# STONYHURST COLLEGE OBSERVATORY.

# RESULTS

OF

# METEOROLOGICAL & MAGNETICAL OBSERVATIONS

WITH REPORT AND NOTES OF THE DIRECTOR,

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

1903.

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# REPORT AND NOTES.

THE Director regrets the untoward circumstances which have resulted in the failure of the Malta meteorological returns, after long waiting for them.

The meteorological and magnetical continuous records have been carried on as usual, except that the vertical force magnet has been left out of running on account of its defective balance. All the other instruments have been working satisfactorily.

A new magnetic-dip circle (by Dover, No. 159) has been presented to the Observatory by the Royal Society through an application of funds at the disposal of the Government Grant Committee. It takes the place of one by Barrow & Co., (No. 32), which has been in service for the monthly absolute measures since 1863, and was employed on the magnetic surveys of France and Belgium in 1868, 69, 71, and again at several stations on the expeditions for observing the "Transits of Venus" in 1874 and 1882. The new instrument, compared with the standard Inclinometer of the National Physical Laboratory, was found to work well, with an average difference of only 1'·5 lower than the standard's measure of the Dip angle. Its regular monthly measures commenced in February.

The compilation of the monthly meteorological reports for the Register General has been transferred to the Meteorological Office. The temperature readings in these tables are therefore now taken from thermometers in the shade of a Stevenson's screen on the north wall of the Observatory, instead of from the older instruments in the more open shade of a Glaisher screen. The same change has been made here, for the sake of uniformity, and the Glaisher screen is no longer in use.

The annual adopted mean temperature as deduced from the two sets of thermometers in the four years 1868-71 showed an average lower temperature in the north-wall-shade of 0°·16 Fa. (" Results" 1871, page 35.)

The year will probably be known for some time to come as the *wet* year. The total rainfall was 11·8 inches above the annual average, and 21·9 inches greater than in the preceding year. In each month, excepting June and December, the amount was above the average for the month ; and in October, the wettest month, the excess of rain was nearly half the full excess of the twelve months.

December was the most cloudy month, with only six per cent. of its possible bright sunshine. The other months show no remarkable difference from an average year. But the clouds at night have been much more persistent, judging by the comparatively small number of nights available for stellar photography.

The prevailing wind of the year was from the west, as may be seen in the tabular summary. The total length of this current was 39815 miles distributed over 124 days; these numbers being more than double the corresponding numbers for any other point of the

compass, and in excess of the annual average of 35 years by nearly 11,300 miles and 18 days.

The strongest gale of wind occurred on February 27th. The velocity reached 60 miles per hour at 2 a.m., at 3 a.m., and at 7 a.m., from S., S. W., and W. S. W., respectively, while the barometer was rounding its lowest reading of the month 28,444 inches.

The mean temperature of the year was 0°·5 above the average, only 0°·1 above the mean temperature of the preceding year. The summer months were cooler, without any hot days, the highest temperature being only 76°·0, and the mean 0°·54 below the summer average. But the winter months were mild and showed a mean temperature 1°·92 above the winter average.

The solar surface has been observed on 207 days notwithstanding the unfavourable weather, and 194 drawings have been added to the series, with notes of clear surface on 13 dates. But progress with the stellar spectrographs has been greatly impeded by the almost continuous cloudy state of the nights. Only 141 plates have been added to the collection of photographic spectra.

The large grating-solar-spectrometer has been practically out of service during the year. Some experimental work has been carried out on sun-spots; and these only emphasize the foregone conclusion that the spectra of small spots, and even of those of average magnitude cannot be observed satisfactorily without a much larger image of the solar disc than is at present possible.

The spectroscopic study of the variations of $\beta$ Lyrae was completed in October, and the results were presented to the Royal Astronomical Society in November; but their publication

was delayed by the difficulties attending the reproduction of the series of the photographic spectra. These were not ready for the December number of the Monthly Notices; and the paper appears in the following January number.

The astronomical instruments of the late Colonel Cross's Observatory at Redscar have been presented to the Stonyhurst Observatory by his son the present squire. The smaller of the two equatorial polar axes, built for a 7 inch Newtonion reflector has been mounted in a revolving shed, and is intended to carry the 4 inch prismatic camera, as soon as some difficulties connected with the clock-driving have been overcome. The two spectrographs will then be in operation together, one on the Perry equatorial for the blue and yellow regions, and the prismatic camera for the violet and ultra-violet spectrum.

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, 1903.

| Results of Observations taken during the Month | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer .... inches | 29·472 | 29·458 |
| Highest ,, on the 14th ,, | 30·224 | 30·279 |
| Lowest ,, on the 7th ,, | 28·504 | 28·601 |
| Range of Barometer Readings ..... ,, | 1·720 | 1·678 |
| Highest Reading of a Max. Therm. on the 26th | 50·9 | 51·4 |
| Lowest Reading of a Min. Therm. on the 14th | 22·5 | 20·8 |
| Range of Thermometer Readings ..... | 28·4 | 30 6 |
| Mean of all the Highest Readings ..... | 41·6 | 42·3 |
| Mean of all the Lowest Readings ..... | 34·7 | 32·6 |
| Mean Daily Range ..... | 6·9 | 9·7 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... | 38·2 | 37·2 |
| Mean Temperature from Dry Bulb ..... | 37·9 | 37·3 |
| Adopted Mean Temperature ..... | 38·1 | 37·2 |
| Mean Temperature of Evaporation ..... | 36·6 | 36·1 |
| Mean Temperature of Dew Point ..... | 34·6 | 33·9 |
| Mean Elastic force of Vapour .....inches | 0·200 | 0·196 |
| Mean weight of Vapour in a cubic 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) .. | 0·87 | 0·79 |
| Mean weight of a cubic foot of air .... grains | 548·2 | 549·7 |
| Fall of Rain .....inches | 5·262 | 4·148 |
| Number of days on which Rain fell..... | 19 | 20·7 |

## JANUARY, 1903.

| No. of days in the month on which the prevailing wind was | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| | 2 | 5 | 4 | 0 | 6 | 4 | 10 | 0 |
| Mean Velocity in miles per hour | 7·6 | 5·1 | 11·1 | 0 | 13 9 | 18·6 | 16·5 | 0 |
| Total No. of miles for each Direction | 365 | 617 | 1061 | 0 | 2001 | 1789 | 3964 | 0 |

The total No. of miles registered during the month was 9797.

The max. Velocity of the wind was 42 miles per hour, on the 2nd at 8 a.m. Dir. S. b E.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·1

| | | | |
|---|---|---|---|
| In the month of January the highest reading of the Barometer during 56 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 ... ... | + | 0·014 | inches |
| Monthly range ,, ... ... | + | ·042 | ,, |
| Mean of highest temperatures ... ... | — | 0·7 | degrees |
| Mean of lowest ,, ... ... | + | 2·1 | ,, |
| Mean daily range ,, ... ... | — | 2·8 | ,, |
| Adopted mean temperature ... ... | + | 0·9 | ,, |
| Total rainfall ... ... ... | + | 1·114 | inches |

Ground frost on 1st, 5th, 8th—19th, 23rd, 31st. Hoar frost on 1st. Snow on 8th, 10th, 12th, 18th and 23rd. Heavy rain on 5th and 26th. Gales of wind on 2nd, 9th, 30th and 31st. Lightning on 3rd. Lunar Halo on 6th and 12th

## FEBRUARY, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years |
|---|---|---|
| Mean Reading of the Barometer | inches 29·575 | 29·511 |
| Highest ,, on the 9th ,, | 30·135 | 30·079 |
| Lowest ,, on the 27th ,, | 28·424 | 28·687 |
| Range of Barometer Readings | 1·711 | 1·392 |
| Highest Reading of a Max. Therm. on the 21st | 53·4 | 52·3 |
| Lowest Reading of a Min. Therm. on the 2nd | 30·3 | 21·8 |
| Range of Thermometer Readings | 23·1 | 30·5 |
| Mean of all the Highest Readings | 47·0 | 44·2 |
| Mean of all the Lowest Readings | 39·0 | 33·3 |
| Mean Daily Range | 8·0 | 10·9 |
| Deduced Monthly Mean (from Mean of Max. and Min) | 43·0 | 38·1 |
| Mean Temperature from Dry Bulb | 42·5 | 38·2 |
| Adopted Mean Temperature | 42·8 | 38·2 |
| Mean Temperature of Evaporation | 41·0 | 36·7 |
| Mean Temperature of Dew Point | 38·8 | 34·4 |
| Mean elastic force of Vapour inches | 0·236 | 0·193 |
| Mean weight of Vapour in a cub. ft. of air grains | 2·7 | 2·4 |
| Mean additional weight required for saturation,, | 0·5 | 0·4 |
| Mean degree of Humidity (saturation 1·00) | 0·86 | 0·87 |
| Mean weight of a cubic foot of air grains | 545·1 | 549·0 |
| Fall of Rain inches | 4·609 | 3·457 |
| Number of days on which Rain fell | 20 | 18·0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 0 | 0 | 0 | 1 | 2 | 9 | 14 | 2 |
| Mean Velocity in miles per hour | 0 | 0 | 0 | 4·8 | 22·6 | 14·5 | 19·9 | 11·4 |
| Total No. of Miles for each Direction | 0 | 0 | 0 | 116 | 1087 | 3124 | 6678 | 549 |

The total number of miles registered during the month was 11554.
The max. Velocity of the wind was 60 miles per hour, on the 27th at 2, 6, and 7 a.m. Dir. S., S.W., and W.S.W., respectively.

## FEBRUARY, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 8·8 |
| In the month of February, the highest reading of the Barometer during 56 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 .. .. | + | 0·064 | inches |
| Monthly range ,, .. .. | + | 0·319 | ,, |
| Mean of highest temperatures .. .. | + | 2·8 | degrees |
| Mean of lowest ,, .. .. | + | 5·7 | ,, |
| Mean daily range ,, .. .. | — | 2·9 | ,, |
| Adopted mean temperature .. .. | + | 4·6 | ,, |
| Total rainfall ,, .. .. | + | 1·152 | inches |

Ground frost on 1st, 2nd, 13th, 18th, 24th, 26th—28th. Snow on 1st and 23rd. Hail on 1st, 23rd, 26th. Heavy rain on 21st. Gales of wind on 1st, 19th, 23rd, 24th, 25th, 26th and 27th. Fog on 4th. Thunder on 25th and 27th. Lightning on 1st and 25th.

## MARCH, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years |
|---|---|---|
| Mean Reading of the Barometer.....inches | 29·297 | 29·459 |
| Highest ,, on the 8th ,, | 29·896 | 30 065 |
| Lowest ,, on the 2nd ,, | 28·200 | 28·644 |
| Range of Barometer Readings..... ,, | 1·696 | 1·421 |
| Highest Reading of Max. Therm. on the 22nd | 58·9 | 57·2 |
| Lowest Reading of a Min. Therm. on the 2nd | 32·7 | 22·5 |
| Range of Thermometer Readings ..... | 26·2 | 34·7 |
| Mean of all the Highest Readings ..... | 48·2 | 47·4 |
| Mean of all the Lowest Readings ..... | 38·5 | 34·0 |
| Mean Daily Range..... | 9·7 | 13·4 |
| Deduced Monthly Mean (from Mean of Max. and Min.)..... | 43 4 | 39·8 |
| Mean Temperature from Dry Bulb..... | 42 6 | 40 0 |
| Adopted Mean Temperature ..... | 43·0 | 39·9 |
| Mean Temperature of Evaporation ..... | 40·6 | 38·0 |
| Mean Temperature of Dew Point ..... | 37·7 | 35·4 |
| Mean elastic force of Vapour .....inches | 0·226 | 0·206 |
| Mean weight of Vapour in a cub. ft. of air grains | 2·6 | 2·4 |
| Mean additional weight required for saturation,, | 0·6 | 0·5 |
| Mean degree of Humidity (saturation 1·00) .. | 0·82 | 0·84 |
| Mean weight of a cubic foot of air....grains | 540·0 | 546·3 |
| Fall of rain .....inches | 4·994 | 3·306 |
| Number of days on which rain fell..... | 25 | 18·1 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 0 | 0 | 1 | 1 | 11 | 5 | 12 | 1 |
| Mean Velocity in miles per hour | 0 | 0 | 11·3 | 8·2 | 17·8 | 22 0 | 16·1 | 14·4 |
| Total No. of miles for each Direction | 0 | 0 | 271 | 197 | 4690 | 2637 | 4632 | 346 |

The total number of miles registered during the month was 12773
The max. Velocity of the wind was 46 miles per hour, on the 1st at Noon. Dir. S.

## MARCH, 1903.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·2

In the month of March, the highest reading of the Barometer during 56 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 ... | — | 0·162 inches |
| Monthly range ,, .. ... | + | 0·275 ,, |
| Mean of highest temperatures .. | + | 0·8 degrees |
| Mean of lowest ,, ... ... | + | 4·5 ,, |
| Mean daily range ,, ... ... | — | 3·7 ,, |
| Adopted mean temperature ... ... | + | 3·1 ,, |
| Total rainfall ... ... ... | + | 1·688 inches |

Ground frost on 1st, 2nd, 4th, 6th, 7th, 10th, 11th, 15th. 27th and 28th. Snow on 2nd and 18th. Hail on 1st, 2nd, 5th, 6th, 7th, 26th and 30th. Heavy rain on 2nd and 17th. Gales of wind on 1st, 17th, 22nd, 23rd, 25th, 26th, 28th, 29th and 30th. Thunder on 26th and 30th. Lightning on 7th and 26th. Lunar Halo on 8th, 11th and 12th.

## APRIL, 1903

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer ....inches | 29·468 | 29·484 |
| Highest ,, on the 17th ,, | 30·052 | 29·967 |
| Lowest ,, on the 29th ,, | 28·873 | 28·816 |
| Range of Barometer Readings..... ,, | 1·179 | 1·151 |
| Highest Reading of a Max.Therm. on the 28th | 54·6 | 65·8 |
| Lowest Reading of a Min. Therm. on the 18th | 28·5 | 28·0 |
| Range of Thermometer Readings ..... | 26·1 | 37·8 |
| Mean of all the Highest Readings..... | 48·0 | 55·6 |
| Mean of all the Lowest Readings ..... | 36·2 | 37·7 |
| Mean Daily Range..... | 11·8 | 17·9 |
| Deduced Monthly Mean (from Mean of Max. and Min.)..... | 42·1 | 44·4 |
| Mean Temperature from Dry Bulb ..... | 42·3 | 44·6 |
| Adopted Mean Temperature ..... | 42·2 | 44·5 |
| Mean Temperature of Evaporation ..... | 39·0 | 41·7 |
| Mean Temperature of Dew Point ..... | 35·1 | 38·1 |
| Mean elastic force of Vapour .....inches | 0·205 | 0·235 |
| Mean weight of Vapour in a cub.ft.of air grains | 2·4 | 2·7 |
| Mean additional weight required for saturation,, | 0·7 | 0·7 |
| Mean degree of Humidity (saturation 1·00).. | 0·77 | 0·79 |
| Mean weight of a cubic foot of air ....grains | 544·1 | 542·0 |
| Fall of rain .....inches | 2·902 | 2·419 |
| Number of Days on which rain fell ..... | 15 | 15·8 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 5 | 3 | 4 | 1 | 1 | 0 | 10 | 6 |
| Mean Velocity in miles per hour | 10·8 | 4·5 | 6·8 | 4·2 | 4·4 | 0 | 12·5 | 15·8 |
| Total No. of miles for each Direction | 1294 | 321 | 649 | 100 | 105 | 0 | 3011 | 2273 |

The total No. of miles registered during the month was 7753.
The max. Velocity of the wind was 43 miles per hour, on the 7th at 8 a.m. Dir. W.N.W.

## APRIL, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 6·7 |
| In the month of April, the highest reading of the Barometer during 56 years, was on the 17th, in 1887, and was | | | 30·251 |
| The lowest ,, | 20th, 1868 | ,, | 28·358 |
| The highest Temperature | 14th, 1852 | ,, | 74·1 |
| The lowest ,, | 13th, 1892 | ,, | 20·8 |
| The highest adopted mean temperature of the month, | | 1865 ... | 48·5 |
| The lowest ,, | ,, | 1879 ... | 40·7 |
| Greatest fall of rain during the month in | | 1867 | 5·672 in |
| Least ,, | ,, | 1852 | 0·478 in |
| Greatest number of days on which rain fell | | 1867 | 26 |
| Least ,, | ,, | 1852 | 3 |

### TABLE OF DIFFERENCES.

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

| | | | |
|---|---|---|---|
| Mean barometric pressure ... ... | — | 0·016 | inches |
| Monthly range ,, ... ... | + | 0·028 | ,, |
| Mean of highest temperature ... | — | 7·6 | degrees |
| Mean of lowest ,, ... | — | 1·5 | ,, |
| Mean daily range ,, ... ... | — | 6·1 | ,, |
| Adopted mean temperature ... ... | — | 2·3 | ,, |
| Total rainfall ... ... ... | + | 0·483 | inches |

Ground frost on 1st, 3rd, 8th, 9th, 12th—25th, 27th and 28th. Snow on 11th, 12th, 13th, 14th, 16th and 22nd. Hail on 2nd, 7th, 11th and 12th. Heavy rain on 3rd and 14th. Gale of wind on 7th. Fog on 25th.

## MAY, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer .... inches | 29·483 | 29·521 |
| Highest ,, on the 23rd ,, | 30·061 | 29·965 |
| Lowest ,, on the 5th ,, | 28·813 | 28·936 |
| Range of Barometer Readings ..... ,, | 1·248 | 1·029 |
| Highest Reading of a Max.Therm. on the 31st | 76·1 | 71·9 |
| Lowest Reading of a Min.Therm.on the 12th | 32·8 | 31·4 |
| Range of Thermometer Readings ..... | 43·3 | 40·5 |
| Mean of all the Highest Readings..... | 57·6 | 59·8 |
| Mean of all the Lowest Readings ..... | 44·3 | 42·0 |
| Mean Daily Range..... | 13·3 | 17·8 |
| Deduced Monthly Mean (from Mean of Max. and Min.)..... | 51·0 | 49·1 |
| Mean Temperature from Dry Bulb..... | 50·8 | 49·6 |
| Adopted Mean Temperature ..... | 50·9 | 49·4 |
| Mean Temperature of Evaporation ..... | 46·9 | 46·0 |
| Mean Temperature of Dew Point ..... | 42·7 | 42·4 |
| Mean elastic force of Vapour ..... inches | 0·275 | 0·274 |
| Mean weight of Vapour in a cub.ft.of air grains | 3·2 | 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 | 534·8 | 537·2 |
| Fall of Rain .....inches | 3·309 | 2·618 |
| Number of days on which Rain fell ..... | 19 | 15·5 |

| No. of days in the month on which the prevailing wind was | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| | 3 | 12 | 5 | 0 | 1 | 3 | 6 | 1 |
| Mean Velocity in miles per hour | 5·6 | 6·8 | 8·8 | 0 | 15·6 | 9·6 | 10·4 | 6·8 |
| Total No. of miles for each Direction | 405 | 1966 | 1059 | 0 | 374 | 692 | 1504 | 163 |

The total number of miles registered during the month was 6163.
The max. Velocity of the wind was 38 miles per hour, on the 22nd at noon and 2 p.m. Dir. S.S.W.

## MAY, 1903.

| | | |
|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | 7·5 |
| In the month of May, the highest reading of the Barometer during 56 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 .. .. | — | 0·038 inches |
| Monthly range ,, .. .. | + | 0·219 ,, |
| Mean of highest temperatures .. | — | 2·2 degrees |
| Mean of lowest ,, .. .. | + | 2·3 ,, |
| Mean daily range ,, .. .. | — | 4·5 ,, |
| Adopted Mean temperature .. .. | + | 1·5 ,, |
| Total rainfall .. .. .. | + | 0·691 inches |

Ground frost on 12th, 13th, 19th and 20th. Hail on 1st and 2nd. Heavy rain on 5th. Gale of Wind on 22nd. Thunder on 1st, 2nd 5th. Lightning on 5th.

## JUNE, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer.....inches | 29·683 | 29·549 |
| Highest ,, on the 4th ,, | 30·064 | 29·907 |
| Lowest ,, on the 16th ,, | 29 226 | 29·036 |
| Range of Barometer Readings ..... ,, | 0·838 | 0·871 |
| Highest Reading of a Max. Therm. on the 27th | 70·3 | 77·6 |
| Lowest Reading of a Min. Therm. on the 21st | 36·2 | 38·7 |
| Range of Thermometer Readings ..... | 34·1 | 38 9 |
| Mean of all the Highest Readings..... | 62·4 | 66·0 |
| Mean of all the Lowest Readings ..... | 47·5 | 47·9 |
| Mean Daily Range..... | 14·9 | 18·1 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... ..... | 55·0 | 55·2 |
| Mean Temperature from Dry Bulb..... | 54 9 | 55·3 |
| Adopted Mean Temperature ..... | 55·0 | 55·3 |
| Mean Temperature of Evaporation ..... | 50·2 | 52·1 |
| Mean Temperature of Dew Point ..... | 45·6 | 48·6 |
| Mean elastic force of Vapour ..... inches | 0·307 | 0·353 |
| Mean weight of Vapour in a cub.ft.of air grains | 3·5 | 3·9 |
| Mean additional weight required for saturation,, | 1·4 | 1·0 |
| Mean degree of Humidity (saturation 1·00).. | 0·71 | 0·78 |
| Mean weight of a cubic foot of air .... grains | 533·7 | 531·0 |
| Fall of rain..... inches | 2·363 | 3·442 |
| Number of days on which Rain fell ..... | 10 | 16 3 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 1 | 8 | 10 | 0 | 3 | 2 | 6 | 0 |
| Mean Velocity in miles per hour | 4·8 | 7·2 | 8·5 | 0 | 8·1 | 6·0 | 8·2 | 0 |
| Total No. of Miles for each Direction | 116 | 1377 | 2045 | 0 | 583 | 288 | 1182 | 0 |

The total number of miles registered during the month was 5591.
The max. Velocity of the wind was 27 miles per hour, on the 1st, at 3 p.m. Dir. W.

## JUNE, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 7·2 |
| In the month of June, the highest reading of the Barometer during 56 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 .. | + | 0·134 | inches |
| Monthly range ,, .. | — | 0·033 | ,, |
| Mean of highest temperatures .. | — | 3·6 | degrees |
| Mean of lowest ,, .. | — | 0·4 | ,, |
| Mean daily range ,, .. | — | 3·2 | ,, |
| Adopted mean temperature .. | — | 0·3 | ,, |
| Total rainfall .. | — | 1·079 | inches |

Ground frost on 12th, 19th, 21st and 22nd. Heavy rain on 26th. Thunder on 5th and 24th. Lightning on 5th and 24th. Lunar Halo on 2nd, 8th and 10th.

On the 21st (Mid-Summer Day), in early morning, ground frost registered 6 degrees, and ice was found on the ponds.

## JULY, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer ....inches | 29·505 | 29·515 |
| Highest ,, on the 9th ,, | 29·936 | 29·889 |
| Lowest ,, on the 17th ,, | 29·084 | 29·004 |
| Range of Barometer Readings ..... ,, | 0·852 | 0·885 |
| Highest Reading of a Max.Therm. on the 2nd | 75·1 | 78·9 |
| Lowest Reading of a Min. Therm. on the 8th | 45·2 | 42·1 |
| Range of Thermometer Readings ..... | 29·9 | 36·8 |
| Mean of all the Highest Readings ..... | 63·4 | 68·0 |
| Mean of all the Lowest Readings ..... | 52·1 | 50·7 |
| Mean Daily Range ..... | 11·3 | 17·3 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... | 57·8 | 57·8 |
| Mean Temperature from Dry Bulb..... | 57·7 | 57·9 |
| Adopted Mean Temperature ..... | 57·8 | 57·9 |
| Mean Temperature of Evaporation ..... | 54·0 | 54·8 |
| Mean Temperature of Dew Point ..... | 50·6 | 52·1 |
| Mean elastic force of Vapour..... inches | 0·368 | 0·389 |
| Mean weight of Vapour in a cub.ft. of air grains | 4·1 | 4 5 |
| Mean additional weight required for saturation,, | 1·2 | 1·0 |
| Mean degree of Humidity (saturation 1·00).. | 0 77 | 0·81 |
| Mean weight of a cubic foot of air ....grains | 527·3 | 527·4 |
| Fall of Rain..... inches | 4·680 | 4·058 |
| Number of days on which Rain fell ..... | 17 | 17·8 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 1 | 2 | 0 | 1 | 4 | 2 | 15 | 6 |
| Mean Velocity in miles per hour | 11·8 | 5·0 | 0 | 5·3 | 9·8 | 7 6 | 8·4 | 12·9 |
| Total No. of miles for each Direction | 283 | 242 | 0 | 127 | 937 | 366 | 3026 | 1857 |

The total number of miles registered during the month was 6838.
The max Velocity of the wind was 38 miles per hour, on the 6th at 6 a.m. Dir. W.N.W.

## JULY, 1903.

| | | | | |
|---|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | | 7·8 |
| In the month of July, the highest reading of the Barometer during 56 years, was on the 24th, in 1868, and was..... | | | | 30·112 |
| 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 barometic pressure | ... | — | 0·010 inches |
| Monthly Range ,, | ... | — | 0·033 ,, |
| Mean of highest temperatures | ... | — | 4·6 degrees |
| Mean of lowest ,, | ... | + | 1·4 ,, |
| Mean daily range ,, | ... | — | 6·0 ,, |
| Adopted mean temperature | ... | — | 0·1 ,, |
| Total rainfall ... | ... | + | 0·622 inches |

Heavy rain on 11th, 14th, 21st and 27th. Gales of wind on 6th Thunder on 11th. Lightning on 30th.

## AUGUST, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer.....inches | 29·388 | 29·493 |
| Highest ,, on the 7th ,, | 29·756 | 29·888 |
| Lowest ,, on the 15th ,, | 28·492 | 28·945 |
| Range of Barometer Readings ..... ,, | 1·264 | 0·943 |
| Highest Reading of a Max. Therm. on the 8th | 68·7 | 77·1 |
| Lowest Reading of a Min.Therm. on the 23rd | 43·3 | 41·4 |
| Range of Thermometer Readings ..... ..... | 25·4 | 35·7 |
| Mean of all the Highest Readings ..... | 61·5 | 67·2 |
| Mean of all the Lowest Readings ..... | 50·9 | 50·4 |
| Mean Daily Range ..... ..... | 10·6 | 16·8 |
| Deduced Monthly Mean (from Mean of Max. and Min) ..... ..... ..... | 56·2 | 57·2 |
| Mean Temperature from Dry Bulb ..... | 55·9 | 57·6 |
| Adopted Mean Temperature ..... | 56·1 | 57·4 |
| Mean Temperature of Evaporation ..... ..... | 52·7 | 54 5 |
| Mean Temperature of Dew Point ..... | 49·5 | 51·7 |
| Mean elastic force of Vapour .....inches | 0·356 | 0·387 |
| Mean weight of Vapour in a cub.ft.of air grains | 4·0 | 4·3 |
| Mean additional weight required for saturation,, | 1·0 | 0·9 |
| Mean degree of Humidity (saturation 1·00) ... | 0·79 | 0·82 |
| Mean weight of a cubic foot of air .. grains | 526·6 | 527·4 |
| Fall of Rain ..... inches | 6·410 | 5·081 |
| Number of days on which Rain fell ..... | 23 | 19·8 |

| No. of days in the month on which the prevailing wind was | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 1 | 0 | 2 | 6 | 18 | 1 |
| Mean Velocity in miles per hour | 12·5 | 5·7 | 3·8 | 0 | 11·2 | 11·4 | 12·9 | 3·3 |
| Total No. of miles for each Direction. | 299 | 272 | 92 | 0 | 534 | 1640 | 5570 | 79 |

The total number of miles registered during the month was 8486.
The max. Velocity of the wind was 45 miles per hour, W., on the 31st, at 3-30 a.m.

## AUGUST, 1903.

| | | |
|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | 8·1 |
| In the month of August, the highest reading of the Barometer during 56 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 ... .. | — | 0·105 inches |
| Monthly range ,, ... .. | + | 0·321 ,, |
| Mean of highest temperatures .. | — | 5·7 degrees |
| Mean of lowest ,, ... .. | + | 0·5 ,, |
| Mean daily range ,, ... .. | — | 6·2 ,, |
| Adopted mean temperature ... .. | — | 1·3 ,, |
| Total rainfall ... ... .. | + | 1·329 inches |

Heavy rain on 2nd, 14th, 19th, 26th, 27th and 28th. Gale of Wind on 31st. Thunder on 14th and 23rd. Lighting on 14th and 23rd.

The reading of Barometer on the 15th, 28·492 inches, is the lowest on record for the month of August.

## SEPTEMBER, 1903.

| Result of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer.....inches | 29·599 | 29·524 |
| Highest ,, on the 15th ,, | 30·164 | 30·027 |
| Lowest ,, on the 10th ,, | 28·671 | 28·853 |
| Range of Barometer Readings ..... ,, | 1·493 | 1·174 |
| Highest Reading of a Max. Therm. on the 23rd | 67·9 | 72·6 |
| Lowest Reading of a Min. Therm. on the 16th | 35·7 | 36·3 |
| Range of Thermometer Readings ..... | 32·2 | 36·3 |
| Mean of all the Highest Readings ..... | 60·1 | 62·5 |
| Mean of all the Lowest Readings ..... | 47·8 | 47·0 |
| Mean Daily Range ..... | 12·3 | 15·5 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... | 54·0 | 53·6 |
| Mean Temperature from Dry Bulb..... | 53·4 | 54·2 |
| Adopted Mean Temperature ..... | 53·7 | 53·9 |
| Mean Temperature of Evaporation ..... | 51·0 | 51·1 |
| Mean Temperature of Dew Point ..... | 48·4 | 48·4 |
| Mean elastic force of Vapour .....inches | 0·338 | 0·340 |
| Mean weight of Vapour in a cub.ft. of air grains | 3·8 | 4·0 |
| Mean additional weight required for saturation,, | 0·8 | 0·8 |
| Mean degree of Humidity (saturation 1·00).. | 0·82 | 0·81 |
| Mean weight of cubic foot of air ....grains | 533·4 | 532·3 |
| Fall of Rain .....inches | 6·020 | 4·537 |
| Number of days on which Rain fell ..... | 20 | 18·7 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 4 | 2 | 5 | 5 | 3 | 1 | 8 | 2 |
| Mean Velocity in miles per hour | 4·9 | 5·7 | 11·3 | 8·0 | 5·2 | 12·7 | 12·1 | 11·3 |
| Total No. of miles for each Direction | 472 | 274 | 1358 | 959 | 377 | 305 | 2325 | 542 |

The total number of miles registered during the month was 6612.
The max. Velocity of the wind was 34 miles per hour, on the 9th and 21st at 3 and 11 a.m. Dir. W. and E. respectively.

## SEPTEMBER, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 6·9 |
| In the month of September, the highest reading of the Barometer during 56 years, was on the 15th, in 1851, and was | | | ...30·274 |
| The lowest | ,, | 25th, 1896 ,, | ...28 314 |
| The highest Temperature | | 6th, 1868 ,, | ... 85·0 |
| The lowest | ,, | 25th, 1885, and 30th, 1888 | ... 29·8 |
| The highest adopted mean temperature of the month, | | 1865 | ... 59·1 |
| The lowest | ,, ,, | .. 1863 | ... 50·9 |
| Greatest fall of rain during the month in | | .. 1869 | 9·539in |
| Least | ,, ,, | .. 1894 | 0·801in |
| Greatest number of days on which rain fell | | .. 1866 | 30 |
| Least | ,, ,, | 1851 and 1894 | 6 |

### Table of Differences.

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

| | | | |
|---|---|---|---|
| Mean barometric pressure ... ... | + | 0·075 | inches |
| Monthly range ... ... | + | 0·319 | ,, |
| Mean of highest temperatures ... ... | — | 2·4 | degrees |
| Mean of lowest ,, .. .. | + | 0 8 | ,, |
| Mean daily range ,, .. .. | — | 3·2 | ,, |
| Adopted mean temperature .. .. | — | 0·2 | ,, |
| Total rainfall ,, .. .. | + | 1·483 | inches |

Ground frost on 13th—17th. Hail on 9th. Heavy rain on 1st, 7th, 8th and 10th Thunder on 5th, 9th, 11th, 25th and 27th. Lightning on 9th, 23rd and 27th.

## OCTOBER, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer ....inches | 29·139 | 29·428 |
| Highest ,, on the 18th ,, | 29·664 | 30·020 |
| Lowest ,, on the 12th ,, | 28·836 | 28·652 |
| Range of Barometer Readings ..... ,, | 0·828 | 1·368 |
| Highest Reading of a Max. Ther. on the 1st & 6th | 58·2 | 64·3 |
| Lowest Reading of a Min. Therm. on the 10th | 34·5 | 29·0 |
| Range of Thermometer Readings ..... | 23·7 | 35·3 |
| Mean of all the Highest Readings ..... | 53·0 | 54·7 |
| Mean of all the Lowest Readings ..... | 45·1 | 41·6 |
| Mean Daily Range..... | 7·9 | 13·1 |
| Deduced Monthly Mean (from Mean of Max and Min.) ..... | 49·1 | 47·2 |
| Mean Temperature from Dry Bulb ..... | 48·4 | 47·7 |
| Adopted Mean Temperature ..... | 48·8 | 47·4 |
| Mean Temperature of Evaporation ..... | 47·0 | 45·2 |
| Mean Temperature of Dew Point ..... | 45·0 | 42·8 |
| Mean elastic force of Vapour .....inches | 0·300 | 0·276 |
| Mean weight of Vapour in a cub.ft. of air grains | 3·3 | 3·2 |
| Mean additional weight required for saturation ,, | 0·5 | 0·6 |
| Mean degree of Humidity (saturation 1·00) .. | 0·87 | 0·84 |
| Mean weight of a cubic foot of air ....grains | 529·5 | 537·5 |
| Fall of Rain .....inches | 10·832 | 5·112 |
| Number of days on which Rain fell ..... | 29 | 21·2 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 0 | 1 | 3 | 1 | 9 | 4 | 10 | 3 |
| Mean Velocity in miles per hour | 0 | 6·5 | 7·9 | 11·4 | 12·7 | 13·7 | 12·7 | 9·8 |
| Total No. of miles for each Direction | 0 | 157 | 571 | 274 | 2735 | 1318 | 3044 | 707 |

The total number of miles registered during the month was 8806.
The max. Velocity of the wind was 45 miles per hour, on the the 6th, at 10 p.m. Dir. W.S.W.

## OCTOBER, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 8·9 |
| In the month of October the highest reading of the Barometer during 56 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 ... ... | — | 0·289 inches |
| Monthly range ,, ... ... | — | 0·540 ,, |
| Mean of highest temperatures ... | — | 1·7 degrees |
| Mean of lowest ,, ... ... | + | 3·5 ,, |
| Mean daily range ,, ... ... | — | 5·2 ,, |
| Adopted mean temperature .. ... | + | 1·4 ,, |
| Total rainfall .. ... ... | + | 5·720 inches |

Ground Frost on 10th, 24th and 28th. Hail on 13th, 15th and 16th. Heavy rain on 1st, 2nd, 6th, 7th, 12th, 14th, 15th, 16th and 27th. Gales on 6th, 24th and 25th. Thunder on 13th, 15th and 22nd. Lightning on 5th, 13th, 15th, 22nd and 25th. Lunar halo on 2nd and 5th.

## NOVEMBER, 1903.

| Results of Observations taken during the Month. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer ....inches | 29·607 | 29·475 |
| Highest ,, on the 5th ,, | 30·222 | 30·072 |
| Lowest ,, on the 28th ,, | 28·690 | 28·564 |
| Range of Barometer Readings ,, | 1·532 | 1·508 |
| Highest Reading of a Max. Therm. on the 1st | 53·3 | 56·0 |
| Lowest Reading of a Min. Therm. on the 30th | 25·8 | 25·4 |
| Range of Thermometer Readings..... | 27·5 | 30·6 |
| Mean of all the Highest Readings..... | 46·5 | 47·4 |
| Mean of all the Lowest Readings ..... | 38·3 | 36·5 |
| Mean Daily Range..... | 8·2 | 10·9 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... | 42·4 | 41·6 |
| Mean Temperature (from Dry Bulb)..... ..... | 41·9 | 41·9 |
| Adopted Mean Temperature ..... | 42·2 | 41·8 |
| Mean Temperature of Evaporation ..... | 40·7 | 39·6 |
| Mean Temperature of Dew Point ..... | 38·9 | 38·2 |
| Mean elastic force of Vapour .....inches | 0·237 | 0·232 |
| Mean weight of Vapour in a cub. ft. of air grains | 2·7 | 2·7 |
| Mean additional weight required for saturation,, | 0·4 | 0·4 |
| Mean degree of Humidity (saturation 1·00)... | 0·89 | 0·87 |
| Mean weight of a cubic foot of air ...grains | 546·7 | 544·9 |
| Fall of Rain ..... inches | 4·589 | 4·376 |
| Number of days on which rain fell ..... | 21 | 19·7 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 1 | 4 | 2 | 0 | 5 | 2 | 14 | 2 |
| Mean velocity in miles per hour | 5·0 | 4·3 | 4·9 | 0 | 9·0 | 3·9 | 14·2 | 9·9 |
| Total No. of miles for each Direction | 120 | 413 | 236 | 0 | 1077 | 186 | 4771 | 474 |

The total number of miles registered during the month was 7277.
The max. Velocity of wind was 48 miles per hour, on the 21st at 7 a.m. Dir. W.

## NOVEMBER, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 6·3 |
| In the month of November, the highest reading of the Barometer during 56 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 .. .. | + | 0·132 inches |
| Monthly range ,, .. .. | + | 0·024 ,, |
| Mean of highest temperatures .. | — | 0·9 degrees |
| Mean of lowest ,, .. .. | + | 1·8 ,, |
| Mean daily range ,, .. .. | — | 2·7 ,, |
| Adopted mean temperature .. .. | + | 0·4 ,, |
| Total rainfall .. .. .. | + | 0·213 inches |

Ground frost on 3rd—8th, 15th—21st, 24th, 29th and 30th. Snow on 29th. Hail on 14th and 25th. Heavy rain on 2nd and 25th. Gales on 21st, 23rd and 24th. Fog on 3rd, 4th and 12th. Lightning on 14th.

## DECEMBER, 1903.

| Results of Observations taken during the Month. | | | Mean for the last 56 years. |
|---|---|---|---|
| Mean Reading of the Barometer..... | inches | 29·322 | 29·448 |
| Highest ,, on the 28th ,, | | 29·839 | 30·069 |
| Lowest ,, on the 10th ,, | | 28·544 | 28·557 |
| Range of Barometer Readings ..... | ,, | 1·295 | 1·512 |
| Highest Reading of a Max Therm. on the 22nd | | 49·2 | 53·2 |
| Lowest Reading of a Min. Therm. on the 2nd | | 24·1 | 20·3 |
| Range of Thermometer Readings ..... ..... | | 25·1 | 32·9 |
| Mean of all the Highest Readings ..... ..... | | 40·6 | 43·2 |
| Mean of all the Lowest Readings ..... | | 35·0 | 33·1 |
| Mean Daily Range ..... ..... | | 5·6 | 10·1 |
| Deduced Monthly Mean (from Mean of Max. and Min.) ..... | | 37·8 | 38 2 |
| Mean Temperature from Dry Bulb ..... | | 37·5 | 38·8 |
| Adopted Mean Temperature ..... | | 37·7 | 38·5 |
| Mean Temperature of Evaporation ..... | | 36·4 | 36·9 |
| Mean Temperature of Dew Point ..... | | 34·7 | 35·0 |
| Mean elastic force of Vapour..... | inches | 0·201 | 0·206 |
| Mean weight of Vapour in a cub.ft.of air | grains | 2·4 | 2·4 |
| Mean additional weight required for saturation | ,, | 0·4 | 0·4 |
| Mean degree of Humidity (saturation 1·00).. | | 0·89 | 0·87 |
| Mean weight of a cubic foot of air .. | grains | 546·2 | 547·8 |
| Fall of Rain ..... | inches | 2·970 | 4·515 |
| Number of Days on which rain fell ..... | | 13 | 20·7 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No. of days in the month on which the prevailing wind was | 4 | 2 | 12 | 0 | 6 | 6 | 1 | 0 |
| Mean Velocity in miles per hour | 4·3 | 8·8 | 9·8 | 0 | 14·0 | 12·2 | 4·5 | 0 |
| Total No. of miles for each Direction | 416 | 421 | 2832 | 0 | 2012 | 1761 | 108 | 0 |

The total number of miles registered during the month was 7550.
The max. Velocity of the wind was 47 miles per hour, on the 7th, at 9 a.m. Dir. S.S.E.

## DECEMBER, 1903.

| | | | |
|---|---|---|---|
| Mean amount of Cloud (an overcast sky being indicated by 10·0) | | | 7·8 |
| In the Month of December, the highest reading of the Barometer during 56 years, was on the 22nd, in 1849, and was | | | 30·378 |
| The lowest | ,, | 8th, 1886 ,, | 27·350 |
| The highest Temperature | | 9th, 1876 ,, | 58·1 |
| The lowest | ,, | 24th, 1860 ,, | 6·7 |
| The highest adopted mean temperature of the month | | 1857 | 44·6 |
| The lowest | ,, ,, | .. 1878 | 30·3 |
| Greatest fall of rain during the month | | .. 1880 | 9·211 in |
| Least | ,, | .. 1890 | 0·550 in |
| Greatest number of days on which rain fell | | .. 1868 | 31 |
| Least | ,, | .. 1890 | 8 |

### TABLE OF DIFFERENCES.

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

| | | | |
|---|---|---|---|
| Mean barometric pressure ... ... | — | 0·126 | inches |
| Monthly range ,, ... ... | — | 0·217 | ,, |
| Mean of highest temperatures ... | — | 2·6 | degrees |
| Mean of lowest ,, ... ... | + | 1·9 | ,, |
| Mean daily range ,, ... ... | — | 4·5 | ,, |
| Adopted mean temperature ... ... | — | 0·8 | ,, |
| Total rainfall ... ... .. | — | 1·545 | inches |

Ground frost on 1st, 2nd, 4th—8th, 12th, 14th—18th, 25th—27th, 29th—31st. Snow on 2nd, 26th and 28th. Hail on 2nd and 4th. Heavy rain on 3rd. Gales on 7th and 22nd. Fog on 5th, 6th, 17th, 18th and 20th. Lightning on 9th. Lunar halo on 6th.

# Summary of Observations, 1903.

| Results of Observations taken during the Year. | | Mean for the last 56 years. |
|---|---|---|
| Mean Reading of the Barometer ..... inches | 29·462 | 29·493 |
| Highest , on Jan. 14th ,, | 30·224 | 30·285 |
| Lowest , on March 2nd ,, | 28·200 | 28·251 |
| Range of Barometer Readings ,, | 2·024 | 2·034 |
| Highest Reading of a Max.Therm. on May 31st | 76·1 | 81·8 |
| Lowest Reading of a Min.Therm. on Jan. 14th | 22·5 | 15·3 |
| Range of Thermometer Readings ..... | 53·6 | 66·5 |
| Mean of all the Highest Readings..... | 52·5 | 54·9 |
| Mean of all the Lowest Readings..... | 42·5 | 40·6 |
| Mean Daily Range..... | 10·0 | 14·3 |
| Deduced Yearly Mean (from Mean of Max. and Min.)..... | 47·5 | 46·8 |
| Mean Temperature from Dry Bulb..... | 47·2 | 46·9 |
| Adopted Mean Temperature ..... | 47·4 | 46·9 |
| Mean Temperature of Evaporation .. ..... | 44·7 | 44 5 |
| Mean Temperature of Dew Point ..... | 41·8 | 42·1 |
| Mean elastic force of Vapour .....inches | 0·271 | 0·273 |
| Mean weight of Vapour in a cub. ft. of air grains | 3·1 | 3·3 |
| Mean additional weight required for saturation,, | 0·7 | 0·7 |
| Mean degree of Humidity (saturation 1·00) .. | 0·82 | 0·83 |
| Mean weight of a cubic foot of air.....grains | 538·0 | 539·2 |
| Total fall of rain in the year ..... inches | 58·940 | 47·069 |
| Number of days per month on which Rain fell | 19·3 | 18·5 |

## Summary of Wind.

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| No of days in the year on which the prevailing wind was ..... | 22 | 41 | 47 | 10 | 53 | 44 | 124 | 24 |
| Mean Velocity in miles per hour ..... | 7·1 | 6·2 | 9·0 | 7·4 | 13·1 | 13·4 | 13·4 | 12·1 |
| Total No. of miles for each Direction ..... | 3770 | 6060 | 10174 | 1773 | 16512 | 14106 | 39815 | 6990 |

The total No. of miles registered during the year was 99200.
The max. Velocity of the wind was 60 miles per hour, on Feb.27th, at 2,6, and 7 a.m. Dir. S.,S.W.,and W.S.W.,respectively.

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

## Table of Differences, 1903.

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

| | | | |
|---|---|---|---|
| Mean barometric pressure .. .. | — | 0·031 | inches |
| Yearly range ,, .. .. | — | 0·010 | ,, |
| Mean of highest temperatures .. .. | — | 2·4 | degrees |
| Mean of lowest ,, .. .. | + | 1·9 | ,, |
| Mean daily range .. .. .. | — | 4·3 | ,, |
| Adopted mean temperature .. .. | + | 0·5 | ,, |
| Total rainfall .. .. .. | + | 11·871 | inches |

## Extreme Readings in the Last 56 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 56 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 ..... | | 63·2 |
| 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.

| 1903. | Frost. | Hoar Frost. | Snow. | Hail. | Heavy Rain. |
|---|---|---|---|---|---|
| January | 1, 5, 8—19, 23, 31 | 1 | 8, 10, 12, 18, 23 | | 5, 26 |
| February | 1, 2, 13, 18, 24, 26—28 | | 1, 23 | 1, 23, 26 | 21 |
| March | 1, 2, 4, 6, 7, 10, 11, 15, 27, 28 | | 2, 18 | 1,2,5,6,7,26,30 | 2, 17 |
| April | 1, 3, 8, 9, 12—25, 27, 28 | | 11, 12, 13, 14, 16, 22 | 2, 7, 11, 12 | 3, 14 |
| May | 12, 13, 19, 20 | | | 1, 2 | 5 |
| June | 12, 19, 21, 22 | | | | 26 |
| July | | | | | 11, 14, 21, 27 |
| August | | | | | 2, 14, 19, 26, 27, 28 |
| September | 13—17 | | | 9 | 1, 7, 8, 10 |
| October | 10, 24, 28 | | | 13, 15, 16 | 1,2,6,7,12,14,15,16,27 |
| November | 3—8, 15—21, 24, 29—30 | | 29 | 14, 25 | 2, 25 |
| December | 1, 2, 4—8, 12, 14—18, 25—27. 29—31 | | 2, 26, 28 | 2, 4 | 3 |

| 1903 | Gales of Wind. | Fog. | Thunder | Lightning. | Lunar Halo. | Solar Halo. |
|---|---|---|---|---|---|---|
| January | 2, 9, 30, 31 | | | 3 | 6, 12 | |
| February | 1, 19, 23, 24, 25, 26, 27 | 4 | 25, 27 | 1, 25 | | |
| March | 1,17,22,23,25,26,28,29,30 | | 26, 30 | 7, 26 | 8, 11, 12 | |
| April | 7 | 25 | | | | |
| May | 22 | | 1, 2, 5 | 5 | | |
| June | | | 5, 24 | 5, 24 | 2, 8, 10 | |
| July | 6 | | 11 | 30 | | |
| August | 31 | | 14, 23 | 14, 23 | | |
| September | | | 5, 9, 11, 25, 27 | 9, 23, 27 | | |
| October | 6, 24, 25 | | 13, 15, 22 | 5, 13, 15, 22, 25 | 2, 5 | |
| November | 21, 23, 24 | 3, 4, 12 | | 14 | | |
| December | 7, 22 | 5, 6, 17, 18, 20 | | 9 | 6 | |

# 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 | 0 | 3·6 | 6·6 | 8·5 | 9·1 | 6·6 | 3·3 | 0 | 0 | 0 | 0 | 0 | 0 |
| February | 0 | 0 | 0 | 0 | 3·7 | 5·6 | 6·5 | 6·0 | 6·4 | 7·1 | 5·5 | 1·6 | 0 | 0 | 0 | 0 | 0 |
| March | 0 | 0 | 0 | 1·7 | 6·2 | 8·9 | 11·2 | 10·0 | 10·8 | 10·0 | 10·8 | 9·1 | 4·2 | 0·3 | 0 | 0 | 0 |
| April | 0 | 0·8 | 9·7 | 14·8 | 15·3 | 12·7 | 13·5 | 15·1 | 16·5 | 15·0 | 14·6 | 14·9 | 13·6 | 9·6 | 1·0 | 0 | 0 |
| May | 0·3 | 5·1 | 9·3 | 10·0 | 13·0 | 14·5 | 15·1 | 15·4 | 13·8 | 13·6 | 13·9 | 14·9 | 15·7 | 13·5 | 6·6 | 0·5 | 0 |
| June | 1·1 | 8·7 | 10·6 | 14·0 | 13·6 | 15·4 | 16·5 | 17·0 | 16·9 | 14·8 | 15·5 | 14·4 | 13·6 | 11·9 | 10·2 | 3·2 | 0 |
| July | 0·8 | 3·6 | 6·2 | 7·3 | 9·7 | 11·9 | 13·6 | 13·2 | 15·8 | 16·6 | 15·6 | 16·2 | 15·8 | 13·6 | 9·8 | 2·4 | 0 |
| August | 0 | 0·3 | 6·3 | 8·5 | 12·3 | 15·6 | 17·1 | 15·4 | 14·2 | 13·6 | 15·0 | 14·0 | 11·0 | 8·5 | 5·6 | 0 | 0 |
| September | 0 | 0 | 1·6 | 8·8 | 13·9 | 15·4 | 15·1 | 17·0 | 18·0 | 17·0 | 14·9 | 12·8 | 8·9 | 5·0 | 0·2 | 0 | 0 |
| October | 0 | 0 | 0 | 0·8 | 3·7 | 7·3 | 7·3 | 8·6 | 9·8 | 9·2 | 8·4 | 4·3 | 0·7 | 0 | 0 | 0 | 0 |
| November | 0 | 0 | 0 | 0 | 1·6 | 10·5 | 12·8 | 13·2 | 10·5 | 8·0 | 6·1 | 2·5 | 0 | 0 | 0 | 0 | 0 |
| December | 0 | 0 | 0 | 0 | 0 | 0·7 | 2·5 | 3·2 | 3·5 | 3·4 | 0·5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 2·2 | 18·5 | 43·7 | 65·9 | 93·0 | 122·1 | 137·8 | 142·6 | 145·3 | 134·9 | 124·1 | 104·7 | 83·5 | 62·4 | 33·4 | 6·1 | 0 |

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

| 1903. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January - - - | 0 | 2·3 | 0·3 | 0 | 0 | 0 | 0·3 | 4·0 | 0 | 0·9 | 5·3 | 5·3 | 0·7 | 2·5 | 3·2 | 4·3 | 0 |
| February - - - | 3·3 | 6·8 | 0 | 0 | 0 | 1·8 | 0 | 0 | 2·1 | 0 | 0 | 5·4 | 0·9 | 0 | 0 | 0 | 0 |
| March - - - | 0 | 0 | 8·3 | 2·2 | 5·8 | 5·2 | 1·3 | 8·0 | 0 | 6·8 | 0·5 | 0 | 1·7 | 0·6 | 0·3 | 2·3 | 0 |
| April - - - | 0 | 7·1 | 0 | 6·4 | 6·0 | 0 | 7·6 | 9·7 | 0·3 | 0·1 | 3·3 | 6·0 | 9·7 | 6·8 | 8·2 | 10·1 | 10·2 |
| May - - - | 2·3 | 2·2 | 0 | 0 | 2·2 | 0 | 0 | 5·1 | 0 | 0 | 0 | 11·6 | 0·8 | 2·4 | 6·2 | 2·2 | 3·1 |
| June - - - | 7·9 | 5·7 | 14·2 | 12·9 | 3·9 | 9·3 | 6·7 | 12·8 | 7·4 | 13·4 | 3·1 | 10·5 | 0·6 | 0 | 0·2 | 7·6 | 0·3 |
| July - - - | 11·2 | 7·4 | 12·5 | 7·2 | 0 | 3·9 | 14·2 | 1·7 | 8·8 | 7·3 | 0 | 10·3 | 9·4 | 0·3 | 0·9 | 0 | 3·3 |
| August - - - | 1·2 | 6·7 | 7·7 | 7·6 | 9·0 | 9·4 | 10·0 | 0·5 | 11·6 | 2·4 | 3·0 | 11·8 | 7·3 | 2·2 | 0 | 5·0 | 2·2 |
| September - - - | 6·3 | 0 | 6·2 | 4·0 | 7·7 | 10·6 | 4·7 | 0 | 5·4 | 2·1 | 8·8 | 7·8 | 7·9 | 7·7 | 7·3 | 9·8 | 4·0 |
| October - - - | 0 | 1·2 | 1·8 | 7·1 | 4 5 | 0 | 1·7 | 0 | 0 | 6·3 | 0 | 0 | 5·8 | 0 | 3·6 | 1·8 | 4·8 |
| November - - - | 1·3 | 0 | 6·7 | 5·7 | 3·7 | 3·7 | 0·5 | 1·0 | 5·1 | 0 | 0 | 0 | 0 | 3·3 | 4·0 | 7·1 | 5·7 |
| December - - - | 4·2 | 0 | 0 | 0 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1·3 | 0 | 0 | 0·5 | 0 | 0 | 0 |

## TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

*(Continued.)*

| 1903. | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Monthly Total. | Per centage each month |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January - - | 0 | 0 | 0 | 0 | 0 | 3·5 | 2·6 | 0·2 | 0 | 0 | 1·0 | 0 | 0 | 1·3 | 37·7 | 15·2 |
| February - - | 2·0 | 6·8 | 0 | 0 | 0 | 3·8 | 0 | 1·7 | 5·8 | 1·7 | 0·3 | 0 | 0 | 0 | 42·4 | 15·6 |
| March - - | 6·9 | 0 | 0 | 0 | 2·8 | 0 | 4·2 | 0·3 | 4·8 | 3·8 | 0·3 | 7·8 | 2·2 | 7·1 | 83·2 | 22·7 |
| April - - | 7·6 | 9·7 | 10·8 | 1·2 | 5·4 | 5·4 | 12·0 | 9·2 | 7·5 | 0 | 3·0 | 2·0 | 1·8 | 0 | 167·1 | 39·9 |
| May - - | 8·1 | 10·2 | 2·7 | 8·3 | 7·7 | 12·3 | 13·4 | 12·3 | 13·6 | 14·2 | 9·7 | 7·4 | 6·8 | 10·4 | 175·2 | 35·5 |
| June - - - | 2·8 | 12·4 | 11·1 | 11·2 | 8·1 | 9·8 | 0·4 | 4·7 | 0 | 0·3 | 8·2 | 8·7 | 3·2 | 0 | 197·4 | 38·9 |
| July - - - | 0·6 | 2·2 | 9·8 | 1·2 | 7·6 | 5·7 | 10·4 | 6·2 | 6·2 | 0 | 8·8 | 5·8 | 5·0 | 4·2 | 172·1 | 33·8 |
| August - - | 2·0 | 8·5 | 0 | 7·1 | 10·8 | 6·3 | 0 | 7·2 | 0 | 0 | 3·7 | 8·7 | 0 | 5·5 | 157·4 | 34·4 |
| September - | 9·7 | 1·8 | 6·3 | 8·7 | 0·8 | 5·1 | 0 | 0 | 5·0 | 0 | 4·1 | 0 | 6·8 | 0 | 148·6 | 39·2 |
| October - - | 0·6 | 0 | 0 | 5·3 | 0 | 4·2 | 0 | 1·9 | 0·2 | 0 | 1·3 | 5·7 | 0 | 2·3 | 60·1 | 18·4 |
| November - | 6·3 | 0 | 0 | 0·3 | 0 | 1·2 | 3·9 | 1·6 | 0·7 | 0 | 0 | 0·2 | 3·2 | 0 | 65·2 | 25·5 |
| December - - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1·1 | 0·7 | 0 | 0 | 3·0 | 0 | 2·4 | 13·8 | 6·0 |

# SUMMARY OF SUNSHINE.

| 1903. | Number of days on which Sunshine was recorded. | Amount or Total Number of Hours | Per centage of possible Sunshine. | Mean for the last 23 Years. | | |
|---|---|---|---|---|---|---|
| | | | | Days. | Amount hours | Per centage of possible Sunshine |
| January ... | 16 | 37·7 | 15·2 | 13·8 | 35·1 | 14·1 |
| February... | 13 | 42·4 | 15·6 | 17·3 | 58·9 | 21·5 |
| March ... | 22 | 83·2 | 22·7 | 24·1 | 105·9 | 28·9 |
| April ... | 26 | 167·1 | 39·9 | 26·1 | 150·4 | 35·9 |
| May ... | 24 | 175·2 | 35·5 | 27·6 | 196·3 | 39·9 |
| June ... | 28 | 197·4 | 38·9 | 27·6 | 193·1 | 38·0 |
| July ... | 27 | 172·1 | 33·8 | 28·3 | 178·1 | 35·0 |
| August ... | 25 | 157·4 | 34·4 | 27·4 | 151·0 | 33·0 |
| September | 24 | 148·6 | 39·2 | 25·3 | 126·2 | 33·3 |
| October ... | 18 | 60·1 | 18·4 | 22·8 | 86·8 | 26·6 |
| November | 20 | 65·2 | 25·5 | 16·8 | 44·5 | 17·4 |
| December | 8 | 13·8 | 6·0 | 12·7 | 25·2 | 10·9 |
| Year | 251 | 1320·2 | 29·6 | 269·5 | 1351·5 | 30·0 |

# SUMMARY OF SUNSHINE

*(Continued).*

## EXTREMES FOR THE LAST 23 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 | 19 | 1881, 1882, 1902 | 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 | 22 | 1886 | 266·6 | 1881 | 127·0 | 1886 | 54·1 | 1881 | 25·8 | 1886 |
| June | 30 | 1896 | 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. 1903. | G. M. T. | Cloud. | | Wind. | | Direction of Lower Clouds. |
|---|---|---|---|---|---|---|
| | | Direction. | V'locity (0—6.) | Direction. | Force. (0—12.) | |
| January 16 | 2·30 p.m. | NE | 2 | ENE | 3 | — |
| February 12 | 4 p.m. | NW | 2 | NW b W | 1 | — |
| ,, 18 | 10 a.m. | W | 2 | SSW | 0 | SW |
| ,, 20 | 2 p.m. | W | 2 | S b W | 4 | WSW |
| ,, 23 | 10 a.m. | W | 2 | WSW | 4 | W |
| ,, 27 | 1 p.m. | W | 3 | WSW | 6 | SW |
| ,, 28 | 10·15 a.m. | SW | 2 | Calm | 0 | W |
| March 4 | 3 p.m. | SW | 3 | W b S | 4 | WNW |
| ,, 5 | 3 p.m. | SW | 3 | W b S | 4 | W |
| April 7 | 10 a.m. | SW | 2 | WNW | 6 | W |
| ,, 8 | 8 a.m. | N | 3 | WNW | 1 | W |
| ,, 18 | 8 a.m. | NW | 2 | W b S | 1 | W |
| ,, 18 | 9 a.m. | W | 2 | WNW | 2 | W |
| ,, 23 | 9 a.m. | SSW | 2 | Calm | 0 | — |
| ,, 25 | Noon. | N | 1 | N | 3 | SW |
| May 22 | 8 a.m. | S | 2 | S | 2 | SW |
| ,, 23 | 8 a.m. | S | 1 | Calm | 0 | SW |
| ,, 24 | 10 a.m. | N | 1 | E | 2 | — |
| ,, 25 | 9 a.m. | NE | 1 | SSW | 1 | N |
| ,, 26 | 5 p.m. | NE | 2 | ENE | 2 | — |
| ,, 28 | Noon. | N | 2 | ENE | 4 | NE |
| ,, 29 | 8 a.m. | SE | 1 | ENE | 1 | — |
| ,, 30 | 9 a.m. | NE | 1 | ESE | 2 | — |
| June 1 | 8 a.m. | SE | 1 | WSW | 1 | NE |
| ,, 2 | 8 a.m. | SE | 1 | E | 1 | NE |
| ,, 6 | 9 a.m. | N | 1 | E | 1 | NE |
| ,, 8 | 10 a.m. | NNE | 3 | E | 2 | NE |
| ,, 9 | 8 a.m. | ENE | 1 | NE | 3 | NE |
| ,, 10 | 8 a.m. | ENE | 1 | NE b E | 2 | NE |
| ,, 23 | 8 a.m. | S | 1 | S | 4 | NE |
| July 2 | 8 a.m. | S | 1 | NE | 1 | NE |
| ,, 9 | 4 p.m. | NW | 3 | W | 2 | W |
| ,, 10 | 3 p.m. | NW | 1 | W | 3 | W |
| ,, 11 | 8 p.m. | E | 1 | Calm | 0 | — |
| ,, 12 | 4·30 p.m. | WNW | 2 | WNW | 4 | W |
| ,, 22 | 5·30 p.m. | W | 2 | W | 1 | — |
| ,, 23 | 10 a.m. | W | 1 | Calm | 0 | S |
| ,, 24 | 10 a.m. | SW | 2 | WNW | 3 | W |
| ,, 25 | 9 a.m. | SW | 2 | SSE | 2 | SE |
| ,, 28 | 4 p.m. | W | 1 | W | 2 | — |
| ,, 29 | 4 p.m. | S | 2 | WNW | 3 | W |
| ,, 30 | 5 p.m. | SW | 1 | W | 3 | W |

## OBSERVATIONS OF UPPER CLOUDS (Continued).

| Date. 1903. | G. M. T. | Cloud | | Wind. | | Direction of Lower Clouds. |
|---|---|---|---|---|---|---|
| | | Direction | Velocity (0—6.) | Direction. | Force. (0—12) | |
| August 2 | 8 a.m. | W | 1 | WNW | 2 | W |
| ,, 4 | 10 a.m. | WNW | 2 | W | 4 | W |
| ,, 6 | 10 a.m. | SW | 1 | W | 4 | W |
| ,, 7 | 2-30 p.m. | NW | 1 | W | 1 | SW |
| ,, 12 | 8 a.m. | WNW | 1 | Calm | 0 | W |
| ,, 13 | 4 p.m. | S | 1 | Calm | 0 | — |
| ,, 17 | 8 p.m. | W | 1 | Calm | 0 | W |
| September 1 | 5 p.m. | W | 1 | W b S | 1 | W |
| ,, 3 | 2-45 p.m. | NW | 2 | W b S | 3 | S |
| ,, 9 | 5-15 p.m. | NW | 2 | WNW | 3 | SW |
| ,, 10 | 8 a.m. | NW | 2 | WNW | 3 | W |
| ,, 11 | 3 p.m. | S b W | 3 | NW | 3 | NW |
| ,, 13 | 11 a.m. | W | 2 | N | 1 | SW |
| ,, 15 | 7-30 a.m. | N | 2 | Calm | 0 | — |
| ,, 16 | 8 a.m. | N | 2 | Calm | 0 | NNE |
| ,, 16 | 5 p.m. | NW | 2 | Calm | 0 | N |
| ,, 20 | 3 p.m. | SE | 1 | E b S | 4 | — |
| ,, 21 | 2 p.m. | E | 3 | E | 5 | ESE |
| ,, 27 | 5-30 p.m. | SW | 1 | Calm | 0 | W |
| ,, 28 | 5-40 p.m. | S | 1 | SE | 1 | SW |
| ,, 30 | 5-30 p.m. | S b E | 1 | S b W | 3 | SW |
| October 2 | 9 p.m. | WSW | 2 | WSW | 2 | W |
| ,, 5 | 9-30 a.m. | NW | 2 | SW | 2 | SW |
| ,, 7 | 2 p.m. | WSW | 3 | WSW | 2 | W |
| ,, 7 | 4 p.m. | SW | 3 | WSW | 1 | — |
| ,, 9 | 5 p.m. | NNW | 2 | NNW | 3 | NW |
| ,, 15 | 3-30 p.m. | NW | 2 | WSW | 4 | SW |
| ,, 21 | 8 a.m. | SW b W | 3 | WSW | 3 | SW |
| ,, 23 | 8 a.m. | SW | 1 | Calm | 0 | W |
| ,, 31 | 11 a.m. | NW | 2 | SW | 1 | SW |
| November 4 | 8 a.m. | NW | 1 | Calm | 0 | SW |
| ,, 5 | Noon. | E | 1 | Calm | 0 | NE |
| ,, 6 | 8 a.m. | ENE | 1 | Calm | 0 | NE |
| ,, 17 | 8 a.m. | NNW | 3 | NW b W | 3 | NW |
| ,, 26 | 10 a.m. | WNW | 2 | WNW | 1 | NW |
| December 9 | 2 p.m. | NW | 2 | SW b W | 2 | SW |
| ,, 11 | Noon. | NW | 2 | SSW | 3 | S |
| ,, 12 | Noon. | N | 2 | ENE | 1 | — |
| ,, 14 | 4 p.m. | NW | 2 | Calm | 0 | — |
| ,, 24 | 9 a.m. | N | 2 | NE | 1 | NW |
| ,, 30 | 10 a.m. | NNE | 1 | ENE | 1 | — |
| ,, 31 | 9 a.m. | SE | 1 | ENE | 2 | NE |

# Observations of Earth-Magnetism, 1903.

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

In these observations the same Magnet has been employed from the beginning of the series in March. 1863. The weight of the Magnet with its stirrup is 825 grains, and its length 3·94 inches nearly. Its moment of inertia, measured by the method of vibrations, with and without a known increase of the moment, is 5·27303 to the English foot—second—grain units, at the temperature 35° Fahr., and its rate of increase is 0·00073 for increase of 10°.

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

The induction co-efficient $\mu$ 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 with one exception.

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 10·4 of arc.

In the calculations of the ratio $\frac{m}{X}$, the third and subsequent terms of the series $1 + \frac{P}{r2} + \frac{Q}{r4} +$ &c., have always been omitted.

The value of the constant P was found to be —0·00327.

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 twelve 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.

| 1903 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. | 5 16 0 | 18 4·3 | 18 4·1 | 1 | 68 | 42·9 | 12 12 15 |
| | 12 16 0 | 18 3·7 | | 2 | 68 | 49·8 | ,, 12 48 |
| | 19 16 0 | 18 3·3 | | | | | |
| | 26 16 0 | 18 5·2 | | | | | |
| Feb. | 3 16 0 | 18 4·3 | 18 2·5 | 1 | 68 | 48·9 | 17 11 43 |
| | 9 16 0 | 18 1·9 | | 2 | 68 | 49·3 | ,,. 12 33 |
| | 17 16 0 | 18 0·2 | | | | | |
| | 23 16 0 | 18 3·4 | | | | | |
| March | 2 16 0 | 18 4·1 | 18 2.6 | 1 | 68 | 48·6 | 23 10 5 |
| | 9 16 5 | 18 2·1 | | 2 | 68 | 49·6 | ,, 10 45 |
| | 16 16 15 | 18 0·5 | | | | | |
| | 23 16 0 | 18 3·2 | | | | | |
| | 30 16 0 | 18 3·2 | | | | | |
| April | 6 16 0 | 18 5·9 | 18 4·1 | 1 | 68 | 54·6 | 16 11 40 |
| | 13 16 0 | 18 5·4 | | 2 | 68 | 52·8 | ,, 12 18 |
| | 20 16 0 | 18 1·0 | | | | | |
| | 27 16 0 | 18 4·2 | | | | | |
| May | 4 16 0 | 18 0·0 | 18 1·3 | 1 | 68 | 49·6 | 18 11 22 |
| | 11 16 0 | 18 1·2 | | 2 | 68 | 49·6 | ,, 12 8 |
| | 18 16 0 | 18 2·1 | | | | | |
| | 25 16 0 | 18 1·7 | | | | | |
| June | 1 16 0 | 18 6·0 | 18 4·1 | 1 | 68 | 48·8 | 17 11 39 |
| | 8 16 0 | 18 2·1 | | 2 | 68 | 50·3 | ,, 12 17 |
| | 16 16 5 | 18 3·5 | | | | | |
| | 22 16 5 | 18 1·5 | | | | | |
| | 29 16 0 | 18 7·4 | | | | | |
| July | 6 16 5 | 18 1·2 | 18 1·0 | 1 | 68 | 50·1 | 23 10 15 |
| | 13 16 0 | 18 3·6 | | 2 | 68 | 51·0 | ,, 10 49 |
| | 20 16 0 | 17 59·5 | | | | | |
| | 29 16 0 | 17 59·7 | | | | | |

# OBSERVATIONS OF DECLINATION AND DIP.

*(Continued.)*

| 1903 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. |
| | 3 16 30 | 17 54·2 | | | | |
| | 10 16 10 | 18 1·1 | | | | |
| Aug. | 17 16 0 | 17 56·3 | 17 57·2 | 1 | 68 48·2 | 18 12 30 |
| | 24 16 30 | 17 56·2 | | 2 | 68 49·2 | ,, 13 8 |
| | 31 16 0 | 17 58·4 | | | | |
| | 7 16 0 | 17 56·3 | | | | |
| | 15 16 5 | 17 55·0 | | | | |
| Sept. | 21 16 5 | 17 55·8 | 17 56·6 | 1 | 68 49·8 | 21 10 0 |
| | 28 16 5 | 17 59·2 | | 2 | 68 51·1 | ,, 10 39 |
| | 5 16 0 | 18 3·3 | | | | |
| | 12 16 5 | 18 11·9 | | | | |
| Oct. | 21 16 5 | 17 59·7 | 18 5·1 | 1 | 68 49·1 | 21 11 30 |
| | 26 16 5 | 18 5·4 | | 2 | 68 48·2 | ,, 12 20 |
| | 2 16 0 | 18 1·3 | | | | |
| | 9 16 0 | 18 3·6 | | | | |
| Nov. | 16 16 0 | 18 7·4 | 18 4·3 | 1 | 68 49·3 | 18 11 27 |
| | 23 16 0 | 18 5·1 | | 2 | 68 48·9 | ,, 12 0 |
| | 30 16 0 | 18 3·9 | | | | |
| | 7 16 0 | 17 59·9 | | | | |
| | 14 16 0 | 18 0·7 | | | | |
| Dec. | 21 16 5 | 17 59·4 | 17 59·4 | 1 | 68 49·7 | 18 11 35 |
| | 29 16 0 | 17 57·7 | | 2 | 68 51·3 | ,, 12 4 |
| Yearly Mean | | | 18 1·9 | | 68 49·6 | |

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

| 1903. 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. | 12 10 42 | 44·0 | 6·0239 | 12 11 23<br>11 31 | 45·0<br>45·0 | 11 34·4<br>5 14·7 | 0·37964 |
| Feb. | 17 9 0 | 42·4 | 6·0264 | 17 10 3<br>10 5 | 44·5<br>44·5 | 11 32·6<br>5 14·4 | 0·37898 |
| Mar. | 13 9 48 | 50·0 | 6·0304 | 13 10 32<br>10 30 | 50·5<br>50·5 | 11 32·5<br>5 14·5 | 0·37907 |
| Apr. | 16 9 35 | 40·8 | 6·0348 | 16 10 39<br>10 39 | 43·1<br>43·0 | 11 33·7<br>5 14·2 | 0·37871 |
| May | 18 9 15 | 51·4 | 6·0281 | 18 10 8<br>10 8 | 52·4<br>51·8 | 11 32·3<br>5 13·8 | 0·37914 |
| June | 17 9 40 | 57·4 | 6·0321 | 17 10 33<br>10 33 | 58·0<br>58·4 | 11 31·6<br>5 13·5 | 0·37897 |
| July | 21 9 53 | 63·9 | 6·0369 | 21 11 3<br>11 0 | 66·5<br>67·0 | 11 29·0<br>5 12·6 | 0·37844 |
| Aug. | 18 9 51 | 56·3 | 6·0346 | 18 11 8<br>11 10 | 59·8<br>60·0 | 11 30·6<br>5 13·2 | 0·37870 |
| Sept. | 19 9 38 | 58·6 | 6·0357 | 19 10 12<br>10 32 | 60·0<br>60·0 | 11 31·6<br>5 14·0 | 0·37889 |
| Oct. | 21 9 31 | 59·7 | 6·0328 | 21 10 23<br>10 21 | 61·1<br>62·4 | 11 31·2<br>5 13·6 | 0·37914 |
| Nov. | 18 9 38 | 44·0 | 6·0282 | 18 10 25<br>10 25 | 48·5<br>48·0 | 11 34·4<br>5 13·9 | 0·37948 |
| Dec. | 18 9 26 | 37·6 | 6·0303 | 18 10 35<br>10 38 | 40·5<br>40·5 | 11 32·1<br>5 13·8 | 0·37833 |

# MAGNETIC INTENSITY.

| | BRITISH UNITS. | | | C. G. S. UNITS. | | |
|---|---|---|---|---|---|---|
| 1903 | Horizontal Force. | Vertical Force. | Total Force. | Horizontal Force. | Vertical Force. | Total Force. |
| Jan. ... | 3·7666 | 9·96971 | 10·4028 | 0·17367 | 0·44711 | 0·47965 |
| Feb. .. | 3·7683 | 9·97246 | 10·4292 | 0·17375 | 0·44838 | 0·48087 |
| Mar. ... | 3·7661 | 9·97186 | 10·4227 | 0·17365 | 0·44810 | 0·48057 |
| April ... | 3·7629 | 9·97495 | 10·4504 | 0·17350 | 0·44953 | 0·48184 |
| May ... | 3·7686 | 9·97295 | 10·4338 | 0·17376 | 0·44861 | 0·48108 |
| June ... | 3·7669 | 9·97242 | 10·4283 | 0·17368 | 0·44836 | 0·48082 |
| July ... | 3·7700 | 9·97414 | 10·4456 | 0·17383 | 0·44915 | 0·48162 |
| Aug. ... | 3·7682 | 9·97208 | 10·4256 | 0·17374 | 0·44820 | 0·48070 |
| Sept. ... | 3·7640 | 9·97251 | 10·4280 | 0·17355 | 0·44840 | 0·48081 |
| Oct. ... | 3·7682 | 9·97204 | 10·4251 | 0·17374 | 0·44818 | 0·48068 |
| Nov. ... | 3·7656 | 9·97172 | 10·4213 | 0·17362 | 0·44804 | 0·48050 |
| Dec. ... | 3·7685 | 9·97145 | 10·4167 | 0·17376 | 0·44791 | 0·48029 |
| Means | 3·7670 | 9·97236 | 10·4275 | 0·17369 | 0·44833 | 0·48079 |

# HORIZONTAL MAGNETIC DIRECTION.

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

| 1903 | Mean of the highest daily readings. (a) | Mean of the lowest daily readings (b) | Means of $a$ and $b$. (c) | Means of daily readings at 4a.m. & 4p.m. (d) | Differences $d-c$. | Difference of $a$ and $b$, or Mean daily range. | Highest reading of the month. | Lowest reading of the month. | Monthly range. |
|---|---|---|---|---|---|---|---|---|---|
| | 18°+ | 17°+ | 17°+ | | | | 18°+ | 17°+ | |
| | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ | ′ |
| January | 6·1 | 59·9 | 63·0 | 63·6 | 0·6 | 6·2 | 8·3 | 40·3 | 28·0 |
| February | 6·2 | 58·7 | 62·5 | 62·7 | 0·2 | 7·5 | 9·9 | 46·9 | 23·0 |
| March | 6·9 | 57·8 | 62·4 | 62·2 | +0·2 | 9·1 | 12·1 | 52·3 | 19·8 |
| April | 7·5 | 56·1 | 61·8 | 62·0 | 0·2 | 11·4 | 19·3 | 45·3 | 34·0 |
| May | 7·0 | 55·9 | 61·5 | 61·7 | 0·2 | 11·1 | 11·4 | 45·9 | 25·5 |
| June | 7·1 | 54·3 | 60·7 | 60·9 | 0·2 | 12·8 | 11·9 | 45·9 | 26·0 |
| July | 6·2 | 54·1 | 60·2 | 60·5 | 0·3 | 12·1 | 14·7 | 49·9 | 24·8 |
| August | 6·6 | 53·0 | 59·8 | 59·6 | +0·2 | 13·6 | 15·7 | 37·9 | 37·8 |
| September | 5·5 | 53·3 | 59·4 | 58·9 | +0·5 | 12·2 | 10·9 | 41·9 | 29·0 |
| October | 9·0 | 46·7 | 57·9 | 59·4 | 1·5 | 22·3 | 88·9 | —16·1 | 165·0 |
| November | 2·6 | 51·0 | 56·8 | 58·5 | 1·7 | 11·6 | 5·9 | 40·4 | 25·5 |
| December | 3·9 | 52·1 | 58·0 | 59·3 | 1·3 | 11·8 | 36·2 | 15·9 | 80·3 |
| Means .. | 6·2 | 54·4 | 60·3 | 60·8 | 0·5 | 11·8 | 20·4 | 37·2 | 43·2 |
| Correction for diurnal range | | | | —0·3 | | | | | |
| Mean for the year | | | | 18° 0′ ·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 $10^{-5}$ C. G. S.

| 1903. | Mean of the highest daily readings. (a) | Mean of the lowest daily readings. (b) | Means of $a$ and $b$. (c) | Means of daily readings 4a.m. & 4p.m. (d) | Differences $d-c$ | Differences of $a$ and $b$ or Mean daily Range. | Highest reading of the Month. | Lowest reading of the Month. | Monthly Range. |
|---|---|---|---|---|---|---|---|---|---|
| | 17000 + | | | | 0+ | | 17000+ | | 0+ |
| January | 401 | 381 | 391 | 395 | 4 | 20 | 416 | 356 | 60 |
| February | 401 | 372 | 387 | 393 | 6 | 29 | 420 | 345 | 75 |
| March | 404 | 369 | 387 | 394 | 7 | 35 | 416 | 351 | 65 |
| April | 409 | 349 | 379 | 389 | 10 | 60 | 476 | 254 | 222 |
| May | 412 | 363 | 388 | 396 | 8 | 49 | 446 | 351 | 95 |
| June | 410 | 353 | 382 | 391 | 9 | 57 | 461 | 309 | 152 |
| July | 411 | 349 | 380 | 390 | 10 | 62 | 436 | 321 | 115 |
| August | 404 | 341 | 373 | 383 | 10 | 63 | 429 | 279 | 150 |
| September | 402 | 345 | 374 | 382 | 8 | 57 | 424 | 311 | 113 |
| †October | 403 | 329 | 366 | 377 | 11 | 74 | 466 | —64 | 530 |
| November | 376 | 330 | 353 | 357 | 4 | 46 | 403 | 269 | 134 |
| December | 397 | 351 | 374 | 375 | 1 | 46 | 581 | 201 | 380 |
| Means | 403 | 353 | 378 | 385 | 7 | 50 | 448 | 274 | 174 |

Correction for diurnal range — 00003

Mean Horizontal Force for the year 0·17382 C.G.S. units.

† Not including the great storm of October 31st, when the spot of light was often off the paper.

# DATES OF MAGNETIC DISTURBANCES, 1903.

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 | c | s | s | c | m | s | c | s | s | s | s |
| 2 | c | c | c | s | c | m | c | c | s | s | m | c |
| 3 | c | c | c | c | c | s | c | c | c | s | s | c |
| 4 | c | c | c | s | m | s | c | s | s | s | m | s |
| 5 | c | c | c | m | s | c | s | c | m | s | c | s |
| 6 | c | c | c | m | m | c | s | c | c | s | s | s |
| 7 | c | s | s | s | s | c | c | c | m | s | s | s |
| 8 | c | m | s | m | s | c | c | s | s | s | s | s |
| 9 | s | s | s | s | s | c | s | s | s | c | s | c |
| 10 | s | s | c | s | c | c | s | s | s | c | m | c |
| 11 | s | s | c | c | c | c | s | m | s | s | s | c |
| 12 | c | s | m | c | c | c | s | s | m | g | s | c |
| 13 | c | s | s | c | s | c | s | m | s | m | s | g |
| 14 | c | c | c | c | s | c | s | m | c | s | c | c |
| 15 | c | s | c | s | c | c | s | s | c | c | c | s |
| 16 | c | c | c | s | s | s | s | c | c | s | s | c |
| 17 | c | c | c | s | c | s | s | c | c | s | s | c |
| 18 | s | c | c | s | c | s | s | s | c | s | m | c |
| 19 | s | c | c | c | c | s | s | c | m | s | c | s |
| 20 | c | c | c | c | c | s | s | s | s | c | s | s |
| 21 | c | s | c | c | s | s | c | m | s | c | s | c |
| 22 | c | c | s | c | s | s | c | m | s | s | s | c |
| 23 | s | s | c | c | s | s | c | s | s | s | s | c |
| 24 | s | s | c | c | s | s | c | c | c | c | c | c |
| 25 | c | s | c | c | s | c | m | m | c | s | c | c |
| 26 | m | c | c | m | c | c | m | m | c | s | c | c |
| 27 | c | c | c | c | s | s | m | s | s | c | c | c |
| 28 | c | c | c | c | s | s | s | c | c | c | s | c |
| 29 | c | | c | c | s | m | s | c | s | s | s | s |
| 30 | c | | s | s | s | s | c | s | s | vg | c | m |
| 31 | c | | s | | c | | s | c | | vg | | s |
| Totals c | 23 | 16 | 22 | 16 | 13 | 13 | 10 | 12 | 11 | 8 | 9 | 18 |
| Totals s | 7 | 11 | 8 | 10 | 16 | 14 | 18 | 12 | 15 | 19 | 17 | 11 |
| Totals m | 1 | 1 | 1 | 4 | 2 | 3 | 3 | 7 | 4 | 1 | 4 | 1 |
| Totals g | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Totals vg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |

The figures express, in decimals of a day, the Greenwich Civil time at which the drawing was made.

| 1903. | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ·44 | | | | ·41 | ·40 | ·51 | | ·35 | | ·38 | ·39 |
| 2 | ·47 | ·42 | | ·50 | ·62 | ·33 | ·34 | | | | | ·41 |
| 3 | ·50 | | ·39 | | | ·33 | ·30 | ·29 | ·36 | ·46 | ·34 & ·45 | |
| 4 | | | ·53 | ·45 | | ·43 | ·49 | ·48 | ·34 | ·35 | ·53 | 39 |
| 5 | | | ·42 | ·33 | ·42 | ·46 | | | | ·47 | ·39 | |
| 6 | | ·45 | | | | ·35 | ·38 | | ·35 | | ·39 | |
| 7 | | | ·48 | ·34 | | ·70 | ·33 | ·40 | ·34 | ·60 | ·39 | |
| 8 | ·38 | | ·36 | ·34 | ·37 | ·33 | | | | | ·45 | |
| 9 | | ·62 | ·47 | | | ·41 | ·38 | ·41 | ·46 | | ·40 | |
| 10 | ·43 | | ·39 | | ·33 | ·33 | ·67 | | ·35 | ·42 | | |
| 11 | ·40 | | ·49 | ·46 | | | | ·38 | ·38 | | | ·46 |
| 12 | ·39 | ·44 | ·49 | ·38 | ·37 | ·40 | ·33 | ·34 | ·41 | | | ·44 |
| 13 | ·38 | | ·38 | ·33 | ·48 | ·43 | ·65 | ·39 | ·45 | ·35 | ·50 | |
| 14 | ·42 | | ·46 | ·35 | ·45 | | | | ·30 | | ·37 | ·49 |
| 15 | ·41 | | | ·33 | ·65 | | ·66 | | ·45 | ·38 | ·41 | ·52 |
| 16 | ·43 | | ·66 | ·35 | | ·39 | | | ·33 | ·33 | ·39 | |
| 17 | | | | ·35 | ·77 | | ·54 | ·48 | ·37 | ·38 | ·40 | |
| 18 | | ·49 | ·39 | ·32 | ·32 | ·33 | | | ·39 | ·39 | ·37 | |
| 19 | | | | ·35 | ·34 | ·43 | | ·41 | | | | |
| 20 | | ·34 | | ·34 | ·71 | ·34 | ·34 | | ·44 | | | |
| 21 | | | | ·73 | ·47 | ·35 | ·39 | ·30 | ·34 | ·37 | ·49 | |
| 22 | | | ·40 | ·29 | ·33 | ·32 | | ·39 | ·66 | | | |
| 23 | ·49 | ·41 | | ·33 | ·33 | ·53 | ·37 | ·37 | ·50 | ·33 | ·54 | ·51 |
| 24 | ·47 | | ·37 | ·37 | ·36 | | ·39 | | | | ·42 | |
| 25 | | ·37 | | ·38 | ·34 | ·40 | ·30 | ·52 | | ·34 | | ·53 |
| 26 | | ·38 | ·38 | ·35 | ·46 | | ·74 | | ·48 | ·37 | ·42 | ·49 |
| 27 | | | ·47 | | ·35 | ·35 | | | | | | ·40 |
| 28 | | ·39 | | ·42 | ·35 | | 41 | ·41 | ·34 | ·48 | | |
| 29 | | | ·39 | ·74 | ·42 | ·41 | | | | ·35 & ·40 | ·44 | ·40 & ·50 |
| 30 | | | | ·51 | ·46 | | | ·38 | ·33 | | | |
| 31 | ·46 | | ·37 | | ·36 | | ·75 | | | ·42 | ·40 | ·43 |

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