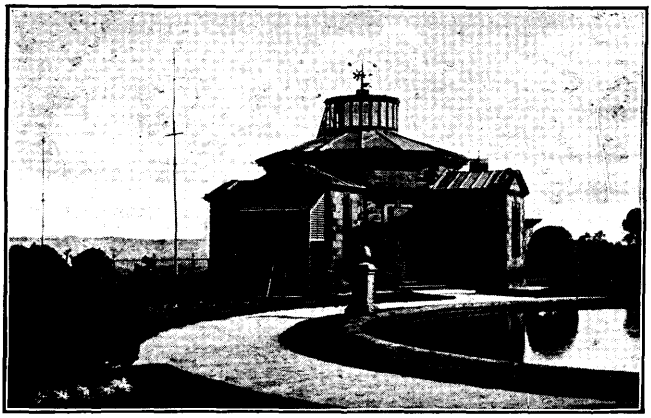
STONYHURST COLLEGE OBSERVATORY.

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



(FOUNDED 1838.)

Results of Geophysical and Solar Observations,

1923.

With Report and Notes of the Director,

Rev. A. L. CORTIE, S.J., D.Sc., F.R.A.S., F. Inst P.

BLACKBURN:
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CONTENTS.

REPORT AND NOTES.

GENERAL.—In addition to the Director, the staff consists of Father J. Rowland, S.J., B.Sc. (Lond.), F.R.A.S., and of the Rev. H. Macklin, S.J., B.Sc. (Oxon.), the greater part of whose time is taken up in teaching mathematics in the College. Father B. G. Swindells, S.J., B.Sc., A.R.C.Sc., the Professor of Physics, helps occasionally in the work of the observatory. Mr. Joseph Burns performs the duties of Meteorological Clerk. A very successful visit was paid to the observatory, on September 15th, by a large party of the members of the British Association, the meetings of which were being held in Liverpool. The Director has given many public lectures on astronomical topics during the year. As a result of two of these, visits were made to the observatory by parties from the Burnley Literary and Scientific Club, and from the Blackburn Literary Club. He also fulfils the duties of President of the Manchester Astronomical Society.

All the instruments, which are under the care of Father Rowland, continue to be in good working order Through the generosity of the Government Grant Committee of the Royal Society, £100 was allotted to the Director for the purchase of a Milne-Shaw seismograph, which was erected in the north pavilion of the observatory by Mr. J. J. Shaw himself, just in time for the visit of the British Association. From our good friend, Mr. E. T. Whitelow, F.R.A.S., we have received further

gifts of a Zöllner photometer, a Dawes solar eyepiece, and a full set of the valuable maps and the catalogue of Argelander and Schönfeld's Durchmusterung.

The change in the lighting system of the College from gas to electricity has entailed a number of changes at the observatory, and has presented some problems, which have happily been solved without involving any serious interruption of our records. Taken collectively, the changes introduced constitute a notable improvement in the condition of the observatory.

As it was evident when gas making ceased that some time must elapse before an electricity supply would be available at the Observatory, we were privileged to be the sole users of the last remains of gas in the gasholder, and with this we were able to maintain the lighting of the Magnetographs, till paraffin lamps, specially designed to suit the instruments, could be constructed. These lamps were brought into use on 1922, September 27th, and apart from the trouble incidental to the maintenance of all oil lamps, gave a satisfactory service till 1923, March 22nd, when they were replaced by electric light. They will be available as a standby, in case of any prolonged failure of the electric light supply. The electric light service comprises two separate systems :—

(1) A supply at 220 volts D.C. from the College mains for general lighting and power purposes ;

(2) A low voltage installation giving a supply at 10—14 volts for instrument lighting and experimental work.

About the first of these little need be said, except

that it is very effective and convenient, and is a considerable improvement on the previous lighting of the Observatory. It was brought into use towards the close of 1922.

The low voltage plant, which was not available till September, 1923, comprises a 1 h.p. motor, taking current from the 220 volt supply, direct coupled to a ½-K.W. shunt dynamo, delivering current at 10 to 20 volts, to a 7-cell battery of 200 ampere-hours capacity, by the Hart Accumulator Company. We are greatly indebted to Mr. J. W. Record, of the Record Electrical Company, Ltd., Broadheath, Manchester, who kindly presented all the indicating instruments for the fully equipped three-panel switchboard by which the plant is controlled. This plant is housed in one of the beautiful garden pavilions built by Sir Nicholas Shireburn (c. 1700), to the designs of Sir Christopher Wren, who was not only an architect, but a distinguished astronomer, and it seems singularly appropriate that the building designed by him should now become a portion of the Observatory. From the pavilion, current is conveyed by an underground cable to a distribution board in the Meteorological Observatory, whence it is taken to the underground magnetic chamber for lighting the instruments, to the Spectrograph room for experimental work, and to the Seismograph room, where it is used to charge small local accumulators for operating the clock circuits. Further uses of this low voltage supply which are contemplated are the field illumination of the Meridian Circle, and field and circle illumination of the 15-inch equatorial at the Dome.

The lamps adopted for the Magnetographs are of

the "Festoon" type, and are mounted in front of the instrument slits on special holders constructed in the Observatory, which permit of adjustment in every direction, so as to allow for any irregularities which may be found in individual lamps. It may be thought that in introducing D.C. electric lighting into the Magnetic room, there would be some risk of disturbance of the magnets by the extraneous field due to the currents, but careful tests show that no discernible effect is produced either by the general lighting circuits or the low voltage instrument circuits.

A further great improvement which has been rendered possible by the introduction of electricity is the application of electric power to turn the Dome of the 15-inch equatorial. This is effected by means of a ½-h.p. reversible motor, taking current at 220 volts from a pair of copper contact rails which have been laid round the dome, and operating through a 1500 to 60 r.p.m. reduction gear and chain drive on to the spindle of the original hand turning gear, which will still be available for use in case of failure of the motor.

The whole of the electrical work was carried out by Messrs. Edward Dewhurst, Ltd., Mount Street, Preston, under the general direction of Mr. G. J. Gibbs, M.I.M.E., A.M.I.E.E.

METEOROLOGICAL.—The Meteorological continuous records have been uninterrupted during the year. For a description of the instruments and for the values of their constants reference may be made to our Report for 1920, pp. v—vii. Subsequently to this Report, the standard barometer was restored to its original position

at 381 feet above sea level on 1921. November 10th, The instrument was also under repair in 1922 from June 7th to July 7th.

The dominating character of the weather during the year was its wet and cloudy condition. The rainfall was the greatest recorded since systematic observations were commenced 76 years ago. The total precipitation for the year was 63·558 inches on 262 days. This quantity is 133 per cent. of our average fall, 47·068 inches, in the preceding three-quarters of a century. The corresponding humidity of the atmosphere and the mean amount of cloudiness were both above the average. In every month of the year, except November and December, the cloudiness was abnormal. For previous records of rainfall we must go back to 1866, with 62·093 inches, and to 1872, in which year rain fell on 281 days. April 12th constitutes a record for the greatest fall of rain on any one day during that month, and October, with October, 1903, has also a record for the greatest number of days on which rain fell in that month, namely 29. Heavy falls of rain of one inch or more in 24 hours occurred on April 12th, July 27th, August 29th, and November 12th and 13th. And yet the percentage of possible sunshine, 26·7, was not much below the mean for the last 43 years, since records began, which stands at 29·4. But its distribution was below the normal during the harvest months, July—October, which were all wet and cloudy.

The adopted mean temperature of the year was 46·5°, only half a degree below the average. Absolutely July, August, and September were the warmest months, and February, November and December the coldest

months of the year. But the adopted mean temperature for May and June were no less than 4·2° and 3·5° below the normal respectively. On the contrary, January, February, March enjoyed temperatures above the normal. April, October and December were normal, July was above the normal, August below it, and November as much as 3·9° below the average. Temperature in the shade reached 70° and more on 10 days only, eight in July, and two in August. The highest temperature in the shade, 82·5°, occurred on July 12th.

Fine dry periods of five days or more were recorded as follows: March 8th—12th, 14th—26th; April 1st—5th, 15th—22nd; June 22nd—29th; that is a total of five periods with an average duration of seven days. Bright sunshine for 10 hours or more was registered on three days in April, six days in May, three days in June, five days in July, one day in August, and one day in September, a total of 19 days. The days of the year on which the duration of sunshine was the greatest were April 20th, 22nd, 24th; May 7th, 12th, 17th, 29th; June 2nd, 11th, 14th; July 12th, and August 4th.

Gales of wind occurred as follows:—three in February, one in August, two in October, and one in November. The greatest velocity of wind was that on February 7th, which attained a value of 48 miles per hour at noon in the direction of S. by E. The prevailing wind during the year was West.

Magnetical.—Absolute measures of Horizontal Magnetic Force have been made once each month by the method of Vibration and Deflection. The constants of the magnetometer needles were described in our

1921 Annual Report (p. vii). The Inclination is also measured, once each month, by two needles, with Dover's Circle, No. 159. The Declination is observed four times each month, at nearly equal intervals, and usually at 16 hours. The Differential Instruments, or Photo-Magnetographs, which have been in practically continuous action since the year 1866, are of the Kew Observatory pattern, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are somewhat shorter, being 152·4 Cms. The time-scale is provided by the Synchronome clock, cutting off the light every two hours. Times are controlled by the wireless signals from Paris. The scale values of the instruments are as follows :—

For the Unifilar	...	11·28′	per Cm. of Ordinate.
,, Bifilar	...	·000497 C.G.S.	,, ,,
,, Balance	...	·00100 (approx.)	,,

Four daily readings are measured on the curves, the highest, the lowest, and those at the hours 4 and 16.

The absolute measures of Horizontal Direction and Force are 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 ; and the month means are taken from the readings on the five quietest days of the month.

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

In the Table of Magnetic Disturbances (page 38) the intention 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; *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 (quiet), 1 (moderately disturbed), and 2 (highly disturbed). The character figures are assigned according to the scheme detailed in the Annuaire for 1918 of the Royal Dutch Meteorological Institute. From a comparison of these character letters with the figures published for each day from the central international station at De Bilt for the years 1921, 1922, the mean values of the figures corresponding to each letter are c=0·2, s=0·6, m=0·9, g=1·3, and v.g.=1·5. The civil day is used for both the international figures and for our own characteristic letters. The rule followed in assigning these letters to denote the magnetic character of a day is as follows:—

From the measured ranges of D and H in minutes of arc on the five quietest days of a month a mean value is obtained of D and H combined. Similarly for each day of the month a mean value in minutes of arc of the range of D and H combined is set down. The excess of this mean daily range over the mean for the five quietest days gives the magnetic character of the day. The following values of the excess are adopted for the table

of magnetic disturbances :—0 to 2 calm, 2 to 7 small, 7 to 15 moderate, 15 to 20 great, above 20 very great. Further, an inspection of the curves helps to settle the magnetic character of the day in doubtful cases.

The mean daily range of the Declination magnet for the quiet days, 5·5′, and for all days, 9·7′, was lower than in 1922, with values 6·9′ and 13·5′ respectively. Similarly for Horizontal Force the mean ranges for quiet and for all days were 24 and 44 units, as compared with 28 and 60 units in 1922. The percentage of magnetically quiet days for the year was 45, the figure for 1922 being 30. Also the magnetic character figure for the year was 0·49, as compared with 0·67 for 1922. These numbers all indicate a considerable fall in magnetic general disturbance corresponding to the decline in solar activity.

The mean magnetic characters for the various months, derived from numerical values corresponding to the Stonyhurst letters, point to February as the most magnetically active month. There is no great difference among the other months, though March, October and January come next in order. But on March 24th—25th a considerable magnetic disturbance occurred, characterized by rapid oscillations of great range, the extreme range in declination being 66′ and in horizontal force 238 units. A detailed description of this storm was communicated to *Nature* for 1923, April 21st. It was preceded by a marked disturbance at a 27-day interval on February 25th—28th, which was accompanied by strong earth-currents, as recorded by the late Father Dechevrens, S.J., at his observatory at St. Louis, Jersey, and by displays of Aurora Borealis. These disturbances occurred at a period of solar calm. But they were mem-

bers of a very long series which can be traced back at intervals of 27 days, as far as 1921, October 27th. This series of magnetic disturbances was synchronous with a disturbed region of sun-spots and faculæ which was intermittently active during the same long period. A region of the sun therefore may continue to be magnetically active, even though the sun-spots may have become invisible. This is the explanation of the occurrence of great magnetic storms when no spots are visible on the sun. A detailed study is being made of this particular case. The sun-spots in high solar latitudes, which appeared at the end of September and continued to the end of the year, and which indicated the beginnings of a new and overlapping solar cycle, were also accompanied by notable magnetic disturbances. Sudden commencements of disturbance were noted on February 25th, 3 h. 30 m.; June 12th, 23 h. 10 m.; July 22nd, 21 h. 22 m.; August 13th, 21 h. 0 m.; September 26th, 17 h. 48 m.; and October 14th, 21 h. 18 m. On March 18th, 21 h. 12 m., there was a bay movement on the declination magnet, followed by a repetition on March 20th, 20 h. 24 m.

ASTRONOMICAL: Time Service.—The time service of the Observatory is under the charge of Father Rowland. He reports as follows:—

The radio time signals have been taken regularly during the year from the Eiffel Tower, and the errors and daily rates of the siderial and meantime clocks and the chronometers have been determined by their means. Incidentally to the installation in September of a Milne-Shaw Seismograph, which requires a time mark every minute, a notable addition was made to our time equip-

ment, by the purchase of a Synchronome Electric Clock. This clock is fitted with seconds switch, which is tripped at each oscillation of the pendulum, and transmits electric impulses to operate a full Mean Time dial in the central room of the Observatory. The Master Clock is erected with the Milne-Shaw seismograph in the North pavilion of the Observatory, formerly the Thermograph room. The seconds dial is arranged to make a contact of three seconds duration every minute to operate an eclipsing shutter on the seismograph ; and the primary dial, which only indicates half-minutes, makes a contact of two minutes duration every two hours, and operates a mercury switch, cutting off the current from the magnetograph lamps, and so provides a reliable time scale on the magnetic records. The current for operating all these circuits is derived from two small 6-volt accumulators, of which one is in service whilst the other is standing by, or being charged through a fixed resistance from the 12-volt supply, the change over being effected very simply without interruption of the service by means of a small control board.

One advantage of adopting the Synchronome Clock for our Mean Time Standard is that it will be possible at some future date, if funds are available, to convert it into a time-keeper of the highest precision, by the addition of a controlling free pendulum in vacuo, according to a system which the makers claim to give " a higher degree of time measurement than has yet been achieved by man "—a claim which tests of the system carried out at the Royal Observatory, Edinburgh, seem to justify.

The measurement of the areas and positions of the

spots on the drawings was made by the Rev. H. Macklin, and the results are exhibited in the Tables on pp. 39, et seq. He reports as follows :—

Observations of the solar surface were made on 249 days, and include 246 drawings. Of these drawings 233 are complete, and show all spots and faculæ ; the remaining 13 are complete for the spots, but not for the faculæ.

The mean daily disc-area of the spots (in units of 1/5000th of the visible surface), stands at 0·37. A comparison of the mean disc-area of the spots, with the mean daily range of magnetic Declination in minutes of arc, and of Horizontal Force in units 10^{-5} C.G.S., is set forth as follows :—

Year	1918	1919	1920	1921	1922	1923
Spot-Area	7·9	8·4	4·05	3·14	1·73	0·37
Declination Range	12·4	12·7	11·2	11·4	13·5	9·7
Horizontal Force Range	69	66	57	54	60	44

The sun-spot activity showed a very marked decline, and evidently approached its minimum in the course of the year. The only spot-group of any size was No. 151, which appeared on the disc at the end of the preceding year and was last seen on January 4th, 1923 ; its maximum area was 13·0 units, the latitude and longitude of the two chief spots being + 6°·3, 93°·9, and + 6°·5, 85°·4.

The distribution of the spots in latitude is shown in the following table :—

JANUARY—MARCH.

In positive latitude 6 groups with an area of 15·1 units.
In negative latitude 2 groups with an area of 0·3 units.

APRIL—JUNE.

In positive latitude 6 groups with an area of 5·9 units.
In negative latitude 8 groups with an area of 2·8 units.

JULY—SEPTEMBER.

In positive latitude 8 groups with an area of 2·1 units.
In negative latitude 5 groups with an area of 3·9 units.

OCTOBER—DECEMBER.

In positive latitude 3 groups with an area of 3·8 units.
In negative latitude 6 groups with an area of 5·3 units.

In the whole year there were in N. latitude 23 spot-groups with an area of 26·9 units; and in S. latitude 21 groups, with an area of 12·3 units.

There were 122 spotless days in 1923, mainly in the months January to August, as against 93 spotless days in 1922, the relative and respective proportions of all days of observation being 49·6 per cent. and 36·3 per cent.

The large grating spectrograph has been employed mainly in experimental work. Photographic observations of stellar spectra have been considerably hampered by the abnormal weather conditions. But some few stellar spectra have been secured, both with the Hilger direct vision spectroscope attached to the 15-inch equatorial, and with the 4-inch Thorp prismatic camera. And some further progress has been made in the correlation of absolute magnitudes and the spectra of stars.

SEISMOLOGICAL.—Father Rowland reports :—Bulletins of the records from the Milne Seismograph, of which a short account is given on p. xiii of our Annual Report for 1909, have been sent throughout the year to the Secretary of the Seismological Committee of the British Association for the Advancement of Science, and to some seventy seismological stations throughout the world. Unfortunately the effects of years of wear in the motor clock have shown themselves with increasing frequency during the year, so that the record has been much interrupted, and it is useless to give a table of the number of shocks recorded each month. The total during the year was 78, of which the most notable were an earthquake in the N. Pacific, on February 3rd, which sent a tidal wave over the Sandwich Islands some 2,000 miles distant from the origin, and the great Japanese earthquake of September 1st, which destroyed Tokio and Yokohama. In both of these disturbances the record was broken by the boom of the seismograph adhering to the stop at the limit of its traverse near the time of maximum phase. It has long been apparent that this instrument was out of date, and its records of inferior value.* It is accordingly a matter of great satisfaction that we have now been able, with the aid of a grant of £100 from the Royal Society, to replace it by an up-to-date Milne-Shaw Seismograph. It is not necessary to give a full description of this instrument. Suffice it to say that it is of the horizontal pendulum type with high magnification and electromagnetic damping. The magnification is approximately forty times as great as in the standard Milne, whilst in practice the sensitivity to tilt is from ten to

* See Report, 1917, p. xiv.; and 1922, p. xiv.

twenty times as great, according to the pendulum period adopted. The instrument is mounted with its boom in the astronomical meridian, on a brick pier built up from the ground and free from contact with the floor in the old Thermograph room. The constants adopted are : Magnification 250, Boom Period 12 secs., Damping 20 : 1. The sensitivity to tilt with this boom period is 43·5 m.m. to 1 sec. of arc.

For a considerable time after the erection of the instrument much trouble was experienced from irregular settling of the brick pier, which resulted in entanglement of the different lines of the record. Though this settling has not yet ceased, it has become more regular and of smaller amount, and does not seriously interfere with the records. At present the drift of the light spot indicates a progressive tilt downwards towards the East, of the order of about half a second of arc per day, corresponding to a daily sinking of the east side of the pier by about one fifteen thousandth of an inch.

We are greatly indebted to Mr. J. J. Shaw, the inventor and maker, for much self-sacrificing labour to ensure timely delivery of the instrument, and especially for kindly coming at his own expense to erect and adjust it before the meeting of the British Association in September, and we take this opportunity of placing on record our appreciation and thanks.

The following papers have been published during the year :—

1. Sun-Spot Areas and Terrestrial Magnetic Hori-

zontal Ranges and Disturbances. *The Observatory*, 46, No. 586.

2. Solar and Terrestrial Magnetic Phenomena, 1913—1921. *Monthly Notices, R.A.S.*, 83, 204—215.

3. Comparison of Sun-Spot Areas and Terrestrial Magnetic Horizontal Force Ranges, 1911—1921. *Ibid*, 83, 215—217.

4. A comparison of the measures of P. G. Lais, S.O., of the preceding cluster (*h*) in Perseus.

Atti della Pontificia Accademia Romana dei Nouvi Lincei, 76, 6.

5. Series of Magnetic Disturbances. *The Observatory*, 46, No. 593, and *Report of the British Association*, 1923, 426.

Our grateful thanks are tendered to the Governments, Institutions, Observatories, and individuals who have kindly contributed presentations to the Library during the year.

METEOROLOGICAL REPORT.

JANUARY, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·673	29·484
Highest ,, ,, on the 25th ... ,,	30·185	30·126
Lowest ,, ,, on the 2nd ... ,,	28·939	28·583
Range of Barometer Readings ..... ,,	1·246	1·543
Highest Reading of a Max. Therm. on the 2nd....	51·2	51·4
Lowest Reading of a Min Therm. on the 23rd...	28·3	21·6
Range of Thermometer Readings	22·9	29·8
Mean of Highest Daily Readings	45·9	42·5
Mean of Lowest Daily Readings	36·8	33·2
Mean Daily Range	9·1	9·3
Deduced Mean Temp. (from mean of Max. and Min.)	41·2	37·6
Mean Temperature from Dry Bulb	42·9	37·8
Adopted Mean Temperature	42·1	37·7
Mean Temperature of Evaporation	41·4	36·5
Mean Temperature of Dew Point	40·6	34·4
Mean elastic force of Vapour ..... inches	0·253	0·200
Mean weight of Vapour in a cub. ft. of air, grains	2·9	2·4
Mean additional weight required for saturation ,,	0·4	0·4
Mean degree of Humidity (saturation 100)	94	87
Mean weight of a cubic foot of air ..... grains	547·7	549·4
Mean amount of Cloud (0—10)	8·4	7·8
Fall of Rain ..... inches	7·065	4·322
Greatest Rainfall in one day (31st) ..... inches	0·860	0·826
No. of days on which ·005 in. or more Rain fell...	25	19·5

Wind:—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	2	0	1	0	1	2	24	1
Mean Velocity in miles per hr	11·3	0	1·9	0	14·9	9·2	14·1	5·1
Total No. of miles.....	543	0	46	0	357	442	8120	122

		Mean*
Total No. of miles registered	9630	8287·3
Greatest hourly velocity (10th, at 4 a.m., Dir. W.S.W.)	33	41·1

* *For the last* 56 *years.*

JANUARY, 1923.

DIFFERENCES.

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

Mean barometric pressure	+	0·189 in.
Monthly range ,, ...	—	0·297 in.
Mean of highest daily temperatures	+	3·4°
Mean of lowest ,, ,, ...	+	3·6°
Mean daily range	—	0·2°
Adopted mean temperature	+	4·4°
Total rainfall	+	2·743 in.

Ground Frost on 1st, 2nd, 4th, 5th, 12th—14th, 21st, 23rd—25th. Snow on 10th. Hail on 3rd, 6th, 9th, 10th. Hoar Frost on 1st and 23rd. Heavy Rain on 5th, 6th, 19th, 28th, 29th, 31st. Lightning on 9th. Fog on 13th, 17th, 19th, and 30th.

EXTREME READINGS FOR JANUARY.

During 76 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	1916	44·7°
Lowest ,, ,,	1881	29·2°
Greatest fall of rain	1921	8·589 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, 1923.

Results of Observations taken during the Month.			Mean for the last 76 years.
Mean Reading of the Barometer	inches	29·088	29·490
Highest ,, ,, on the 13th ...	,,	29·701	30·098
Lowest ,, ,, on the 27th ...	,,	28·099	28·651
Range of Barometer Readings	,,	1·602	1·447
Highest Reading of a Max. Therm. on the 1st.....		53·0	52·0
Lowest Reading of a Min. Therm. on the 21st.....		28·5	22·6
Range of Thermometer Readings		24·5	29·4
Mean of Highest Daily Readings		43·7	44·0
Mean of Lowest Daily Readings		36·0	33·6
Mean Daily Range		7·7	10·4
Deduced Mean Temp. (from mean of Max. and Min.)		39·5	38·3
Mean Temperature from Dry Bulb		40·3	38·5
Adopted Mean Temperature		39·9	38·4
Mean Temperature of Evaporation		38·6	36·8
Mean Temperature of Dew Point		36·9	34·6
Mean elastic force of Vapour	inches	0·220	0·196
Mean weight of Vapour in a cub. ft. of air, grains		2·6	2·4
Mean additional weight required for saturation ,,		0·3	0·4
Mean degree of Humidity (saturation 100)		90	86
Mean weight of a cubic foot of air	grains	539·5	548·6
Mean amount of Cloud (0—10)		8·7	7·5
Fall of Rain	inches	5·457	3·539
Greatest Rainfall in one day (27th)	,,	0·540	0·764
No. of days on which ·005 in. or more Rain fell...		26	16·8

Wind:—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	1	5	8	0	6	1	5	2
Mean Velocity in miles per hr.	4·3	7·0	9·4	0	20·3	3·8	16·4	6·3
Total No. of miles.....	102	839	1814	0	2928	92	1970	304

		Mean*
Total No. of miles registered	8049	7502·0
Greatest hourly velocity (7th, at Noon, Dir. S. by E.)	48	41·1

* *For the last* 56 *years.*

FEBRUARY, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·402 in.
Monthly range ,, ...	+	0·155 in.
Mean of highest daily temperatures	—	0·3°
Mean of lowest ,, ,, ...	+	2·4°
Mean daily range	—	2·7°
Adopted mean temperature	+	1·5°
Total rainfall	+	1·918 in.

Ground Frost on 5th, 9th, 13th—15th, 18th—24th. Hoar Frost on 5th and 13th. Snow on 14th, 18th, 19th, 21st. Hail on 7th. Gales of Wind on 7th, 26th and 27th. Heavy Rain on 27th. Lightning on 17th. Fog on 8th, 12th, and 22nd.

EXTREME READINGS FOR FEBRUARY,

During 76 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 ,, ,, ,, ...	1917	3160

* *Since* 1867 *only.*

MARCH, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·619	29·448
Highest ,, ,, on the 18th ... ,,	30·030	30·044
Lowest ,, ,, on the 2nd ... ,,	28·703	28·641
Range of Barometer Readings ..... ,,	1·327	1·403
Highest Reading of a Max. Therm. on the 27th...	63·6	56·8
Lowest Reading of a Min. Therm. on the 26th.....	32·1	23·4
Range of Thermometer Readings	31·5	33·4
Mean of Highest Daily Readings	48·9	47·0
Mean of Lowest Daily Readings	38·0	34·4
Mean Daily Range	10·9	12·6
Deduced Mean Temp. (from mean of Max. and Min.)	42·5	39·8
Mean Temperature from Dry Bulb	43·8	40·3
Adopted Mean Temperature	43·2	40·1
Mean Temperature of Evaporation	41·2	38·2
Mean Temperature of Dew Point	38·8	35·8
Mean elastic force of Vapour ..... inches	0·236	0·210
Mean weight of Vapour in a cub. ft. of air, grains	2·7	2·4
Mean additional weight required for saturation ,,	0·5	0·5
Mean degree of Humidity (saturation 100)	84	85
Mean weight of a cubic foot of air ..... grains	545·5	546·0
Mean amount of Cloud (0—10)	8·8	7·5
Fall of Rain ..... inches	1·424	3·393
Greatest Rainfall in one day (6th) ..... ,,	0·285	0·772
No. of days on which ·005 in. or more Rain fell...	13	16·9

Wind:—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of Days	0	6	11	2	4	2	5	1
Mean Velocity in miles per hr.	0	4·8	11·3	6·4	10·8	6·5	11·0	7·0
Total No. of miles.....	0	692	2995	309	1037	313	1315	168

		Mean*
Total No. of miles registered	6829	8447·6
Greatest hourly velocity (15th, at 10 p.m., Dir. E.)	33	40·5

* *For the last 56 years.*

MARCH, 1923.

DIFFERENCES.

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

Mean barometric pressure	+	0·171 in.
Monthly range ,, ...	—	0·076 in.
Mean of highest daily temperatures	+	1·9°
Mean of lowest ,, ,, ...	+	3·6°
Mean daily range	—	1·7°
Adopted mean temperature	+	3·1°
Total rainfall	—	1·969 in.

Ground Frost on 3rd, 5th, 9th, 12th, 23rd—26th. Hail on 2nd.

EXTREME READINGS FOR MARCH,

During 76 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	1920	44·2°
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, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·359	29·486
Highest ,, ,, on the 2nd ... ,,	29·824	29·960
Lowest ,, ,, on the 13th ... ,,	28·751	28·790
Range of Barometer Readings ..... ,,	1·073	1·170
Highest Reading of a Max. Therm. on the 4th...	56·7	64·6
Lowest Reading of a Min. Therm. on the 24th...	28·0	28·1
Range of Thermometer Readings	28·7	36·5
Mean of Highest Daily Readings	50·2	54·4
Mean of Lowest Daily Readings	37·7	37·8
Mean Daily Range	12·5	16·6
Deduced Mean Temp. (from mean of Max. and Min.)	42·5	43·9
Mean Temperature from Dry Bulb	44·5	44·7
Adopted Mean Temperature	43·5	44·3
Mean Temperature of Evaporation	41·0	41·6
Mean Temperature of Dew Point	38·1	38·2
Mean elastic force of Vapour ..... inches	0·229	0·234
Mean weight of Vapour in a cub. ft. of air, grains	2·6	2·7
Mean additional weight required for saturation ,,	0·6	0·7
Mean degree of Humidity (saturation 100)	81	80
Mean weight of a cubic foot of air ..... grains	540·6	542·2
Mean amount of Cloud (0—10)	7·9	6·8
Fall of Rain ..... inches	3·622	2·593
Greatest Rainfall in one day (12th) ..... ,,	1·260	0·603
No. of days on which ·005 in. or more Rain fell...	14	14·9

Wind:—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	0	5	15	0	2	1	7	0
Mean Velocity in miles per hr.	0	8·2	9·6	0	11·9	20·8	9·2	0
Total No. of miles.....	0	987	3463	0	572	500	1550	0

		Mean*
Total No of miles registered	7072	7500·6
Greatest hourly velocity (26th, 4 p.m., Dir. W.N.W.)	31	36·1

* *For the last 56 years.*

APRIL, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·127 in.
Monthly range ,, ...	—	0·097 in.
Mean of highest daily temperatures	—	4·2°
Mean of lowest ,, ,, ...	—	0·1°
Mean daily range	—	4·1°
Adopted mean temperature	—	0·8°
Total rainfall	+	1·029 in.

Ground Frost on 4th, 10th, 15th, 17th, 18th, 20th, 21st, 23rd and 24th. Hoar Frost on 24th. Snow on 9th. Hail on 28th. Heavy Rain on 12th and 30th. Fog on 3rd, 11th, 12th and 24th. Thunder on 12th and 14th. Lightning on 12th, 14th and 23rd. Solar Halo on 27th.

EXTREME READINGS FOR APRIL,

During 76 Years.

Highest reading of Barometer ...	1906 (8th)	30·317 in.
Lowest ,, ,, ...	1919 (14th)	28·250 in.
Highest temperature	1852 (14th)	74·1°
Lowest ,, ...	1917 (2nd)	13·6°
Highest adopted mean temperature	1865	48·5°
Lowest ,, ,, ...	1917	39·8°
Greatest fall of rain	1867	5·672 in.
Least ,, ...	1852	0·478 in.
Greatest fall of rain in one day ...	1923 (12th)	1·260 in.
Greatest No. of days on which ·005 in. or more rain fell ...	1920	27
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, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·491	29·543
Highest ,, ,, on the 29th ... ,,	29·875	29·991
Lowest ,, ,, on the 11th ... ,,	28·739	28·954
Range of Barometer Readings ..... ,,	1·136	1·037
Highest Reading of a Max. Therm. on the 3rd & 4th	62·0	71·9
Lowest Reading of a Min. Therm. on the 17th.....	34·5	32·0
Range of Thermometer Readings	27·5	39·9
Mean of Highest Daily Readings	52·0	59·4
Mean of Lowest Daily Readings	40·4	42·5
Mean Daily Range	11·6	16·9
Deduced Mean Temp. (from mean of Max. and Min.)	44·5	49·2
Mean Temperature from Dry Bulb	46·4	50·1
Adopted Mean Temperature	45·5	49·7
Mean Temperature of Evaporation	43·3	46·5
Mean Temperature of Dew Point	40·8	43·0
Mean elastic force of Vapour ..... inches	0·225	0·280
Mean weight of Vapour in a cub. ft. of air, grains	2·9	3·2
Mean additional weight required for saturation ,,	0·6	0·9
Mean degree of Humidity (saturation 100)	84	77
Mean weight of a cubic foot of air ..... grains	540·9	537·0
Mean amount of Cloud (0—10)	8·3	7·0
Fall of Rain ..... inches	4·413	2·719
Greatest Rainfall in one day (13th) ..... ,,	0·630	0·640
No. of days on which ·005 in. or more Rain fell...	19	14·5

Wind:—Direction	N	NE	E	SE	S	SW	W	NW
No. of days.....	1	5	1	0	0	2	19	3
Mean Velocity in miles per hr.	5·9	8·3	7·3	0	0	9·6	9·8	11·7
Total No. of miles.....	142	992	174	0	0	463	4489	840

		Mean*
Total No of miles registered	7100	6921·1
Greatest hourly velocity (17th, at 1 p.m., Dir. W.N.W.)	34	32·6

* *For the last* 56 *years.*

MAY, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·052 in.
Monthly range ,, ...	+	0·099 in.
Mean of highest daily temperatures	—	7·4°
Mean of lowest ,, ,, ...	—	2·1°
Mean daily range	—	5·3°
Adopted mean temperature	—	4·2°
Total rainfall	+	1·694 in.

Ground Frost on 8th, 12th, 13th, and 24th. Snow on 13th and 16th. Hail on 5th, 9th, 12th—16th, 25th and 26th. Heavy Rain on 5th, 10th, and 13th. Fog on 6th. Thunder on 12th, 13th, 15th, 16th, 25th and 26th. Lightning on 12th and 25th.

EXTREME READINGS FOR MAY,

During 76 Years.

Highest reading of Barometer ...	1881 (10th)	30·332 in.
Lowest ,, ,, ...	1887 (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	1920	6·511 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 ,, ,, ,,	1918	5113

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

JUNE, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·718	29·562
Highest ,, ,, on the 2nd ... ,,	30·015	29·937
Lowest ,, ,, on the 9th ... ,,	29·370	29·049
Range of Barometer Readings ..... ,,	0·645	0·888
Highest Reading of a Max. Therm. on the 23rd...	64·5	76·8
Lowest Reading of a Min. Therm. on the 17th...	38·4	39·1
Range of Thermometer Readings	26·1	37·7
Mean of Highest Daily Readings	58·3	65·1
Mean of Lowest Daily Readings	47·6	48·1
Mean Daily Range	10·7	17·0
Deduced Mean Temp. (from mean of Max. and Min.)	51·2	54·8
Mean Temperature from Dry Bulb	52·0	55·3
Adopted Mean Temperature	51·6	55·1
Mean Temperature of Evaporation	48·7	51·8
Mean Temperature of Dew Point	45·8	48·3
Mean elastic force of Vapour ..... inches	0·309	0·347
Mean weight of Vapour in a cub. ft. of air, grains	3·5	3·8
Mean additional weight required for saturation ,,	0·8	1·0
Mean degree of Humidity (saturation 100)	81	78
Mean weight of a cubic foot of air ..... grains	538·0	531·4
Mean amount of Cloud (0—10)	8·9	7·2
Fall of Rain ..... inches	1·570	3·304
Greatest Rainfall in one day (8th) ..... ,,	0·780	0·797
No. of days on which ·005 in. or more Rain fell...	13	15·1

Wind :—Direction	N	NE	E	SE	S	SW	W	NW
No. of days.....	2	1	0	0	0	1	20	6
Mean Velocity in miles per hr.	8·9	7·1	0	0	0	16·7	11·3	9·2
Total No. of miles.....	425	171	0	0	0	401	5441	1331

		Mean*
Total No. of miles registered	7769	6204·8
Greatest hourly velocity (10th, 9 a.m., Dir. W.S.W.)	32	29·3

* *For the last* 56 *years*

JUNE, 1923.

DIFFERENCES.

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

Mean barometric pressure	+	0·156 in.
Monthly range ,, ...	—	0·296 in.
Mean of highest daily temperatures	—	6·8°
Mean of lowest ,, ,, ...	—	0·5°
Mean daily range	—	6·3°
Adopted mean temperature	—	3·5°
Total rainfall	—	1·734 in.

Heavy Rain on 8th.

EXTREME READINGS FOR JUNE,

During 76 Years.

Highest reading of 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 in.
Greatest fall of rain in one day ...	1857 (8th)	2·093 in.
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 ,, ,, ,, ...	1915	3967

* *Since* 1867 *only.* † *And* 1912.

JULY, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·545	29·526
Highest ,, ,, on the 21st..... ,,	29·863	29·902
Lowest ,, ,, on the 31st..... ,,	28·865	29·010
Range of Barometer Readings ..... ,,	0·998	0·892
Highest Reading of a Max. Therm. on the 12th...	82·5	78·2
Lowest Reading of a Min. Therm. on the 27th...	49·6	42·6
Range of Thermometer Readings	32·9	35·6
Mean of Highest Daily Readings	67·2	67·3
Mean of Lowest Daily Readings	54·7	51·1
Mean Daily Range	12·5	16·2
Deduced Mean Temp. (from mean of Max. and Min.)	59·1	57·6
Mean Temperature from Dry Bulb	60·7	58·0
Adopted Mean Temperature	59·9	57·8
Mean Temperature of Evaporation	57·1	54·7
Mean Temperature of Dew Point	54·7	51·9
Mean elastic force of Vapour ..... inches	0·427	0·388
Mean weight of Vapour in a cub. ft. of air, grains	4·8	4·4
Mean additional weight required for saturation ,,	1·0	1·1
Mean degree of Humidity (saturation 100)	83	81
Mean weight of a cubic foot of air ..... grains	525·4	527·6
Mean amount of Cloud (0—10)	8·4	7·4
Fall of Rain ..... inches	6·056	4·040
Greatest Rainfall in one day (27th) ..... ,,	1·458	0·888
No. of days on which ·005 in. or more Rain fell...	21	16·6

Wind:—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	0	2	3	0	1	2	23	0
Mean Velocity in miles per hr.	0	7·3	8·1	0	7·0	4.8	9·7	0
Total No. of Miles.....	0	352	582	0	167	232	5364	0

		Mean*
Total No. of miles registered	6697	6379·1
Greatest hourly velocity (26th, at Noon, Dir. W.N.W.)	27	28·2

* *For the last 56 years.*

JULY, 1923.

DIFFERENCES.

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

Mean barometric pressure	+	0·019 in.
Monthly range ,, ...	+	0·106 in.
Mean of highest daily temperatures	—	0·1°
Mean of lowest ,, ,, ...	+	3·6°
Mean daily range	—	3·7°
Adopted mean temperature	+	2·1°
Total rainfall	+	2·016 in

Heavy Rain on 22nd, 27th and 30th. Solar Halo on 5th. Thunder on 7th, 10th, 30th. Lightning on 7th, 10th and 30th.

EXTREME READINGS FOR JULY,

During 76 Years.

Highest reading of Barometer ...	1911	(10th)	30·203 in
Lowest ,, ,, ...	1922	(6th)	28·493 in.
Highest temperature	1901	(20th)	89·0°
Lowest ,, ...	1857	(1st)	36·0°
Highest adopted mean temperature	1901	.....	63·2°
Lowest ,, ,,	1922	.....	54·0°
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 ...	†1920	.....	28
Least ,, ,, ,, ...	†1863	.....	8
*Greatest hourly velocity of wind ..	1892	(8th)	44 mls
*Greatest No. of miles registered ...	1879	.....	8288
*Least ,, ,, ,, ...	1913	.....	4577

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

AUGUST, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·449	29·494
Highest ,, ,, on 4th & 11th ,,	29·903	29·886
Lowest ,, ,, on the 29th ... ,,	28·801	28·945
Range of Barometer Readings ..... ,,	1·102	0·941
Highest Reading of a Max. Therm. on the 5th...	73·0	76·2
Lowest Reading of a Min. Therm. on the 25th...	44·5	41·8
Range of Thermometer Readings	28·5	34·4
Mean of Highest Daily Readings	62·5	66·4
Mean of Lowest Daily Readings	51·3	50·8
Mean Daily Range	11·2	15·6
Deduced Mean Temp. (from mean of Max. and Min.)	55·2	56·9
Mean Temperature from Dry Bulb	57·0	57·7
Adopted Mean Temperature	56·1	57·3
Mean Temperature of Evaporation	53·7	54·5
Mean Temperature of Dew Point	51·4	51·8
Mean elastic force of Vapour ..... inches	0·382	0·386
Mean weight of Vapour in a cub. ft. of air, grains	4·3	4·3
Mean additional weight required for saturation ,,	0·9	0·9
Mean degree of Humidity (saturation 100)	85	82
Mean weight of a cubic foot of air ..... grains	528·1	527·5
Mean amount of Cloud (0—10)	8·2	7·3
Fall of Rain ..... inches	7·652	5·043
Greatest Rainfall in one day (29th) ..... ,,	1·040	1·059
No. of days on which ·005 in. or more Rain fell...	26	18·5

Wind :—Direction	N	NE	E	SE	S	SW	W	NW
No. of days.....	0	0	1	0	4	6	19	1
Mean Velocity in miles per hr.	0	0	8·3	0	8·8	10·3	11·5	2·6
Total No. of miles.....	0	0	198	0	846	1478	5258	62

		Mean*
Total No. of miles registered	7842	6351·9
Greatest hourly velocity (2nd, 4 p.m. and Midnight, Dir. S.S.W.)	36	30·8

* *For the last* 56 *years.*

AUGUST, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·045 in.
Monthly range ,, ...	+	0·161 in.
Mean of highest daily temperatures	—	3·9°
Mean of lowest ,, ,, ...	+	0·5°
Mean daily range	—	4·4°
Adopted mean temperature	—	1·2°
Total rainfall	+	2·609 in.

Heavy Rain on 12th, 17th, 21st, 29th. Gale of Wind on 2nd. Fog on 13th. Thunder on 21st and 31st. Lightning on 21st, 30th and 31st. Solar Halo on 8th.

EXTREME READINGS FOR AUGUST,

During 76 Years.

Highest reading of Barometer ...	1874 (21st)	30·114 in.
Lowest ,, ,, ...	1917 (28th)	28·156 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 ,, ,, ,, ...	1915	3918

* *Since* 1867 *only.*

SEPTEMBER, 1923.

Results of Observations taken during the Month.			Mean for the last 76 years.
Mean Reading of the Barometer	inches	29·490	29·544
Highest ,, ,, on the 3rd & 8th	,,	29·958	30·008
Lowest ,, ,, on the 18th ...	,,	28·915	28·889
Range of Barometer Readings	,,	1·043	1·119
Highest Reading of a Max. Therm. on the 30th...		68·3	71·9
Lowest Reading of a Min. Therm. on the 3rd.....		39·1	36·7
Range of Thermometer Readings		29·2	35·2
Mean of Highest Daily Readings		58·0	61·9
Mean of Lowest Daily Readings		47·0	47·3
Mean Daily Range		11·0	14·6
Deduced Mean Temp. (from mean of Max. and Min.)		51·2	53·3
Mean Temperature from Dry Bulb		52·8	54·2
Adopted Mean Temperature		52·0	53·8
Mean Temperature of Evaporation		50·1	51·0
Mean Temperature of Dew Point		48·2	48·3
Mean elastic force of Vapour	inches	0·338	0·339
Mean weight of Vapour in a cub. ft. of air, grains		3·8	3·9
Mean additional weight required for saturation ,,		0·6	0·8
Mean degree of Humidity (saturation 100)		87	82
Mean weight of a cubic foot of air	grains	533·3	532·6
Mean amount of Cloud (0—10)		7·3	6·7
Fall of Rain	inches	6·973	4·311
Greatest Rainfall in one day (24th)	,,	0·890	0·956
No. of days on which ·005 in. or more Rain fell...		25	16·4

Wind :—Direction	N	NE	E	SE	S	SW	W	NW
No. of days.....	0	0	0	1	3	4	21	1
Mean Velocity in miles per hr.	0	0	0	6·5	12·1	11·3	8·7	8·2
Total No. of miles.....	0	0	0	157	868	1080	4388	197

		Mean*
Total No. of miles registered	6690	6053·8
Greatest hourly velocity (17th, at 9 p.m., Dir. S. by E.).....	29	31·9

* *For the last 56 years.*

SEPTEMBER, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·054 in.
Monthly range ,, ...	—	0·076 in.
Mean of highest daily temperatures	—	3·9°
Mean of lowest ,, ,, ...	—	0·3°
Mean daily range	—	3·6°
Adopted mean temperature	—	1·8°
Total rainfall	+	2·662 in.

Hail on 22nd. Heavy Rain on 11th, 17th, 18th, 19th, 21st and 24th. Fog on 24th and 29th. Thunder on 18th, 22nd, 23rd and 25th. Lightning on 18th, 23rd and 25th. Lunar Halo on 26th. Solar Halo on 3rd, 4th, 8th and 27th.

EXTREME READINGS FOR SEPTEMBER,

During 76 Years.

Highest reading of Barometer ...	1851 (15th)	30·247 in.
Lowest ,, ,, ...	1918 (23rd)	28·210 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	1918	12·620 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 ...	1918	29
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, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·197	29·447
Highest ,, ,, on the 31st..... ,,	29·832	30·016
Lowest ,, ,, on the 23rd ... ,,	28·370	28·692
Range of Barometer Readings ..... ,,	1·462	1·324
Highest Reading of a Max. Therm. on the 18th...	59·2	64·0
Lowest Reading of a Min. Therm. on the 5th...	34·2	29·8
Range of Thermometer Readings	25·0	34·2
Mean of Highest Daily Readings	52·9	54·5
Mean of Lowest Daily Readings	44·0	42·1
Mean Daily Range	8·9	12·4
Deduced Mean Temp. (from mean of Max. and Min.)	47·5	47·3
Mean Temperature from Dry Bulb	48·3	48·0
Adopted Mean Temperature	47·9	47·7
Mean Temperature of Evaporation	45·7	45·5
Mean Temperature of Dew Point	43·3	43·0
Mean elastic force of Vapour ..... inches	0·280	0·279
Mean weight of Vapour in a cub. ft. of air, grains	3·2	3·2
Mean additional weight required for saturation ,,	0·6	0·6
Mean degree of Humidity (saturation 100)	86	84
Mean weight of a cubic foot of air ..... grains	532·8	537·6
Mean amount of Cloud (0—10)	8·2	7·3
Fall of Rain ..... inches	6·492	4·896
Greatest Rainfall in one day (12th) ..... ,,	0·840	0·963
No. of days on which ·005 in. or more Rain fell...	29	18·7

Wind :—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	3	0	0	0	7	4	16	1
Mean Velocity in miles per hr.	5·6	0	0	0	15·4	14·9	12·5	6·0
Total No. of miles.....	406	0	0	0	2587	1427	4816	145

		Mean*
Total No. of miles registered	9381	6857·5
Greatest hourly velocity (27th, Midnight, Dir. S. by W.)	37	36·9

* *For the last 56 years.*

OCTOBER, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·250 in.
Monthly range ,, ...	+	0·138 in.
Mean of highest daily temperatures	—	1·6°
Mean of lowest ,, ,, ...	+	1·9°
Mean daily range	—	3·5°
Adopted mean temperature	+	0·2°
Total rainfall	+	1·596 in.

Ground Frost on 5th and 15th. Hail on 12th and 22nd. Heavy Rain on 8th, 10th, 12th, 24th. Gales of Wind on 21st and 27th. Fog on 5th, 14th and 31st. Lightning on 27th. Lunar Halo on 19th.

EXTREME READINGS FOR OCTOBER,

During 76 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	1921	53·8°
Lowest ,, ,,	1895	42·8°
Greatest fall of rain	1870	13·437 in.
Least ,, ...	1922	0·918 in.
Greatest fall of rain in one day ...	1870 (8th)	2·529 in.
Greatest No. of days on which ·005 ins or more rain fell ...	1903 and 1923.....	29
Least ,, ,, ,, ...	1920	8
*Greatest hourly velocity of wind...	1877 (15th)	52 mls.
*Greatest No. of miles registered ...	1874	9818
*Least ,, ,, ,, ...	1915	3965

* *Since* 1867 *only.*

NOVEMBER, 1923.

Results of Observations taken during the Month.			Mean for the last 76 years.
Mean Reading of the Barometer	inches	29·313	29·466
Highest ,, ,, on the 10th ...	,,	29·996	30·068
Lowest ,, ,, on the 15th ...	,,	28·321	28·570
Range of Barometer Readings	,,	1·675	1·498
Highest Reading of a Max. Therm. on the 2nd...		54·0	55·7
Lowest Reading of a Min. Therm. on the 30th...		24·2	25·4
Range of Thermometer Readings		29·8	30·3
Mean of Highest Daily Readings		42·7	47·1
Mean of Lowest Daily Readings		33·4	36·7
Mean Daily Range		9·3	10·4
Deduced Mean Temp. (from mean of Max. and Min.)		37·7	41·6
Mean Temperature from Dry Bulb		38·0	42·0
Adopted Mean Temperature		37·9	41·8
Mean Temperature of Evaporation		36·1	39·7
Mean Temperature of Dew Point		33·7	38·1
Mean elastic force of Vapour	inches	0·193	0·231
Mean weight of Vapour in a cub. ft. of air,	grains	2·2	2·7
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	545·9	544·7
Mean amount of Cloud (0—10)		7·3	7·4
Fall of Rain	inches	7·801	4·405
Greatest Rainfall in one day (12th)	,,	2·320	0·991
No. of days on which ·005 in. or more Rain fell...		24	18·1

Wind :—Direction	N	NE	E	SE	S	SW	W	NW
No. of days.....	4	6	0	1	1	4	14	0
Mean Velocity in miles per hr.	6·9	4·9	0	19·2	3.7	8·8	10·9	0
Total No. of miles.....	643	711	0	461	88	842	3640	0

		Mean*
Total No. of miles registered	6385	7184·3
Greatest hourly velocity (15th at Noon, Dir. S.S.E.)	43	40·9

* *For the last* 56 *years.* † *And in other years.*

NOVEMBER, 1923.

DIFFERENCES.

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

Mean barometric pressure	—	0·153 in.
Monthly range ,, ...	+	0·177 in.
Mean of highest daily temperatures	—	4·4°
Mean of lowest ,, ,, ...	—	3·3°
Mean daily range	—	1·1°
Adopted mean temperature	—	3·9°
Total rainfall	+	3·396 in.

Ground Frost on 5th—11th, 15th, 17th, 19th—30th. Hoar Frost on 6th, 7th, 8th, 11th, 21st—25th. Snow on 8th, 15th, 17th, 18th, 20th, 25th, 27th, 29th. Hail on 2nd, 3rd, 4th, 14th—18th, 28th, 30th. Heavy Rain on 2nd, 12th, 13th, 15th, 16th. Gales of Wind on 15th. Fog on 1st, 11th, 24th, 25th, 27th and 30th. Thunder on 15th, 17th and 18th. Lightning on 3rd, 15th and 17th.

EXTREME READINGS FOR NOVEMBER, During 76 Years.

Highest reading of Barometer ...	1922 (15th)	30·375 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 ,, ,,	1915	36·3°
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 ,, ,, ,, ...	1915	4893

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

DECEMBER, 1923.

Results of Observations taken during the Month.		Mean for the last 76 years.
Mean Reading of the Barometer ..... inches	29·504	29·430
Highest ,, ,, on the 20th ... ,,	30·114	30·057
Lowest ,, ,, on the 4th ... ,,	28·725	28·536
Range of Barometer Readings ..... ,,	1·389	1·521
Highest Reading of a Max. Therm. on the 17th...	48·6	52·8
Lowest Reading of a Min. Therm. on the 25th...	23·5	21·4
Range of Thermometer Readings	25·1	31·4
Mean of Highest Daily Readings	42·2	43·4
Mean of Lowest Daily Readings	33·5	33·8
Mean Daily Range	8·7	9·6
Deduced Mean Temp. (from mean of Max. and Min.)	37·8	38·6
Mean Temperature from Dry Bulb	38·4	39·2
Adopted Mean Temperature	38·1	38·9
Mean Temperature of Evaporation	36·9	37·3
Mean Temperature of Dew Point	35·2	35·4
Mean elastic force of Vapour ..... inches	0·205	0·208
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)	90	87
Mean weight of a cubic foot of air ..... grains	549·5	547·0
Mean amount of Cloud (0—10)	7·7	7·7
Fall of Rain ..... inches	5·033	4·744
Greatest Rainfall in one day (25th) ..... ,,	0·520	0·855
No. of days on which ·005 in. or more Rain fell...	27	20·2

Wind :—Direction.....	N	NE	E	SE	S	SW	W	NW
No. of days.....	5	2	1	0	4	3	12	4
Mean Velocity in miles per hr.	2·5	4·7	2·3	0	13·6	8·3	11·9	11·0
Total No. of miles.....	303	228	56	0	1303	600	3431	1054

		Mean*
Total No. of miles registered	6975	7848·0
Greatest hourly velocity (22nd, 8 a.m., Dir. W.N.W.)	34	42·0

* *For the last 56 years.*

DECEMBER, 1923.

DIFFERENCES.

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

Mean barometric pressure	+	0·074 in.
Monthly range ,, ...	—	0·132 in.
Mean of highest daily temperature	—	1·2°
Mean of lowest ,, ,, ...	—	0·3°
Mean daily range	—	0·9°
Adopted mean temperature	—	0·8°
Total rainfall	+	0·289 in.

Ground Frost on 1st, 3rd—7th, 9th, 10th, 14th, 19th—22nd, 24th—30th. Hoar Frost on 29th. Snow on 4th, 19th, 21st, 25th, 26th. Hail on 4th, 15th, 24th, 25th. Heavy rain on 25th, 27th, 29th. Fog on 3rd, 6th, 9th—11th, 27th, 29th—31st.

EXTREME READINGS FOR DECEMBER,

During 76 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	1918	10·595 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 ...	1918	30
Least ,, ,, ,, ...	†1853	8
*Greatest hourly velocity of wind...	1894 (22nd)	72 mls.
*Greatest No. of miles registered ...	1898	11265
*Least ,, ,, ,, ...	1916	4517

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

Summary of Observations, 1923.

Results of Observations taken during the Year.		Mean for the last 76 Years.
Readings of Barometer in inches.		
Mean of the Year	29·454	29·494
Highest Monthly Mean (June)	29·718	29·744
Lowest ,, ,, (February)	29·088	29·224
Highest Reading (January 25th)	30·185	30·292
Lowest ,, (February 27th)	28·099	28·207
Range	2·086	2·085
Thermometer, Fahrenheit.		
Highest Monthly Mean Temperature (July)	59·9	58·6
Lowest ,, ,, ,, (November).	37·9	35·7
Highest Reading of a Max. Therm. (July 12th)	82·5	81·3
Lowest ,, Min. ,, (Dec. 25th)	23·5	16·3
Range of Thermometer Readings	59·0	65·0
Mean of Highest Daily ,,	52·0	54·4
Mean of Lowest Daily ,,	41·7	41·0
Mean Daily Range	10·3	13·4
Deduced Mean Temp. (from Mean of Max. and Min.)	45·8	46·8
Mean Temperature from Dry Bulb	47·1	47·1
Adopted Mean Temperature of the Year	46·5	47·0
Mean Temperature of Evaporation	44·5	44·6
Mean Temperature of Dew Point	42·3	42·1
Mean elastic force of Vapour ... inches	0·275	0·274
Mean weight of Vapour in a cub. ft. of air ... grns.	3·1	3·2
Mean additional weight required for saturation ,,	0·6	0·7
Mean degree of Humidity (saturation 100)	86	83
Mean weight of a cubic foot of air ... grns.	538·9	539·1
Mean amount of Cloud (0—10)	8·2	7·3
Total fall of Rain ... inches	63·558	47·285
Greatest Monthly Rainfall (November)	7·801	7·591
Least ,, ,, (March)	1·424	1·243
Greatest Rainfall in one day (November 12th)	2·320	1·629
No. of days per Month on which ·005 inch or more Rain fell	21·8	17·2

SUMMARY OF WIND, 1923.

Prevailing Direction	N	NE	E	SE	S	SW	W	NW
No. of days for each	18	32	41	4	33	32	185	20
Mean Velocity in miles per hour ..	5·9	6·5	9·5	9·7	10·4	10·2	11·2	8·8
Total No. of miles for each Direction	2564	4972	9328	927	10753	7870	49782	4223

		Mean for the last 56 years.
Total No. of miles registered	90419	85520·2
Greatest Monthly Total (January)	9630	9962·6
Least ,, ,, (November)	6385	4961·0
Greatest hourly velocity (February 7th)	48	50·4
Prevailing Direction of Wind	W.	

DIFFERENCES, 1923.

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

Mean barometric pressure	—	0·040 in.
Yearly range ,, ...	+	0·001 in.
Mean of highest daily temperatures	—	2·4°
Mean of lowest ,, ,, ...	+	0·7°
Mean daily range	—	3·1°
Adopted mean temperature	—	0·5°
Total rainfall	+	16·273 in.

ABSOLUTE EXTREMES

FOR THE LAST 76 YEARS.

Readings of Barometer, in inches.

Highest monthly mean	1891 (Feb.)	29·997
Lowest ,, ,, ...	1868 (Dec.)	28·984
Highest yearly ,, ...	1921	29·615
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 ,, ,, ...	1921	49·4
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 76 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	1923	63·558
Least ,, ,, ,, ...	1887	31·250
Days on which ·005 in. or more Rain fell :		
Greatest No. in one month	1890 (Jan.) ..... and 1918 (Dec.)	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 ,, ,, ...	1917 (Feb.)	3160
Greatest Mean No. ,, ,, ...	March	8448
Least ,, ,, ,, ...	September	6054
Greatest No. ,, ,, year..	1868	102395
Least ,, ,, ,, ,, ...	1915	70623

* *Record dates from* 1867 *only.*

DATES OF OCCASIONAL PHENOMENA.

1923	Frost	Hoar Frost	Snow	Hail	Heavy Rain
January	1, 2, 4, 5, 12-14, 21, 23-25	1, 23	10	3, 6, 9, 10	5, 6, 19, 28, 29, 31
February	5, 9, 13-15, 18-24	5, 13	14, 18, 19, 21	27	27
March	3, 5, 9, 12, 23-26			2	
April	4, 10, 15, 17, 18, 20, 21, 23, 24	24	9	28	12, 30
May	8, 12, 13, 24		13, 16	5, 9, 12-16, 25, 26	5, 10, 13
June					8
July					22, 27, 30
August					12, 17, 21, 29
September				22	11, 17-19, 21, 24
October	5, 15			12, 22	8, 10, 12, 24
November	5-11, 15, 17, 19-30	6-8, 11, 21-25	8 15,17,18,20,25,27,29	2,3,4, 14-18,28,30	2, 12, 13, 15, 16
December	1, 3-7, 9, 10, 14, 19-22, 24-30	29	4, 19, 21, 25, 26	4, 15, 24, 25	25, 27, 29

1923	Gales of Wind	Fog	Thunder	Lightning	Lunar Halo	Solar Halo	Aurora Borealis
January		13, 17, 19, 30		9			
February	7, 26, 27	8, 12, 22		17			
March							
April		3, 11, 12, 24	12, 14	12, 14, 23		27	
May		6	12, 13, 15, 16,25,26	12, 25			
June							
July			22, 27, 30	22, 27, 30		5	
August	2	13	21, 31	21, 30, 31		8	
September		24, 29	18, 22, 23, 25	18, 23, 25	26	3, 4, 8, 27	
October	21, 27	5, 14, 31		27	19		
November	15	1,11,24,25,27, 30	15, 17, 18	3, 15, 17			
December		3,6,9-11,27,29-31					

MONTHLY TOTALS FOR EACH HOUR OF RECORDED SUNSHINE.

1923. 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 ...	...	...	...	...	0·3	3·7	6·7	7·2	6·1	6·5	3·4	0·6	...	...	...	...	...
February ...	...	...	...	...	0·9	3·9	6·1	6·4	6·2	5·3	3·7	2·0	...	...	...	...	...
March ...	...	...	...	1·0	4·4	6·9	9·8	11·3	13·3	12·7	11·9	10·5	6·4	0·6	...	...	...
April ...	...	1·8	6·0	7·7	8·5	11·2	14·7	15·9	14·7	13·7	10·9	8·5	8·6	6·0	1·6	...	...
May ...	0·5	4·1	9·5	10·6	12·8	11·4	15·1	14·6	14·5	16·9	14·5	13·5	13·4	13·3	6·6	0·8	...
June ...	0·3	4·4	6·2	8·1	10·2	10·1	7·9	9·6	9·4	13·3	14·5	15·0	13·3	11·0	7·4	2·3	...
July ...	0·2	3·2	8·6	8·9	8·1	9·7	11·2	12·5	13·1	13·2	14·1	15·1	12·9	12·4	8·1	2·2	0.3
August ...	...	1·4	3·1	7·1	7·3	10·0	11·9	12·4	10·5	13·1	13·4	11·5	11·1	7·3	5·6	1·3	...
September ...	...	...	1·1	5·7	10·0	13·0	13·8	14·0	15·5	16·1	12·2	12·7	9.1	5·9	1·0	...	...
October ...	...	...	...	0·4	4·0	8·4	8·7	10·4	10·3	10·7	12·0	10·6	5·4	...	...	...	...
November ...	...	...	...	...	1·7	6·3	9·0	12·6	10·1	9·6	7·3	1·5	...	...	...	...	...
December ...	...	...	...	...	...	4·3	6·6	7·1	7·2	5·8	5·9	0·3	0·3	0·1	...	...	...
Sums ...	1·0	14·9	34·5	49·5	68·2	98·9	121·5	134·0	130·9	136·9	123·8	101·8	80·5	56·6	30·3	6·6	0·3

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

1923	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January ...	...	...	1·1	4·8	...	3·6	...	1·2	0·8	...	4·5	1·1	...	3·8	1·6	...	...
February ...	...	...	3·1	7·3	2·7	...	0·9	0·4	2·1	...	...	...	1·3	...	...	5·5	...
March ...	0·5	4·7	...	0·3	1·8	0·9	1·8	0·6	0·1	0·1	0·1	...	4·1	...	...	0·1	7·1
April ...	...	...	1·2	1·1	2·5	...	0·6	8·1	8·2	0·6	1·7	...	1·7	1·5	4·7	3·7	8·6
May ...	8·9	5·6	5·7	4·4	1·6	7·5	13·8	10·2	8·0	8·4	4·8	12·0	1·3	4·2	7·5	4·4	12·2
June ...	3·5	13·6	...	7·4	6·6	4·8	4·9	0·5	...	6·7	13·8	0·4	1·8	11·5	0·6	3·2	8·2
July ...	0·4	0·3	...	...	7·2	12·2	5·6	4·9	9·2	3·2	10·6	13·5	12·0	10·0	0·1	7·4	5·0
August ...	8·0	1·0	6·6	12·5	5·1	5·2	0·4	2·8	1·7	6·8	8·5	0·1	...	2·5	10·0	2·0	0·6
September ..	7·1	8·7	6·2	4·8	2·7	3·5	8·7	10·5	5·0	7·6	6·5	1·0	0·5	3·2	7·8	3·2	0·3
October ...	3·1	7·2	...	7·7	...	2·8	0·1	1·6	2·0	...	4·2	0·1	5·0	6.3	2·5	2·8	5·0
November...	...	4·7	1·4	2·6	1·2	1·2	5·8	0·1	2·7	5·9	...	...	...	4·3	0·2	1·2	0·6
December ...	...	0·2	2·4	...	0·3	4·8	...	1·5	3·3	...	...	...	4·0	...	2·9	...	...

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

1923	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTHLY Total	MONTHLY Percen.
January ...	2·6	...	6·0	...	0·4	0·4	...	2·6	...	...	...	...	...	...	34·5	13·9
February ...	...	0·4	1·1	...	1·0	5·9	...	0·2	2·5	...	0·1				34·5	12·7
March ..	3·9	4·6	6·7	8·6	7·3	4·7	6·0	2·9	5·8	4·1	2·7	3·1	6·2	...	88·8	24·3
April ...	3·5	0·7	13·2	7·3	12·2	2·5	11·1	7·9	5·0	8·7	3·8	9·7	...		129·8	31·0
May ...	1·9	...	...	3·6	2·6	2·5	10·1	7·5	3·8	5·0	0·2	11·0	3·3	0·1	172·1	34·9
June ...	...	5·7	4·9	0·2	2·8	8·8	3·1	2·2	5·9	6·3	4·5	6·5	4·6		143·0	28·1
July ...	5·8	...	6·1	8·7	...	0·2	6·0	6·1	7·0	1·5	1·3	0·8	2·3	6·4	153·8	30·2
August ...	6·0	0·5	...	4·4	4·2	1·2	9·7	...	9·3	6·5	2·2	...	4·5	4·7	127·0	27·8
September ..	4·3	0·7	3·9	6·0	5·8	5·3	2·8	1·3	1·1	...	5·3	...	6·3		130·1	34·3
October ...	0·2	5·3	2·6	1·8	1·8	...	3·7	3·3	2·1	3·2	1·7	0·2	...	4·6	80·9	24·8
November...	1·3	5·7	1·0	2·7	2·9	4·3	4·5	1·2	...	...	1·4	...	1·2		58·1	22·7
December ..	0·9	3·5	6·0	...	...	6·0	1·8	...	...	...	...	...	...	...	37·6	16·3

SUMMARY OF SUNSHINE.

	Bright Sunshine Recorded					
	1923			Mean for the last 43 years		
	Number of		Percentage of Possible Sunshine	Number of		Percentage of Possible Sunshine
	Days	Hours		Days	Hours	
January ...	14	34·5	13·9	14·2	32·5	13·1
February ...	13	34·5	12·7	17·6	57·5	21·0
March ...	26	88·8	24·3	24·2	101·9	27·9
April ...	25	129·8	31·0	26·3	147·5	35·2
May ...	29	172·1	34·9	27·7	186·0	37·7
June ...	27	143·0	28·1	28·0	185·4	36·5
July ...	27	153·8	30·2	28·3	172·2	33·8
August ...	27	127·0	27·8	27·6	147·5	32·3
September ..	28	130·1	34·3	25·7	124·2	32·8
October ...	26	80·9	24·8	23·6	85·9	26·3
November ..	23	58·1	22·7	17·7	46·5	18·2
December ...	13	37·6	16·3	13·5	26·0	11·3
Year ...	278	1190·2	26·7	274·3	1313·2	29·4

SUMMARY OF SUNSHINE—*Continued.*

EXTREMES FOR THE LAST 43 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
April	30	*1909	22	1920	223·7	1893	80·7	1920	53·4	1893	19·3	1920
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	24	1920	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	86·6	1915	18·5	1891	33·8	1915	7·2	1891
Dec.	20	1917	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.*

HORIZONTAL MAGNETIC DIRECTION.

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

1923	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 a.m. readings	4 p.m. readings*					
	15° +						15° +	15° +	
	′	′	′	′	′	′	′	′	′
January ...	23·1	20·3	22·1	21·9	21·9	7·2	27·0	5·0	22·0
February ...	22·1	19·3	20·1	20·3	20·5	9·7	28·0	0·0	28·0
March	23·1	16·3	18·3	20·3	19·5	12·6	37·0	—29·0	66·0
April	21·9	12·1	15·9	18·5	17·1	12·4	26·0	2·0	24·0
May	19·1	12·3	14·5	17·7	15·9	10·6	25·0	1·0	24·0
June	15·3	8·7	11·1	14·3	12·4	11·4	29·0	— 4·0	33·0
July	17·1	9·7	11·5	14·9	13·3	10·0	21·0	— 1·0	22·0
August ...	23·1	15·7	17·5	20·5	19·2	9·5	26·0	6·0	20·0
September ...	22·9	16·9	17·7	20·9	19·6	10·5	37·0	— 6·0	43·0
October ...	21·1	16·1	17·5	18·1	18·2	10·4	33·0	— 7·0	40·0
November ...	19·1	16·3	16·9	17·9	17·6	6·3	33·0	6·0	27·0
December ...	18·5	15·7	16·3	17·1	16·9	6·0	24·0	7·0	17·0
Means	20·5	15·0	16·6	18·5	17·7	9·7	29·0	— 2·0	31·0

Mean for the year ... ... 15° 17·7′ W.

* *For the 5 quietest days.*

† *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.

1923	MEANS OF * Highest readings	Lowest readings	4 a.m. readings	4 p.m. readings	Mean for the month	Mean daily range †	Highest reading of the month	Lowest reading of the month	Monthly range
	17000 +					0 +	17000 +		0 +
January ...	316	302	306	307	308	29·4	339	260	79
February ...	309	293	302	304	302	40·9	353	225	128
March ...	310	291	300	303	301	48·8	466	229	237
April	329	291	313	319	313	50·2	369	264	105
May	328	299	318	319	316	49·3	383	268	115
June	316	277	304	306	301	57·2	383	233	150
July	317	285	298	303	301	48·0	356	246	110
August ...	311	282	299	305	299	43·1	347	237	110
September ...	323	297	315	316	313	49·7	356	127	229
October ...	317	294	311	307	307	47·5	365	171	194
November ...	323	311	321	318	318	29·0	347	246	101
December ...	324	312	321	319	319	29·0	347	246	101
Means	319	295	309	311	308	43·5	368	229	139

Mean for the year ... ... ·17308 C. G. S. Units.

* *For the 5 quietest days.*

† *Includes all days.*

ABSOLUTE MEASURES—SUMMARY.

1923	DIRECTION		FORCE.		
	Declination Corrected	Inclination	Horizontal	Vertical	Total
			C. G. S. UNITS.		
	° ′	° ′			
	15 +	68 +	0·17000+	0·44000+	0·47000+
January ...	23·8	42·6	308	417	670
February ...	23·0	42·2	285	339	588
March ...	23·6	43·4	319	472	726
April	20·7	44·0	310	475	725
May	19·3	42·6	337	491	750
June	17·8	40·1	323	357	620
July	19·1	38·9	321	309	574
August ...	15·9	39·9	312	326	589
September ...	14·6	43·0	315	449	702
October ...	12·8	41·1	294	321	576
November ...	11·2	38·7	295	233	494
December ...	10·8	42·3	282	338	587
Means ...	15 17·6	68 41·6	0·17308	0·44377	0·47633

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 v.g. The days are civil days.

1923	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1923
D.													D.
1	c	m	s	c	c	c	s	s	s	c	s	c	1
2	c	s	c	c	c	s	m	s	s	c	v.g.	c	2
3	s	m	c	c	m	s	c	m	s	c	s	c	3
4	s	s	c	s	s	s	c	s	s	c	c	m	4
5	s	s	c	c	s	s	c	c	c	c	c	c	5
6	s	s	c	c	c	s	s	s	c	c	c	c	6
7	c	s	s	c	c	c	s	c	c	c	s	c	7
8	c	s	c	c	s	c	c	c	c	s	s	c	8
9	c	c	c	s	c	c	c	s	m	s	s	m	9
10	c	m	c	s	c	c	m	c	s	s	c	s	10
11	s	c	c	s	c	s	m	c	s	s	c	c	11
12	c	c	c	s	c	s	s	s	c	s	m	c	12
13	m	c	c	m	c	g	c	m	s	s	s	c	13
14	s	m	m	s	s	m	c	c	s	m	c	s	14
15	s	c	*	s	s	s	c	s	c	v.g.	c	s	15
16	s	s	m	s	c	s	s	c	c	v.g.	c	c	16
17	s	m	s	c	g	c	s	s	c	g	c	c	17
18	c	m	m	c	m	s	m	c	s	g	c	c	18
19	c	s	s	s	m	s	s	c	c	s	c	c	19
20	m	s	s	s	*	s	s	c	c	s	c	c	20
21	m	s	s	m	s	s	c	*	c	c	c	c	21
22	m	s	s	m	c	c	s	c	s	s	m	c	22
23	m	s	c	s	s	c	m	c	s	c	s	m	23
24	s	s	v.g.	m	c	c	c	s	s	c	c	s	24
25	c	g	v.g.	c	c	c	c	c	c	*	c	m	25
26	c	v.g.	m	c	c	s	c	c	v.g.	s	c	v.g.	26
27	c	v.g.	m	c	s	s	s	s	v.g.	s	m	m	27
28	c	m	m	c	c	s	c	s	m	c	s	s	28
29	m		m	s	m	s	c	c	s	c	m	c	29
30	m		c	c	m	g	c	s	c	c	s	c	30
31	s		s		s		s	m		s		c	31
TOTAL c	13	5	13	14	15	10	15	15	13	13	16	20	
TOTAL s	11	13	8	12	9	17	11	12	13	12	9	5	
TOTAL m	7	7	7	4	5	1	5	3	2	1	4	5	
TOTAL g	...	1	...	...	1	2	...	...	...	2	...	...	
TOTAL vg	...	2	2	...	...	...	...	...	2	2	1	1	

* 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.

n=note without a complete drawing.

1923	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1923
D.													D.
1	5·2				0·0	0·2		0·0	0·1	1·5			1
2			0·0		0·0	0·3	0·4		0·5	1·2	2·1	0·0	2
3	2·0	0·0		0.0	0·0			0·0	1·9		2·2	0·0	3
4	0·4	0·0		0·0	0·0	0·1		0·0	2·3	0·8	2·4		4
5		0·0	0·0	0·0	0·0	0·1	0·4	0·0	2·0		1·7	0·0	5
6	0 0		0·0		0·0	0·0	0·1	0·0	1·1	0·0	1·7	0·0	6
7		n	0·0	0·1	0·0	0·0	0·0		1·0		1·8		7
8	0 0	0·0		0·0	0·0	0·0	0·0	0·0	0·9	0·0		0·0	8
9	0 0	0·0	0·0	0·0	0·0		0·0	0·0		0·1	1·8	0·0	9
10				0·0	0·0	0·0	0·0	0·0	1·3		1·8		10
11	0·0		0·0	0·0	0·0	0·0	0·0	0·0	1·0	0·7	0·9		11
12	0·0	0·0			0·2		0·0						12
13		0·0	0 0	0·1		0·0	0·0		0·9	0 8		0·0	13
14	0·0			0·1	0 0	0·0	0·0	0·0	0·9	0·7	0·4		14
15	0·0			0·0	0·0			0·0	0·9	0·8		0·0	15
16		0·1		0·0	0·0	0·0	0·0	0·0	0·5	0·6			16
17			0·0	0·1	0·0	0·0	0·0			0·4			17
18	0·0		0·0	0·1	0·0		0·0	0·0	0·2		0·0	0·0	18
19			0·0	0·0		0·7				0·1	0·0	0·2	19
20	0·0		0·0	0·5		0·2	0·0		0·0	0·0	0·0	0·7	20
21			0 0	0·8	0·0	0·1	0·0	0·0	0·0	0·2	0·0		21
22	0·0	0·0	0·3	1·1		0·2		0·0	0·0	0·5	0·0		22
23	0.1	0·0	0·1	0·3	0·2	0·1		0·0	0·0		0·0	1·2	23
24			0·0	0·3	0·4	0·1	0·1	0·0	0·1	2·8	0·1	0·4	24
25	0·0	0·0	0·2	0·2	0·5	1·1	0·0		1·0	2·6	0·3		25
26		0·0	0·0	0·1		1·4	0·0	0·0	n	1·8			26
27			0·0	0·2	0·0	1·4	0·0	0·0	1·5	0·7	0·2		27
28			0·0	0·3		1·4	0·0	0·0	1·3	0·4	0·1	n	28
29			0·2	0·0	0·4	4·2	0·2						29
30			1·1		0·4	4·9		0·0	1·4		0·0		30
31								0·0		0·5			31
Daily Means	0·5	0·0	0·1	0·2	0·1	0·7	0·1	0·0	0·9	0·8	0·8	0·2	

SUN-SPOT STATISTICS, 1923.

The numbering of the groups is in continuation of that in the annual Report for 1922. Any area less than $\frac{1}{10}$ unit is entered as 0·0.

Date	No. of Group	Mean Latitude	Mean Longitude	Max. Area	Where Measured
Dec. 22 (1922)—					
Jan. 4	151	+ 6°·3	93°·9	13·0	Chief spot (1).
,, ,,	151	+ 6°·5	85°·4	13·0	Chief spot (2).
Dec. 25 (1922)—					
Jan. 1 ...	152	+ 8°·8	67°·3	0·5	Centre of group.
Dec. 25 (1922)—					
Jan. 4 ...	153	— 3°·9	55°·7	0·3	
Jan. 23	154	+ 5°·7	75°·1	0·1	Centre of group.
Feb. 16	155	+10°·8	182°·5	0·1	Chief spot.
Mar. 20	156	—11°·2	120°·3	0·0	
Mar. 22—26 ...	157	+ 6°·3	87°·9	0·3	Centre of group.
Mar. 29—Apr. 3	158	+ 4°·5	296°·0	1·1	Centre of group.
April 7	159	—13°·0	189°·3	0·1	
Apr. 10, Apr. 13	160	+22°·4	122°·6	0·0	
Apr. 13—14 ...	161	— 5°·4	146°·8	0·1	Centre of group.
Apr. 17—18 ...	162	+ 4°·6	115°·8	0·1	Centre of group.
Apr. 19—29 ...	163	— 6°·1	3°·2	1·1	Chief spot.
May 12	164	+ 7°·5	111°·4	0·2	Centre of group.
May 23	165a	— 6°·9	265°·2	0·2	Centre of group.
May 24—25 ...	165	— 9°·9	277°·5	0·5	Centre of group.
May 29—June 2	166	+ 9°·2	196°·9	0·4	
June 1—2... ...	167	— 7°·3	167°·1	0·2	Chief spot.
June 4	167a	— 6°·9	163°·4	0·1	Chief spot.
June 5	167b	— 6°·0	174°·1	0·1	Chief spot.
June 19—26	168	— 3°·0	309°·0	0·7	Centre of group.
June 25—26	168	+ 4°·0	311°·1	0·7	Spot (a).
June 25—July 2	169	+ 7°·8	222°·2	4·9	Chief spot.
June 29—30	169	+ 8°·1	219°·3	4·9	Centre of group.
July 5	170	+ 9°·5	104°·5	0·2	Centre of group.
July 5	171	+20°·1	95°·9	0·2	Centre of group.
July 6	172	+ 4°·7	89°·0	0·1	Centre of group.
July 8	173	—15°·6	36°·6	0·0	
July 9	174	—10°·8	47°·9	0·0	
July 11	175	+ 6°·3	345°·1	0·0	

SUN-SPOT STATISTICS, 1923—*Contd.*

Date	No. of Group	Mean Latitude	Mean Longitude	Max. Area	Where Measured
July 24—26 ...	176	+ 7°·2	237°·3	0·1	
July 27—29 ...	177	+ 4°·8	203°·7	0·2	Centre of group.
Aug. 31—Sept. 8	178	—27°·2	39°·5	2·3	Chief spot.
Sept. 7—18 ...	179	+21°·2	286°·7	1·3	Chief spot.
Sept. 21	180	+20°·3	119°·7	0·0	Centre of group.
Sept. 24—Oct. 4	181	—16°·8	59°·1	1·5	Chief spot.
Sept. 28—Oct. 1	182	—26°·8	35°·4	0·1	Centre of group.
Oct. 2	183	—14°·2	30°·5	0·0	
Oct. 9—20 ...	184	+ 3°·9	223°·9	0·8	Chief spot.
Oct. 11	185	—19°·6	208°·8	0·0	
Oct. 21—31 ...	186	—16°·5	58°·6	0·2	
Oct. 22—28 ...	187	— 5°·8	97°·9	2·6	Chief spot.
Oct. 31–Nov. 6	188	—26°·9	335°·1	2·2	Cen. of group (1)
,,	188	—29°·0	328°·6	2·2	Cen. of group (2)
Nov. 4—14 ...	189	+29°·9	233°·3	1·8	Chief spot.
Nov. 24—28 ...	190	—21°·4	336°·5	0·3	Chief spot.
Dec. 19—24 ...	191	+27°·6	32°·4	1·2	Chief spot.

DISTURBED SUN-SPOT AREAS, 1923.

No. of Area	Date	No. of Group	Mean Latitude	Mean Longitude	Max. Area	Mean Types
37	July 8	173	—15°·6	36°·6	0·0	I.
	Oct. 2	183	—14°·2	30°·5	0·0	I.
38	Aug. 31—Sept. 8	178	—27°·2	39°·5	2·3	IV*d* IV*b*
	Sept. 28—Oct. 1	182	—26°·8	35°·4	0·1	I.
39	Sept. 24—Oct. 4	181	—16°·8	59°·1	1·5	IV*b*
	Oct. 21—31 ...	186	—16°·5	58°·6	0·2	I.
40	Dec. 22 (1922) —Jan. 4	151	+ 6°·5	85°·4	13·0	II*a*
	Dec. 25 (1922) Jan. 1...	152	+ 8°·8	67°·3	0·5	III*b*
	Jan. 23	154	+ 5°·7	75°·1	0·1	I.
	Mar. 22—26 ...	157	+ 6°·3	87°·9	0·3	I.
	July 6	172	+ 4°·7	89°·0	0·1	I.
41	Apr. 17—18 ...	162	+ 4°·6	115°·8	0·1	I.
	May 12	164	+ 7°·5	111°·4	0·2	I.
	July 5	170	+ 9°·5	104°·5	0·2	I.
42	Apr. 10, Apr. 13	160	+22°·4	122°·6	0·0	I.
	Sept. 21	180	+20°·3	119°·7	0·0	I.
43	Apr. 13—14 ...	161	— 5°·4	146°·8	0·1	I.
	June 4	167a	— 6°·9	163°·4	0·1	I.
44	Feb. 16	155	+10°·8	182°·5	0·1	I.
	May 29--June 2	166	+ 9°·2	196°·9	0·4	IV*a*.
45	July 27—29 ...	177	+ 4°·8	203°·7	0·2	I.
	Oct. 9—20 ...	184	+ 3°·9	223°·9	0·8	IV*b*.

DISTURBED SUN-SPOT AREAS, 1923.—*Cont.*

No. of Area	Date	No. of Group	Mean Latitude	Mean Longitude	Max. Area	Mean Types
46	June 25--July 2	169	+ 7°·8	222°·2	4·9	IV*b*, V.
	June 29—30	169	+ 8°·1	219°·3	4·9	IV*b*, V.
	July 24—26 ...	176	+ 7°·2	237°·3	0·1	I.
47	Mar. 29--Apr. 3	158	+ 4°·5	296°·0	1·1	III*b*.
	June 25—26 ...	168a	+ 4°·0	311°·1	0·7	III*b*, I.
48	Oct. 31-Nov. 6	188	—26°·9	335°·1	2·2	III*b*.
	,,	188	—29°·0	328°·6	2·2	III*b*.
	Nov. 24—28 ...	190	—21°·4	336°·5	0·3	I.