5·5	72 / 70	0·17368	0·17394
Sept.	18 9 58	6·1145	75	11 13·7 / 5 6·9	61 / 62	0·17374	0·17390
Oct.	16 11 20	6·1180	68	11 13·6 / 5 6·0	67 / 67	0·17353	0·17367
Nov.	19 11 50	6·1068	55	11 14·3 / 5 5·9	52 / 53	0·17377	0·17379
Dec.	17 11 10	6·1080	62	11 15·2 / 5 6·3	43 / 46	0·17363	0·17368

ABSOLUTE MEASURES—SUMMARY.

DIRECTION.			FORCE.		
1913.	Declination Corrected.	Inclination.	Horizontal.	Vertical.	Total.
	° ′	° ′	C. G. S. UNITS.		
January ...	17 0·0	68 41·7	0·17370	0·44540	0·47807
February ...	16 57·0	68 42·9	0·17370	0·44587	0·47851
March ...	16 56·5	68 41·4	0·17367	0·44521	0·47789
April ...	16 55·0	68 41·9	0·17383	0·44582	0·47850
May ...	16 57·3	68 39·8	0·17376	0·44484	0·47758
June ...	16 57·0	68 40·1	0·17378	0·44503	0·47775
July ...	16 53·6	68 41·1	0·17350	0·44469	0·47734
August ...	16 56·7	68 41·1	0·17394	0·44582	0·47855
September..	16 56·6	68 42·3	0·17390	0·44615	0·47884
October ...	16 53·1	68 41·1	0·17367	0·44512	0·47780
November ..	16 52·8	68 40·1	0·17379	0·44505	0·47778
December ..	16 49·7	68 40·4	0·17368	0·44486	0·47757
Means ...	16 55·4	68 41·2	0·17374	0·44532	0·47802

HORIZONTAL MAGNETIC DIRECTION.

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

1913.	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 ...	60·4	56·6	58·3	58·0	58·3	6·6	69·8	49·8	20·0
February ...	59·9	53·1	57·9	56·6	56·9	8·1	66·8	47·8	19 0
March... ...	61·5	53·6	58·0	56·0	57·3	11·0	69 8	44·8	25·0
April	60·6	51·4	57·9	54·8	56·2	11·2	73·8	38·8	35·0
May	62·3	53·5	59·9	56 7	58·1	10·7	66·3	44·3	22 0
June	61·4	52·0	59·6	54·8	57·0	11·3	64·8	45·3	19·5
July	61·3	51·4	58·5	54·3	56·4	11·2	65·3	49·3	16·0
August ...	60·9	51·2	56·3	53·0	55·4	11·3	64·3	47·3	17·0
September ..	59·4	51·1	54·9	53 4	54·7	11·3	64·8	43·3	21·5
October ...	56·8	50 4	53·3	52·5	53·3	11·9	64·3	35·8	28·5
November ...	54·7	50·4	52·3	51 8	52·3	6·4	49·3	30·3	19·0
December ...	51·7	49·3	50·5	50·4	50·5	5·4	57·3	36·3	21·0
Means... ...	59·2	52·0	56·5	54·4	55·5	9·7	64·7	42·8	21·9

Mean for the year... ... 16° 55′·5 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.

1913.	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. *					
	17000 +				0 +		17000 +		0 +
January ...	378	370	374	376	375	29	377	293	84
February ...	377	360	370	370	369	36	390	328	62
March	370	350	367	365	363	26	473	363	110
April	400	361	392	390	386	47	443	328	115
May	397	362	385	379	381	46	416	337	79
June	386	338	376	364	366	56	412	306	106
July	373	335	358	356	356	48	416	320	96
August ...	396	361	385	384	382	44	413	343	70
September ...	386	353	369	377	371	45	413	308	105
October ...	388	362	381	382	378	44	413	316	97
November ...	389	371	383	385	382	28	418	334	84
December ..	390	378	384	384	384	24	419	313	106
Means... ...	386	358	377	376	374	39	417	324	93

Mean for the year ... ... 0·17374 C. G. S. Units.

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

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.

1913.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	1913
D.													D.
1	c	c	c	s	s	m	s	c	s	c	m	c	1
2	s	c	c	s	s	s	s	s	s	c	m	c	2
3	s	c	s	s	s	s	s	s	s	c	c	c	3
4	s	c	s	s	m	s	c	s	s	m	c	m	4
5	c	c	c	c	m	c	s	s	s	m	c	c	5
6	c	s	s	c	m	c	s	*	m	s	s	c	6
7	c	s	c	c	s	c	s	*	m	m	s	c	7
8	c	s	s	s	s	c	s	s	m	m	s	s	8
9	s	s	c	g	s	c	s	m	s	m	c	s	9
10	s	c	c	s	s	c	s	s	s	s	c	c	10
11	c	s	s	s	s	c	s	s	s	c	c	c	11
12	c	s	c	m	s	c	m	s	s	s	c	c	12
13	c	s	s	s	c	c	s	s	s	s	c	c	13
14	c	s	m	s	c	s	s	s	s	s	c	c	14
15	c	s	m	s	s	s	s	s	s	s	c	s	15
16	c	s	m	s	s	c	s	s	s	s	c	c	16
17	*	s	s	s	s	c	s	s	s	c	c	c	17
18	*	c	s	c	s	s	s	s	s	m	c	s	18
19	s	c	c	s	s	s	s	c	s	s	c	c	19
20	s	s	s	c	s	s	s	c	c	s	c	s	20
21	c	s	s	s	c	s	c	s	c	c	c	s	21
22	c	s	s	s	c	s	s	c	s	c	c	c	22
23	c	c	s	s	c	s	c	s	s	c	c	c	23
24	c	s	s	s	s	s	s	c	s	c	c	s	24
25	s	s	s	s	s	s	s	s	c	s	c	m	25
26	c	s	s	s	s	s	s	s	s	c	c	s	26
27	c	c	s	s	s	s	c	s	s	c	s	s	27
28	s	c	s	c	s	s	s	s	s	*	s	c	28
29	s		s	c	s	s	s	c	c	c	c	c	29
30	s		s	s	c	s	s	s	s	c	c	c	30
31	s		s		s		c	s		s		c	31
Totals c	17	11	8	7	6	11	5	6	4	12	23	20	
Totals s	12	17	20	21	22	18	25	22	23	12	5	9	
Totals m	...	...	3	1	3	1	1	1	3	6	2	2	
Totals g	...	...	...	1	...	...	...	...	...	...	...	...	
Totals 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.

1913.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	1913.
D.													D.
1		...			...	...	...			...	f	...	1
2	0·4		...		...	...		...	...		...		2
3				...		...		...	...	...			3
4			...	...		...		...	...		f		4
5			...	...		...		...	...			...	5
6	...		...			...		...	...				6
7			...	0·1	...	f	...	...	...		...		7
8		...	...	...			...	...		0·1			8
9	...		...					...			...		9
10					...	...		f	...				10
11		...	...		...			...	...		...		11
12		...	...	...	...	...		...		0·1	...		12
13		...	...		...				...	f		0·3	13
14					...		...		...		...		14
15			...		...	...	...		...	...	...		15
16	...	...	...	...	...	...	f	...	...	...			16
17			...	...	...	...			...	...		f	17
18		...	...		...		f	f	...				18
19		0·1	...	...	...		...	f	...	f	...		19
20				...		...	...	..	...	f			20
21		0·6	...		...	...		...	...	...		f	21
22		0·6		f			...			...	...		22
23		0·4					...	0·1		...	...		23
24		0·4	...	...				...	...	...	0·2	0·2	24
25	...		...	...	...	...	...	...	...	0·1			25
26	0·2	0·2			...		...	...	f		f		26
27					...	...	...	f	f	0·5			27
28							...		...	0·4		0·1	28
29			...			...	f	...	...	0·5		0·2	29
30					...	...	0·1	...	...	...		0·5	30
31	...		...		...		...	...		0·5		0·6	31
Daily Means	0·1	0·2	...	...	...	...	...	...	...	0·1	0·01	0·2	

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

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