



STONYHURST COLLEGE
OBSERVATORY.

RESULTS
OF
METEOROLOGICAL & MAGNETICAL
OBSERVATIONS

WITH REPORT AND NOTES OF THE DIRECTOR.

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

1905.

CLITHEROE :

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REPORT AND NOTES.



THE meteorological continuous records have been carried on as usual. All the instruments have been in good working condition throughout the year; and the usual weekly and monthly returns have been sent to the *Meteorological Office*.

The general character of the year has been calm and mild. The highest and lowest temperatures were respectively 78·2 in June, and 23·5 in January. There have been no heavy gales of wind; the highest velocities registered were as follows in miles per hour: on March 15th 57; on June 6th 49; on November 27th 48; on February 27th 40. The rainfall was close on 8 inches below the annual average, and the registered bright sun shine shows a little above the average number of hours.

The year has been remarkable for the prevalence of south-westerly as compared with westerly winds. Out of the total number of miles length of air passing over the Observatory (88,945), 27,373 were registered from the south-west, against 22,554 from the west. Usually the mileage from the west greatly exceeds that from the south west; the only previous exceptions in 25 years being the years 1888 and 1891.

The annual mean daily range of temperature has been during the last three years nearly 4° below the general average. In 1903-4-5. it was $10^{\circ}0$, $10^{\circ}3$ and $10^{\circ}5$; and in the preceding three years it was $16^{\circ}3$, $14^{\circ}9$ and $15^{\circ}5$. The difference is apparently to be attributed to the change made on January 1st, 1903; when the Glaisher-screen was abandoned and the readings taken from the thermometers of the Stevenson-screen in the north-wall shade of the Observatory (Cf Report and Notes 1903, page 6). It seems probable that the more open position of the Glaisher screen would give the lowest temperatures more correctly, but the highest readings would be affected by surrounding radiations. The mean temperatures of the months do not appear to be affected by the change; and this goes to show that the differences balance one another, the Stevenson-screen showing the night readings higher, and the day readings lower than the Glaisher screen.

The photo magnetographs of Horizontal direction and force have been in good working order throughout the year. The Vertical-force balance has been sent to Paris to be transformed according to the design of M. Mailhat

Exchange tracings of magnetic disturbances on the under-mentioned dates have been sent, according to agreement, to the Imperial Magnetic Observatory at Potsdam.

1904—April 1. May 12-13, 13 14, 27-28. June 15-16 July 6-7. August 1-2, 3-4. September 24-25. October 6-7, 7-8, 21-22. November 4-5, 5-6.

1905—January 5-6. February 3-4. March 2-3. November 12-13, 15-16.

Drawings of solar spots and faculae have been made on 196 days. The mean disc area of the spots (in units $1/5000$ of the visible surface) appears at 6.8 per diem; and the mean daily range of the Magnetic declination (in minutes of arc) at 14.9. The signification of these numbers is shown in the following table, which covers the previous minimum epoch of solar and magnetic disturbances.

Year ...	1900	·01	·02	·03	·04	·05
Spot area ...	0.55	0.29	0.33	1.93	2.54	6.8
Declination range	9.7	9.1	9.0	11.8	11.9	14.9

The Rowland grating spectrograph has been employed on the larger sun-spots for eye observations of the red end of the spectrum and for photographs of the green and yellow regions. But the instrument was dismantled in the spring of the year, to make room for experiments with a smaller Rowland grating and a concave reflector, preparatory to use on the solar eclipse. And we are indebted to the Royal Irish Academy for the loan of an excellent coelostat (by Sir Howard Grubb), through the kind recommendation of the late Professor Joly. Experiments with this apparatus have also added to our collection of sun-spot spectrograms

The eclipse expedition to Vinaroz, undertaken by Fr. Cortie, secured some valuable photographs of the solar corona; but unfortunately the focus adjustment for the flash spectrum by the grating, was found to have had accidentally a wrong setting.

A larger Coelostat (15-inch mirror) has been kindly placed at our service by the Council of the Royal Astronomical Society;

and experiments are being made for the mounting of this in conjunction with one of the 15 inch reflectors of the late Colonel Cross, in order to take part more efficiently in the international programme of observations of sun-spot spectra.

The stellar spectrograph has been employed on nearly every available night. But only 212 exposures have been made, on 110 nights.

PUBLICATIONS.

"Eleventh Report of the Section for the Observations of the Sun." Memoirs B A.A., vol. xiii., part ii., 1905.

"Magnetic Storms and Associated Sun-Spots." Monthly Notices, R.A S. January, 1905.

WALTER SIDGREAVES, S.J.

Stonyhurst Observatory.

Lat. 53° 50' 40"N. Long. 9m. 52s. 68, W. Height of the
Barometer above the sea 381 ft.

METEOROLOGICAL REPORT.

JANUARY, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.	
Mean Reading of the Barometer inches	29·789	29·468
Highest „ „ on the 28th „	30·489	30·283
Lowest „ „ on the 17th „	28·585	28·596
Range of Barometer Readings „	1·904	1·687
Highest Reading of a Max. Therm. on 6th & 8th	49·2	51·3
Lowest Reading of a Min. Therm. on the 16th	23·5	21·0
Range of Thermometer Readings	25·9	30·3
Mean of all the Highest Readings	41·9	42·3
Mean of all the Lowest Readings	35·1	32·7
Mean Daily Range	6·8	9·6
Deduced Monthly Mean from (Mean of Max. and Min.)	38·5	37·2
Mean Temperature from Dry Bulb.	38·1	37·3
Adopted Mean Temperature	38·3	37·3
Mean Temperature of Evaporation	36·6	36·1
Mean Temperature of Dew Point	34·3	33·9
Mean elastic force of Vapour. inches	0·198	0·197
Mean weight of Vapour in a cub. ft. of air grains	2·3	2·4
Mean additional weight required for saturation, „	0·4	0·4
Mean degree of Humidity (saturation 1·00) ..	0·86	0·79
Mean weight of a cubic foot of air grains	554·6	549·8
Fall of Rain. inches	2·938	4·123
Number of days on which Rain fell	19	20·7

JANUARY, 1905.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	0	6	0	5	14	6	0
Mean velocity in miles per hour	0	0	13·8	0	8·8	15·6	11·7	0
Total No. of miles for each Direction	0	0	1982	0	1055	5256	1681	0

The total number of miles registered during the month was 9974.

The max. Velocity of wind was 49 miles per hour, on the 6th at 9 p.m. Dir. W. by S.

Mean amount Cloud (an overcast sky being indicated by 10·0) 8 3

In the Month of January the highest reading of the Barometer during 53 years, was on the 9th, in 1896, and was ... 30 597

The Lowest ,, 26th, 1884 ,, 27·803

The highest Temperature 7th, 1887 ,, 59·9

The lowest ,, 15th, 1881 ,, 4·6

The highest adopted mean temperature of the month, 1898 43·7

The lowest ,, ,, 1881 29·2

Greatest fall of rain for the month in 1852 8·147

Least ,, ,, 1881 0·472

Greatest number of days on which rain fell 1872 31

Least ,, ,, 1879 8

TABLE OF DIFFERENCES.

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

Mean barometric pressure	..	..	+	0·326 inches
Monthly range	..	..	+	0·217 ,,
Mean of highest temperatures	..	..	—	0·4 degrees
Mean of lowest	..	..	+	2·4 ,,
Mean daily range	..	..	—	2·8 ,,
Adopted mean temperature	..	..	+	1·0 ,,
Total rainfall	..	..	—	1·185 inches

Ground frost on 1st, 2nd, 6th, 10th, 13th—27th. Fog on 2nd and 13th. Hail on 1st, 9th, 12th, 16th and 18th. Snow on 1st, 2nd, 9th, 16th, 17th and 18th. Gales of wind on 6th, 15th and 31st.

FEBRUARY, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.
Mean Reading of the Barometer inches 29·698	29·508
Highest " on the 21st ,, 30·212	30·079
Lowest " on the 27th ,, 28·427	28·676
Range of Barometer Readings , 1·775	1·403
Highest Reading of a Max. Therm. on the 18th 51·2	52·2
Lowest Reading of a Min. Therm. on the 12th 28·3	21 9
Range of Thermometer Readings 22·9	30·3
Mean of all the Highest Readings 43·9	44·1
Mean of all the Lowest Readings 36·3	33·3
Mean Daily Range 7·6	10 8
Deduced Monthly Mean (from Mean of Max. and Min.) 40·1	38·2
Mean Temperature from Dry Bulb 39·3	38·2
Adopted Mean Temperature 39·7	38·2
Mean Temperature of Evaporation 37·7	36·7
Mean Temperature of Dew Point 35·1	34·4
Mean elastic force of Vapour inches 0·205	0·193
Mean weight of Vapour in a cub. ft. of air grains 2·4	2·4
Mean additional weight required for saturation, , 0·5	0·4
Mean degree of Humidity (saturation 1·00) . . 0·84	0·86
Mean weight of a cubic foot of air grains 551·2	549·0
Fall of Rain inches 2·680	3·453
Number of days on which Rain fell 20	18·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	2	0	0	4	11	9	2
Mean Velocity in miles per hour	0	10 3	0	0	23 3	16·8	14·0	14·3
Total No. of miles for each Direction.	0	496	0	0	1233	4446	3014	687

The total number of miles registered during the month was 9876.
 The max. Velocity of the wind was 50 miles per hour, on the 26th, at 7 a. m. Dir. S.S.E.

FEBRUARY, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·2
In the month of February, the highest reading of the Barometer during 58 years, was on the 1st, in 1902, and was	.... 30·476
The lowest	„ 19th, 1900 „ 27·870
The highest Temperature	8th, 1877 „ 58·3
The lowest	„ 11th, 1902 „ 5·0
The highest adopted mean temperature of the month, 1869 ..	44·0
The lowest	„ „ 1855 28·6
Greatest fall of rain for the month in	1848 8·882in
Least	„ „ „ 1858 0·306in
Greatest number of days on which rain fell	1868 28
Least	„ „ „ 1858 and '95 6

TABLE OF DIFFERENCES.

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

Mean barometric pressure	.. ..	+ 0·190 inches
Monthly range	„	+ 0·372 „
Mean of highest temperatures	.. ..	— 0·2 degrees
Mean of lowest	„	+ 3·0 „
Mean daily range	„	— 3·2 „
Adopted mean temperature	.. ..	+ 1·5 „
Total rainfall	„	— 0·773 inches

Ground frost on 7th, 8th, 11th, 12th, 19th—27th Fog on 13th. Hail on 2nd, 11th, 19th, 24th, 27th and 28th. Snow on 11th, 19th, 25th, 27th and 28th. Gales of wind on 1st, 2nd, 19th, 26th, 27th and 28th.

MARCH, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years
Mean Reading of the Barometer inches	29.246
Highest ,, on the 3rd ,,	29.904
Lowest ,, on the 15th ,,	28.278
Range of Barometer Readings	1.626
Highest Reading of a Max. Therm. on the 22nd	57.2
Lowest Reading of a Min. Therm. on the 3rd	27.7
Range of Thermometer Readings	29.5
Mean of all the Highest Readings	48.0
Mean of all the Lowest Readings	37.8
Mean Daily Range	10.2
Deduced Monthly Mean (from Mean of Max. and Min.)	42.9
Mean Temperature from Dry Bulb	42.4
Adopted Mean Temperature	42.7
Mean Temperature of Evaporation	40.6
Mean Temperature of Dew Point	38.1
Mean Elastic force of Vapour .....inches	0.230
Mean weight of Vapour in a cubic ft. of air grains	2.7
Mean additional weight required for saturation,,	0.5
Mean degree of Humidity (saturation 1.00) ..	0.84
Mean weight of a cubic foot of air grains	539.3
Fall of Rain .....inches	3.480
Number of days on which Rain fell.....	21

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	0	1	5	4	17	1	0
Mean Velocity in miles per hour	8.1	0	6.3	16.2	14.0	11.9	16.8	0
Total No. of Miles for each Direction	586	0	152	1943	1345	4852	403	0

The total number of miles registered during the month was 9281.
 The max. Velocity of the wind was 57 miles per hour, on the 15th at 9 a.m. Dir. S.S.E.

MARCH, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				7·6
In the month of March, the highest reading of the Barometer during 58 years, was on the 6th in 1852, and was ... 30·401				
The lowest	,,	3rd, 1897	,,	.. 28·157
The highest Temperature	,,	25th, 1871	,,	.. 68·0
The lowest	,,	6th, 1886	,,	.. 11·5
The highest adopted mean temperature of the month, 1871..				44·0
The lowest	,,	,,	1855 and 1892..	35·6
Greatest fall of rain during the month in				.. 1896... 7·079 in
Least	,,	,,	.. 1852...	0·352 in
Greatest number of days on which rain fell, 1859, 61, 68 & 72				28
Least	,,	,,	.. 1852..	3

TABLE OF DIFFERENCES.

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

Mean barometric pressure	..	—	0·212 inches
Monthly range	,, ..	+	204 ,,
Mean of highest temperatures	..	+	0·7 degrees
Mean of lowest	,, ..	+	3·7 ,,
Mean daily range	,, ..	—	3·0 ,,
Adopted mean temperature	.. ..	+	2·8 ,,
Total rainfall	.. ..	+	0·181 inches

Ground frost on 1st, 6th, 8th, 10th, 18th—20th, and 30th.
 Hail on 9th, 11th, and 14th. Heavy rain on 10th. Gales of wind on 9th and 15th. Fog on 4th. Thunder on 9th and 17th. Lightning on 9th. Lunar Halo on 19th and 20th. Aurora Borealis on 2nd.

APRIL, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.	
Mean Reading of the Barometer inches	29·421	29·483
Highest „ on the 1st „	29·809	29·963
Lowest „ on the 30th „	28·712	28 815
Range of Barometer Readings..... „	1·097	1·148
Highest Reading of a Max. Therm. on 13th & 15th	55·9	65·6
Lowest Reading of a Min. Therm. on 8th	25·5	28·1
Range of Thermometer Readings	30·4	37·5
Mean of all the Highest Readings.....	48·5	55·4
Mean of all the Lowest Readings.....	38·1	37·7
Mean Daily Range.....	10·4	17 7
Deduced Monthly Mean (from Mean of Max. and Min.)	43·3	44·4
Mean Temperature from Dry Bulb.....	43·1	44·6
Adopted Mean Temperature.....	43·2	44 5
Mean Temperature of Evaporation.....	40·8	41·7
Mean Temperature of Dew Point	38·0	38·2
Mean elastic force of Vapour .....inches	0·228	0·235
Mean weight of Vapour in a cub. ft. of airgrains	2·6	2·7
Mean additional weight required for saturation,,	0·6	0·7
Mean degree of Humidity (saturation 1·00)...	0·81	0·79
Mean weight of a cubic foot of air...grains...	542·1	542·0
Fall of Rain..... inches	3·690	2·466
Number of days on which Rain fell.....	20	16·0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		3	4	1	5	3	6	7	1
Mean Velocity in miles per hour	7·7	10·8	5·2	11·0	12·4	15·3	13·9	11·0
Total No. of miles for each Direction	532	1039	125	1322	892	2210	2335	265

The total number of miles registered during the month was 8720.
 The max Velocity of the wind was 40 miles per hour, on the 5th at 1 p.m. Dir. W.S.W.

APRIL, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	7·6
In the month of April, the highest reading of the Barometer during 58 years, was on the 17th, in 1887, and was	30·251
The lowest	20th, 1868
The highest Temperature	14th, 1852
The lowest	13th, 1892
The highest adopted mean temperature of the month, 1865 ...	48·5
The lowest	1879 ...
Greatest fall of rain during the month in	1867
Least	1852
Greatest number of days on which rain fell	1867
Least	1852

TABLE OF DIFFERENCES.

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

Mean barometric pressure	.. ..	— 0·062 inches
Monthly range	.. ..	— 0·051 "
Mean of highest temperature	.. ..	— 6·9 degrees
Mean of lowest	.. ..	— 0·4 "
Mean daily range	.. ..	— 7·3 "
Adopted mean temperature	.. ..	— 1·3 "
Total rainfall	... ..	+ 1·224 inches

Ground frost on 1st—3rd, 6th—10th, 18th, 20th, 22nd and 25th.
 Snow on 6th, 7th, 18th and 19th. Hail on 18th, 23rd and 24th.
 Heavy rain on 6th and 26th. Gales of wind on 5th. Fog on 11th and 12th.

MAY, 1905.

Results of Observations taken during the Month.		Mean for the last 58 years.
Mean Reading of the Barometer.....inches	29.733	29.525
Highest ,, on the 5th ,,	30.095	29.965
Lowest ,, on the 1st ,,	28.716	28.934
Range of Barometer Readings..... ,,	1.379	1.031
Highest Reading of Max. Therm. on the 28th	67.9	71.7
Lowest Reading of a Min. Therm. on the 22nd	33.9	31.5
Range of Thermometer Readings	34.0	40.2
Mean of all the Highest Readings	57.9	59.7
Mean of all the Lowest Readings	43.2	42.0
Mean Daily Range.....	14.7	17.7
Deduced Monthly Mean (from Mean of Max. and Min.).....	50.6	49.1
Mean Temperature from Dry Bulb.....	50.5	49.6
Adopted Mean Temperature	50.6	49.4
Mean Temperature of Evaporation	46.7	46.1
Mean Temperature of Dew Point	42.6	42.4
Mean elastic force of Vapour .....inches	0.274	0.275
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 1.00) ..	0.75	0.76
Mean weight of a cubic foot of air....grains	539.8	537.3
Fall of rain .....inches	0.650	2.590
Number of days on which rain fell.....	6	15.3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	8	0	1	2	7	10	0
Mean Velocity in miles per hour	6.1	7.2	0	24.7	8.0	7.0	9.2	0
Total No. of miles for each Direction	439	1381	0	593	382	1177	2208	0

The total No. of miles registered during the month was 6179.
 The max. Velocity of the wind was 32 miles per hour, on the 1st at 8 a.m. Dir. S. E. by S.

MAY, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	7·0
In the month of May, the highest reading of the Barometer during 58 years, was on the 2nd in 1895, and was	30·217
The lowest ,, 28th, 1877 ,,	28·559
The highest Temperature 19th, 1864 ,,	82·5
The lowest ,, 4th, 1855 ,,	23·5
The highest adopted mean temperature of the month, 1848	55·1
The lowest ,, ,, 1855	45·0
Greatest fall of rain during the month in 1886	6·224 in
Least ,, ,, 1859	0·249 in
Greatest number of days on which rain fell 1872	28
Least ,, ,, 1853 and 1896	5

TABLE OF DIFFERENCES.

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

Mean barometric pressure	..	..	+	0·208 inches
Monthly range	,,	..	+	0·348 ,,
Mean of highest temperatures	..	..	—	1·8 degrees
Mean of lowest	,,	..	+	1·2 ,,
Mean daily range	,,	..	—	3·0 ,,
Adopted Mean temperature	..	..	+	1·2 ,,
Total rainfall	..	..	—	1·940 inches

Ground frost on 4th, 6th, 9th, 21st—23rd.

JUNE, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years	
Mean Reading of the Barometer inches	29·575	29·551
Highest ,, on the 23rd ,,	30·010	29·909
Lowest ,, on the 18th ,,	29·260	29·041
Range of Barometer Readings..... ,,	0·750	0·868
Highest Reading of a Max. Therm. on the 25th	78·2	77·5
Lowest Reading of a Min. Therm. on the 9th	40·1	38·8
Range of Thermometer Readings.....	38·1	38·7
Mean of all the Highest Readings.....	66·0	65·9
Mean of all the Lowest Readings	49·7	48·0
Mean Daily Range.....	16·3	17·9
Deduced Monthly Mean (from Mean of Max. and Min.)	57·9	55·2
Mean Temperature from Dry Bulb	58·4	55·3
Adopted Mean Temperature	58·2	55·3
Mean Temperature of Evaporation	53·2	52·1
Mean Temperature of Dew Point	48·7	48·6
Mean elastic force of Vapour inches	0·345	0·352
Mean weight of Vapour in a cub.ft. of air grains	3·8	3·9
Mean additional weight required for saturation,,	1·6	1·0
Mean degree of Humidity (saturation 1·00)..	0·71	0·78
Mean weight of a cubic foot of air . . . grains	528·4	531·0
Fall of Rain.....inches	3·095	3·401
Number of days on which rain fell	8	16·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	9	2	0	3	8	0	1
Mean Velocity in miles per hour	8·5	8·5	9·4	0	12·4	8·8	0	3·9
Total No. of miles for each Direction.	1421	1845	452	0	892	1680	0	93

The total number of miles registered during the month was 6883.
 The max. Velocity of the wind was 32 miles per hour on the 20th at Noon. Dir. S. by E.

JUNE, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	6·4
In the month of June, the highest reading of the Barometer during 58 years, was on the 15th, in 1874, and was	30·219
The lowest .. 23rd, 1893	28·813
The highest Temperature 18th, 1893	88·7
The lowest .. 9th, 1902	32·0
The highest adopted mean temperature of the month, 1858..	59·0
The lowest 1856 and 1860..	52·2
Greatest fall of rain during the month in 1848	7·125 in
Least 1887	0·525 in
Greatest number of days on which rain fell 1862	27
Least 1887	4

TABLE OF DIFFERENCES.

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

Mean barometric pressure ..	+ 0·024 inches
Monthly range ..	+ 0·118 ..
Mean of highest temperatures ..	+ 0·1 degrees
Mean of lowest ..	+ 1·7 ..
Mean daily range ..	— 1·6 ..
Adopted mean temperature ..	+ 2·9 ..
Total rainfall ..	— 306 inches

Thunder on 17th, 18th, and 19th. Heavy rain on 17th, and 19th.
Lunar Halo on 15th.

JULY, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years	
Mean Reading of the Barometer ....inches	29.632	29.519
Highest " on the 3rd ,,	29.907	29.890
Lowest " on the 29th ,,	29.290	29.015
Range of Barometer Readings ,,	0.617	0.875
Highest Reading of a Max. Ther. on the 9th	77.9	78.8
Lowest Reading of a Min. Therm. on the 4th	45.3	42.2
Range of Thermometer Readings	32.6	36.6
Mean of all the Highest Readings	67.1	68.0
Mean of all the Lowest Readings	54.4	50.9
Mean Daily Range.....	12.7	17.1
Deduced Monthly Mean (from Mean of Max and Min.)	60.8	57.9
Mean Temperature from Dry Bulb	60.8	58.0
Adopted Mean Temperature	60.8	58.0
Mean Temperature of Evaporation	56.9	54.9
Mean Temperature of Dew Point	53.6	52.1
Mean elastic force of Vapour .....inches	0.411	0.390
Mean weight of Vapour in a cub.ft. of air grains	4.6	4.5
Mean additional weight required for saturation,,	1.4	1.1
Mean degree of Humidity (saturation 1.00) ..	0.77	0.81
Mean weight of a cubic foot of air ....grains	526.3	527.4
Fall of Rain	3.560	4.016
Number of days on which Rain fell	16	17.7

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	1	0	0	2	13	14	0
Mean Velocity in miles per hour	6.7	9.0	0	0	9.0	9.1	6.8	0
Total No. of miles for each Direction	160	215	0	0	432	2845	2277	0

The total number of miles registered during the month was 5929
 The max. Velocity of the wind was 27 miles per hour, on the
 30th, at Noon. Dir. S.W.

JULY, 1905.

Mean amount Cloud (an overcast sky being indicated by 10·0) 7·6

In the month of July, the highest reading of the Barometer

during 58 years, was on the 24th, in 1868, and was30·112

The lowest ,, 15th, 1877 ,, 28·564

The highest Temperature 20th, 1901 ,, 89·0

The lowest ,, 1st, 1857 ,, 36·0

The highest adopted mean temperature of the month, 1901 63·2

The lowest ,, " " 1888 54·5

Greatest fall of rain during the month in .. 1888 8·602 in

Least ,, " " 1868 0·669 in

Greatest number of days on which rain fell .. 1861 30

Least ,, " " 1868 9

TABLE OF DIFFERENCES.

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

Mean barometric pressure .. + 0·113 inches

Monthly Range ,, .. — 0·258 ,,

Mean of highest temperatures .. — 0·9 degrees

Mean of lowest ,, .. + 3·5 ,,

Mean daily range ,, .. — 4·4 ,,

Adopted mean temperature .. + 2·8 ,,

Total rainfall — 0·456 inches

Thunder on 2nd and 9th. Lightning on 2nd and 9th. Heavy rain on 17th. Lunar Halo on 11th. Fog on 12th.

AUGUST, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.
Mean Reading of the Barometer.....inches	29·448
Highest ,, on the 31st ,,	29·897
Lowest ,, on the 4th ,,	28·875
Range of Barometer Readings ,,	1·022
Highest Reading of a Max. Therm. on the 15th	67·7
Lowest Reading of a Min. Therm. on the 9th	43·3
Range of Thermometer Readings	24·4
Mean of all the Highest Readings	62·3
Mean of all the Lowest Readings	51·3
Mean Daily Range.....	11·0
Deduced Monthly Mean (from Mean of Max. and Min).....	56·8
Mean Temperature from Dry Bulb.....	57·2
Adopted Mean Temperature	57·0
Mean Temperature of Evaporation	53·7
Mean Temperature of Dew Point	50·6
Mean elastic force of Vapour .....inches	0·369
Mean weight of Vapour in a cub.ft. of air grains	4·1
Mean additional weight required for saturation,,	1·1
Mean degree of Humidity (saturation 1·00)..	0·79
Mean weight of cubic foot of air ....grains	527·3
Fall of Rain .....inches	4·095
Number of days on which Rain fell	20

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	2	3	2	2	11	8	0
Mean Velocity in miles per hour	7·6	8·1	7·1	15·1	11·8	8·3	7·3	0
Total No. of miles for each Direction	546	390	513	727	564	2198	1401	0

The total No. of miles registered during the month was 6339.
The max. Velocity of the wind was 35 miles per hour, on the 19th
at 2 p.m. Dir. S.W.

AUGUST, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·3
In the month of August, the highest reading of the Barometer during 58 years, was on the 21st, in 1874, and was	.... 30·114
The lowest ,, 15th, 1903 ,,	.... 28·492
The highest Temperature 2nd, 1868 ,,	.... 88·0
The lowest ,, 13th, 1887 ,,	.... 33·4
The highest adopted mean temperature of the month, 1899	61·7
The lowest ,, ,,	1848 52·5
Greatest fall of rain during the month in	1891 9·869 in
Least ,, ,,	1871 2·085 in
Greatest number of days on which rain fell	1860 28
Least ,, ,,	1880 6

TABLE OF DIFFERENCES.

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

Mean barometric pressure	—	0·046 inches
Monthly range ,, ..	+	0·081 ,,
Mean of highest temperatures	—	4·8 degrees
Mean of lowest ,, ..	+	0·5 ,,
Mean daily range ,, ..	—	5·6 ,,
Adopted mean temperature	—	0·4 ,,
Total rainfall 	—	0·972 inches

Thunder on 3rd, 7th, 9th and 26th. Lightning on 9th. Heavy rain on 25th. Fog on 27th. Lunar Halo on 13th.

SEPTEMBER, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.
Mean Reading of the Barometer.....inches 29.564	29.527
Highest " on the 17th " 29.968	30.024
Lowest " on the 7th " 28.903	28.862
Range of Barometer Readings " 1.005	1.162
Highest Reading of a Max. Therm. on the 7th 62.4	72.3
Lowest Reading of a Min. Therm. on the 21st 37.7	36.4
Range of Thermometer Readings 24.7	35.9
Mean of all the Highest Readings..... 57.8	62.4
Mean of all the Lowest Readings 47.2	47.0
Mean Daily Range..... 10.6	15.4
Deduced Monthly Mean (from Mean of Max. and Min.) 52.5	53.6
Mean Temperature from Dry Bulb..... 52.6	54.1
Adopted Mean Temperature 52.6	53.8
Mean Temperature of Evaporation..... 50.2	51.0
Mean Temperature of Dew Point 47.8	48.3
Mean elastic force of Vapour inches 0.332	0.339
Mean weight of Vapour in a cub.ft. of air grains 3.7	3.9
Mean additional weight required for saturation,, 0.7	0.8
Mean degree of Humidity (saturation 1.00..) 0.84	0.81
Mean weight of a cubic foot of air ... grains 534.1	532.3
Fall of rain..... inches 4.385	4.479
Number of days on which Rain fell 18	18.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	3	3	0	8	5	5	1
Mean Velocity in miles per hour	5.6	8.9	9.3	0	11.3	10.8	7.6	3.7
Total No. of miles for each Direction	674	639	672	0	2261	1292	912	89

The total number of miles registered during the month was 6538.
The max. Velocity of the wind was 33 miles per hour, on the 3rd, at 1 and 2 p.m. Dir. S.W.

OCTOBER, 1905.

Result of Observations taken during the Month.	Mean for the last 58 years.	
Mean Reading of the Barometer.....inches	29.598	29.436
Highest " on the 11th " "	30.132	30.024
Lowest " on the 31st " "	28.637	28.655
Range of Barometer Readings.....	1.495	1.369
Highest Reading of a Max Therm. on the 9th	58.1	64.1
Lowest Reading of a Min. Therm. on the 17th	27.4	29.1
Range of Thermometer Readings	30.7	35.0
Mean of all the Highest Readings	49.9	54.6
Mean of all the Lowest Readings	38.1	41.5
Mean Daily Range	11.8	13.1
Deduced Monthly Mean (from Mean of Max. and Min.)	44.0	47.1
Mean Temperature from Dry Bulb	43.8	47.6
Adopted Mean Temperature	43.9	47.4
Mean Temperature of Evaporation	41.8	45.2
Mean Temperature of Dew Point	39.4	42.3
Mean elastic force of Vapour.....inches	0.242	0.276
Mean weight of Vapour in a cub. ft. of air grains	2.8	3.2
Mean additional weight required for saturation,,	0.5	0.6
Mean degree of Humidity (saturation 1.00)..	0.84	0.84
Mean weight of a cubic foot of air .. grains	544.6	537.7
Fall of Rain	4.715	5.081
Number of Days on which rain fell	15	21.0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	3	0	0	3	2	10	6
Mean Velocity in miles per hour	6.6	3.9	0	0	9.8	8.5	14.1	9.3
Total No. of miles for each Direction	1103	282	0	0	707	406	3393	1344

The total number of miles registered during the month was 7235.
The max. Velocity of the wind was 37 miles per hour, on the 14th, at Mfdnight. Dir. W.

OCTOBER, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	6·5		
In the month of October the highest reading of the Barometer during 58 years, was on the 5th, in 1884, and was ..	30·306		
The lowest	„	19th, 1862	„ 28·139
The highest Temperature		9th, 1869	„ 72·8
The lowest	„	28th, 1895	„ 17·8
The highest adopted mean temperature of the month, 1861 & 76	51·6		
The lowest	„	„	1895 .. 42·8
Greatest fall of rain during the month in ..	1870	13·437 in	
Least	„	„	1856 1·328 in
Greatest number of days on which rain fell ..	1873	31	
Least	„	„	1881-'87-'97-'99 12

TABLE OF DIFFERENCES.

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

Mean barometric pressure	+	0·162 inches
Monthly range „	+	0·126 „
Mean of highest temperatures	—	4·7 degrees
Mean of lowest „	—	3·4 „
Mean daily range „	—	1·3 „
Adopted mean temperature	—	3·5 „
Total rainfall	—	0·372 inches

Ground Frost on 3rd, 14th—26th, 28th and 29th. Heavy rain on 3rd, 14th and 26th. Gale of Wind on 14th. Fog on 10th. Lunar Halo on 9th.

NOVEMBER, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.
Mean Reading of the Barometer inches 29·256	29·474
Highest „ on the 18th „ 29·841	30·069
Lowest „ on the 26th „ 28·290	28·566
Range of Barometer Readings „ 1·551	1·503
Highest Reading of a Max. Therm. on the 11th 51·5	55·9
Lowest Reading of a Min. Therm. on the 18th 24·8	25·4
Range of Thermometer Readings 26·7	30·5
Mean of all the Highest Readings 44·7	47·3
Mean of all the Lowest Readings 36·9	36·6
Mean Daily Range 7·8	10·7
Deduced Monthly Mean (from Mean of Max. and Min) 40·8	41·6
Mean Temperature from Dry Bulb..... 40·2	41·9
Adopted Mean Temperature 40·5	41·7
Mean Temperature of Evaporation 39·0	39·6
Mean Temperature of Dew Point 37·1	38·2
Mean elastic force of Vapour inches 0·220	0·232
Mean weight of Vapour in a cub.ft. of air grains 2·5	2·7
Mean additional weight required for saturation,, 0·4	0·4
Mean degree of Humidity (saturation 1·00) ... 0·88	0·87
Mean weight of a cubic foot of air .. grains.. 541·8	544·9
Fall of Rain..... inches 4·230	4·387
Number of days on which Rain fell 20	19·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	4	7	5	1	6	0	6	1
Mean Velocity in miles per hour	4·4	5·5	3·7	10·5	11·5	0	11·9	5·2
Total No. of Miles for each Direction	422	931	448	253	1663	0	1710	125

The total number of miles registered during the month was 5552.
 The max. Velocity of the wind was 48 miles per hour, on the 27th, at 2 a.m. Dir. N.W. by W.

NOVEMBER, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				7·6
In the month of November, the highest reading of the Barometer during 58 years was on the 12th, in 1857, and was 30·350				
The lowest	"	11th, 1891	"	27·938
The highest Temperature		1st, 1900	"	62·4
The lowest	"	15th, 1901	"	17·5
The highest adopted mean temperature of the month, 1881 and 1899				47·0
The lowest	"	"	1851	36·7
Greatest fall of rain during the month in ..				1866 9·026in
Least	"	"	1855	1·158in
Greatest number of days on which rain fell ..				1872 29
Least	"	"	1855	8

TABLE OF DIFFERENCES.

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

Mean barometric pressure	—	0·218 inches
Monthly range	+	0·048 "
Mean of highest temperatures	—	2·6 degrees
Mean of lowest	+	0·3 "
Mean daily range	—	2·9 "
Adopted mean temperature	—	1·2 "
Total rainfall	—	0·157 inches

Ground frost on 1st, 3rd, 4th, 9th, 10th, 15th—22nd and 29th.
 Hoar Frost on 19th. Fog on 4th. Hail on 15th. Snow on 20th.
 Heavy rain on 22nd. Gale of wind on 27th. Lunar Halo on 16th.

DECEMBER, 1905.

Results of Observations taken during the Month.	Mean for the last 58 years.
Mean Reading of the Barometer.....inches	29·752
Highest " on the 12th ,,	30·484
Lowest " on the 29th ,,	28·910
Range of Barometer Readings	1·574
Highest Reading of a Max. Therm. on the 7th	50·4
Lowest Reading of a Min. Therm. on the 31st	28·9
Range of Thermometer Readings	21·5
Mean of all the Highest Readings	44·1
Mean of all the Lowest Readings	38·1
Mean Daily Range	6·0
Deduced Monthly Mean (from Mean of Max. and Min)	41·1
Mean Temperature from Dry Bulb	40·8
Adopted Mean Temperature	41·0
Mean Temperature of Evaporation	39·6
Mean Temperature of Dew Point	37·8
Mean elastic force of Vapour .....inches	0·227
Mean weight of Vapour in a cub.ft. of air grains	2·6
Mean additional weight required for saturation,,	0·4
Mean degree of Humidity (saturation 1·00) ...	0·89
Mean weight of a cubic foot of air .. grains	545·7
Fall of Rain	1·320
Number of days on which Rain fell	14

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	3	2	0	6	6	13	0
Mean Velocity in miles per hour	4·9	7·9	12·5	0	9·9	7·0	10·3	0
Total No. of miles for each Direction	117	567	598	0	1422	1011	3224	0

The total number of miles registered during the month was 6939.
 The max. Velocity of the wind was 35 miles per hour, on the 5th at 3 p.m. Dir. S.

DECEMBER, 1905.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·0
In the Month of December, the highest reading of the Barometer during 58 years, was on the 22nd, in 1849, and was	30·378
The lowest	27·350
The highest Temperature	58·1
The lowest	6·7
The highest adopted mean temperature of the month	44·6
The lowest	30·3
Greatest fall of rain during the month	9·211 in
Least.	0·550 in
Greatest number of days on which rain fell	31
Least	8

TABLE OF DIFFERENCES.

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

Mean barometric pressure	.. ..	+ 0·298 inches
Monthly range	.. ..	+ 0·056 "
Mean of highest temperatures	.. ..	+ 0·9 degrees
Mean of lowest	.. ..	+ 4·9 "
Mean daily range	.. ..	— 4·0 "
Adopted mean temperature	.. ..	+ 2·5 "
Total rainfall	.. ..	— 3·117 inches

Ground frost on 6th, 9th, 10th, 12th, 13th, 19th, 28th—31st.
Fog on 4th, 12th, 13th and 14th. Lunar halo on 6th and 12th.

Summary of Observations, 1905.

Results of Observations taken during the Year.	Mean for the last 58 years.
Mean Reading of the Barometer inches 29·559	29·495
Highest ,, on Jan. 28th ,, 30·489	30·290
Lowest ,, on Mar. 15th ,, 28·278	28·253
Range of Barometer Readings , , 2·211	2·037
Highest Reading of a Max. Therm. on June 25th 78·2	81·7
Lowest Reading of a Min. Therm. on Jan. 16th 23·5	15·6
Range of Thermometer Readings 54·7	66·1
Mean of all the Highest Readings 52·7	54·8
Mean of all the Lowest Readings 42·2	40·7
Mean Daily Range 10·5	14·1
Deduced Yearly Mean (from Mean of Max. and Min.) 47·4	46·9
Mean Temperature from Dry Bulb 47·3	46·9
Adopted Mean Temperature 47·4	46·9
Mean Temperature of Evaporation 44·7	44·5
Mean Temperature of Dew Point 41·9	42·1
Mean elastic force of Vapour inches 0·273	0·273
Mean weight of Vapour in a cub. ft. of air grains 3·1	3·3
Mean additional weight required for saturation, , 0·8	0·7
Mean degree of Humidity (saturation 1·00) . . 0·82	0·83
Mean weight of a cubic foot of air . . . grains 539·6	539·2
Total fall of rain in the year inches 38·838	46·799
Number of Days per month on which rain fell 16·4	18·4

SUMMARY OF WIND.

No of days in the year on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
.	37	42	23	14	48	100	89	12
Mean Velocity in miles per hour	6·8	7·6	9·0	14·4	11·2	11·4	10·6	9·0
Total No. of miles for each Direction	6002	7785	4942	4838	12848	27373	22554	2603

The total No. of miles registered during the year was 88945.
 The max. Velocity of the wind was 57 miles per hour, on March 15th, at 9 a.m. Dir. S. S. E.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·9

TABLE OF DIFFERENCES, 1905.

The signs + and -- mean respectively above and below the yearly average.

Mean barometric pressure	..	..	+	0·064 inches
Yearly range	..	..	+	0·174 ..
Mean of highest temperatures	..	..	—	2·1 degrees
Mean of lowest	..	..	+	1·5 ..
Mean daily range	..	..	—	3·6 ..
Adopted mean temperature	..	..	+	0·5 ..
Total rainfall	..	..	—	7·961 inches

EXTREME READINGS IN THE LAST 58 YEARS.

The Maximum monthly mean height of the Barometer was in February, 1891, and was	inches	29·997
The Minimum " " in December, 1868, and was		28·984
The Maximum yearly mean height of the Barometer was in 1896, and was	inches	29·584
The Minimum " " in 1886, and was		29·389
The greatest monthly range of the Barometer was in January, 1884, and was	inches	2·409
The least " " in July, 1852, and was ..		0·505
The highest reading of the Barometer during 58 years was on January 9th, 1896, and was	inches	30·597
The lowest " " on December 8th, 1886, and was		27·350
Extreme range	inches	3·247
The highest temperature was on July 20th, 1901, and was ..		89·0
The lowest " " January 15th, 1881		4·6
The highest adopted mean temperature of a month, July, 1901, and was		68·2
The lowest " " February, 1855 ..		28·6
The highest adopted mean temperature of a year, 1868 ..		49·1
The lowest " " 1879 ..		44·1
The greatest monthly mean weight of vapour } in a cubic foot of air	grains } July, 1852	5·1
The least " " February, 1855 and 1895, grains		1·4
The greatest fall of rain in a month was in October, 1870, and was	inches	13·437
The least " " May, 1859 ..		0·249
The greatest number of days on which rain fell in one month, January, 1872, October, 1873, December, 1868		31
The least " " March, 1852		3
The greatest fall of rain in one year in 1866	inches	62·183
The least " " 1887		31·250
The greatest number of days in one year on which rain fell .. 1872		319
The least " " 1855		148

DATES OF OCCASIONAL PHENOMENA.

1905.	Frost.	Hoar Frost.	Snow.	Hail.	Heavy Rain.	
January	1, 2, 6, 10, 13-27	..	1, 2, 9, 16, 17, 18	1, 9, 12, 16, 18	27, 28	
February	7, 8, 11, 12, 19-27	..	.. 11, 19, 25, 27, 28	2, 11, 19, 24, 27, 28	..	
March	1, 6, 8, 10, 19-20, 30	..	..	9, 11, 14	.. 10 ..	
April	1-3, 6-10, 18, 20, 22, 25	..	.. 6, 7, 18, 19	.. 18, 23, 24	6, 26	
May	.. 4-6, 9, 21, 23	..	..	..	.. 17, 19	
June	..	..	..	..	.. 17 ..	
July	..	..	..	..	.. 25 ..	
August	..	.. 21	..	..	1, 8, 9	
September	..	3, 14-26, 28, 29	..	..	3, 14, 26	
October	..	1, 3, 4, 9, 10, 15-22, 29..	..	.. 15	.. 22 ..	
November	..	6, 9, 10, 12, 13, 19, 28-31	..	..	..
December	..	..	..	..	..
1905.	Gales of Wind.	Fog.	Thunder.	Lightning.	Lunar Halo.	Solar Aurora. Halo. Borealis
January	6, 15, 31	..	..	..	..	..
February	1, 2, 19, 26, 27, 28	2, 13	..	..	..	..
March	.. 9, 15 ..	13	9, 17	9	19, 20	.. 2nd
April	.. 5 ..	..	..	..	..	..
May	..	11, 12	..	..	..	..
June	..	..	17, 18, 19	..	15	..
July	..	12	2, 9	2, 9	11	..
August	..	27	3, 7, 9, 26	9	13	..
September	..	17	7	7	..	..
October	.. 14 ..	10	..	..	9	..
November	.. 27 ..	4	..	..	15	..
December	..	4, 12, 14	..	..	6, 12	..

MONTHLY TABLES 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	0	0	0	1.2	3.3	3.9	6.2	7.5	5.9	3.6	0.3	0	0	0	0	0
February	0	0	0	1.6	5.1	6.9	11.0	10.8	11.6	9.0	8.9	7.9	1.7	0	0	0	0
March	0	0	0.2	5.0	12.8	16.5	17.8	16.5	18.5	16.6	14.7	9.6	6.7	2.4	0.6	0	0
April	0.1	1.2	7.9	8.7	11.3	12.6	12.1	14.3	12.9	14.9	13.1	11.2	9.0	3.6	0.6	0	0
May	1.2	7.5	9.5	12.8	14.7	16.6	14.5	15.7	17.1	17.2	17.4	18.2	17.3	18.2	12.9	2.4	0
June	2.6	8.5	15.2	17.8	16.2	16.0	16.2	15.7	16.0	16.5	18.9	17.2	18.5	16.2	14.4	5.7	0
July	0.7	3.4	7.0	10.8	12.6	14.4	15.2	18.3	17.2	16.7	16.2	17.1	15.5	13.8	12.8	5.1	0
August	0	1.3	7.3	10.5	11.6	12.4	13.3	11.5	12.0	10.2	11.3	10.9	11.0	7.4	3.5	0.5	0
September	0	0	1.5	6.1	10.8	14.7	15.4	14.8	8.3	8.6	10.1	8.3	7.5	2.3	0	0	0
October	0	0	0.2	2.5	6.7	10.0	14.9	15.4	13.7	14.1	12.1	9.5	3.4	0.1	0	0	0
November	0	0	0	0	1.2	5.7	8.4	10.6	10.8	6.9	6.5	2.2	0	0	0	0	0
December	0	0	0	0	0.2	2.4	5.4	8.1	7.8	6.2	2.8	0.3	0	0	0	0	0
Total	4.6	21.9	48.8	75.8	104.4	131.5	148.1	157.9	153.4	142.8	135.6	112.7	90.6	6.40	44.8	13.7	0

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

1905.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January	0	0	0	0	1.3	0	0.2	0	1.8	1.8	1.7	1.5	2.5	1.4	0	0.4	0.2
February	3.7	3.7	2.9	0	0	0.1	6.7	1.7	0.1	0	5.3	1.4	0	6.0	0	1.4	5.5
March	4.3	7.3	5.7	0.1	0	0	0.8	3.0	4.4	5.4	3.2	1.1	4.7	3.0	5.8	5.6	7.0
April	0	8.6	9.6	0.4	6.4	10.7	1.7	10.0	6.0	0	0	7.6	0	0	9.3	0	1.5
May	0.3	0	9.4	3.2	9.2	12.4	5.3	11.6	10.5	8.3	6.3	9.9	3.7	0.8	1.5	7.4	14.4
June	7.4	0.5	5.7	10.5	6.2	3.4	0.3	8.5	13.9	14.6	13.1	13.6	4.5	13.2	11.3	5.3	0.7
July	0	3.2	6.7	13.2	4.5	7.8	12.7	13.3	8.5	2.7	5.2	1.2	5.8	11.7	3.2	8.3	1.2
August	5.2	9.3	0	3.7	2.3	8.4	0.6	9.3	0.6	3.2	8.1	5.2	8.3	4.7	4.8	1.4	5.7
September	0.1	3.0	0	0.1	0.3	0	3.7	4.4	1.3	5.6	7.5	6.5	3.7	9.8	4.5	9.2	3.3
October	2.5	2.6	0.8	1.5	6.3	9.2	0	0	1.4	3.5	0.2	0	3.3	1.2	0	9.1	4.0
November	0	0.3	0.8	0	0	1.3	5.4	3.3	5.1	0.5	0.7	0	0	1.2	4.4	6.5	2.3
December	2.2	0.3	0	0	0.7	1.7	4.9	3.8	4.8	0	1.3	0.1	0	0	1.8	1.2	0

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.
(Continued.)

1905.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January	3.8	0	0	0.4	0	0	0	3.7	4.3	0	2.6	0.3	0.3	3.7	31.9	12.9
February	0.7	2.3	5.8	5.3	8.2	5.8	0.3	2.3	3.5	1.3	0.5	0	0	0	74.5	27.4
March	5.7	9.9	3.0	0.5	8.1	4.6	5.0	0	7.6	6.4	1.5	8.8	6.1	9.3	137.9	28.9
April	3.7	2.3	6.5	3.2	8.8	9.8	11.9	11.2	0	0.7	0	2.3	1.3	0	133.5	35.8
May	13.1	11.0	9.3	7.2	7.9	9.0	4.7	2.4	4.8	0.2	0.4	9.2	10.8	9.0	213.2	39.5
June	1.2	5.3	3.0	6.7	9.3	12.0	14.7	12.8	11.4	11.9	8.5	2.0	0.1	0	231.6	38.6
July	12.6	11.1	5.9	6.2	0	2.4	6.2	5.7	0.8	11.7	10.7	0.4	6.2	7.7	196.8	35.4
August	0.1	1.3	1.6	4.2	8.4	4.2	12.7	0	0.7	6.7	0.2	3.7	2.5	7.6	134.7	33.2
September	1.2	3.2	5.6	6.4	1.3	6.0	2.6	4.8	4.2	0.4	1.7	2.8	5.2	0	108.4	33.4
October	2.9	8.4	7.2	5.3	7.1	1.3	6.0	3.7	0	7.2	0	3.6	3.0	1.3	102.6	27.1
November	3.3	4.2	0.3	0	0	1.3	2.8	0	0.8	1.8	0	5.5	0	0	52.3	17.3
December	0.3	0.4	0	0	0	0.2	0.4	0	1.4	2.5	0	0	0	5.2	33.2	11.1

SUMMARY OF SUNSHINE.

1905.	Number of days on which Sunshine was recorded.	Amount or Total Number of Hours	Per centage of possible Sunshine.	Mean for the last 25 Years.		
				Days.	Amount hours	Per centage of possible Sunshine
January ...	18	31·9	12·9	14·0	34·5	13·9
February ...	23	74·5	27·4	17·4	58·5	21·4
March ...	28	137·9	28·9	24·0	105·9	28·6
April ...	22	133·5	35·8	26·0	149·9	35·9
May ...	30	213·2	39·5	27·6	194·7	39·4
June ...	30	231·6	38·6	27·8	196·0	38·3
July ...	29	196·8	35·4	28·4	180·0	35·2
August ...	29	134·7	33·2	27·6	151·7	33·3
September	28	108·4	33·4	25·5	126·6	33·6
October ...	25	102·6	27·1	22·8	88·2	26·9
November	20	52·3	17·3	16·8	45·1	17·5
December	17	33·2	11·1	12·9	25·6	10·9
Year	299	1450·6	32·5	270·6	1356·8	30·1

SUMMARY OF SUNSHINE

(Continued).

EXTREMES FOR THE LAST 25 YEARS.

MONTH	Number of Days on which Sunshine was recorded.				Amount or Total number of Hours.				Percentage of possible Sunshine.			
	GREATEST		LEAST		GREATEST		LEAST		GREATEST		LEAST	
	Days	Year	Days	Year	Hours	Year	Hours	Year	o/o	Year	o/o	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 1905	17	1904	162.1	1893	67.0	1895	44.2	1893	18.3	1895
Apr.	29	1900	23	{ 1883 1885 1888 1897	223.7	1893	95.7	1889	53.4	1893	22.8	1889
May	30	{ 1881 1882 1884 1888 1905	22	1886	266.6	1881	127.0	1886	54.1	1881	25.8	1886
June	30	{ 1896 1904	24	{ 1888 1897	272.5	1887	115.0	1890	53.6	1887	22.6	1890
July	31	1882	25	1888	247.2	1887	98.0	1888	48.6	1887	19.3	1888
Aug.	31	{ 1886 1893	23	1894	235.2	1899	88.4	1891	51.5	1899	19.3	1891
Sept	29	{ 1895 1899	21	1897	170.0	1895	62.9	1896	44.9	1895	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	65.2	1903	18.5	1891	25.5	1903	7.2	1891
Dec.	18	1886	6	1882	60.1	1886	13.8	1903	26.0	1886	6.0	1903
Year	290	1887	251	1903	1613.7	1887	1132.1	1888	36.1	1887	25.3	1888

OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date. 1905.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.	
		Direction.	Velocity (0-6.)	Direction.	Force (0-12)		
January	10	9 a.m.	NW	3	W	3	W
"	11	10 a.m.	NW	2	SW	5	W
"	12	9 a.m.	NNW	2	W	1	W
"	16	10 a.m.	SE	2	ENE	4	E
February	1	9 a.m.	W	2	SW	3	SW
"	3	10 a.m.	NW	1	W	3	NW
"	7	9 a.m.	SW	2	W	1	SW
"	14	9 a.m.	NW	1	W	1	W
March	14	9 a.m.	NW	2	SW	2	SW
"	15	9 a.m.	NW	2	SSE	9	S
"	16	9 a.m.	NW	2	SSE	5	S
"	17	9 a.m.	N	2	SW	3	SW
"	20	9 a.m.	S	2	SW	1	S
April	1	9 a.m.	S	2	SW	1	SW
"	6	9 a.m.	NW	2	W	4	NW
"	22	9 a.m.	NW	2	WSW	3	NW
May	10	9 a.m.	SW	1	S	2	SW
"	17	9 a.m.	SW	1	N	2	NE
"	18	10 a.m.	SW	1	NNE	1	N
"	26	9 a.m.	W	2	SSW	2	SW
"	30	9 a.m.	S	2	SW	1	W
June	6	9 a.m.	NE	2	N	3	NE
"	9	9 a.m.	E	2	NE	1	E
"	10	9 a.m.	E	2	NE	1	NE
"	13	9 a.m.	E	2	ENE	3	SE
"	14	9 a.m.	NE	2	NE	2	NE
"	15	9 a.m.	W	2	NE	2	SE
"	24	10 a.m.	N	1	N	1	N
"	28	10 a.m.	SSW	2	W	1	W
July	3	9 a.m.	NW	2	W	2	W
"	4	9 a.m.	NW	2	SW	1	SW
"	6	9 a.m.	NW	2	W	2	W
"	10	9 a.m.	NW	1	NW	1	W
"	18	9 a.m.	W	1	WSW	3	W
"	24	9 a.m.	NNW	1	SW	1	W
"	27	9 a.m.	S	1	Calm	0	W
"	28	9 a.m.	W	1	Calm	0	NW
August	2	9 a.m.	S	1	W	3	SW
"	8	9 a.m.	SW	1	SSW	1	SW
"	14	9 a.m.	SW	2	WSW	1	SW
"	21	9 a.m.	WNW	1	ESE	3	S
"	24	9 a.m.	SW	2	WSW	2	SW
September	16	9 a.m.	SW	1	Calm	0	SW

OBSERVATIONS OF UPPER CLOUDS (Continued).

Date 1904.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	Velocity (0-6).	Direction.	Force (0-12)	
September 25	9 a.m.	NE	1	NE	1	—
October 2	9 a.m.	W	1	W	1	SW
" 3	10 a.m.	W	1	Calm	0	—
" 10	10 a.m.	W	2	Calm	0	SW
" 14	9 a.m.	N	2	NW	2	NE
" 23	9 a.m.	S	2	Calm	0	SW
" 28	9 a.m.	SW	2	Calm	0	S
" 29	9 a.m.	SW	2	Calm	0	NE
November 16	9 a.m.	NNW	2	N	1	—
" 25	10 a.m.	NW	2	S	2	—
" 26	10 a.m.	N	2	SE	3	—
" 29	10 a.m.	N	2	NNE	1	NW
December 15	10 a.m.	NNW	2	S	1	W
" 16	10 a.m.	SW	2	SW	2	—
" 19	10 a.m.	NW	2	Calm	0	—
" 21	10 a.m.	N	2	Calm	0	NE
" 31	10 a.m.	W	3	W	1	W

OBSERVATIONS OF EARTH-MAGNETISM, 1905.

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 + 0.00004ft. 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 or 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; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1.5^s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through 90° has been about 14'.0 of arc.

In the calculations of the ratio $\frac{m}{X}$, the third and subsequent

terms of the series $1 \begin{matrix} P & Q \\ + & - & + & - & + \\ r^2 & r^4 \end{matrix}$ &c., have always been omitted.

The value of the constant P was found to be -0.00637 .

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; and in the final table the results are given also in C. G. S. units, in parallel columns.

The Dip. or angle between the direction of total force, and that of its horizontal component, has been measured with Dover's Circle, No. 159, once each month by two needles, always when possible on the days of vibration and deflection observations.

The Declination has been observed at the beginning of each week, usually on Mondays at 4 p.m. and is quoted as the angle between the horizontal direction of force and the Astronomical Meridian, measured from the North Point.

The Differential Instruments, or Photo-Magnetographs, are of the same pattern as those at the Kew Observatory, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are shorter, and the clock is not provided with an automatic light-cut-off, for the time scale. The "cut-offs" are made by hand at the hours 0, 2, 20, and 22 of the astronomical day, to furnish two time marks at each end of the day's curves, the changes being made between 10-30 and 11 a.m., civil time.

The scale value of the Bifilar horizontal force torsion balance, has remained very constant at 0.00051 C. G. S. for one centimetre, during the last thirteen years.

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

The corrections for diurnal range, employed in the tables, are taken from the Kew Reports 1891-1902.

OBSERVATIONS OF DECLINATION AND DIP.

1905 MONTH	G.M.T. CIVIL DAY	WEST DECLINATION		MAGNETIC DIP.										
		Observations.	Monthly Mean.	Needle	DIP.	G.M.T. CIVIL DAY								
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.								
Jan.	2 16 0	17 53.4	17 55.2	1	68 4.63	20 10 55								
	9 16 20	17 55.0				2	68 46.0	„ 11 48						
	16 16 0	17 58.2		1	68 47.8			14 12 0						
	23 16 10	17 54.6						2	68 48.0	„ 12 36				
	30 16 0	17 54.7				17 54.8	68 48.0			„ 12 36				
Feb.	6 16 0	17 54.7	2					68 48.0	„ 12 36					
	13 16 0	17 59.7		1	68 48.5						16 12 1			
	20 16 10	17 53.2										2	68 49.5	„ 12 25
	27 16 10	17 51.7													17 55.1	68 49.5	„ 12 25
March	6 15 45	17 53.6	1	68 48.5	16 12 1									
	13 16 0	17 57.1				2	68 49.5	„ 12 25						
	20 16 0	17 53.6							17 51.3	68 45.8	15 15 53			
	27 16 0	17 56.1				2	68 43.7	„ 16 22						
April	3 16 0	17 48.6	1	68 45.8	15 15 53									
	10 16 0	17 52.9										2	68 43.7	„ 16 22
	17 16 0	17 51.8				17 52.3	68 45.9	13 11 45						
May	24 16 0	17 51.7	1	68 45.9	13 11 45									
	1 16 0	17 54.6							2	68 47.7	„ 12 18			
	9 16 0	17 51.8										17 51.5	68 45.4	14 11 4
	15 16 0	17 53.4							1	68 45.4	14 11 4			
22 16 30	17 51.7	2	68 45.8	„ 11 28										
29 16 10	17 50.1				17 54.0	68 44.6	14 17 7							
June	5 16 0	17 51.8	1	68 45.4				14 11 4						
	12 16 0	17 52.3							2	68 45.8	„ 11 28			
	20 16 0	17 48.6										17 54.0	68 44.6	14 17 7
	26 16 0	17 53.3							1	68 44.6	14 17 7			
July	3 16 5	17 54.5	2	68 45.0	„ 17 43									
	10 16 0	17 56.4				17 51.8	68 45.0	„ 17 43						
	17 16 0	17 52.5	1	68 45.0	„ 17 43									
	24 16 45	17 54.6							2	68 45.0	„ 17 43			
31 16 0	17 51.8	1										68 45.0	„ 17 43	

OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.

1905. Month.	G. M. T. (Civil Day)	Temp.	Time of one vibration	G. M. T.	Temp.	Observed Deflection at 1.0 ft. at 1.3 ft.	Value of m.
	D. H. M.	°	S.	D. H. M.	°	° /	
Jan.	19 10 4	35.1	6.0307	19 { 11 18 11 22	36.1 36.0	11 29.6 5 12.7	0.37805
Feb.	14 9 57	59.7	6.0380	14 { 10 57 10 57	58.3 58.0	11 26.9 5 11.2	0.37816
Mar.	16 10 11	51.3	6.0410	16 { 11 4 11 5	53.5 53.8	11 30.3 5 12.5	0.37855
Apr.	15 10 35	54.5	6.0428	15 { 11 28 11 28	54.0 54.9	11 28.2 5 12.0	0.37794
May	13 9 32	52.9	6.0432	13 { 10 36 10 43	54.5 55.0	11 27.8 5 12.1	0.37783
June	14 10 10	58.9	6.0444	14 { 11 13 11 9	62.4 62.8	11 28.7 5 11.6	0.37844
July	14 9 28	70.0	6.0418	14 { 10 28 10 37	71.0 71.8	11 27.3 5 11.4	0.37858
Aug.	12 9 38	60.0	6.0380	12 { 11 8 11 5	62.6 62.6	11 25.9 5 11.1	0.37787
Sept.	14 9 31	51.7	6.0400	14 { 11 15 11 14	56.1 56.2	11 28.0 5 11.6	0.37787
Oct.	17 9 52	49.3	6.0358	17 { 11 23 11 22	52.0 52.5	11 27.0 5 11.7	0.37771
Nov.	18 9 20	34.1	6.0334	18 { 11 20 11 19	48.0 48.9	11 28.3 5 11.9	0.37755
Dec.	18 12 26	45.3	6.0417	18 { 10 0 10 0	44.0 44.0	11 28.0 5 21.5	0.37703

MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
1905	Horizon- tal Force.	Vertical Force.	Total Force.	Horizontal Force.	Vertical Force.	Total Force.
Jan.	3·7697	9·7034	10·4100	0·17382	0·44740	0·47998
Feb.	3·7730	9·7264	10·4326	0·17396	0·44846	0·48102
Mar.	3·7618	9·7072	10·4105	0·17345	0·44757	0·48000
April	3·7658	9·6815	10·3880	0·17364	0·44639	0·47897
May	3·7652	9·6973	10·4026	0·17361	0·44712	0·47964
June	3·7646	9·6853	10·3911	0·17358	0·44657	0·47911
July	3·7666	9·6842	10·3909	0·17367	0·44651	0·47910
Aug.	3·7717	9·6978	10·4055	0·17391	0·44714	0·47977
Sept.	3·7659	9·6895	10·3957	0·17364	0·44676	0·47932
Oct.	3·7699	9·7098	10·4160	0·17382	0·44770	0·48026
Nov.	3·7649	9·7000	10·4050	0·17359	0·44724	0·47975
Dec.	3·7617	9·7016	10·4052	0·17344	0·44732	0·47976
Means	3·7667	† 9·6987	10·4044	0·17368	0·44718	0·47972

† See Corrigendum to 1904, page j.

HORIZONTAL MAGNETIC DIRECTION.

Horizontal Magnetic Direction, west of north, (from daily measures of the continuous curves.)

1905	Mean of the highest daily readings	Mean of the lowest daily readings	Means of a and b .	Means of daily readings at 4a.m. & 4p.m.	Differences $d-c$.	Difference of a and b , or Mean daily range.	Highest reading of the month.	Lowest reading of the month.	Monthly range.
	(a)	(b)	(c)	(d)			18°+	16°+	
	17°+	17°+	17°+	17°+			18°+	16°+	
January	58.9	45.5	52.2	53.4	1.2	13.4	15.2	76.2	59.0
February	60.3	41.9	51.1	53.7	2.6	18.4	7.7	76.7	51.0
March	61.2	43.5	52.3	53.4	1.1	17.7	14.7	91.7	43.0
April	62.1	46.6	54.3	55.0	0.7	15.5	39.7	96.7	63.0
May	58.5	44.7	51.6	52.2	0.6	13.8	5.7	101.2	24.5
June	59.7	43.9	51.7	51.9	0.3	15.8	5.7	100.2	25.5
July	60.7	43.9	52.3	50.9	-1.4	16.8	4.7	98.7	26.0
August	59.3	44.1	51.7	50.9	-0.8	15.2	6.7	92.7	34.0
September	57.7	42.9	50.3	50.0	-0.3	14.8	5.7	95.7	30.0
October	55.9	43.4	49.7	49.7	0.0	12.5	26.7	86.7	60.0
November	55.1	38.8	46.9	48.8	1.9	16.3	11.2	51.2	80.0
December	52.7	42.6	47.6	47.8	0.2	10.1	13.2	94.1	39.1
Means ..	58.5	43.5	51.0	51.5	0.5	15.0	13.1	88.5	44.6

Mean for the year

17° 51' .5

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 C. G. S.

1905.	Mean of the highest daily readings.	Mean of the lowest daily readings.	Means of a and b .	Means of daily readings 4a.m. & 4p.m.	Differences	Differences of a and b or Mean daily Range.	Highest reading of the Month.	Lowest reading of the Month.	Monthly Range.
	(a)	(b)	(c)	(d)	ences	Mean daily Range.			
			17000 +			0 +		17000 +	
January -	361	321	341	346	5	40	436	281	155
February -	431	366	398	403	5	65	496	248	248
March -	427	362	394	412	18	65	521	291	230
April -	416	355	385	393	8	61	508	215	293
May -	423	366	394	395	1	57	456	228	228
June -	424	353	388	392	4	71	463	296	407
July -	417	355	386	385	-1	62	492	317	175
August -	408	335	371	378	7	73	461	296	165
September -	404	336	370	382	12	68	461	288	173
October -	392	328	360	367	7	64	456	197	259
November -	402	341	371	365	-6	61	521	171	350
December -	393	363	378	382	4	30	419	321	098
Means -	408	348	378	384	6	59	474	262	212

Mean Horizontal Force for the year $\overline{0.17384}$ C. G. S. units.

DATES OF MAGNETIC DISTURBANCES, 1905.

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.

Month.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	
Day 1	c	s	m	m	s	c	c	m	c	m	c	c	
2	c	g	m	m	s	s	c	m	s	s	c	c	
3	c	g	s	s	s	s	c	m	m	c	c	s	
4	s	g	c	s	c	s	c	s	m	c	c	s	
5	m	m	s	s	c	s	m	s	m	s	s	s	
6	s	s	m	s	c	s	m	m	c	s	s	c	
7	s	s	c	c	c	s	m	s	s	c	s	c	
8	c	c	s	c	s	s	m	c	s	c	s	c	
9	c	s	s	c	c	m	s	c	s	s	s	c	
10	s	s	c	c	c	s	c	c	s	s	c	c	
11	s	c	s	c	c	s	c	s	s	s	c	c	
12	s	s	s	s	s	c	s	s	c	s	c	c	
13	c	s	s	c	s	c	s	m	c	c	g	s	
14	s	m	m	s	c	c	c	s	c	s	s	s	
15	c	m	m	c	c	s	c	c	c	c	s	s	
16	s	m	s	c	c	c	c	c	c	c	g	c	
17	s	s	s	c	s	c	c	c	c	s	m	c	
18	c	c	c	c	s	c	c	c	m	s	s	c	
19	s	c	c	s	c	c	c	s	m	c	c	s	
20	s	s	c	s	s	c	c	s	s	c	c	s	
21	s	c	c	s	c	s	c	c	s	c	c	m	
22	s	m	c	c	c	m	s	s	c	c	s	c	
23	c	s	c	c	s	m	m	s	c	c	s	c	
24	s	c	c	c	s	s	s	c	c	c	s	c	
25	s	s	c	s	c	s	s	s	s	c	c	c	
26	c	c	c	c	s	c	s	s	m	s	c	c	
27	s	s	s	s	m	c	s	s	m	s	s	c	
28	s	c	c	s	s	c	c	m	c	c	c	c	
29	s		c	s	s	s	c	m	c	s	c	s	
30	c		s	s	s	s	c	s	c	c	c	s	
31	s		m	s	s		c	s		c		s	
Totals	c s m g vg	11 19 1 0 0	8 12 6 2 0	13 12 6 2 0	14 14 2 0 0	14 16 1 0 0	13 14 3 0 0	18 8 5 0 0	9 15 7 0 0	11 12 7 0 0	16 14 1 0 0	15 12 1 0 0	18 12 1 0 0

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