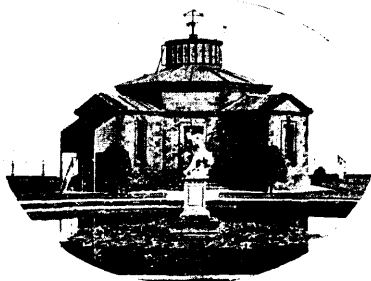


STONYHURST COLLEGE OBSERVATORY.

Lat. $53^{\circ} 50' 40''$ N. Long. $9^{\text{m}} 52^{\text{s}}.68$ W.
Height of the Barometer above the Sea, 381 feet.



(FOUNDED 1838.)

Results of Meteorological and Magnetical Observations.

1909.

With Report and Notes of the Director,

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

LIVERPOOL:

PHILIP, SON & NEPHEW, LTD., PRINTERS, SOUTH CASTLE STREET.

1910.

CONTENTS.

Report and Notes of the Director	v.
Monthly Meteorological Tables	1
Yearly Meteorological Summary	25
Extreme Readings during 62 years	27
Dates of Occasional Phenomena	29
Monthly Totals of Recorded Sunshine for each hour	30
Total amount of Sunshine recorded on each day	31
Summary of Sunshine	33
Summary of Sunshine: Monthly extremes during 29 years	34
Observations of Upper Clouds (Cirrus)	35
 Magnetic Report:—	
1. Absolute Values of the Elements of Earth-Magnetism	38
2. Horizontal Direction and Force deduced from daily curves	41
3. Magnetic Disturbances, 1909	43
Dates and Disc Areas of Solar Drawings, 1909	44
Presentations to the Library	45
Seismological and Astro-physical Notes	XII.—XIII.

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 $\frac{1}{2}$ 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, and are annually compared with the Office-standards. 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.

The year has been a mild and quiet year generally. Judged by personal impressions, the winter months would be called relatively warm, and the summer months cold; and these impressions agree fairly well with the mean temperatures of the two periods: the winter months showing only $\frac{1}{4}^{\circ}$ and the summer months $\frac{3}{4}^{\circ}$ below the semi-annual averages. But there were no hot days in the summer, the thermometer never having risen to 80° , and only on nine days exceeded 70° , with $75^{\circ}1$ for the highest of the year. And June was a remarkably cold and cloudy midsummer month, at a mean temperature $3^{\circ}2$ below the month's average. July also was a very unsummerlike month, at a mean temperature $1^{\circ}3$ below its average, with a rainfall the greatest of the 12 months, not much short of double its average. August was a better month, the warmest of the year, at $0^{\circ}9$ above its average, with less rain, and about its average duration of sunshine. But September again was cold at nearly 2° below its average.

The wettest months of the year were July and December, with over 7 inches of rain, and October with

nearly $5\frac{1}{2}$ inches. The distribution of rain throughout the year was nearly equal in the winter and summer months, counting the summer months from April to September, both included. But in the second half of the year, July to December, the rainfall was much greater than in the first half, the amounts being 29.6 and 19.1 inches respectively: showing an excess of 10.5 inches in the second half, which is 2.6 inches above the average excess.

The total amount of sunshine for the year, 1337.2 hours, is $12\frac{1}{2}$ hours less than the 29 years average. Excesses over the average occur in the following months: in February 18 hours, in April 43 h., in May 53 h., in November 28 h.; and deficiencies in March 36 h., in June 45 h., in July 48 h., and in September 35 h. In the other four months the amounts were all close upon the averages.

November, with a total of $73\frac{1}{2}$ hours, exceeded all previous records by $8\frac{1}{4}$ hours.

The prevailing wind has been as usual from the West on 107 days. And restricting the statement to two general directions,—the two sides of the astronomical meridian—we have from the West 200 days against 104 days from the East; the remaining 61 days belonging to the neutral directions North and South.

On 6 days only the wind velocity indicated a gale, as against 4 days in 1908. The mean velocity, however, of the gales in 1909 was 3 miles per hour less than those of 1908. And the total length of current crossing the Observatory in 1909 is the least on record, being 9699 miles below the average, and 1298 miles below the previous record which occurred in 1908.

Fine and dry periods of the year may be noted as follows, but not excluding occasional interruptions by light rains of short duration:—January 19—30; February 10—28; March 7—22; April 1—11; May 2—22; June 1—4, 6—9, 11—17; August 1—16; September 7—22; October 25—31; November 2—7, 13—26; December 12—17. July was distinguished by rain almost throughout.

Halos have been of more frequent occurrence during the year than in 1908: 28 solar and 14 lunar halos having been noted. About half of these occurred in fine dry periods and half in broken or showery weather.

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 $q(t^{\circ} - 32^{\circ}) + q'(t^{\circ} - 32^{\circ})^2$ 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 each month from the mean of twelve determinations of the time of 100 vibrations.

The angles of deflection are each the mean of two sets of readings.

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.

The average deflection of the magnet caused by a twist of the torsion circle through 90° has been about $7\cdot3$ of arc.

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 value of the constant P was found to be $-0\cdot00130$.

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-Magneto-graphs, 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. The time-scale is provided by hand screens cutting off the light at noted times at the beginning and end of the curves.

The scale value of the Unifilar Declination Magnet is $11'28$ arc per centimetre.

The scale value of the Bifilar torsion balance was 0.00047 C.G.S. for one centimetre, in the first 5 months of the year, and 0.0005 for the remaining 7 months.

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 43) 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 greater 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.

Photographic copies of the principal magnetic disturbances in declination, horizontal force, and vertical force during the year 1909 have been sent to the Imperial Magnetic Observatory at Potsdam.

Solar and Astro-physical.—The solar surface has been observed on all available days, and 193 drawings of spots and faculæ have been added to our collection. On five days only the surface was found quite free from spots.

The mean disc area of the spots (in units of $\frac{1}{5000}$ th of the visible surface) appears at 3·8 ; and the mean daily range of magnetic Declination (in minutes of arc) at 13·5. And the following table shows a secondary maximum of solar activity and magnetic disturbance in 1907.

Year.....	1904	1905	1906	1907	1908	1909
Spot area.....	2·5	6·8	4·8	5·8	4·6	3·8
Declination range	11·9	15·0*	13·9*	14·7	14·1*	13·5

With the solar grating spectrograph a series of photographs of the spectra of the larger sun-spots has been obtained in the region of the red and yellow. These have been supplemented by eye observations taken with a 12-prism spectroscope attached to the 15-inch equatorial.

Very little progress has been made with the red end spectra of the stars. Trials on α Ceti and β Lyrae have failed through irregular running of the driving clock of the 15-inch equatorial, which needs to be very accurate for the smaller stars ; and it has been found that the red

* Previous values slightly in error.

dispersion by the single compound prism of the spectrograph is too small for the fine lines of most of the brighter stars. At present trials are being made with the two compound prisms belonging to the instrument.

Seismological.—Through favour of the Royal Geographical Society, the Observatory has come into possession of the Milne Seismograph which was built for the Antarctic expedition of s.s. *Discovery*; and it has cost the College £36 to have it furnished with the latest improvements. It is of non-magnetic material, and is mounted in the north corner of the underground magnetic chamber, on a stone pillar resting on a concrete foundation one foot deep in the natural hard clayey sand bed; and the boom, or horizontal pendulum, lies in the astronomical meridian. Its continuous photographic record dates from July 1st; and the first proof of its efficiency was its response to the North Indian earthquake of July 7th. This was followed by records of earthquakes felt—one in Greece, July 15th; two in Mexico, July 30th, 31st; one in Japan, August 14th; and one in Switzerland, December 28th. Other marked earth shakings have been registered, of which no information has been received relating to their origins: two in August, five in September, six in October, four in November, and three in December; the longest free period being 13 days between the 4th and 18th of October.

Besides these, very many minor disturbances have been registered and sent to Dr. Milne's Seismic Observatory at Shide, in the Isle of Wight, for comparison with those of other Observatories in England and Scotland. By these comparisons the true earth tremors are separated from what are believed to be local air tremors, about which so

little is known that they can only be looked upon as vexatious intruders. But they are worth investigation, for their origin is quite mysterious. In our short experience they seem liable to start some 20 to 40 minutes after one has been in the room and left it. And although it is almost impossible to enter the chamber without disturbing the boom, we have not found any effect to have been the result of outside movements.

Copies of our register are sent quarterly to some 30 Seismic Observatories in Europe, America, China, Japan and Australia; and half-yearly returns are sent to the Seismological Committee of the British Association for the Advancement of Science. Also photographic copies of the more noteworthy seismographs are sent to the same Committee and to the Observatory at Shide: and these can be supplied to any observing station on application.

The following papers have been published during the year:—

“Solar Activity in 1908: Sun-Spots.” Monthly Notices, R.A.S., 69, 4. February, 1909.

“On the possible existence of steam in the regions of Sun-Spots.” (Abstract.) British Association Report, 1908. *Dublin.*

“Note on Captain Daunt’s observations of helium D_3 absorption in the neighbourhood of Sun-Spots, 1908.” Monthly Notes, R.A.S., 69, 7. May, 1909.

“The Solar Surface in 1908.” Journal of the British Astronomical Association, 19, 7.

“The Sun-Spots and associated Magnetic Storms of September—October, 1909.” Monthly Notices, R.A.S., 70, 1. November, 1909.

“The Spectra of Sun-Spots.” Annual Report, Liverpool Astronomical Society, 1908-9.

“The foundations of Astrophysics.” The “Observatory,” No. 416. December, 1909.

WALTER SIDGREAVES, S.J.,

DIRECTOR.

January, 1910.

METEOROLOGICAL REPORT.

JANUARY, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29·661	29·476							
Highest ,, ,, on the 4th ... ,,	30·273	30·284							
Lowest ,, ,, on the 14th ... ,,	28·420	28·595							
Range of Barometer Readings	1·853	1·689							
Highest Reading of a Max. Therm. on the 18th...	49·6	51·2							
Lowest Reading of a Min. Therm. on the 28th...	19·0	21·0							
Range of Thermometer Readings.....	30·6	30·2							
Mean of Highest Daily Readings	42·2	42·3							
Mean of Lowest Daily Readings	33·4	32·7							
Mean Daily Range	8·8	9·6							
Deduced Mean Temp. (from mean of Max. and Min.)	37·6	37·3							
Mean Temperature from Dry Bulb	37·9	37·4							
Adopted Mean Temperature ..	37·8	37·3							
Mean Temperature of Evaporation	36·0	36·1							
Mean Temperature of Dew Point.....	33·6	34·0							
Mean elastic force of Vapour	inches 0·192	0·197							
Mean weight of Vapour in a cub. ft. of air, grains	2·2	2·4							
Mean additional weight required for saturation ,,	0·5	0·4							
Mean degree of Humidity (saturation 100).....	85	80							
Mean weight of a cubic foot of air.....	grains 552·4	549·9							
Mean amount of Cloud (0—10)	6·8	7·8							
Fall of Rain	inches 2·677	4·133							
Greatest Rainfall in one day (14th)	,, 0·580	0·777							
No. of days on which ·005 in. or more Rain fell...	19	19·0							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	1	4	1	0	6	5	9	5	
Mean Velocity in miles per hour	2·5	3·7	4·2	0	12·7	9·2	14·6	9·2	
Total No. of miles for each Direction	60	358	101	0	1835	1098	3156	1100	
Total No. of miles registered	7708							Mean.*	
								8260·8	
Greatest hourly velocity (16th, 3 p.m., and 18th, Noon. Dir. W. and S. respectively)	38							42·5	

* For the last 42 years.

JANUARY, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0.185 in.
Monthly range	„	...	...	...	+ 0.164 „
Mean of highest temperatures	...	...	...	...	— 0.1°
Mean of lowest	„	...	...	...	+ 0.7°
Mean daily range	„	...	...	...	— 0.8°
Adopted mean temperature	...	...	...	...	+ 0.5°
Total rainfall	...	...	...	...	— 1.456 in.

Ground frost on 6th, 8th, 9th, 12th, 13th, 15th—17th, 19th—31st. Hoar frost on 20th, 21st, 26th, 27th and 28th. Snow on 3rd, 15th, 16th, 24th and 31st. Hail on 12th, 15th and 16th. Heavy rain on 14th. Gales of wind on 16th and 18th. Fog on 1st, 9th and 10th. Thunder on 7th. Lightning on 7th and 16th. Lunar halo on the 9th and 30th.

EXTREME READINGS FOR JANUARY, During 62 Years.

Highest reading of Barometer	1896 (9th)	30.597 in.
Lowest	„ „ 1884 (26th)	27.803 „
Highest temperature	1887 (7th)	59.9°
Lowest	„ 1881 (15th)	4.6°
Highest adopted mean temperature	1898	43.7°
Lowest	„ „ 1881	29.2°
Greatest fall of rain	1852	8.147 in.
Least	„ 1881	0.472 „
Greatest fall of rain in one day	1886 (3rd)	1.700 „
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, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29.711	29.510							
Highest " " on the 13th... "	30.176	30.083							
Lowest " " on the 10th... "	28.916	28.665							
Range of Barometer Readings	" 1.260	1.418							
Highest Reading of a Max. Therm. on the 22nd	48.3	52.0							
Lowest Reading of a Min. Therm. on the 25th...	26.5	22.1							
Range of Thermometer Readings.....	21.8	29.9							
Mean of Highest Daily Readings..	42.1	44.0							
Mean of Lowest Daily Readings	32.5	33.3							
Mean Daily Range	9.6	10.7							
Deduced Mean Temp. (from mean of Max. and Min.)	36.9	38.1							
Mean Temperature from Dry Bulb	37.7	38.2							
Adopted Mean Temperature.....	37.3	38.1							
Mean Temperature of Evaporation	35.2	36.7							
Mean Temperature of Dew Point.....	32.3	34.4							
Mean elastic force of Vapour.....inches	0.183	0.193							
Mean weight of Vapour in a cub. ft. of air, grains	2.1	2.4							
Mean additional weight required for saturation ,,	0.5	0.4							
Mean degree of Humidity (saturation 100).....	83	87							
Mean weight of a cubic foot of air	grains 554.2	549.1							
Mean amount of Cloud (0—10)	6.2	7.6							
Fall of Rain	inches 4.201	3.476							
Greatest Rainfall in one day (3rd)	" 2.000	0.766							
No. of days on which .005 in. or more Rain fell...	12	16.6							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	2	9	1	2	5	2	5	2	
Mean Velocity in miles per hour	8.7	6.0	6.7	7.5	6.2	10.7	16.4	5.6	
Total No. of miles for each Direction	419	1303	160	360	742	512	1970	269	
Total No. of miles registered	5735							Mean.*	
	7594.9							7594.9	
Greatest hourly velocity (5th, 6 a.m. Dir. W.)...	38							42.3	

* For the last 42 years.

FEBRUARY, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0·201 in.
Monthly range	„	...	...	...	— 0·158 „
Mean of highest temperatures	...	...	...	...	— 1·9°
Mean of lowest	„	...	...	...	— 0·8°
Mean daily range	„	...	...	...	— 1·1°
Adopted mean temperature	...	...	...	...	— 0·8°
Total rainfall	...	...	...	...	+ 0·725 in.

Ground frost on 1st, 2nd, 6th—10th, 12th—14th, 16th—28th.
Hoar frost on 7th, 14th, 17th and 19th. Snow on 5th, 9th, 25th,
26th, 27th and 28th. Hail on 9th, 15th and 28th. Heavy rain on
2nd, 3rd, and 4th. Gales of wind on 5th. Fog on 16th. Lunar
halo on 5th. Solar halo on the 8th.

EXTREME READINGS FOR FEBRUARY, During 62 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 or more rain fell	.....	1880	.....	26
Least	„ „ „	1855	4
*Greatest hourly velocity of the wind	... ..	1903 (27th)	.....	60 mls.
*Greatest No. of miles registered	.....	1868	.....	12577
*Least	„ „ „	1886	4251

MARCH, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.
Mean Reading of the Barometer	29.090	29.455
Highest " " on the 12th ... "	29.689	30.052
Lowest " " on the 29th... "	28.639	28.634
Range of Barometer Readings	1.050	1.418
Highest Reading of a Max. Therm. on 20th and 29th	53.0	57.0
Lowest Reading of a Min. Therm. on the 4th ...	19.9	22.8
Range of Thermometer Readings.....	33.1	34.2
Mean of Highest Daily Readings	43.0	47.2
Mean of Lowest Daily Readings	32.9	34.1
Mean Daily Range	10.1	13.1
Deduced Mean Temp. (from mean of Max. and Min.)	37.0	39.7
Mean Temperature from Dry Bulb	38.6	40.1
Adopted Mean Temperature.....	37.8	39.9
Mean Temperature of Evaporation	36.7	38.0
Mean Temperature of Dew Point.....	35.2	35.5
Mean elastic force of Vapour.....inches	0.206	0.207
Mean weight of Vapour in a cub. ft. of air, grains	2.4	2.4
Mean additional weight required for saturation ,,	0.3	0.5
Mean degree of Humidity (saturation 100).....	91	85
Mean weight of a cubic foot of air	541.7	546.3
Mean amount of Cloud (0—10)	7.1	7.5
Fall of Rain	2.664	3.343
Greatest Rainfall in one day (28th)	0.750	0.781
No. of days on which .005 in. or more Rain fell...	17	16.5

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	7	3	2	3	8	1	3
Mean Velocity in miles per hour	6.1	7.7	7.8	12.1	7.6	5.8	7.5	15.5
Total No. of miles for each Direction	586	1301	562	580	547	1104	180	1117

		Mean.*
Total No. of miles registered	5977	8574.5
Greatest hourly velocity (25th, 5 a.m. Dir. W.)	30	42.0

* For the last 12 years.

MARCH, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	— 0·365 in.
Monthly range	„	...	...	...	— 0·368 „
Mean of highest temperatures	...	...	...	...	— 4·2°
Mean of lowest	„	...	...	...	— 1·2°
Mean daily range	„	...	...	...	— 3·0°
Adopted mean temperature	...	...	...	...	— 2·1°
Total rainfall	...	...	...	...	— 0·679 in.

Ground frost on 1st—17th, 22nd and 27th. Hoar frost on 17th and 22nd. Snow on 1st—4th, 6th, 7th, 9th, 11th, 12th—15th, and 17th. Hail on 11th. Heavy rain on 24th and 28th. Lunar halo on 1st, 4th and 5th.

EXTREME READINGS FOR MARCH, During 62 Years.

Highest reading of Barometer	.....	1852 (6th)	.....	30·401 in.
Lowest	„ „	.....	1897 (3rd)	..... 28·157 „
Highest temperature	.....	1871 (25th)	.....	68·0°
Lowest	„	.....	1886 (6th)	..... 11·5°
Highest adopted mean temperature	.....	1871	.....	44·0°
Lowest	„ „	.....	†1855	..... 35·6°
Greatest fall of rain	.....	1896	.....	7·079 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.

† And 1892.

APRIL, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years							
Mean Reading of the Barometer	inches 29·505	29·485							
Highest „ „ on the 2nd „	30·098	29·972							
Lowest „ „ on the 24th „	28·976	28·818							
Range of Barometer Readings	„ 1·122	1·154							
Highest Reading of a Max. Therm. on the 10th...	62·4	65·3							
Lowest Reading of a Min. Therm. on the 2nd ...	30·5	28·1							
Range of Thermometer Readings.....	31·9	37·2							
Mean of Highest Daily Readings.....	54·0	55·2							
Mean of Lowest Daily Readings	38·4	37·7							
Mean Daily Range	15·6	17·5							
Deduced Mean Temp. (from mean of Max. and Min.)	44·7	44·1							
Mean Temperature from Dry Bulb	46·4	44·6							
Adopted Mean Temperature.....	45·6	44·4							
Mean Temperature of Evaporation	42·8	41·6							
Mean Temperature of Dew Point.....	39·6	38·2							
Mean elastic force of Vapour.....inches	0·244	0·235							
Mean weight of Vapour in a cub. ft. of air, grains	2·8	2·7							
Mean additional weight required for saturation „	0·7	0·7							
Mean degree of Humidity (saturation 100).....	80	80							
Mean weight of a cubic foot of air	540·8	542·1							
Mean amount of Cloud (0—10)	5·1	6·8							
Fall of Rain	inches 4·361	2·477							
Greatest Rainfall in one day (19th)	„ 0·680	0·576							
No. of days on which ·005 in. or more Rain fell...	17	14·7							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	0	4	3	3	4	4	12	0	
Mean Velocity in miles per hour	0	7·2	10·5	13·3	11·0	8·7	12·3	0	
Total No. of miles for each Direction	0	689	758	960	1053	836	3540	0	
Total No. of miles registered	7836							Mean.*	
								757·2·2	
Greatest hourly velocity (22nd, 3 and 6 p.m. Dir. S.E. by S.)	32							36·6	

* For the last 12 years.

APRIL, 1909.

DIFFERENCES.

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

Mean barometric pressure	... ..	+ 0.020 in.
Monthly range	,,	— 0.032 ,,
Mean of highest temperatures	... ..	— 1.2°
Mean of lowest	,,	+ 0.7°
Mean daily range	,,	— 1.9°
Adopted mean temperature	... ..	+ 1.2°
Total rainfall	... ..	+ 1.884 in.

Ground frost on 1st, 2nd, 5th, 7th—10th, 15th, 19th, 21st and 30th. Hoar frost on 9th. Hail on 28th. Heavy rain on 13th, 19th and 24th. Thunder and lightning on 23rd, 26th and 27th. Lunar halo on 2nd. Solar halo on 2nd, 3rd, 4th, 11th, 18th, 19th and 21st.

EXTREME READINGS FOR APRIL, During 62 Years.

Highest reading of Barometer	.....	1887 (17th)	.....	30.251 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	.....	1899 (9th)	.....	1.060 ,,
Greatest No. of days on which .005 in. or more rain fell	.....	1867	.....	24
Least	,,	1852	.....	4
*Greatest hourly velocity of the wind	... ..	1904 (10th)	.....	50 mls.
*Greatest No. of miles registered	.....	1904	.....	11016
*Least	,,	1884	.....	5047

* Since 1867 only.

MAY, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29.672	29.524							
Highest ,, ,, on the 4th ... ,,	29.982	29.963							
Lowest ,, ,, on the 26th ... ,,	28.906	28.929							
Range of Barometer Readings	,, 1.076	1.034							
Highest Reading of a Max. Therm. on the 21st...	75.0	71.7							
Lowest Reading of a Min. Therm. on the 2nd ...	30.0	31.6							
Range of Thermometer Readings..	45.0	40.1							
Mean of Highest Daily Readings.....	58.0	59.5							
Mean of Lowest Daily Readings	41.4	42.1							
Mean Daily Range	16.6	17.4							
Deduced Mean Temp. (from mean of Max. and Min.)	48.0	49.0							
Mean Temperature from Dry Bulb	50.4	49.7							
Adopted Mean Temperature.....	49.2	49.4							
Mean Temperature of Evaporation	45.9	46.1							
Mean Temperature of Dew Point...	42.4	42.6							
Mean elastic force of Vapour.....inches	0.272	0.276							
Mean weight of Vapour in a cub. ft. of air, grains	3.1	3.1							
Mean additional weight required for saturation ,,	1.0	0.9							
Mean degree of Humidity (saturation 100).....	77	76							
Mean weight of a cubic foot of air	grains 539.8	537.3							
Mean amount of Cloud (0—10).....	5.2	7.1							
Fall of Rain	inches 2.445	2.659							
Greatest Rainfall in one day (25th)	,, 0.700	0.626							
No. of days on which .005 in. or more Rain fell...	13	14.5							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	0	4	6	3	2	5	9	2	
	Mean Velocity in miles per hour	0	3.8	12.6	10.4	8.6	6.0	8.4	8.0
Total No. of miles for each Direction	0	365	1816	746	413	714	1806	383	
Total No. of miles registered	6243							Mean *	
	Greatest hourly velocity (6th, 2 p.m. Dir. E.)...							7173.4	
							33.8		

* For the last 42 years.

MAY, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0.148 in.
Monthly range	„	...	...	..	+ 0.042 „
Mean of highest temperatures	...	...	...	...	— 1.5°
Mean of lowest	„	...	...	...	— 0.7°
Mean daily range	„	...	...	...	— 0.8°
Adopted mean temperature	...	...	...	...	— 0.2°
Total rainfall	...	...	...	...	— 0.214 in.

Ground frost on 1st, 2nd, 3rd, 9th, 13th—16th, and 19th. Hoar frost on 1st, 2nd, 13th, 16th and 19th. Snow on 15th. Hail on 1st and 14th. Thunder and heavy rain on 25th. Solar halo on 2nd, 3rd, 14th, 18th, 19th and 22nd.

EXTREME READINGS FOR MAY,
During 62 Years.

Highest reading of Barometer	.....	1895 (2nd)	.....	30.217 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, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.
Mean Reading of the Barometer	inches 29·568	29·553
Highest ,, ,, on the 17th... ,,	29·968	29·912
Lowest ,, ,, on the 22nd... ,,	28·868	29·037
Range of Barometer Readings	1·100	0·875
Highest Reading of a Max. Therm. on the 14th	65·5	77·2
Lowest Reading of a Min. Therm. on the 7th ...	37·0	38·9
Range of Thermometer Readings	28·5	38·3
Mean of Highest Daily Readings	59·7	65·7
Mean of Lowest Daily Readings	45·7	47·9
Mean Daily Range	14·0	17·8
Deduced Mean Temp. (from mean of Max. and Min.)	50·9	55·0
Mean Temperature from Dry Bulb	52·8	55·3
Adopted Mean Temperature	51·9	55·1
Mean Temperature of Evaporation	48·9	52·0
Mean Temperature of Dew Point	45·9	48·5
Mean elastic force of Vapour	inches 0·311	0·351
Mean weight of Vapour in a cub. ft. of air, grains	3·5	3·9
Mean additional weight required for saturation ,,	0·9	1·0
Mean degree of Humidity (saturation 100)	80	78
Mean weight of a cubic foot of air	grains 535·0	531·2
Mean amount of Cloud (0—10)	6·9	7·3
Fall of Rain	inches 2·791	3·438
Greatest Rainfall in one day (21st)	,, 0·400	0·807
No. of days on which $\geq 0\cdot05$ in. or more Rain fell...	16	15·3

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	3	12	1	0	2	5	6	1
Mean Velocity in miles per hour	7·3	6·1	3·4	0	9·2	5·3	6·6	9·0
Total No. of miles for each Direction	527	1755	81	0	440	637	952	216

	Mean.*
Total No. of miles registered	4608
Greatest hourly velocity (23rd, 11 a.m. Dir. S.)	25
	6237·1
	30·3

* For the last 45 years.

JUNE, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0.015 in.
Monthly range	„	...	...	...	+ 0.225 „
Mean of highest temperatures	...	...	...	...	— 6.0°
Mean of lowest	„	...	...	...	— 2.2°
Mean daily range	„	...	...	...	— 3.8°
Adopted mean temperature	...	...	...	...	— 3.2°
Total rainfall	...	...	...	...	— 0.647 in.

Ground frost on 3rd and 7th. Hoar frost on 7th. Thunder on 10th, 23rd, 27th and 28th. Lightning on 27th. Solar halo on 2nd, 7th, 13th and 24th.

The mean temperature for this month is the lowest on record, with the sole exception of June, 1907.

EXTREME READINGS FOR JUNE, During 62 Years.

Highest reading of the Barometer	.....	1874 (15th)	.....	30.219 in.
Lowest	„	„	.....	28.813 „	
Highest temperature	.....	1893 (18th)	.....	88.7°
Lowest	„	1902 (9th)	32.0°	
Highest adopted mean temperature	.....	1858	.....	59.0°
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.

JULY, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29·457	29·521							
Highest ,, ,, on the 19th... ,,	29·853	29·896							
Lowest ,, ,, on the 25th... ,,	28·837	29·014							
Range of Barometer Readings	1·016	0·882							
Highest Reading of a Max. Therm. on the 2nd	71·0	78·7							
Lowest Reading of a Min. Therm. on the 1st ...	42·5	42·3							
Range of Thermometer Readings.....	28·5	36·4							
Mean of Highest Daily Readings.....	61·7	67·7							
Mean of Lowest Daily Readings	51·5	50·9							
Mean Daily Range	10·2	16·8							
Deduced Mean Temp. (from mean of Max. and Min.)	56·6	57·7							
Mean Temperature from Dry Bulb	56·6	57·8							
Adopted Mean Temperature.....	56·6	57·9							
Mean Temperature of Evaporation	53·2	54·8							
Mean Temperature of Dew Point... ..	50·0	52·1							
Mean elastic force of Vapour.....inches	0·362	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)	79	81							
Mean weight of a cubic foot of air	grains 527·7	527·6							
Mean amount of Cloud (0—10)	8·3	7·5							
Fall of Rain	inches 7·513	4·064							
Greatest Rainfall in one day (15th)	,, 1·010	0·871							
No. of days on which ·005 in. or more Rain fell...	27	16·7							
	N	NE	E	SE	S	SW	W	NW	
	0	1	0	1	1	6	18	4	
	No. of days in the month on which the prevailing Wind was								
0	3·2	0	3·4	6·9	11·6	11·9	10·5		
Mean Velocity in miles per hour									
0	77	0	82	165	1677	5130		1005	
Total No. of miles for each Direction									
Total No. of miles registered						8136		Mean.*	
						6573·5		29·5	
Greatest hourly velocity (30th, 2 p.m. Dir. W.S.W.)						30			

* For the last 42 years.

JULY, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	— 0·064 in.
Monthly range	„	...	...	...	+ 0·134 „
Mean of highest temperatures	...	...	...	...	— 6·0°
Mean of lowest	„	...	...	...	+ 0·6°
Mean daily range	„	...	...	...	— 6·6°
Adopted mean temperature	...	...	...	...	— 1·3
Total rainfall	...	...	...	...	+ 3·449 in.

A remarkably wet and cold month.

Hail on 23rd. Heavy rain on 5th, 9th, 15th, 23rd, 29th and 30th. Thunder on 5th, 7th, 10th, 23rd, 24th and 25th. Lightning on 7th, 23rd and 24th. Solar halo on 15th and 24th.

EXTREME READINGS FOR JULY, During 62 Years.

Highest reading of Barometer	.....	1868 (24th)	.....	30·112 in.
Lowest	„	„	.....	28·564 „	
Highest temperature	.....	1901 (20th)	.....	89·0°
Lowest	„	1857 (1st)	36·0°	
Highest adopted mean temperature	.....	1901	.....	63·2°
Lowest	„	„	1888	54·5°
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	.....	†1861	.....	27
or more rain fell	.....	.....	.....	.....
Least	„	„	†1863	8
*Greatest hourly velocity of the wind	...	1892 (8th)	.....	44 mls.	
*Greatest No. of miles registered	.....	1877	.....	8288
*Least	„	„	1872	4668

* Since 1867 only.

† And in other years.

AUGUST, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29.560	29.496							
Highest ,, ,, on the 11th... ,,	29.909	29.892							
Lowest ,, ,, on the 18th... ,,	29.043	28.950							
Range of Barometer Readings	0.866	0.942							
Highest Reading of a Max. Therm. on the 15th...	75.1	76.7							
Lowest Reading of a Min. Therm. on the 30th...	44.7	41.5							
Range of Thermometer Readings.....	30.4	35.2							
Mean of Highest Daily Readings.....	63.8	66.8							
Mean of Lowest Daily Readings	51.8	50.5							
Mean Daily Range	12.0	16.3							
Deduced Mean Temp. (from Mean of Max. and Min.)	57.8	57.0							
Mean Temperature from Dry Bulb	58.5	57.6							
Adopted Mean Temperature.....	58.2	57.3							
Mean Temperature of Evaporation	54.9	54.4							
Mean Temperature of Dew Point.....	51.9	51.7							
Mean elastic force of Vapour.....inches	0.388	0.386							
Mean weight of Vapour in a cub. ft. of air, grains	4.4	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	527.8	527.6							
Mean amount of Cloud (0—10)	5.9	7.3							
Fall of Rain	inches 3.188	5.037							
Greatest Rainfall in one day (20th)	0.900	1.062							
No. of days on which .005 in. or more Rain fell...	18	18.4							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	0	3	0	0	1	4	21	2	
Mean Velocity in miles per hour	0	6.8	0	0	7.2	6.0	7.8	8.5	
Total No. of miles for each Direction	0	493	0	0	174	576	3925	406	
Total No. of miles registered	5574							Mean.*	
	6553.6								
Greatest hourly velocity (31st, 9 a.m. Dir. N.N.W.)	27							32.2	

* For the last 62 years.

AUGUST, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0.064 in.
Monthly range	„	...	...	...	— 0.076 „
Mean of highest temperatures	...	...	...	...	— 3.0°
Mean of lowest	„	...	...	...	+ 1.3°
Mean daily range	„	...	...	...	— 4.3°
Adopted mean temperature	...	...	...	...	+ 0.9°
Total rainfall	...	...	...	...	— 1.849 in.

Solar halo on the 3rd. Thunder and lightning on the 16th.
Heavy rain on the 20th.

EXTREME READINGS FOR AUGUST, During 62 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	1899	.....61.7°
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, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29-629	29-535							
Highest ,, ,, on the 14th... ,,	29-988	30-024							
Lowest ,, ,, on the 7th ... ,,	29-037	28-867							
Range of Barometer Readings	,, 0-951	1-157							
Highest Reading of a Max. Therm. on the 24th...	62-1	72-3							
Lowest Reading of a Min. Therm. on the 9th ...	38-1	36-4							
Range of Thermometer Readings.....	24-0	35-9							
Mean of Highest Daily Readings.....	58-1	62-3							
Mean of Lowest Daily Readings	46-5	47-1							
Mean Daily Range	11-6	15-2							
Deduced Mean Temp. (from mean of Max. and Min.)	51-0	53-5							
Mean Temperature from Dry Bulb	52-8	54-2							
Adopted Mean Temperature	51-9	53-8							
Mean Temperature of Evaporation	49-7	51-0							
Mean Temperature of Dew Point.....	47-6	48-4							
Mean elastic force of Vapour.....inches	0-330	0-340							
Mean weight of Vapour in a cub. ft. of air, grains	3-7	4-0							
Mean additional weight required for saturation ,,	0-7	0-8							
Mean degree of Humidity (saturation 100).....	86	82							
Mean weight of a cubic foot of air.....grains	535-9	532-5							
Mean amount of Cloud (0-10)	6-4	6-8							
Fall of Rain	inches 3-534	4-369							
Greatest Rainfall in one day (5th and 27th) ,,	0-825	0-964							
No. of days on which .005 in. or more Rain fell...	14	16-8							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	5	11	1	2	1	0	7	3	
Mean Velocity in miles per hour	4-9	5-1	7-3	6-5	3-5	0	7-6	8-7	
Total No. of miles for each Direction	584	1341	175	312	84	0	1271	625	
Total No. of miles registered	4392							Mean.*	
	Greatest hourly velocity (6th, 3 p.m. Dir. W.)...							6175-9	
							33-3		

* For the last 42 years.

SEPTEMBER, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0·094 in.
Monthly range	„	...	...	...	— 0·206 „
Mean of highest temperatures	...	..	...	...	— 4·2°
Mean of lowest	„	...	...	...	— 0·6°
Mean daily range	„	...	...	...	— 3·6°
Adopted mean temperatures	...	...	...	...	— 1·9°
Total rainfall	...	...	...	...	— 0·835 in.

Hoar frost on 2nd, 5th, 9th, 14th, 15th and 21st. Heavy rain on 5th and 27th. Thunder and lightning on 23rd. Lunar halo on 30th. Solar halo on 19th and 30th.

EXTREME READINGS FOR SEPTEMBER, During 62 Years.

Highest reading of Barometer	.....	1851 (15th)	.....	30·274 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	„	.....	1894	..... 0·801 „
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, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29·303	29·432							
Highest ,, ,, on the 31st... ,,	29·848	30·017							
Lowest ,, ,, on the 5th ... ,,	28·738	28·671							
Range of Barometer Readings	1·110	1·346							
Highest Reading of a Max. Therm. on the 11th...	62·1	64·2							
Lowest Reading of a Min. Therm. on the 31st ...	27·5	29·2							
Range of Thermometer Readings.....	34·6	35·0							
Mean of Highest Daily Readings	54·2	54·6							
Mean of Lowest Daily Readings	43·9	41·8							
Mean Daily Range	10·3	12·8							
Deduced Mean Temp. (from mean of Max. and Min.)	48·1	47·2							
Mean Temperature from Dry Bulb	49·5	47·8							
Adopted Mean Temperature	48·8	47·5							
Mean Temperature of Evaporation	47·2	45·4							
Mean Temperature of Dew Point.....	45·4	43·0							
Mean elastic force of Vapour.....inches	0·305	0·278							
Mean weight of vapour in a cub. ft. of air, grains	3·4	3·2							
Mean additional weight required for saturation ,,	0·5	0·6							
Mean degree of Humidity (saturation 100).....	89	84							
Mean weight of a cubic foot of air.....grains	533·5	537·5							
Mean amount of Cloud (0—10)	7·2	7·4							
Fall of Rain	inches 5·457	5·055							
Greatest Rainfall in one day (23rd)	1·200	0·977							
No. of days on which ·005 in. or more Rain fell...	22	19·1							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	5	2	0	1	6	13	3	1	
Mean Velocity in miles per hour	6·1	11·5	0	9·0	13·4	11·2	14·8	13·4	
Total No. of miles for each Direction	726	551	0	216	1928	3483	1068	321	
Total No. of miles registered	8293							Mean.*	
	7094·0							38·8	
Greatest hourly velocity (13th, 9 a.m. Dir. S.)	45								

* For the last 42 years.

OCTOBER, 1909.

DIFFERENCES.

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

Mean barometric pressure	— 0·129 in.
Monthly range	— 0·236 „
Mean of highest temperatures	— 0·4°
Mean of lowest	+ 2·1°
Mean daily range	— 2·5°
Adopted mean temperature	+ 1·3°
Total rainfall	+ 0·402 in.

Ground frost on 25th—27th, 29th—31st. Hoar frost on 25th, 30th and 31st. Hail on 13th, 21st and 24th. Heavy rain on 3rd, 19th and 23rd. Gales of wind on 13th. Thunder on 13th, 18th and 21st. Lightning on 12th, 13th, 21st, 30th and 31st. Lunar halo on 27th and 28th. Solar halo on 11th, 14th, 26th and 28th.

EXTREME READINGS FOR OCTOBER, During 62 Years.

Highest reading of Barometer	1884 (5th) ..	30·306 in.	
Lowest	„ „ ..	1862 (19th).....28·139 „	
Highest temperature	1908 (1st) ..	73·9°	
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 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

NOVEMBER, 1909.

Results of Observations taken during the Month.	Mean for the last 62 years.	
Mean Reading of the Barometer .....inches	29·586	29·476
Highest ,, ,, on the 23rd... ,,	29·994	30·068
Lowest ,, ,, on the 30th... ,,	28·684	28·578
Range of Barometer Readings ,,	1·310	1·490
Highest Reading of a Max. Therm. on the 3rd ...	54·2	55·9
Lowest Reading of a Min. Therm. on the 14th...	25·0	25·5
Range of Thermometer Readings.....	29·2	30·4
Mean of Highest Daily Readings.....	46·0	47·4
Mean of Lowest Daily Readings	35·3	36·7
Mean Daily Range	10·7	10·7
Deduced Mean Temp.(from mean of Max. and Min.)	40·4	41·6
Mean Temperature from Dry Bulb	40·9	42·0
Adopted Mean Temperature	40·7	41·8
Mean Temperature of Evaporation	39·1	39·8
Mean Temperature of Dew Point.....	37·1	38·3
Mean elastic force of Vapour.....inches	0·220	0·233
Mean weight of Vapour in a cub. ft. of air, grains	2·6	2·7
Mean additional weight required for saturation ,,	0·4	0·4
Mean degree of Humidity (saturation 100).....	87	87
Mean weight of a cubic foot of air..... grains	547·8	544·8
Mean amount of Cloud (0—10)	6·2	7·4
Fall of Rain	2·686	4·360
Greatest Rainfall in one day (28th) ,,	0·720	0·978
No. of days on which ·005 in. or more Rain fell...	13	17·6

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing Wind was	4	8	0	0	1	6	6	5
Mean Velocity in miles per hour	5·3	4·9	0	0	14·5	10·0	9·9	8·3
Total No. of miles for each Direction	505	948	0	0	347	1440	1423	993

Total No. of miles registered	5656	7300·9
Greatest hourly velocity (12th, 6 p.m. Dir. W.)	39	42·4

* For the last 62 years.

NOVEMBER, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	+ 0.110 in.
Monthly range	„	...	...	...	— 0.180 „
Mean of highest temperatures	...	..	...	...	— 1.4°
Mean of lowest	„	...	...	...	— 1.4°
Mean daily range	„	...	...	...	0.0°
Adopted mean temperature	...	...	...	...	— 1.1°
Total rainfall	...	...	...	...	— 1.674 in.

A remarkably fine dry month, with a total absence of fog, and a record of bright sunshine. The total amount, 73½ hours, exceeded the previous record, in 1903, by 8¼ hours.

Ground frost on 7th, 8th, 11th, 13th—26th. Hoar frost on 7th, 8th, 14th—18th, and 20th. Heavy rain on 28th. Gales of wind on 12th. Lightning on 27th. Lunar halo on 24th and 28th. Solar halo on 14th.

EXTREME READINGS FOR NOVEMBER, During 62 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	.....	1872	27
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, 1909.

Results of Observations taken during the Month.		Mean for the last 62 years.							
Mean Reading of the Barometer	inches 29·200	29·447							
Highest ,, ,, on the 14th... ,,	30·120	30·080							
Lowest ,, ,, on the 3rd ... ,,	27·709	28·539							
Range of Barometer Readings	2·411	1·541							
Highest Reading of a Max. Therm. on the 28th...	52·0	53·0							
Lowest Reading of a Min. Therm. on the 21st ...	15·1	20·5							
Range of Thermometer Readings.....	36·9	32·5							
Mean of Highest Daily Readings.....	42·4	43·2							
Mean of Lowest Daily Readings	33·3	33·2							
Mean Daily Range	9·1	10·0							
Deduced Mean Temp. (from mean of Max. and Min.)	37·9	38·2							
Mean Temperature from Dry Bulb	38·5	38·8							
Adopted Mean Temperature	38·2	38·5							
Mean Temperature of Evaporation	37·1	37·0							
Mean Temperature of Dew Point.....	35·6	35·1							
Mean elastic force of Vapour.....inches	0·208	0·206							
Mean weight of Vapour in a cub. ft. of air, grains	2·4	2·4							
Mean additional weight required for saturation ,,	0·3	0·4							
Mean degree of Humidity (saturation 100).....	91	87							
Mean weight of a cubic foot of air.....grains	543·6	547·8							
Mean amount of Cloud (0—10)	7·9	7·6							
Fall of Rain	inches 7·252	4·517							
Greatest Rainfall in one day (2nd)	,, 1·310	0·850							
No. of days on which ·005 in. or more Rain fell...	25	19·5							
No. of days in the month on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW	
	3	3	5	1	2	4	10	3	
Mean Velocity in miles per hour	3·6	7·6	11·8	15·5	7·7	7·0	12·6	4·8	
Total No. of miles for each Direction	257	549	1417	371	369	673	3029	342	
Total No. of miles registered	7007							Mean.*	
	7753·7								
Greatest hourly velocity (3rd, 5 a.m. Dir. W.N.W.)..	49							42·8	

* For the last 42 years.

DECEMBER, 1909.

DIFFERENCES.

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

Mean barometric pressure	...	...	...	...	— 0·247 in.
Monthly range	„	...	...	...	+ 0·870 „
Mean of highest temperatures	...	...	...	...	— 0·8°
Mean of lowest	„	...	...	...	+ 0·1°
Mean daily range	„	...	...	...	— 0·9°
Adopted mean temperature	...	...	...	...	— 0·3°
Total rainfall	...	...	...	...	+ 2·735 in.

The Monthly Range of barometric pressure, 2,411 inches, has been exceeded but once in the 62 years. (See page 27.)

Ground frost on 2nd, 4th—9th, 18th—22nd, 24th—26th, 29th, and 30th. Hoar frost on 4th. Snow on 4th—7th, 18th—20th, and 22nd. Hail on 6th, 19th, 20th, and 25th. Heavy rain on 1st, 2nd, 10th, 21st, 27th, and 30th. Gales of wind on 3rd. Thunder on 19th. Lightning on 5th and 19th. Lunar halo on 21st and 25th.

EXTREME READINGS FOR DECEMBER.

During 62 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, 1909.

Results of Observations taken during the Year.		Mean for the last 62 years.
<i>Readings of Barometer in inches.</i>		
Mean of the Year.....	29·495	29·497
Highest Monthly Mean (February)	29·711	29·747
Lowest „ „ (March)	29·090	29·228
Highest Reading (January 4th).....	30·273	30·294
Lowest „ (December 3rd).....	27·709	28·243
Range	2·564	2·051
<i>Thermometer, Fahrenheit.</i>		
Highest Monthly Mean Temperature (August)...	58·2	58·6
Lowest „ „ „ (Feb.)	37·3	35·3
Highest Reading of a Max. Therm. (August 15th)	75·1	81·6
Lowest „ Min. „ (Dec. 21st) ...	15·1	15·7
Range of Thermometer Readings.....	60·0	65·9
Mean of Highest Daily „	52·1	54·7
Mean of Lowest Daily „	40·6	40·7
Mean Daily Range	11·5	14·0
Deduced Mean Temp. (from mean of Max. and Min.)	45·6	46·8
Mean Temperature from Dry Bulb	46·7	46·9
Adopted Mean Temperature of the Year	46·2	46·8
Mean Temperature of Evaporation	43·9	44·5
Mean Temperature of Dew Point.....	41·4	42·1
Mean elastic force of Vapour .....inches	0·268	0·273
Mean weight of Vapour in a cub. ft. of air...grns.	3·1	3·3
Mean additional weight required for saturation „	0·7	0·7
Mean degree of Humidity (saturation 100).....	84	84
Mean weight of a cubic foot of air .....grns.	540·0	539·3
Mean amount of Cloud (0—10)	6·6	7·3
Total fall of Rain .....inches	48·769	46·928
Greatest Monthly Rainfall (July)	7·513	7·494
Least „ „ (May)	2·445	1·228
Greatest Rainfall in one day (Feb. 3rd)... „	2·000	1·627
No. of days per Month on which ·005 inch or more Rain fell ..	17·8	17·0

SUMMARY OF WIND, 1909.

No. of days in the year on which the prevailing Wind was	N	NE	E	SE	S	SW	W	NW
	27	68	21	15	34	62	107	31
Mean Velocity in miles per hour	5·7	6·0	10·1	10·1	9·9	8·6	10·7	9·1
Total No. of miles for each Direction	3664	9730	5070	3627	8097	12750	27450	6777

		Mean for the last 42 years.
Total No. of miles registered	77165	86864·4
Greatest Monthly Total (October)	8293	10082·7
Least ,, ,, (September)	4392	5101·1
Greatest hourly velocity (December 3rd)	49	52·0
Prevailing Direction of Wind	W	W

DIFFERENCES, 1909.

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

Mean barometric pressure	— 0·002 in
Yearly range ,,	+ 0·513 ,,
Mean of highest temperatures	— 2·6°
Mean of lowest ,,	— 0·1°
Mean daily range	— 2·5°
Adopted mean temperature	— 0·6°
Total rainfall	+ 1·841 in.

**ABSOLUTE EXTREMES
FOR THE LAST 62 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

* By a clerical error, this value has been quoted wrongly since 1886.

The greatest monthly ranges of the period are as follows:—

1884, Jan., 2,409 inches.

1886, Dec., 2,795 "

1909, Dec., 2,411 "

† And on other dates.

ABSOLUTE EXTREMES
FOR THE LAST 62 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	8575
Least " " "	September	6176
Greatest No. " " year...	1868	102395
Least " " " " ...	1909	77165

DATES OF OCCASIONAL PHENOMENA.

1909.	Frost.	Hoar Frost.	Snow.	Hail.	Heavy Rain.
January	6, 8, 9, 12, 13, 15-17, 19-31	20, 21, 26, 27, 28	3, 15, 16, 24, 31	12, 15, 16	14
February	1, 2, 6-10, 12-14, 16-28	7, 14, 17, 19	5, 9, 25, 26, 27, 28	9, 15, 28	2, 3, 4
March	1-17, 22, 27	17, 22	1-4, 6, 7, 9, 11, 12-15, 17	11	24, 28
April	1, 2, 5, 7-10, 15, 19, 21, 30	9		28	13, 19, 24
May	1, 2, 3, 9, 13-16, 19	1, 2, 13, 16, 19	15	1, 14	25
June	3, 7	7			
July				23	5, 9, 15, 23, 29, 30
August					20
September	2, 5, 9, 14, 15, 21				5, 27
October	25-27, 29-31	25, 30, 31		13, 21, 24	3, 19, 23
November	7, 8, 11, 13-26	7, 8, 14-18, 20			28
December	2, 4-9, 18-22, 24-26, 29, 30	4	4-7, 18-20, 22	6, 19, 20, 25	1, 2, 10, 21, 27, 30

1908.	Gales of Wind.	Fog.	Thunder.	Lightning.	*Lunar Halo.	*Solar Halo.	Aurora Borealis.
January	16, 18	1, 9, 10	7	7, 16	9, 30		
February	5	16			5	8	
March					1, 4, 5		
April			23, 26, 27	23, 26, 27	2	2, 3, 4, 11, 18, 19, 21	
May			10, 23, 27, 28	27		2, 3, 14, 18, 19, 22	
June			5, 7, 10, 23, 24, 25	7, 23, 24		2, 7, 13, 24	
July			16	16		15, 24	
August			23	23	30	3	
September			13, 18, 21	12, 13, 21, 30, 31	27, 28	19, 30	
October	13			27	24, 28	11, 14, 26, 28	
November	12		19	5, 19	21, 25	14	
December	3						

* 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 ...	...	...	...	...	0.6	4.0	5.8	8.4	8.1	6.6	3.9	0.4	...	...	...	...	...
February ...	...	...	...	0.3	5.6	9.7	11.7	11.9	12.6	10.5	9.6	5.8	0.4	0.1	...	...	...
March ...	...	...	0.1	2.6	5.2	8.1	10.3	9.3	6.2	7.5	8.6	8.2	4.9	0.2	0.1	...	...
April ...	...	0.8	6.6	12.9	17.1	19.1	20.3	19.5	18.6	17.8	17.3	15.5	14.0	11.6	3.5	0.1	...
May ...	0.1	7.2	12.0	17.1	18.2	19.7	19.3	19.9	19.5	20.4	18.5	20.3	18.8	15.2	11.7	3.9	...
June ...	1.8	6.7	8.7	9.7	11.5	12.5	12.7	10.8	9.0	8.6	9.6	10.2	10.6	10.1	7.9	6.0	0.7
July ...	0.5	5.4	9.1	8.8	9.0	9.4	8.5	8.1	10.0	10.6	9.7	10.7	8.9	8.0	8.3	5.3	0.6
August ...	...	0.4	5.2	9.2	10.9	12.6	10.6	14.0	14.1	12.8	14.0	13.8	12.4	11.4	9.1	2.7	...
September ...	...	...	1.0	4.0	6.8	8.2	10.6	11.1	11.5	8.0	9.1	8.5	7.5	3.5	0.6	...	...
October ...	...	...	...	1.0	6.9	11.8	12.5	13.5	11.7	11.4	10.6	7.3	1.7	...	...	...	...
November ...	...	...	...	...	1.6	8.2	11.0	11.1	12.8	11.6	11.2	5.6	0.4	...	...	...	...
December ...	...	...	...	...	0.2	3.0	4.7	6.3	5.6	6.0	3.5	0.3	0.3	...	...	...	...
Sums ...	2.4	20.5	42.7	65.6	93.6	126.3	138.0	143.9	139.7	131.8	125.6	106.6	79.9	60.1	41.2	18.0	1.3

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1909.																	
January	0.2	0.1	4.1	...	0.6	...	4.2	...	...	2.7	0.3	...
February	...	5.0	...	...	5.6	4.9	0.7	...	...	...	...	2.2	7.5	...	5.6	4.3	1.2
March	...	0.6	...	7.3	5.9	...	0.1	4.2	...	...	0.4	3.8	0.9	5.5	7.5	4.4	3.6
April	...	10.2	0.1	0.2	11.4	9.8	10.3	10.0	11.2	10.9	4.7	3.7	2.2	11.1	10.5	1.7	1.1
May	...	9.7	10.4	7.1	14.5	12.2	13.6	14.8	13.4	13.5	11.3	4.1	1.9	7.8	8.9	5.0	4.6
June	...	6.0	5.6	7.9	...	8.3	15.0	1.4	2.9	3.1	6.1	1.9	13.9	4.3	13.1	3.1	12.8
July	...	7.5	0.4	4.8	0.1	1.0	4.0	15.4	0.2	8.1	2.0	13.4	1.6	0.5	1.0	0.6	8.3
August	4.7	5.1	5.3	13.9	13.4	7.9	12.5	12.9	4.4	9.6	7.4	0.2	7.2	1.4	3.7
September	...	2.9	0.3	0.2	8.1	5.2	2.8	2.8	0.8	4.3	4.8	0.8	0.9	4.0	7.8	1.7	2.0
October	2.3	6.2	0.1	3.1	4.9	0.4	0.1	4.6	1.2	4.2	...	2.9	1.9
November	...	0.8	...	...	...	...	5.5	6.8	...	5.7	0.6	...	7.9	1.2	6.6	5.6	6.8
December	0.6	1.6	3.6	...	...	2.5	...	...	...	...	...	...	3.9	...	...

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

	MONTHLY.															
	Total.	Percentage.	31	30	29	28	27	26	25	24	23	22	21	20	19	18
1909.																
January	37.8	15.2	...	5.8	2.4	...	2.2	0.3	2.9	...	1.6	...	4.9	4.3	1.2	...
February	78.2	28.8	...	...	0.8	0.8	...	1.7	...	3.4	6.8	5.1	7.8	7.0	0.6	...
March	71.3	19.5	0.7	...	0.8	...	5.3	4.5	1.2	...	4.2	0.2	2.5	0.8	...	...
April...	194.7	46.5	...	12.6	9.6	2.8	5.3	1.0	6.5	0.8	7.9	7.9	6.4	4.1	7.9	...
May ...	241.8	49.1	...	8.0	4.5	2.7	3.5	2.1	...	9.6	5.4	4.4	7.0	7.5	11.6	...
June ...	147.1	29.0	...	11.7	6.3	0.5	0.3	5.0	0.3	3.0	...	0.9	0.5	0.9	0.6	...
July ...	130.9	25.7	1.2	6.0	1.0	12.7	0.8	4.6	1.5	0.1	8.7	0.7	0.8	5.5	4.8	...
August	153.2	33.5	7.3	1.8	...	4.6	2.1	4.8	0.5	...	7.8	...	6.3	4.4	1.7	...
September	90.4	23.9	...	0.3	4.6	...	...	0.6	0.4	1.5	2.0	2.0	2.1	4.4	5.7	...
October	88.4	27.1	7.0	7.3	6.3	0.1	6.5	...	7.5	1.8	...	...	4.3	3.1	6.3	...
November	73.5	28.7	...	0.8	...	...	1.3	...	0.2	...	5.4	5.4	0.9	2.9	3.6	...
December	29.9	12.9	3.3	...	3.9	...	...	...	4.1	3.9	...	...	0.6	...	0.3	...

SUMMARY OF SUNSHINE.

	BRIGHT SUNSHINE RECORDED.					
	1909.			Mean for the last 29 years.		
	Number of		Percentage of Possible Sunshine.	Number of		Percentage of Possible Sunshine.
	Days.	Hours.		Days.	Hours.	
January ...	16	37·8	15·2	14·2	34·4	13·9
February ...	18	78·2	28·8	17·7	60·1	22·0
March ...	23	71·3	19·5	24·0	107·7	29·4
April ...	30	194·7	46·5	26·3	151·5	36·2
May... ...	29	241·8	49·1	27·5	189·2	38·4
June ...	28	147·1	29·0	27·8	191·6	37·7
July ...	31	130·9	25·7	28·4	178·8	35·1
August ...	27	153·2	33·5	27·5	152·5	33·4
September ...	28	90·4	23·9	25·7	125·3	33·1
October ...	25	88·4	27·1	23·0	87·4	26·8
November ...	19	73·5	28·7	17·1	45·6	17·8
December ...	12	29·9	12·9	12·9	25·7	11·1
Year ...	286	1337·2	30·0	272·1	1349·8	30·2

SUMMARY OF SUNSHINE—Continued.
EXTREMES FOR THE LAST 29 YEARS.

MONTH.	Number of Days		Number of Hours				Percentage of Possible Sunshine.	
	on which Sunshine was recorded.						Greatest	Least
	Greatest	Least	Greatest	Least	Greatest	Least		
	No. Year	No. Year	No. Year	No. Year	No. Year	% Year	% Year	
Jan.	21 1881	8 1898	64·2 1881	14·9 1885	25·9 1881	6·0 1885		
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	67·0 1895	46·1 1907	18·3 1895		
Apr.	30 1909	22 1905	223·7 1893	95·7 1889	53·4 1893	22·8 1889		
May	30 *1881	22 1886	266·6 1881	79·7 1906	54·1 1881	16·2 1906		
June	30 *1896	24 *1888	272·5 1887	109·0 1907	53·6 1887	21·5 1907		
July	31 *1882	25 1888	247·2 1887	98·0 1888	48·6 1887	19·3 1888		
Aug.	31 *1886	23 1894	235·2 1899	88·4 1891	51·5 1899	19·3 1891		
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	13·8 1903	26·0 1886	6·0 1903		
Year	300 1905	251 1903	1613·7 1887	1132·1 1888	36·1 1887	25·3 1888		

* And in other years.

OBSERVATIONS OF UPPER CLOUDS (CIRRUS.)

1909.	G. M. T.	CLOUD.		WIND.		Direction of Lower Clouds.
		Direction.*	Velocity (0-6.)	Direction.*	Force (0-12.)	
Jan. 7	9-0 p.m.	W by S	3	W	4	W
„ 8	9-0 p.m.	NW	3	NW	3	NW
„ 14	9-0 a.m.	W	3	W by S	5	—
„ 19	9-0 a.m.	SSW	3	WSW	1	S
„ 19	9-0 p.m.	NW	2	W	3	—
Feb. 7	9-0 a.m.	E	3	Calm	0	SE
„ 8	9-0 a.m.	S	4	SE	1	SW
„ 15	9-0 a.m.	NW by W	4	NW by N	1	NW
„ 16	9-0 a.m.	NW	3	Calm	0	N
„ 17	9-0 a.m.	NNW	3	Calm	0	NW
Mar. 13	9-0 a.m.	NNE	3	WNW	2	W by N
„ 15	9-0 a.m.	NE by N	3	NE	1	NE
„ 27	Noon	W by N	3	SW	1	SW by W
Apr. 5	9-0 a.m.	E by N	3	E	3	E
„ 29	Noon	W by S	2	W	3	W by N
May 3	9-0 a.m.	S by W	2	S	4	S
„ 3	5-0 p.m.	S by E	2	S	4	SW
„ 4	9-0 a.m.	S by E	2	SSE	3	S
„ 8	9-0 p.m.	NE	2	Calm	0	—
„ 10	7-30 p.m.	NNW	2	WSW	1	SW
„ 11	5-0 p.m.	NE	2	SW	2	SW
„ 14	9-0 a.m.	W by S	3	W	3	NW
„ 18	9-0 a.m.	NNW	3	W	4	W by N
„ 20	8-0 p.m.	S	2	Calm	0	SW
„ 21	Noon	S by E	4	S	3	—
„ 22	9-0 p.m.	S by W	2	SW by W	1	SW
„ 29	9-0 p.m.	SW	2	SW by W	2	W
„ 30	Noon	E	2	WSW	3	W by S

* Whence coming.

OBSERVATIONS OF UPPER CLOUDS (CIRRUS)—*Continued.*

1909.	G. M. T.	CLOUD.		WIND.		Direction of Lower Clouds.
		Direction.*	Velocity (0-6.)	Direction.*	Force (0-12.)	
June 1	9-0 a. m.	S by W	4	W	2	SW
„ 2	9-0 a. m.	NE	3	NE	2	N by E
„ 3	9-0 a. m.	S	3	NE	2	NE
„ 4	9-0 a. m.	S	3	NE by N	2	NE
„ 6	9-0 p. m.	NE	3	NE	1	—
„ 7	9-0 a. m.	E by S	3	NE	1	SW
„ 12	9-0 p. m.	NE	2	Calm	0	N
„ 13	9-0 p. m.	N	2	Calm	0	—
„ 14	9-0 a. m.	SE	3	Calm	0	W
„ 15	10-0 a. m.	NE	4	NE by N	2	—
„ 17	9-0 p. m.	NW	2	S	1	—
„ 24	9-0 a. m.	S	3	NE	1	NE
„ 26	9-0 a. m.	N	3	NNW	2	NNW
„ 27	9-0 p. m.	S	3	Calm	0	SW
July 7	10-0 a. m.	N by W	3	W	2	SW by W
„ 8	5-0 p. m.	N	4	WNW	2	—
„ 10	9-0 a. m.	N by W	3	NW	3	NW by W
„ 12	3-0 p. m.	N by E	3	W	3	W
„ 17	1-0 p. m.	NNE	4	WSW	4	W by S
„ 18	9-0 p. m.	NW	3	W	1	—
„ 20	10-0 a. m.	N by E	4	WSW	2	SW
„ 27	9-0 a. m.	W	3	SW by S	1	SW
Aug. 4	6-0 p. m.	W	2	WSW	2	—
„ 5	Noon	E	3	WNW	1	SW by W
„ 5	8-0 p. m.	SW	3	Calm	0	—
„ 7	10-0 a. m.	W by N	3	W	2	W by S
„ 7	1-0 p. m.	S by W	4	WSW	2	—
„ 12	Noon	W	4	WSW	4	—
„ 13	Noon	NW	4	WSW	4	W

* Whence coming.

D

OBSERVATIONS OF UPPER CLOUDS
(CIRRUS)—*Continued.*

1909.	G. M. T.	CLOUD.		WIND.		Direction of Lower Clouds.
		Direction.*	Velocity (0-6.)	Direction.*	Force (0-12).	
Aug. 16	6-0 p.m.	S	4	WSW	2	W
„ 18	5-0 p.m.	NW	4	W	2	W
„ 27	9-0 a.m.	W	3	W by N	3	W
„ 28	5-0 p.m.	SW by W	3	W	2	W
„ 30	9-0 a.m.	SW	3	WSW	3	W
Sept. 1	9-0 a.m.	NNW	3	NW by W	5	NW
„ 2	Noon	W	3	WSW	2	SW by W
„ 4	9-0 a.m.	W	3	WSW	2	WSW
„ 7	2-0 p.m.	NW	6	NW by N	2	N
„ 12	9-0 a.m.	NE	3	Calm	0	N
„ 19	9-0 a.m.	NW	3	Calm	0	SW
„ 20	Noon	NW	3	W	1	W
„ 25	9-0 a.m.	NW	2	NE by N	1	W
„ 27	9-0 a.m.	SW	4	Calm	0	NE
Oct. 5	9-0 p.m.	W	2	S	5	W
„ 6	5-0 p.m.	W by N	2	SW by W	1	W by S
„ 14	9-0 a.m.	S	3	WSW	1	S by W
„ 19	9-0 a.m.	NW	3	SW	2	SW
„ 25	9-0 a.m.	NW	3	NW	3	W
„ 26	9-0 a.m.	W	3	NE by E	2	NE
„ 27	9-0 a.m.	NW	2	ENE	2	NE
Nov. 8	2-0 p.m.	SW by W	2	W	1	W
„ 24	9-0 a.m.	NW	2	NW	2	W
„ 29	4-0 p.m.	SE by E	4	SW	1	SW
Dec. 4	9-0 a.m.	N	4	Calm	0	N by E
„ 5	9-0 a.m.	N	3	Calm	0	SW
„ 29	10-30 a.m.	NW by W	4	Calm	0	NW

* Whence coming.

MAGNETIC DECLINATION, WEST.

1909.	G. M. T. Civil Day.	Ob- served.	Cor- rected.	1909.	G. M. T. Civil Day.	Ob- served.	Cor- rected.
	D. H. M.	° /	° /		D. H. M.	° /	° /
Jan.	4 16 0	17 32·7	17 32·7	July	3 18 20	17 31·2	17 30·0
"	11 " "	" 35·2	" 35·2	"	12 16 4	" 33·7	" 29·0
"	18 " 5	" 30·7	" 29·7	"	19 " "	" 31·5	" 26·8
"	26 " 7	" 35·0	" 33·0	"	27 " 0	" 31·3	" 29·1
Feb.	3 16 25	17 34·0	17 34·5	Aug.	3 16 0	17 29·1	17 27·3
"	10 " 10	" 33·3	" 33·8	"	11 " "	" 29·7	" 28·4
"	18 " 15	" 31·3	" 31·3	"	19 " "	" 30·8	" 28·0
"	25 " 0	" 31·3	" 31·3	"	27 " "	" 26·2	" 28·4
Mar.	4 16 15	17 33·5	17 33·1	Sept.	3 16 0	17 28·6	17 26·1
"	12 " 0	" 33·8	" 32·4	"	11 " 15	" 28·5	" 27·0
"	20 " "	" 32·5	" 32·1	"	20 " 7	" 27·7	" 26·2
"	28 " "	" 30·5	" 28·1	"	27 " 10	" 23·8	" 26·3
April	3 16 0	17 30·5	17 29·5	Oct.	4 16 0	17 28·8	17 26·5
"	12 " "	" 35·8	" 30·3	"	12 " "	" 25·2	" 23·4
"	19 " "	" 33·9	" 31·4	"	20 " "	" 26·8	" 25·5
"	27 " "	" 35·7	" 32·7	"	27 " "	" 25·7	" 25·4
May	4 16 0	17 31·4	17 31·4	Nov.	4 16 0	17 26·5	17 24·7
"	12 " "	" 31·5	" 31·5	"	11 " "	" 25·4	" 25·1
"	20 " "	" 31·6	" 30·3	"	26 " "	" 24·5	" 24·5
"	28 " 30	" 29·2	" 26·9				
June	4 16 0	17 30·9	17 27·1	Dec.	4 16 0	17 25·2	17 25·8
"	12 " "	" 34·0	" 31·7	"	11 " "	" 23·8	" 23·9
"	19 " "	" 27·5	" 26·2	"	20 " "	" 23·2	" 22·3
"	26 " "	" 31·2	" 28·9	"	27 " "	" 23·5	" 22·6

HORIZONTAL MAGNETIC FORCE.

1909.	G. M. T. Civil Day.	Observed Time of one Vibration.	Temp.	Observed Deflection at 1'0 ft. at 1'3 ft.	Temp.	Deducted Horizontal Force.	Horizontal Force Corrected.
	D. H. M.	S.	°	° /	°	C.G.S.	UNITS.
Jan.	15 10 0	6·0610	47	{ 11 22·8 } { 5 9·1 }	53	0·17415	0·17419
Feb.	15 10 10	6·0622	55	{ 11 22·4 } { 5 9·1 }	58	0·17420	0·17424
Mar.	15 10 10	6·0648	61	{ 11 22·2 } { 5 9·4 }	59	0·17422	0·17430
April	15 10 35	6·0670	64	{ 11 22·4 } { 5 9·3 }	66	0·17406	0·17431
May	15 9 50	6·0750	64	{ 11 24·5 } { 5 10·0 }	52	0·17375	0·17417
June	15 10 40	6·0779	70	{ 11 21·3 } { 5 8·8 }	63	0·17414	0·17428
July	15 9 55	6·0794	57	{ 11 22·3 } { 5 8·2 }	68	0·17376	0·17404
Aug.	17 10 10	6·0816	72	{ 11 20·8 } { 5 8·2 }	72	0·17408	0·17432
Sept.	15 10 45	6·0796	62	{ 11 22·0 } { 5 9·7 }	56	0·17399	0·17423
Oct.	16 10 10	6·0807	70	{ 11 21·5 } { 5 9·0 }	64	0·17410	0·17432
Nov.	15 9 50	6·0790	49	{ 11 21·3 } { 5 9·2 }	46	0·17396	0·17428
Dec.	15 10 0	6·0754	49	{ 11 22·1 } { 5 8·6 }	49	0·17400	0·17418

ABSOLUTE MEASURES—SUMMARY.

DIRECTION.			FORCE.		
1909.	Declination Corrected.	Inclination.	Horizontal.	Vertical.	Total.
	° '	° '	C. G. S. UNITS.		
January ...	17 32·7	68 44·0	0·17419	0·44754	0·48024
February ...	17 32·7	68 39·9	0·17424	0·44610	0·47892
March ...	17 31·4	68 42·5	0·17430	0·44725	0·48001
April ...	17 31·0	68 40·5	0·17431	0·44651	0·47933
May ...	17 30·0	68 44·4	0·17417	0·44765	0·48033
June ...	17 28·5	68 42·0	0·17428	0·44701	0·47978
July ...	17 28·7	68 41·2	0·17404	0·44609	0·47884
August ...	17 28·0	68 41·8	0·17432	0·44705	0·47984
September..	17 26·4	68 42·7	0·17423	0·44715	0·47989
October ...	17 25·2	68 46·0	0·17432	0·44865	0·48133
November ..	17 24·8	68 48·3	0·17428	0·44944	0·48205
December...	17 23·7	68 40·6	0·17418	0·44622	0·47901
Means ...	17 28·6	68 42·8	0·17424	0·44722	0·47996

HORIZONTAL MAGNETIC DIRECTION.

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

1909.	MEANS OF †				Differences. <i>d-c</i>	Mean daily range. ‡	Highest reading of the month.	Lowest reading of the month.	Monthly range.
	Highest readings. (a)	Lowest readings. (b)	<i>a</i> and <i>b</i> .	The readings at 4 a.m. and 4 p.m. (d)					
	17° +						17° +	16° +	
January	35.0	30.2	32.6	32.5	-0.1	16.6	57	31	86
February	35.2	31.0	33.1	32.2	-0.9	12.5	49	65	44
March	36.4	27.4	31.9	30.8	-1.1	17.4	63	59	64
April	35.6	24.9	30.3	30.5	0.2	14.1	41	75	26
May	34.7	23.6	29.1	30.4	1.3	—	77	52	85
June	32.9	23.3	28.1	28.8	0.7	11.6	38	81	17
July	33.3	23.5	28.4	29.0	0.6	11.5	37	77	20
August	34.0	22.3	28.2	27.7	-0.5	15.0	41	66	35
September	31.2	22.1	26.7	26.1	-0.6	14.7	*	*	—
October	31.9	19.1	25.5	24.9	-0.6	16.4	48	48	60
November	27.8	21.7	24.8	24.8	0.0	10.5	39	71	28
December	26.5	20.9	23.7	23.6	-0.1	11.5	33	57	36
Means...	32.9	24.2	28.5	28.4	-0.1	13.5	47.5	62.0	45.5

Mean for the year... 17° 28'5 W.

† For the 10 quietest days.

* Beyond the recording limit.

‡ 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.

1909.	MEANS OF †				Differences. <i>d-c</i>	Mean daily range. ‡	Highest reading of the month.	Lowest reading of the month.	Monthly range.
	Highest readings. (a)	Lowest readings. (b)	a and b. (c)	The readings at 4 a.m. and 4 p.m. (d)					
	17000 +									0 +	17000 +	0 +
January	427	408	418	419	1	57	494	267	227
February	434	411	423	422	-1	40	477	372	105
March	427	399	413	417	4	59	456	301	155
April	438	392	415	425	10	56	464	372	92
May	463	406	435	440	5	—	—	—	—
June	459	407	433	439	6	63	526	380	146
July	452	403	427	436	9	61	484	371	113
August	444	390	417	428	11	74	512	338	174
September	442	396	419	427	8	72	*	*	—
October	434	382	408	414	6	66	512	*	—
November	438	415	427	430	3	42	472	314	158
December	442	419	430	434	4	39	468	341	127
Means ...	442	402	422	428	6	57	487	340	144

Mean for the year ... 0.17425 C. G. S. Units.

† For the 10 quietest days.

* Beyond the recording limit.

‡ 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.

1909.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	1909
D. 1													D. 1
2	g	m	s	s	s	m	s	m	s	m	s	m	2
3	gm	m	s	c	s	s	s	m	s	m	c	s	3
4	vg	s	m	s	s	s	s	s	m	s	c	s	4
5	m	c	s	c	s	s	c	s	s	s	c	s	5
6	c	m	g	c	*	s	c	s	s	s	s	s	6
7	c	m	s	c	*	s	s	s	m	m	s	c	7
8	s	s	s	c	*	s	s	m	m	m	s	s	8
9	s	s	s	c	s	s	s	s	m	s	s	s	9
10	s	s	s	m	s	s	s	s	s	s	s	c	10
11	c	c	s	m	s	m	s	s	s	s	s	s	11
12	s	c	s	m	s	s	m	s	c	s	s	s	12
13	m	s	s	s	vg	s	m	s	s	s	s	m	13
14	s	s	s	s	vg	m	m	s	m	s	m	g	14
15	s	c	c	s	m	s	s	s	s	s	m	s	15
16	s	s	s	m	*	s	s	c	s	s	m	s	16
17	s	s	s	m	*	s	c	s	s	s	s	s	17
18	s	c	m	m	vg	s	c	s	c	g	s	s	18
19	s	c	vg	s	g	c	s	s	c	g	s	s	19
20	c	s	s	c	s	s	s	s	s	s	m	s	20
21	s	m	g	c	s	m	s	s	g	s	s	m	21
22	c	m	m	s	s	m	s	s	g	m	s	s	22
23	s	m	s	s	s	s	m	s	s	g	s	s	23
24	s	m	s	m	c	s	s	s	s	g	s	s	24
25	m	c	m	m	s	s	s	s	vg	g	s	s	25
26	s	s	m	m	s	s	s	m	s	s	m	s	26
27	m	s	g	s	s	m	s	s	s	s	s	s	27
28	g	s	g	c	s	m	m	m	s	s	c	s	28
29	g		s	s	c	s	s	m	m	s	g	s	29
30	g		s	s	c	s	s	m	g	s	m	s	30
31	g		s	s	s	s	s	m		s	m	s	31
TOTALS	$\begin{cases} c \\ s \\ m \\ g \\ vg \end{cases}$	$\begin{cases} 6 \\ 14 \\ 5 \\ 5 \\ 1 \end{cases}$	$\begin{cases} 7 \\ 12 \\ 9 \\ \dots \\ \dots \end{cases}$	$\begin{cases} 1 \\ 20 \\ 5 \\ 4 \\ 1 \end{cases}$	$\begin{cases} 8 \\ 13 \\ 9 \\ \dots \\ \dots \end{cases}$	$\begin{cases} 3 \\ 18 \\ 1 \\ 2 \\ 2 \end{cases}$	$\begin{cases} 1 \\ 22 \\ 7 \\ \dots \\ \dots \end{cases}$	$\begin{cases} 4 \\ 22 \\ 5 \\ \dots \\ \dots \end{cases}$	$\begin{cases} 1 \\ 22 \\ 8 \\ \dots \\ \dots \end{cases}$	$\begin{cases} 3 \\ 17 \\ 7 \\ 2 \\ 1 \end{cases}$	$\begin{cases} \dots \\ 22 \\ 5 \\ 4 \\ \dots \end{cases}$	$\begin{cases} 5 \\ 18 \\ 6 \\ 1 \\ \dots \end{cases}$	$\begin{cases} 2 \\ 24 \\ 4 \\ 1 \\ \dots \end{cases}$

* No record.

DATES AND DISC AREAS OF SOLAR DRAWINGS.

The unit is $\frac{1}{5000}$ th of the visible surface.

1909.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	1909.
D.													D.
1		12.2		6.3	2.6	0.3	1.2		1.0				1
2				5.3	2.0	...	1.4	1.3	1.4	10.4			2
3			13.4		1.1			1.7					3
4			10.6	8.2	1.1	0.6	0.7	1.0	1.0	7.4		3.8	4
5		1.8	5.8	7.6	1.2			2.0	2.1	7.2		3.5	5
6		1.4		6.0	1.6	4.4		1.6	2.1				6
7		0.5		3.3	2.6	3.3	0.2	0.8	3.5		4.6		7
8	3.7		0.5	3.0	5.1	2.0	0.4	1.0	6.1		3.8	0.8	8
9				1.1	6.4			0.2	10.6	11.0			9
10				...	6.2	1.3	...	0.6	10.6		1.2		10
11				0.4	6.2		...		8.4				11
12	1.8		1.4		5.6	0.5		0.9		11.3			12
13		4.0			8.3	0.7		0.7			2.7		13
14			1.4		9.4	0.5			0.7	8.5			14
15	2.5	2.6	1.2	0.4	10.5	1.1		0.8	...		3.3	2.7	15
16		5.0	1.0		5.8	5.2			0.1	6.7	2.3		16
17		5.0			4.0	4.3	1.7	0.7	0.6		3.5		17
18				1.1	3.3				1.6	3.1	3.1		18
19	4.0	4.6		2.6	2.8				3.0	3.2	3.4		19
20	4.0	4.0		4.4	0.8	0.6	6.2		3.2				20
21	2.8	3.3		5.6	1.0				4.5	2.0	2.8	6.5	21
22	3.5	2.0	14.0	5.0	0.7			0.3	6.4		4.8		22
23		3.7		5.8	2.0	1.6	11.6		8.6		5.6		23
24		4.2			2.1					0.6		5.1	24
25	8.7		14.0	2.7						1.6		5.3	25
26	14.0		13.0	2.5				0.3					26
27	11.0		9.0	2.2	1.2	1.6		0.2		1.5			27
28				1.7	0.5		5.8						28
29	16.0			0.7	0.4	1.3			6.7	1.8		11.8	29
30	13.0			2.4	0.5	1.2	1.3			2.6			30
31								0.5		3.5		10.0	31
Daily Means	7.1	3.9	7.1	3.4	3.4	1.7	2.5	0.9	4.0	5.2	3.4	5.5	

PRESENTATIONS TO THE LIBRARY, 1909.

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

Adams (Alex. J. S.):

Contribution to a study of Terrestrial Magnetic Diurnal Variations, with thirteen plates. (Author.)

Algiers, Observatoire:

Catalogue Photographique du Ciel. Coordonnées Rectilignes. Tome 6. Zone— 2° à 0° . (Observatory.)

Allegheny Observatory of the University of Pittsburg:

Publications, Vol. I., No. 10—18. Star Orbits, etc. (Observatory.)

Arctowski (Henryk):

- : *Les Variations Séculaires du Climat de Varsovie.
- : Sur les variations de la répartition de la pression atmosphérique à la surface du globe. (Author.)

Ashworth (J. R.):

*An Analysis of the Meteorological Elements of Rochdale. (Author.)

Barnes (James):

*On the Spectrum of Calcium, and Magnesium. (Author.)

Batavia, Royal Magnetical and Meteorological Observatory:

- : Meteorological, Magnetical and Seismometric Observations made at Batavia in 1906.
- : Regenwaarnemingen in Nederlandsch-Indie, 1907.
- : Magnetic Survey of the Dutch East-Indies, 1903-1907.
- : Erdbeben Bericht, 1908, Dec. 28—1909—Sept. (Observatory.)

Bellamy (F. A.):

*The International Photographic Survey of the Sky. (Author.)

Berlin, Kgl. Akademie der Wissenschaften:

Eine Sammlung der wichtigsten Ergebnisse erdmagnetischer Beobachtungen. (Academy.)

Berlin, Königl. Preuss. Meteorol. Institut :

- : Ergebnisse der Meteorol. Beobachtungen in Potsdam, 1905-8.
- : Ergebnisse der Magnetischen Beobachtungen in Potsdam, 1903, 1904, 1906.
- : Ergebnisse der Gewitter-Beobachtungen, 1906, 1907.
- : Ergebnisse der Niederschlags-Beobachtungen, 1906, 1907.
- : Ergebnisse der Beobachtungen an den Stationen II. und III. Ordnung, 1903, 1904.
- : Ergebnisse Zehnjähriger Gewitterbeobachtungen in Nord-und Mitteldeutschland.
- : Barometrische Teildepressionen und ihre Wellenförmige Aufeinanderfolge.
- : Die Expedition.....nach Burgos in Spanien zur Beobachtung der totalen Sonnenfinsternis am 30 Aug. 1905.
- : Untersuchungen über die Schwankungen der Niederschläge.
- : Bericht über die Tätigkeit.....1908.
- : Magnetische Kartographie in historisch-kritischer Darstellung.
- : Temperatur- und Feuchtigkeitsverhältnisse in verschiedener Höhe über dem Erdboden. (Institute.)

Bevan (P. V.) :

- *Anomalous Dispersion of Metallic Vapours. (Author.)

Bildt, de, Institut Météorologique Royal des Pays-Bas :

- : Annuaire, A, Météorologie, B Magnétisme Terrestre, 1907.
- : Mededeelingen en Verhandelingen, No. 6, 7. (Institute.)

Birmingham and Midland Institute :

- Records of Meteorological Observations taken at the Observatory, Edgbaston, 1908. (Secretary.)

Bologna, Osservatorio della R. Università :

- *Osservazioni Meteorologiche, 1907. (Observatory.)

Bolton, Corporation Observatory :

- Monthly Meteorological Summaries, 1909. (Observatory.)

Bosnia, Observatorium auf der Bjelasnica :

- Ergebnisse der Meteorologischen Beobachtungen an den Landesstationen in Bosnien-Hercegovina, 1906, 1907. (Observatory.)

Boston, Lowell Institute :

- *"Our Friends, the Enemy" : A discussion bearing on scientific ethics.

Brester (A. Jz.) :

- *"The Solar Vortices of Hale." (Author.)

Bucuresti, Astronomical and Meteorological Observatory:
Buletinul Lunar, 1908, 1909. (*Observatory.*)

Budapest, Institut Royal Météorol. et Magnétique:

- : Évkönyvek de 1905. Vol. 35, part 4.
- : „ „ „ 1906. Vol. 36, part 1—4.
- : Bericht über die Tätigkeit.....1907.
- : Untersuchungen zur Verbesserung der Thermometer Aufstellungen.
- : Die jährliche Periode der Niederschläge in Ungarn.
- : Namen- und Sachregister der Bibliothek, 1908.
- : Bulletin Hebdomadaire des Observatoires Sismiques de la Hongrie et de la Croatie, 1909.
- : Avis macrosismique de Hongrie, 1909.
- : Die Erdbeben in Ungarn, 1900-1902.
- : Rapport sur les Observations faites pendant les Années 1907 et 1908 aux observatoires Sismiques des pays de la Sainte Couronne de Hongrie. (*Institute.*)

Burgos, Observatorio Colegio Maximo:

Observaciones Meteorologicas, 1908. (*Observatory.*)

Calabria, Osservatorio "Morabito":

Bollettino Sismologico, 1908, Nov.—Dec.; 1909, Jan.—April. (*Observatory.*)

Cambridge Observatory:

- : Annual Report of the Observatory Syndicate, 1908-9.
- : Measures of Double Stars made with the Northumberland Equatorial of the Cambridge Observatory, under the direction of Prof. Challis in 1839-1844. (*Observatory.*)

Canada, Department of Marine [etc.]:

Monthly Weather Review, 1908, Sept.—1909, Aug. (*Department.*)

Cape of Good Hope, Royal Observatory:

- : Report of His Majesty's Astronomer for 1906, 1907, 1908.
- : Independent Day-Numbers for 1910 and 1911. (*Observatory.*)

Catania, R. Osservatorio di Catania ed Etneo:

Bullettino Sismologico, 1909. (*Observatory.*)

Chevalier (S.):

*Protubérances Observées les 30 et 31 Juillet, 1908. (*Author.*)

Cleveland Meteorological and Seismic Observatory:

Annual Report for 1908. (*Observatory.*)

Colne Corporation :

Summary of Rainfall at Colne, for 1909, and for the years 1901-1909. (Corporation.)

Commission Internationale de Magnétisme Terrestre :

- : Caractère Magnétique des années 1907 et 1908.
- : Caractère Magnétique de chaque jour des mois Juillet—Dec., 1908; Jan.—Juin, 1909. (Commission.)

Darmstadt, Physical Institute of Technical High School :

Der Hörsaalbau des Physikalischen Instituts, 1904. (Institute.)

de La Baume Pluvinel (A.) et Baldet (F.) :

- :*Sur la photographie de la planète Mars.
- :*Sur le spectre de la comète 1908 c (Morehouse). (Authors.)

Deslandres (Dr. H.) :

- : Etude spectrale des comètes et de leur queue. Radiations nouvelles intenses dans la queue, 1903-9.
- : Images des couches superposées de l'atmosphère solaire. Révélation des Couches supérieures, 1906-9.
- : Etude des mouvements dans les couches superposées de l'atmosphère solaire et en particulier dans les couches supérieures, 1905-9.
- : Loi de Répartition des Raies dans les Spectres de Bandes, etc., 1902-5. (Author.)

Dresden, Königl. Preuss. Meteorol. Institut :

- : Deutsches Meteorologisches Jahrbuch, 1904-1905.
- : Dekaden-Monatsberichte (Vorläufige Mitteilung) der Königl. Sächs. Landes-Wetterwarte, 1908. (Institute.)

Duffield (W. G.) :

*The effect of Pressure upon Arc-Spectra No. 2 Copper λ 4000 to λ 4600. (Author.)

Duffield (W. G.) and Rossi (R.) :

*The Emission Spectrum of Silver heated in a carbon-tube furnace in air. (Authors.)

Dyson (Professor) :

The Systematic Motions of the Stars (second paper) (Author.)

Eagle (Albert) :

- :*On the Spectra of some of the compounds of the Alkaline Earths.
- :*The arc spectrum of Vanadium in the region λ 5800 to λ 7364. (Author.)

Egypt, Survey Department :

- : The Standardization of the Magnetic Instruments at Helwan Observatory during 1907.
- : The Rains of the Nile Basin, and the Nile flood, 1907 and 1908.
- : Magnetic Observations at Helwan Observatory, 1908.
- : Evaporation in Egypt and the Sudan.
- : Meteorological Report, Helwan Observatory, 1907.
- : Measurement of the Volumes discharged by the Nile, 1905, 6 with note on rating formulæ for current meters.
- : A discussion of the observations on atmospheric electricity at Helwan Observatory, 1906-8. (Department.)

Evershed (John) :

- : *The Ultra-Violet region in sun-spot spectra, and the spectrum of Comet 1907 d (Daniel).
- : *Solar prominences in 1907, observed at the Kodaikánal Observatory.
- : *Note on the Wave-Length of H_{δ} and H_{ϵ} in the Solar spectrum. (Author.)

Falmouth Observatory :

Meteorological and Magnetical Tables and Reports for 1908. (Observatory.)

Farman (Maurice) et Touchet (Em.) :

Sur l'activité comparée des essaims des Léonides et des Géminides le 14 Novembre 1907. (Authors.)

Fowler (A.) :

- : *Spectroscopic Comparison of α Ceti with Titanium Oxide.
- : *The Spectrum of Magnesium Hydride.
- : *The Spectrum of Scandium and its Relation to Solar Spectra. (Author.)

Fowler (A.) and Eagle (A.) :

*The Reproduction of Prismatic Spectrum Photographs on a uniform scale of wave-lengths. (Authors.)

Franks (W. S.) :

*The relation between star colours and spectra. (Author.)

Fric (Josef Jan) et Nusl (Fr.) :

- : *Photographie de la Comète 1907 d (Daniel).
- : *Première étude sur les Anomalies de Réfraction. (Authors.)

Fritsche (Dr. H.) :

Die mittlere Temperatur der Luft im Meeresniveau. (Author.)

Gibb (David) :

*Motion of Neptune's Satellite. (Author.)

Gill (Rev. H. V.):

- : *On a possible connexion between the eruption of Vesuvius and the earthquake at San Francisco in April, 1906.
- : *On a New Kind of Glow from Palladium in Vacuum Tubes.
(*Author.*)

Gold (E.):

- *The Isothermal Layer of the Atmosphere and Atmospheric Radiation.
(*Author.*)

Granada, Observatorio de Cartuja:

- : Estadística foto-heliográfica, 1908, Oct.—Dec.; 1909, Jan.—Sept.
- : *Bulletin de L'Activité solaire, 1908, Jan.—March, Sept.—Dec.; 1909, April—Sept.
- : *L'Eclipse Totale de Lune du 3 Juin 1909.
- : *Les observations solaires à l'Observatoire de Cartuja.
- : *Bulletin Magnétique, 1908, March—1909, February.
- : *Le Nouveau Pendule Horizontal de Cartuja.
- : *Aperçu des Instruments les plus usités en Sismologie.
- : *La nueva estación sismológica de Cartuja.
- : Estación sismológica de Cartuja. Resumen del año 1908.
- : Boletín Mensual de la estación sismológica, 1909, Jan.—June.
- : Boletín Mensual del Observatorio Meteorológico de Cartuja, 1909, Jan., Oct.
- : Boletín Anual del Observatorio Meteorológico de Cartuja, 1908.
(*Observatory.*)

Greenwich, Royal Observatory:

- : Astronomical, Magnetical and Meteorological Observations, 1907.....under the direction of Sir W. H. M. Christie.
- : Second Nine-year Catalogue of Stars for 1900.
- : Precession Tables for Third Ten-year Catalogue, 1910.
- : Photo-Heliographic Results, 1906; and Catalogue of Recurrent Groups of Sun Spots, 1874—1906.
- : *Mean Areas and Heliographic Latitudes of Sun-spots, 1906, deduced from photographs taken at the Royal Observatory, Greenwich; at Dehra Dün and Kodaikánal Observatory, India; and in Mauritius.
- : Clock Star List, 1909, 1910.
- : Cape Observatory Annals, Vol. 8, Part 1: Observations of Major Planets, 1897 to 1904; Vol. 10, part 3: A Spectrographic Determination of the Constant of Aberration and of the Solar Parallax.
(*Observatory.*)

Groningen, Astronomical Laboratory:

- Publications.....Edited by Prof. J. C. Kapteyn, Director:
- No. 20. The parallaxes of 3650 stars of different galactic latitudes, derived from photographic plates.....
With an appendix containing rules for the treatment of parallax-plates and a graphical table of parallax-coefficients.
 - No. 23. The Parallax of the Hyades. (*Laboratory.*)

Habana, Observatorio del Colegio de Belen :

Observaciones Meteorologicas, 1908. *(Observatory.)*

Hamburg, Hauptstation für Erdbebenforschung :

— : Erdbeben im Juli-Dezember 1906.

— : Mitteilungen, 1909.

— : Einige neuere Seismogramme.....von Dr. E. Tams.
(Observatory.)

Hamburg, Sternwarte :

— : Astronomische Abhandlungen, Band 1.

— : Jahresbericht für 1907 und 1908. *(Observatory.)*

Harvard College Astronomical Observatory :

— : Annals, Vol. 58, part 3 ; 59, No. 3, 4 ; 61, part 2 ; 64, No. 4-6 ; 68, part 1.

Vol. 58, part 3. Blue Hill Meteorological Observations, 1905.

„ 59, No. 3. Lunar photometry.

„ 59, „ 4. Photographic magnitudes of bright stars.

„ 61, part 2. A search for a planet beyond Neptune.

„ 64, No. 4. Discussion of the revised Harvard Photometry.

„ 64, „ 5. Observations on J.D. 3182 with the 4 in. Meridian Photometer.

„ 64, „ 6. Magnitudes of components of double stars.

„ 68, part 1. Blue Hill Meteorological Observations, 1904-7.

— : Circular, No. 143—148.

— : Sixty-third annual report of the Director.....1908, by E. C. Pickering.

— : *Foreign Associates of National Societies, II., by E. C. Pickering.

— : *Address entitled “The future of Astronomy,” by E. C. Pickering. *(Observatory.)*

Heidelberg (Königstuhl) Astrophysikalisches Institut :

Director's Report for 1908. *(Institute.)*

Hildebrand-Hildebrandsson (H.) :

Quelques recherches sur les centres d'action de l'atmosphère. *(Author.)*

Hongkong Observatory :

Meteorological Observations, 1908.

Huggins (Sir William) :

The Scientific Papers of *(Author.)*

India, Meteorol. Department of the Government :

- : Report of the Director, Bombay and Alibag Observatories, 1908.
- : Annual Rainfall of India, 1908.
- : Memoirs, Vol. 18, part 4 ; 19, part 1 ; 20, part 6, 7.
- : The Simla Seismograms, 1905, June—1908, Nov.
- : Magnetical, Meteorol. and Seismological Observations, Bombay and Alibag Observatories, 1902-1905.
- : Discussions and Compilations of Meteorol. data.
- : Errata to the Annual Tables of Rainfall in the Province of Eastern Bengal and Assam, 1907. (*Department.*)

Innsbruck, University Meteorological Observatory :

Beobachtungen.....1906. (*Observatory.*)

Ireland, Clongowes Meteorological Observatory :

Fourth Annual Report, 1908. (*Observatory.*)

Jensen (Hakon) :

On an Inward Mechanism of Heavenly Bodies. (*Author.*)

Johnstone (Stoney) :

*Telescopic Vision. (*Author.*)

Jurjew, Kais. Univ.-Sternwarte (Dorpat) :

Publikationen.....Band 21, Heft 2. (*Observatory.*)

Kasan, Observatoire Engelhardt de l'Université Impériale :

- : Observations de 24 étoiles doubles.
- : Catalogue de 128 étoiles variables.
- : Publications, No. 3.
- : Beobachtungen des Mondkraters Mösting a und der Mondsterne am Repsold'schen Meridiankreise während der Jahre 1892-1894. (*Observatory.*)

Knobel (E. B.) :

- : *On the Chinese Planisphere.
- : Note on the Regnal Years in the Aramaic Papyri from Assuan. (*Author.*)

Kodaikanal Observatory :

- : Memoirs of. Vol. 1, part 1. The spectrum of sunspots, by John Evershed.
- : Bulletin No. 14—18.
 - No. 14. List of prominences observed, 1908, Jan.—June.
 - „ 15. Radial movements in sun spots.
 - „ 16. Curvature of lines in the spectrum formed by a plane grating.
 - „ 17. Prominences observed, 1908, June—Dec.
 - „ 18. Pressure in the reversing layer.
- : Annual Report of the Director, Kodaikanal and Madras Observatories, 1908. (*Observatory.*)

Lagarde (M. J.):

Formules et Tables pour faciliter l'emploi des Catalogues photographiques en Coordonnées rectilignes. (Author.)

Lancaster, County Palatine of:

Report of the Medical Officer of Health for 1908. (Medical Officer.)

Langley (Edward M.):

The Graphic Treatment of some Astronomical Problems. (G. J. Gibbs.)

Leon (Luis G.):

—: Observaciones Solaires, 1908, Dec. ; 1909, Jan. and April.
—: Estudios de la Luna. (Author.)

Libert (L.):

L'Eclipse partielle de Soleil du 28 Juin 1908. (Author.)

Lick Observatory, University of California:

—: Bulletin, No. 146—172.
—: Publications, Vol. 8, 1908.—Photographs of Nebulæ and Clusters with the Crossley reflector, by James Edward Keeler, 1898-1900. (Observatory.)

Lisbon, Observatorio do Infante D. Luiz:

Annaes, Vol. 44, 1906. (Observatory.)

Liverpool Astronomical Society:

Annual Report, 1909-10. (Society.)

Liverpool Observatory:

Report of the Director1908. (Observatory.)

Lockyer (William J. S.):

*The Magnetic Storm of Sept. 25th, 1909, and the associated solar disturbance. (Author.)

London, Meteorological Office:

—: British Meteorological Year Book, 1908.
—: Meteorological Observations at Stations of the Second Order, 1905, 1906.
—: Codex of Resolutions adopted at International Meteorological Meetings, 1872-1907 (English Edition.)
—: Fourth Annual Report of the Meteorological Committee..... for the year ended 31st March, 1909.
—: A Barometer Manual for the use of Seamen.....6 ed.
—: The Free Atmosphere in the Region of the British Isles.
—: Observations des ascensions internationales simultanées et des stations de montagne et de nuages, 1907, Heft 8—12; 1908, Heft 1, 2, 3. (Office.)

London, Royal Institution :

Proceedings of. Vol. 18, part 3. (*Institution.*)

London, Royal Meteorological Society :

The Meteorological Record. Vol. 28, No. 110—112; 29, 113, 114. (*Society.*)

London, Royal Society :

- : Year Book, R.S., 1909.
- : Report of Magnetic Survey of S. Africa, by J. C. Beattie. (*Society.*)

London, Solar Physics Observatory :

- : A Discussion of Australian Meteorology, by W. J. S. Lockyer.
- : *On the origin of certain Lines in the Spectrum of ϵ Orionis (Alnitam).
- : Report of the Board of Education on the work of the Solar Physics Committee, 1908. (*Observatory.*)

Madagascar, Observatoire :

Observations Météorologiques faites à Tananarive, 1894, 1895, 1899-1903. (*Observatory.*)

Madrid, Instituto Central Meteorológico :

Observaciones Meteorologicas de Provincias, 1908. (*Institute.*)

Manchester University, Meteorol. Department :

Monthly Reports on the Investigation of the Upper Atmosphere, under the direction of Prof. Schuster, 1908, Dec.—1909, Sept. (*Department.*)

Manchester, Municipal School of Technology :

Fourth Annual Report of the Godlee Observatory, 1908. (*Principal.*)

McClellan (F. K.):

Report of the Solar Eclipse Expedition to Flint Island, January 3rd, 1908. (*Author.*)

Manila, Philippine Weather Bureau :

- : Monthly Bulletins, 1908, Feb.—Dec. ; 1909, Jan.—June.
- : Annual Report of the Director, part 1, for the years 1906 and 1907.
- : Mirador Observatory, Baguio, Benguet : A new Meteorological-Geodynamic Station of the Weather Bureau, by Rev. José Algué, S.J., Director. (*Bureau.*)

Mauritius, Royal Alfred Observatory :

Director's Annual Report for 1908. (*Observatory.*)

Mee (Arthur):

The-Story of the Telescope. (Author.)

Mexico, Observatorio del Seminario de Guadalajara :

- : Efemerides del Volcan de Colina segun las observaciones practicadas en los observatorios de Zapotlan y Colina de 1903 a 1905, arregladas por el Presbitero Severo Diaz.
- : Resumen de las observaciones practicadas Durante el Primer Semestre del Año de 1907.
- : Un Temporal de Invierno. Primeros pasos en la Meteorologia de Precision. (Observatory.)

Mexico, Observatorio Meteorologico de Leon :

Boletin Mensual, 1909. (Observatory.)

Mexico, "Instituto Juárez" :

Boletin del Observatorio Meteorologico, 1909, June—Aug. (Institute.)

Mexico, Observatorio Meteorol. Magnet. Central :

Boletin Mensual, 1904, April, Nov., Dec. ; 1905, Jan. ; 1908, Aug.—Dec. ; 1909, Jan., April. (Observatory.)

Mexico, Observatorio Meteorol., Merida :

Boletin Mensual, 1907, April ; 1908, Dec. ; 1909, Jan.—Oct. (Observatory.)

Mexico, Sociedad Astronomica :

- : Revista Mensual de Astronomia, Meteorologia y Fisica del globo, 1909.
- : El regreso del Cometa del Halley. (Society.)

Mexico, Sociedad Cientifica "Antonio Alzate" :

Memorias y Revista. Vol. 25, No. 4 ; 26, No. 10—12 ; 27, 1—3, 5—8. (Society.)

Milan, Reale Osservatorio di Brera :

Differenza della Longitudini Milano-Crea. (Observatory.)

Milne (Dr.) :

- : Reports to the British Association :
 - *Earthquakes, Japan, 1, 2, 4—13.
 - *Seismological, No. 6—13.
 - *Circulars issued, No. 1—18.
- : Transactions of the Seismological Society of Japan. Vol. 1—16, 1880—1892. (Dr. Milne.)

Missouri University, Laws Observatory :

Title-page and Index to Bulletins, Vol. 1, Nos. 1—16. (Observatory.)

Modena, Osservatorio Geofisico della R. Università :

Misure di conducibilità elettrica dell'aria eseguite sul monte cimone nell'estate del 1908. (*Observatory.*)

Moncalieri, Osservatorio Central del R. Coll. Carlo Alberto :

Bollettino Meteorologico e Sismiche, 1908, Dec. ; 1909, Jan.—Aug. (*Observatory.*)

Moscow, Observatoire d'Université Impériale :

- : Beobachtungen, angestellt.....1905, 1906, 1907.
- : Meteorologische Beobachtungen in Moskau, 1907.
- : Luftelectriche Beobachtungen im Ssamarkand'schen Gebiet während der totalen Sonnenfinsternis am 14 Januar 1907. (*Observatory.*)

Mount Wilson Solar Observatory, California :

- : *Contributions, No. 29—42.
- : Index to Vol. 1 (Contributions, No. 1—30.)
- : *Annual Report of the Director, 1908. (*Observatory.*)

Müller (Adolf) :

- : Der Galilei-Prozess (1632-1633.)
- : Galileo Galilei und das Kopernikanische Weltsystem. (*Author.*)

Munich, Kgl. Bayer. Akademie der Wissenschaften :

- : Naturwissenschaftliche Rundschau.
- : *Die Registrierungen der süditalienischen Erdbebenkatastrophe in München. (*Academy.*)

Munich, Königl. Sternwarte :

Magnetische Beobachtungen in München, 1901-1905, und Erdbebenregistrierungen, 1905. (*Observatory.*)

Naples, Osservatorio Pio X. in Valle di Pompei :

- : Bollettino Meteorico-Geodinamico, 1908, Nov., Dec. ; 1909, Jan.—Aug.
- : *Alcune osservazioni sugli epicentri Sismici della Calabria e del Messinese. (*Observatory.*)

Natal, Government Observatory :

Report of the Government Astronomer for 1908. (*Observatory.*)

National Physical Laboratory :

- : Report for the year 1908. (*Laboratory.*)
- : Report of the Observatory Department, and of the Observatory Eskdalemuir, for 1908, with Appendices.
- : Presidential Address to the Physical Society of London, Feb., 1908, by Dr. Chree. (*Observatory Dept.*)

New York, Columbia University Observatory :

Contributions, No. 27. Rutherford Photographs of stars surrounding β Cygni, by Morris Francis Weinrich.
(*Observatory.*)

New York, Meteorological Observatory :

- : Annual Tables, Daily and Hourly, for 1908.
- : Hourly Readings from the Draper Self-Recording Instruments for 1909.
- : Report.....for the year 1909. (*Observatory.*)

Nice, Observatoire :

Annales.....publiées sous la direction de M. le Général Bassot. Tome XI ; XIII., 1 fasc. (*Observatory.*)

Nodon (A.) :

- :*L'Activité Solaire et les Phénomènes Terrestres.
- :*L'Origine Solaire des Cyclones et des Tempêtes.
- :*Les Rayons Coronaux et L'Action Electrique du Soleil. (*Author.*)

Nölke (Dr. Fr.) :

Neue Erklärung des Ursprungs der Kometen. (*Author.*)

Ottawa, Department of the Interior :

Report of the Chief Astronomer for the year ending March 31st, 1907. (*Department.*)

Palomo-Rincon (Joachim) :

Seismogram and details of the Mexican Earthquake of 30th July, 1909, as recorded at the Observatory, Puebla. (*Author.*)

Paris, Bureau Météorologique de France :

- : Bulletin Mensuel, 1909.
- : Bulletin des Publications Nouvelles de la Librairie Gauthier-Villars, 1909. (*Bureau.*)

Paris, Société Météorologique de France :

Revue Mensuelle, 1909. (*Society.*)

Parr (W. Alfred) :

*Osservazioni spettroscopiche solare, con mezzi semplici. (*Author.*)

Perm, Ekaterinburg Observatory :

Curven des Magnetographen.....an stark gestörten Tagen des Jahres 1908. (*Observatory.*)

Perpignan, Observatoire :

Bulletin Météorologique.....1906, 1907. (*Observatory.*)

Perth Observatory, Western Australia :

- : A Catalogue of 1625 stars between 39° and 41° South Declination for the Equinox 1900.0, selected as reference points for the Astrographic Catalogue.
- : Vol. 3, Meridian Observations, 33° to 35° S. Epoch 1900.
(*Observatory.*)

Polo, Hydrographisches Amt der K. und K. Kriegs-Marine :
Veröffentlichungen, No. 28. (*Hydrographic Office.*)**Potsdam, Astrophysikalisches Observatorium :**

- : Publikationen. Band 19, Nr. 56 ; 20, Nr. 60, 61.
- : Director's Report, 1908. (*Observatory.*)

Purvis (John Edward) :

- : *The influence of very strong electromagnetic fields on the spark spectra of (1) vanadium and (2) platinum and iridium.
- : *The influence of a very strong magnetic field on the spark spectra of palladium, rhodium and ruthenium.
- : *The influence of a strong magnetic field on the spark spectra of titanium, chromium and manganese ; of lead, tin, antimony, bismuth and gold [two papers.]
- : *Experiments on the band-spectrum of nitrogen in a strong magnetic field.
- : *The radiation of various spectral lines of neon, helium and sodium in a magnetic field.
- : *The Relationship between the Constitution and the Absorption of Spectra of Pyridine and various Derivatives.
- : *The study of the absorption spectra of the Hydrocarbons isolated from the products of the action of Aluminium-Chloride on Naphthalene, by A. Homer and J. E. Purvis.
- : Untersuchungen über die Leeman-Phäriomene. (*Author.*)

Registrar General :

Quarterly Returns of Marriages, Births and Deaths, No. 240—243.
(*Registrar General.*)

Rossi (R.) :

- *The Effect of Pressure on the Band Spectra of the Fluorides of the Metals of the Alkaline Earths. (*Author.*)

San Fernando, Instituto y Observatorio de Marina :

- : Almanaque Náutico, 1910, 1911.
- : Sismografo Milne: Register, Sept., Oct., Nov., 1909. (*Institute.*)

Schering (Dr. Karl) :

- *Bericht über die Fortschritte unserer kenntnisse von Magnetismus der Erde (VI., 1899-1904). (*Author.*)

Schering (K.), and Zeissig (C.):

Neue photographische Registrirmethode für die Zeit und den Stand von Magneten in Magnetometern und Galvanometern.
(*Authors.*)

Schuster (Prof. Arthur):

- :*The Optics of the Spectroscope.
- :*On the Periodicities of Sun-Spots.
- :*The Periodogram and its Optical Analogy.
- :*The Diurnal Variation of Terrestrial Magnetism. (*Author.*)

Scottish Meteorological Society:

Journal of. Vol. 15, No. 26, with Tables for the year 1908.
(*Society.*)

See (T. J. J.):

- :*On the cause of the remarkable circularity of the orbits of the planets and satellites, and on the origin of the planetary system.
- :*Origin of the lunar terrestrial system by capture.....
- :*Dynamical Theory of the capture of satellites and of the division of nebulae under the secular action of a resisting medium. (*Author.*)

Shaw (H.):

*The arc spectrum of Vanadium in the region λ 5800 to λ 7364.
(*Author.*)

Smithsonian Institution:

Annual Report.....1907. (*Institution.*)

Southport, Fernley Observatory:

Report and Results of Meteorological Observations, 1908.
(*Observatory.*)

Southport Society of Natural Science:

Thirteenth Report. (*Society.*)

Stein (Dr. J.):

- : Calixte III. et la Comète de Halley.
- :*On the relation between Period and Density of Algol Variables.
- :*The Binary Variable Star R Z Cassiopeia.
- :*Nota sulla Posizione Geografica della Specola Vaticana.
- :*I restauri della Specola Vaticana. (*Author.*)

Stockholm, K. Svenska Vetenskaps Akademie:

Observations Météorologiques Suédoises, 1908 [with Appendix].
(*Academy.*)

Störmer (Carl):

*Sur les trajectoires des corpuscules électrisés dans le champ d'un aimant élémentaire avec application aux aurores boréales.
(*Author.*)

St. Petersburg, Observatoire Physique Central Nicolas :

- : Annales.....1905, pt. 1, 2 and supplément ; 1906, pt. 1, 2.
- : Observations faites à la station météorologique de Kharbin en 1898-1906. (*Observatory.*)

Strassburg, K. Hauptstation für Erdbebenforschung :

- : Wöchentliche Erdbebenberichte, 1909.
- : Makroseismische Nachrichten, 1909. (*Institute.*)

Strassburg, International Seismological Association :

- : Katalog der im Jahre 1905 Registrierten Seismischen Störungen.
- : Verzeichnis der Bibliothek des Zentral Bureaus.....1909.
- : Les Tremblements de terre ressentis pendant l'année 1905.
- : Seismogramme des Japonischen Erdbebens am 21 Jan. 1906.
- : Eine neue seismische Untersuchungsplatte, II. Teil.
- : Unifilares Horizontalpendel. (*Central Bureau.*)
- : Comptes Rendus des Séances.....de l'Association Internationale de Sismologie, 1906, 1907. (*Prof. Schuster.*)

Stuart (A. J.):

A method for ascertaining the distance of the Sun, Moon and Planets from the Earth. (*Author.*)

Tacubaya, Observatorio Astronómico Nacional :

- : Anuario.....para el año de 1909, 1910. F. Valle. Año 29, 30.
- : Observaciones Meteorologicas.....1897. (*Observatory.*)

Tokyo, Observatoire Astronomique :

Annales. Tome 3, fasc. 5. (*Observatory.*)

Toronto, Agincourt Observatory :

Magnetical Results—Curves and Tables—1906. (*Observatory.*)

Tortosa, Observatorio del Ebro :

- : Sur la perturbation magnétique du 25 Sept. 1909. Note de M. R. Cirera.
- : L'Observation Solaire par le P. Mariano Balcells, S.J. (*Observatory.*)

Toulouse, Observatoire :

Bulletin de la Commission Météorologique du département de la Haute-Garonne.....1906. (*Observatory.*)

Transvaal, Meteorological Department :

Annual Report for the year ended 30th June, 1908. (*Department.*)

Trieste, J. R. Osservatorio Marittimo :Rapporto Annuale.....1905. *(Observatory.)***Turin, Societa Meteorol. Italiana Comitato Direttivo :**Bollettino Bimensuale, Vol. 27, No. 10—12; 28, 1—12.
*(Society.)***Turin, Società Astronomica Italiana :***Bollettino. Revista. Num 5. *(Society.)***Uccle, Observatoire Royal de Belgique :**

- : Annuaire astronomique pour 1909.
- : Annales.....Nouvelle série: Annales Astronomiques, Tome XI., fasc. 2; XII., fasc. 1.
- : Annales.....Nouvelle série: Physique du Globe. Tome IV., fasc. 1, 2.
- : Annuaire Météorologique, 1909.
- : Annuaire Astronomique, 1910.
- : Annales Météorologiques. Tome 18, fasc. 2; 19, 3; 20, 3.
- : Les Planches suivantes de la Carte photographique du ciel. No. 1—9. *(Observatory.)*

Upsala, Observatoire Astronomique :

- : Sur le calcul de la réfraction différentielle en distance et en angle de position, par Östen Bergstrand.
- : Recherches sur les couleurs des étoiles fixes, par Östen Bergstrand.
- : Arkiv för matematik astronomi och fysik. Band 5. Häfte 1—4; No. 14, 17. Band 6. No 6. *(Observatory.)*

Upsala, Observatoire Météorol. de l'Université d'Upsal :Bulletin Mensuel. Vol. 40, 1908. *(Observatory.)***Vienna, K. K. Zentral-Anstalt für Meteorol. und Geodynamik :**Jahrbücher.....1907. *(Observatory.)***Vienna, von Kuffner'sche Sternwarte :**Publikationen.....Band 6, Teil 6. *(Observatory.)***Vizagapatam, G. V. Juggarow Observatory :**Results of Meteorological Observations, 1904. *(Observatory.)***Wales, Astronomical Society :**The Cambrian Natural Observer. Vol. 10, Supplementary No.; 11, No. 1—3. *(Society.)*

Washburn Observatory, University of Wisconsin :

Publications. Vol. 12. Determinations of proper motion,
1902-1907. (*Observatory.*)

Washington, Carnegie Institution :

*Director's Annual Report of the Department of Terrestrial
Magnetism, 1908. (*Institution.*)

Washington, Hydrographic Office :

- : Monthly Pilot Charts of the N. Atlantic Ocean, 1909.
- : Monthly Pilot Charts of the N. Pacific Ocean, 1909. (*Office.*)

Washington, Library of Congress :

Report of the Librarian of Congress, and Report of the Superintendent of the Library Building and Grounds, for the fiscal year ending June 30th, 1908. (*Library.*)

Washington, U.S. Coast and Geodetic Survey :

- : U.S. Magnetic Tables and Magnetic Charts for 1905.
- : Results of Magnetic Observations made near Honolulu, Hawaii, 1902-4.
- : Results of Magnetic Observations made at Sitka, Alaska, 1902 and 1904, and at Vieques, Porto Rico, 1903-4.
- : Results of Observations made at the Magnetic Observatory at Cheltenham, Maryland, 1901-6.
- : Results of Magnetic Observations from 1907, July 1st, to 1908, June 30th. (*Superintendent.*)

Washington, U.S. Dept. of Agriculture, Weather Bureau :

- : Report of the Chief of the Weather Bureau for 1906-7.
- : Monthly Weather Review, 1908. Vol. 36, No. 10-13 ; 1909, 37, No. 1-6. (*Bureau.*)

Washington, U.S. Naval Observatory :

Synopsis of the Report of the Superintendent for the fiscal years ending June 30th, 1908 and 1909. (*Observatory.*)

Wilde (Henry) :

On a new Binary Progression of the Planetary Distances, and on the Mutability of the Solar System. (*Author.*)

Williams (A. Stanley) :

Zenographical Fragments, II. The Motions and Changes of the markings on Jupiter in 1888. (*Author.*)

Wolff (Oskar) :

Folgerungen aus dem dritten kepler'schen Gesetze. (*Author.*)

Yerkes Observatory, Wisconsin :

The Yerkes Observatory, by Edwin Brant Frost, Director.
(*Observatory.*)

Zágráb, Meteorologoskom Observatoriju :

Jahrbuch.....für das Jahr 1906, 1907. (*Observatory.*)

Zi-Ka-Wei Observatory, Shanghai :

- : Code des signaux.
- : Signaux aux marins.
- : Perturbation magnétique, Sept. 11, 12, 1908.
- : Bulletin des Observations. Vol. 32, 1906. Magnétisme Terrestre.
- : Annales de L'Observation Astronomique de Zô-Sè. Tome 3, 1907. (*Observatory.*)

Zürich, Observatoire federal :

Astronomische Mitteilungen.....No. 100. Herausgegeben von A. Wolfér. (*Observatory.*)

Zürich, Sternwarte des Eidg. Polytechnikums :

Publikationen.....Band 4. Herausgegeben von A. Wolfér. (*Observatory.*)