



STONYHURST COLLEGE

OBSERVATORY.

RESULTS

OF

METEOROLOGICAL AND MAGNETICAL

OBSERVATIONS.

1875.

PRESTON :
J. ROBINSON, PRINTER, 17, CANNON-STREET.

INTRODUCTION.

As the work of this Observatory has now been carried on uninterruptedly for many years, it may be well to preface this report by a few remarks on our several series of observations, in order to convey a clear notion of the total results obtained.

The daily routine duties are comprised under the three general heads of Meteorology, Magnetism, and Astronomy.

Meteorology naturally claims the first place, as Stonyhurst is one of the seven Government Observatories connected with the Board of Trade through the Meteorological Office. Our duties in connexion with this Office are :—1° To furnish a continuous photographic record of all the movements of the Barometer, and of the Wet and Dry-Bulb Thermometers, and to take frequent readings of Standard Instruments to check the Curves. 2° To procure, as far as possible, unbroken traces of every variation in the Direction and in the Velocity of the Wind, and of the time and the amount of Rainfall. 3° To observe the clouds, and weather generally, at stated intervals. 4° To tabulate hourly measurements of all the curves, and to check these by the aid of Subsidiary Scales. Some other Meteorological observations are taken, as the readings of the solar thermometer, of the minimum on grass, and of the daily and monthly

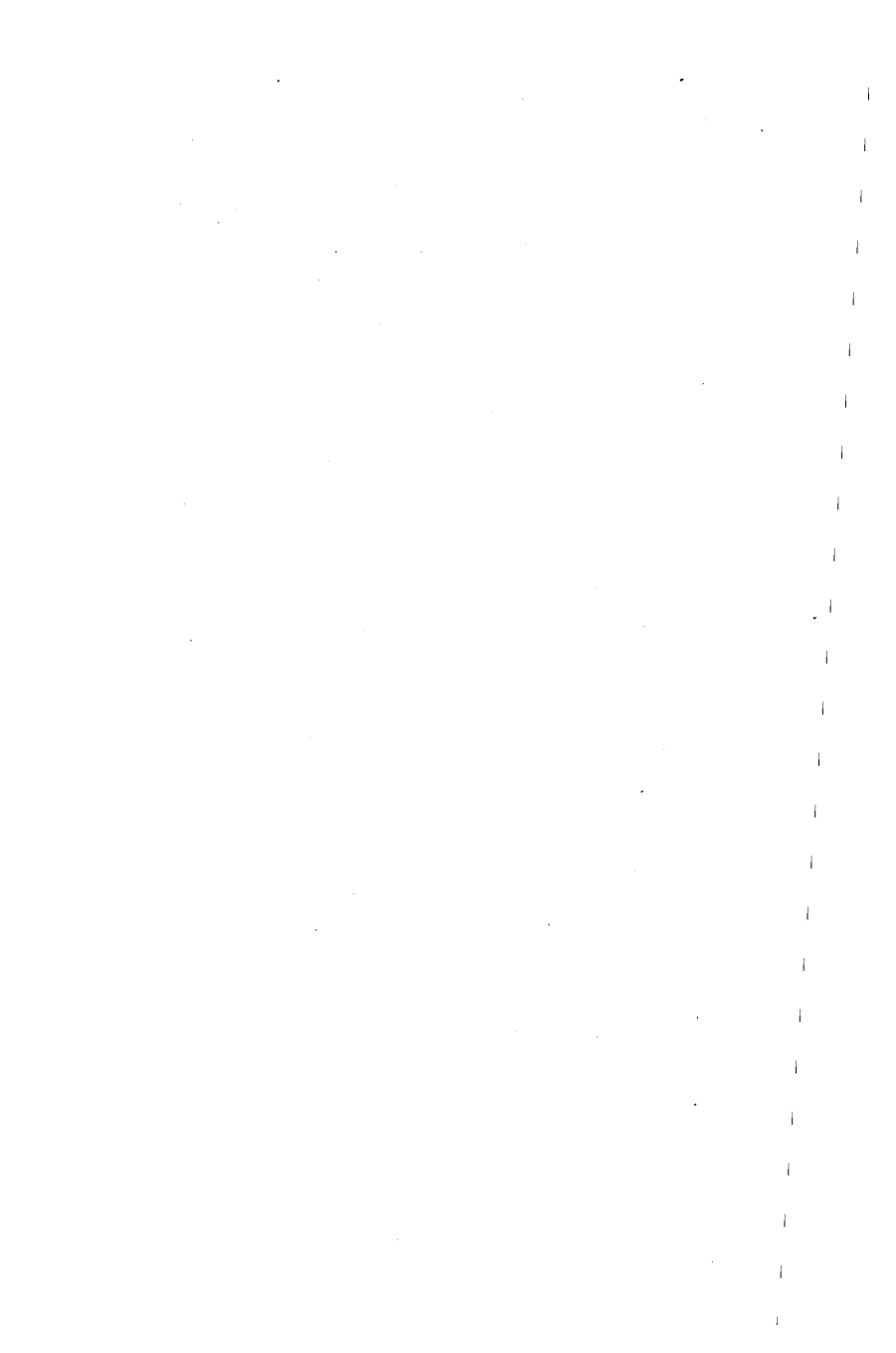
Rain gauges, independently of the Meteorological office; as are also the Evaporation Experiments. Besides the publication of the results by the Government Office, and our private monthly tables, the observations appear in the quarterly reports of the Registrar General, and in the *Nouvelles Météorologique* of the French Meteorological Society. This Observatory takes part in the system of daily synchronous observations; and particular results, such as the Rainfall or Barometric pressure, are not unfrequently furnished to those engaged in some special Scientific research.

Terrestrial Magnetism has received a large share of attention since the first impulse was given to this study by the visit of General Sir EDWARD SABINE, in the course of his Magnetic Survey of the country. Our principal endeavour is to obtain a two-fold unbroken series of observations. With a Dip Circle and Unifilar monthly determinations are made of the Inclination and Horizontal Force, and weekly measures of the Declination; and the self-recording Magnetographs furnish daily curves of the variations of the Declination, and of the two components of the Intensity. The results of the absolute measures of the Magnetic elements are given in the yearly tables at the end of the annual report. The daily curves of the Declinations and Horizontal Force have all been measured, and the hourly and daily means computed. We are about to commence the hourly measurements of the Vertical Force curves. The complete reduction of these numerous tables must be a work of years, but it is hoped that the tables may form the ground work of a series of communications to the Royal Society in the course of their reduction.

Astronomy does not fall so strictly within the sphere of our daily routine duties as Meteorology and Magnetism. The Transit Instrument is used almost exclusively for determining the error and rate of our standard sidereal clock, and the 8ⁱⁿ. Equatoreal is employed in the observation of Jupiter's satellites, and occasionally for double-star measures, and for spectroscopy, photography, and general observations. The August and November Meteors are also watched carefully when the weather is favourable. The Astronomical results appear as occasion demands in the publications of the Astronomical Society, but they have rarely been noticed in our yearly report.

As the Observatory is provided with several sets of self-registering or other Meteorological Instruments, it may prevent any future mistakes if we here place on record, that in the following pages the readings of the Barometer are taken from Adie's standard, a correction—0.02 being applied on account of the difference of height above sea-level between the Adie Barometer, and the instrument formerly in use. The corrections for index error, capillarity, and temperature are never omitted, but the observed values are not reduced to sea-level. The maximum and minimum temperatures are obtained from the patent instruments of Nigretti and Zambra, and the other temperatures from the Hygrometer by the same opticians. These Thermometers have all been compared by Mr. Glaisher with those of Greenwich. Both the direction and the velocity of the wind are given by a self-recording Anemometer by Beck. The Hygrometrical results have been calculated from Glaisher's tables, 5th edition.

S J. PERRY.



No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	1	0	6	7	10	7	0
Mean Velocity in miles per hour	0	2.6	0	7.3	13.2	14.6	12.3	0
Total No. of miles for each Direction	0	63	0	1054	2215	3506	2114	0

The total number of miles registered during the month was 8952.

The max. Velocity of the wind was 42 miles per hour; direction SW. on the 20th, at 3 a.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 8.5

In the month of January, the highest reading of the Barometer during 28 years, was on the 8th, in 1859, and was .. 30.310

The lowest ,, ,, 15th, 1865 27.939

The highest Temperature ,, 30th, 1872 56.2

The lowest ,, ,, 13th, 1867 9.2

The highest adopted mean temperature of } 1875 42.5
the month

The lowest ,, ,, 1871 39.0

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Show fell on the 1st, 21st, 22nd, 25th and 26th.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For February, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·632	29·499
Highest „ on the 16th	30·073	30·104
Lowest „ on the 24th	29·018	28·672
Range of Barometer Readings	1·055	1·432
Highest Reading of a Max. Therm. on the 15th ...	50·4	51·1
Lowest Reading of a Min. Therm. on the 4th ..	25·0	22·8
Range of Thermometer Readings	25·4	28·3
Mean of all the Highest Readings	40·9	43·9
Mean of all the Lowest.....	32·4	33·8
Mean Daily Range	8·5	10·1
Deducted Monthly Mean (from Mean of Max. } and Min.)	36·3	37·4
Mean Temperature from dry bulb	36·3	38·5
Adopted Mean Temperature	36·3	38·0
Mean Temperature of Evaporation	34·8	36·6
Mean Temperature of Dew Point	32·6	34·7
Mean elastic force of Vapour.....	0·186in	0·196in
Mean weight of Vapour in a cubic foot of air	2·1gr	2·4gr
Mean additional weight required for saturation ...	0·4gr	0·4gr
Mean degree of Humidity, (saturation 1·00).....	0·87	0·87
Mean weight of a cubic foot of air	554·1gr	548·7gr
Fall of Rain	1·399in	3·637in
Number of days on which Rain fell.....	18	17·4
Amount of Evaporation	0·059	0·838

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		1	11	8	0	2	2	3	1
Mean Velocity in miles per hour	15.2	7.5	14.5	0	5.4	11.7	6.5	7.8
Total No. of miles for each Direction	365	1991	2785	0	259	561	465	187

The total number of miles registered during the month was 6613.

The max. Velocity of the wind was 31 miles per hour; direction E. on the 20th, at 1 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 8.5

In the month of February, the highest reading of the Barometer during 28 years, was on the 11th, in 1849, and was .. 30.452

The lowest ,, ,, .6th, 1867 28.208

The highest Temperature ,, 5th, 1869 57.5

The lowest ,, ,, 1st, 1855 10.1

The highest adopted mean temperature of the month } 1869 44.0

The lowest ,, ,, 1855 28.6

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Snow fell on the 6th, 7th, 8th, 11th, 19th, 20th, 23rd, 24th, 25th, 27th, and 28th. Slight fog on the 16th.

The rainfall is more than two inches below the average of the past 28 years.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For March, 1875.

Results of Observations taken during the month.		Mean for the last 28 Years.
Mean Reading of the Barometer.....	29.728	29.466
Highest " on the 18th	30.226	30.078
Lowest " on the 6th	29.082	28.719
Range of Barometer Readings	1.144	1.359
Highest Reading of a Max. Therm. on the 31st ...	57.2	56.7
Lowest Reading of a Min. Therm. on the 19th ...	24.0	23.3
Range of Thermometer Readings.....	33.2	33.4
Mean of all the Highest Readings	46.7	43.9
Mean of all the Lowest.....	34.9	34.6
Mean Daily Range	11.8	12.3
Deduced Montlly Mean (from Mean of Max. } and Min.)	39.8	39.8
Mean Temperature from dry bulb.....	40.1	40.0
Adopted Mean Temperature	40.0	39.9
Mean Temperature of Evaporation	38.2	38.1
Mean Temperature of Dew Point.....	35.9	35.6
Mean elastic force of Vapour.....	0.211in	0.210in
Mean weight of Vapour in a cubic foot of air	2.4gr	2.4gr
Mean additional weight required for saturation ...	0.5gr	0.5gr
Mean degree of Humidity, (saturation 1.00).....	0.86	0.85
Mean weight of a cubic foot of air	551.3gr	546.5gr
Fall of Rain	1.246in	3.073in
Number of days on which Rain fell.....	12	18.1
Amount of Evaporation	1.066	1.687

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		1	4	10	1	1	2	7	5
Mean Velocity in miles per hour	5·8	11·4	13·6	13·3	16·5	14·3	14·7	7·4
Total No. of miles for each Direction	138	1097	3268	318	397	684	2491	833

The total number of miles registered during the month was 9276.

The max. Velocity of the wind was 43 miles per hour; direction WbS. on the 9th, at 9 a.m.

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

In the month of March, the highest reading of the Barometer during 28 years, was on the 6th, in 1852. Also on the 6th in 1874, and was..... 30·401

The lowest " " 31st, 1860 28·199

The highest Temperature " 25th, 1871 68·0

The lowest " " 4th, 1866 14·5

The highest adopted mean temperature of }
the month } 1871 44·0

The lowest " " 1855 35·6

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Snow fell on the 1st, 2nd, 3rd, 6th, 12th, and 21st.

There was fog on the 24th.

A Lunar Halo was seen at 9 p.m. on the 20th.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For April, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·622	29·498
Highest „ on the 1st	30·164	29·969
Lowest „ on the 5th	28·633	28·790
Range of Barometer Readings	1·531	1·179
Highest Reading of a Max. Therm. on the 20th ...	70·8	67·7
Lowest Reading of a Min. Therm. on the 13th . . .	29·0	29·0
Range of Thermometer Readings	41·8	38·7
Mean of all the Highest Readings	56·5	54·2
Mean of all the Lowest.....	38·9	38·4
Mean Daily Range	17·6	15·8
Deducted Monthly Mean (from Mean of Max. } and Min.)	46·2	44·8
Mean Temperature from dry bulb	46·8	44·9
Adopted Mean Temperature	46·5	44·9
Mean Temperature of Evaporation	43·3	42·0
Mean Temperature of Dew Point	39·7	38·9
Mean elastic force of Vapour.....	0·245in	0·238in
Mean weight of Vapour in a cubic foot of air	2·8gr	2·8gr
Mean additional weight required for saturation ...	0·8gr	0·7gr
Mean degree of Humidity, (saturation 1·00).....	0·78	0·80
Mean weight of a cubic foot of air	542·1gr	541·7gr
Fall of Rain	1·591in	2·383in
Number of days on which Rain fell.....	8	15·1
Amount of Evaporation	1·616	2·737

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		1	14	2	0	2	4	5	2
Mean Velocity in miles per hour	3.2	10.0	6.5	0	14.6	12.0	11.9	5.4
Total No. of miles for each Direction	77	3355	313	0	701	1151	1422	259

The total number of miles registered during the month was 7278.

The max. Velocity of the wind was 34 miles per hour; direction NE. on the 5th, at 4 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 6.2

In the month of April, the highest reading of the Barometer during 28 years, was on the 22nd, in 1855, and was..... 30.191

The lowest " " 20th, 1868 28.358

The highest Temperature " 14th, 1852 74.1

The lowest " " 12th, 1862 24.7

The highest adopted mean temperature of } 1865 48.5
the month

The lowest " " 1841 40.8

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There was a Thunder storm on the 5th.

The Cuckoo arrived on the 18th.

During the month of April, the magnets were very steady, with the exception of a slight disturbance affecting all the three magnets from 4 p.m. on the 7th until 2 a.m. on the 8th.

A somewhat abrupt movement of all the three magnets took place on the 26th at about 5 p.m., and continued until a little past 6 p.m.

Another similar movement took place a little before 1 a.m. on the 27th, which also lasted about an hour.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For May, 1875.

Results of Observations taken during the month.		Mean for the last 28 Years.
Mean Reading of the Barometer.....	29.539	29.521
Highest ,, on the 24th	29.903	29.939
Lowest ,, on the 18th	29.026	28.971
Range of Barometer Readings	0.877	0.968
Highest Reading of a Max. Therm. on the 14th ...	72.1	72.4
Lowest Reading of a Min. Therm. on the 29th ..	33.6	31.7
Range of Thermometer Readings.....	38.5	40.7
Mean of all the Highest Readings.....	61.4	59.7
Mean of all the Lowest.....	43.6	42.5
Mean Daily Range.....	17.8	17.2
Deducted Monthly Mean (from Mean of Max. } and Min.).....	50.8	49.4
Mean Temperature from dry bulb.....	51.2	49.8
Adopted Mean Temperature.....	51.0	49.6
Mean Temperature of Evaporation.....	48.6	46.4
Mean Temperature of Dew Point.....	46.1	43.0
Mean elastic force of Vapour.....	0.313in	0.279in
Mean weight of Vapour in a cubic foot of air	3.5gr	3.2gr
Mean additional weight required for saturation ...	0.7gr	0.9gr
Mean degree of Humidity, (saturation 1° C0).....	0.84	0.76
Mean weight of a cubic foot of air.....	535.3gr	536.6gr
Fall of Rain.....	2.921in	2.442in
Number of days on which Rain fell.....	23	15.5
Amount of Evaporation	2.916	3.724

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	1	3	0	2	12	13	0
Mean Velocity in miles per hour	0	7.0	5.8	0	14.4	11.6	9.8	0
Total No. of miles for each Direction	0	168	420	0	691	3330	3054	0

The total number of miles registered during the month was 7663.

The max. Velocity of the wind was 39 miles per hour; direction S. by E. on the 21st, at 5 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 7.4

In the month of May, the highest reading of the Barometer during 28 years, was on the 22nd, in 1855, and was 30.124

The lowest " " 1st, 1858 28.564

The highest Temperature " 19th, 1864 82.5

The lowest " " 4th, 1855 23.6

The highest adopted mean temperature of }
the month } 1848 55.1

The lowest " " 1855 45.0

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Thunder storms occurred on the 23rd and 28th, accompanied with hail. Hail also fell on the 19th. Swallows were first seen on the 2nd.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For June, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29.436	29.527
Highest " on the 2nd	29.885	29.910
Lowest " on the 15th	28.784	29.110
Range of Barometer Readings	1.101	0.800
Highest Reading of a Max. Therm. on the 3rd ...	75.1	76.5
Lowest Reading of a Min. Therm. on the 8th ..	41.2	39.2
Range of Thermometer Readings	33.9	37.3
Mean of all the Highest Readings	64.5	65.1
Mean of all the Lowest.....	47.9	48.1
Mean Daily Range	16.6	17.0
Deduced Monthly Mean (from Mean of Max. } and Min.)	54.4	54.8
Mean Temperature from dry bulb.....	54.6	54.7
Adopted Mean Temperature	54.5	54.8
Mean Temperature of Evaporation	51.6	52.2
Mean Temperature of Dew Point.....	48.8	49.1
Mean elastic force of Vapour.....	0.344in	0.360in
Mean weight of Vapour in a cubic foot of air	3.9gr	3.9gr
Mean additional weight required for saturation ...	0.9gr	0.9gr
Mean degree of Humidity, (saturation 1.00).....	0.81	0.79
Mean weight of a cubic foot of air	529.5gr	531.0gr
Fall of Rain	4.469in	3.728in
Number of days on which Rain fell.....	20	17.5
Amount of Evaporation	4.029	3.777

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	3	3	0	0	11	13	0
Mean Velocity in miles per hour	0	7.3	11.1	0	0	11.5	9.0	0
Total No. of miles for each Direction	0	524	801	0	0	3042	2809	0

The total number of miles registered during the month was 7176.

The max. Velocity of the wind was 33 miles per hour; direction S. on the 15th, at 10 a.m.

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 28 years, was on the 15th, in 1874, and was 30.219

The lowest ,, ,, 12th, 1862 28.632

The highest Temperature ,, 28th, 1857 84.6

The lowest ,, ,, 30th, 1856 34.2

The highest adopted mean temperature of the month } 1858 59.0

The lowest ,, ,, 1856 & 1860 52.2

— 0 —

There were thunder storms on the 10th and 15th,. Hail fell on the 12th.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For July, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·557	29·511
Highest „ on the 28th	29·967	29·877
Lowest „ on the 9th	28·903	29·130
Range of Barometer Readings	1·064	0·747
Highest Reading of a Max. Therm. on the 7th ...	77·4	78·8
Lowest Reading of a Min. Therm. on the 12th ...	41·8	42·1
Range of Thermometer Readings.....	35·6	36·7
Mean of all the Highest Readings.....	68·0	68·1
Mean of all the Lowest.....	49·9	51·0
Mean Daily Range	18·1	17·1
Deducted Monthly Mean (from Mean of Max. } and Min.)	57·1	57·7
Mean Temperature from dry bulb.....	57·2	58·0
Adopted Mean Temperature	57·2	57·9
Mean Temperature of Evaporation	54·6	55·1
Mean Temperature of Dew Point.....	52·2	52·6
Mean elastic force of Vapour.....	0·392in	0·397in
Mean weight of Vapour in a cubic foot of air	4·4gr	4·5gr
Mean additional weight required for saturation ...	0·9gr	1·0gr
Mean degree of Humidity, (saturation 1·00).....	0·84	0·82
Mean weight of a cubic foot of air	528·7gr	527·1gr
Fall of Rain	5·69lin	3·950in
Number of days on which Rain fell.....	18·0	17·1
Amount of Evaporation	4·366	4·097

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	8	3	0	1	2	14	3
Mean Velocity in miles per hour	0	9.7	7.8	0	6.0	12.0	8.0	12.8
Total No. of miles for each Direction	0	1864	562	0	143	276	2632	923

The total number of miles registered during the month was 6450.

The max. Velocity of the wind was 28 miles per hour; direction W. on the 10th, at 1 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 6.8

In the month of July, the highest reading of the Barometer during 28 years, was on the 24th, in 1868, and was 30.112

The lowest ,, ,, 14th, 1853 28.670

The highest Temperature ;, 22nd, 1873 88.2

The lowest ,, ,, 1st, 1857 36.0

The highest adopted mean temperature of the month 63.0
 { 1852

The lowest ,, ,, 1851 & 1853 55.5

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There was a thunder storm on the 1st, and thunder was heard on the 3rd, 8th, and 23rd. Lightning was seen on the 18th. An Auroral light was observed at 9 p.m. on the 14th, but it was obscured by heavy clouds.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For August, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·590	29·499
Highest „ on the 20th	29·869	29·894
Lowest „ on the 12th	29·280	28·975
Range of Barometer Readings	0·589	0·919
Highest Reading of a Max. Therm. on the 16th ...	77·7	76·9
Lowest Reading of a Min. Therm. on the 31st ..	43·0	41·5
Range of Thermometer Readings.....	34·7	35·4
Mean of all the Highest Readings	68·2	67·2
Mean of all the Lowest.....	51·3	50·9
Mean Daily Range	16·4	16·3
Deducted Monthly Mean (from Mean of Max. } and Min.)	58·3	57·4
Mean Temperature from dry bulb.....	59·3	57·5
Adopted Mean Temperature	58·8	57·5
Mean Temperature of Evaporation	57·4	54·7
Mean Temperature of Dew Point.....	56·1	52·2
Mean elastic force of Vapour.....	0·45lin	0·393in
Mean weight of Vapour in a cubic foot of air	5·0gr	4·3gr
Mean additional weight required for saturation ...	0·6gr	0·9gr
Mean degree of Humidity, (saturation 1·00).....	0·91	0·83
Mean weight of a cubic foot of air	527·2gr	527·5gr
Fall of Rain	3·76lin	4·78lin
Number of days on which Rain fell.....	19	19·5
Amount of Evaporation	3·171	3·456

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	9	1	0	1	11	8	1
Mean Velocity in miles per hour	0	7.1	5.5	0	11.0	10.0	7.8	2.3
Total No. of miles for each Direction	0	1551	132	0	264	2630	1507	54

The total number of miles registered during the month was 6138.

The max. Velocity of the wind was 28 miles per hour; direction SW. by W on the 27th, at noon.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 7.4

In the month of August, the highest reading of the Barometer during 28 years, was on the 21st, in 1874, and was 30.114

The lowest ,, ,, 26th, 1853 28.637

The highest Temperature ,, 2nd, 1868 88.0

The lowest ,, ,, 21st, 1864 & 1869..... 36.0

The highest adopted mean temperature of the month } 1857 61.0

The lowest ,, ,, 1848 52.5

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A Thunder storm occurred on the 9th, and thunder was also heard on the 10th, 12th, and 13th. Lightning was seen on the 7th.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	5	3	4	5	5	7	1
Mean Velocity in miles per hour	0	9.2	7.8	11.4	12.8	11.6	13.3	3.8
Total No. of miles for each Direction	0	1104	533	1097	1538	1395	2241	90

The total number of miles registered during the month was 8028.

The max. Velocity of the wind was 53 miles per hour; direction S. on the 26th, at midnight.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 6.6

In the month of September, the highest reading of the Barometer during 28 years, was on the 15th, in 1851, and was 30.274

The lowest ,, ,, 22nd, 1863 28.371

The highest Temperature ,, 6th, 1868 85.0

The lowest ,, ,, 6th, 1855 30.7

The highest adopted mean temperature of the month 1865 59.1

The lowest ,, ,, 1863 50.9

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Thunder storms occurred on the 8th, and 19th.

The rainfall exceeds the yearly mean of the month by more than one inch.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For October, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·329	29·398
Highest ,, on the 6th	29·866	29·977
Lowest ,, on the 11th	28·760	28·651
Range of Barometer Readings	1·106	1·326
Highest Reading of a Max. Therm. on the 1st ...	62·0	64·4
Lowest Reading of a Min. Therm. on the 13th ..	31·6	30·0
Range of Thermometer Readings	30·4	34·4
Mean of all the Highest Readings	53·0	54·7
Mean of all the Lowest.....	42·5	42·3
Mean Daily Range	10·5	12·4
Deducted Monthly Mean (from Mean of Max. } and Min.)	46·8	47·5
Mean Temperature from dry bulb	47·5	48·0
Adopted Mean Temperature	47·2	47·8
Mean Temperature of Evaporation	45·0	45·6
Mean Temperature of Dew Point	42·6	43·3
Mean elastic force of Vapour.....	0·273in	0·282in
Mean weight of Vapour in a cubic foot of air	3·2gr	3·2gr
Mean additional weight required for saturation ...	0·6gr	0·6gr
Mean degree of Humidity, (saturation 1·00).....	0·85	0·85
Mean weight of a cubic foot of air	535·8gr	536·1gr
Fall of Rain	3·683in	5·447in
Number of days on which Rain fell.....	21	21·8
Amount of Evaporation	1·403	1·574

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		0	4	11	4	1	7	3	1
Mean Velocity in miles per hour	0	8.4	12.0	8.6	15.7	12.4	12.5	9.4
Total No. of miles for each Direction	0	809	3170	838	376	2089	900	226

The total number of miles registered during the month was 8408.

The max. Velocity of the wind was 37 miles per hour; direction WSW. on the 7th, at 4 a.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 8.7

In the month of October, the highest reading of the Barometer during 28 years, was on the 29th, in 1849, and was 30.238

The lowest " " 19th, 1862 28.139

The highest Temperature " 9th, 1869 72.8

The lowest " " 21st, 1859 25.2

The highest adopted mean temperature of } 1861 51.6
the month

The lowest " " 1850 44.8

— o —

The rainfall is nearly 2 inches below the mean of 28 years.

Stonhurst Observatory,

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

METEOROLOGICAL REPORT

For November, 1875.

Results of Observations taken during the month.	Mean for the last 28 Years.	
Mean Reading of the Barometer.....	29·377	29·462
Highest „ on the 23rd	29·898	30·063
Lowest „ on the 10th	28·453	28·591
Range of Barometer Readings	1·445	1·472
Highest Reading of a Max. Therm. on the 4th ...	56·4	55·3
Lowest Reading of a Min. Therm. on the 25th ...	27·8	25·4
Range of Thermometer Readings	28·6	29·9
Mean of all the Highest Readings	45·9	46·6
Mean of all the Lowest.....	36·4	36·2
Mean Daily Range	9·5	10·4
Deducted Monthly Mean (from Mean of Max. } and Min.).....	40·8	41·0
Mean Temperature from dry bulb.....	41·6	41·2
Adopted Mean Temperature	41·2	41·1
Mean Temperature of Evaporation	39·4	38·7
Mean Temperature of Dew Point.....	37·1	37·5
Mean elastic force of Vapour.....	0·221in	0·224in
Mean weight of Vapour in a cubic foot of air	2·5gr	2·6gr
Mean additional weight required for saturation ...	0·5gr	0·4gr
Mean degree of Humidity, (saturation 1·00).....	0·86	0·87
Mean weight of a cubic foot of air	543·4gr	544·8gr
Fall of Rain	5·810in	4·06in
Number of days on which Rain fell.....	22	19·0
Amount of Evaporation	3·020	1·301

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	12	2	0	2	6	4	4
Mean Velocity in miles per hour	0	9.8	9.2	0	13.1	11.1	12.8	14.7
Total No. of miles for each Direction	0	2826	442	0	627	1592	1228	1413

The total number of miles registered during the month was 8128.

The max. Velocity of the wind was 37 miles per hour; direction SW. by W on the 17th, at 11 p.m.

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 28 years, was on the 12th, in 1857, and was 30.350

The lowest " " 1st, 1859 28.007

The highest Temperature " 6th, 1872 61.9

The lowest " " 17th, 1861 19.1

The highest adopted mean temperature of }
the month } 1857 & 1863 43.8

The lowest " " 1851 36.7

— o —

Hail fell on the 7th, 8th, and 11th.

There were light falls of snow on the 21st, 25th, 26th, 27th, 29th, and 30th.

A well defined Lunar Halo, of about 40° diameter, was seen on the evening of the 12th.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	3	0	0	6	12	4	2
Mean Velocity in miles per hour	6.1	8.8	0	0	11.0	13.2	13.5	5.2
Total No. of miles for each Direction	590	630	0	0	1590	3814	1994	243

The total number of miles registered during the month was 8166.

The max. Velocity of the wind was 38 miles per hour; direction S. by E on the 21st, at 7 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 8.1

In the month of December, the highest reading of the Barometer during 28 years, was on the 22nd, in 1849, and was 30.376

The lowest " " 8th, 1872 28.143

The highest Temperature " 6th, 1856 58.0

The lowest " " 24th, 1860 6.7

The highest adopted mean temperature of the month } 1857 44.6

The lowest " " 1874 31.0

— o —

Snow fell on the 1st, 2nd, and 6th.

There was a fog on the 26th during greater part of the day.

Lightning was seen on the evening of the 22nd.

Summary of the Observations

FOR 1875.

	Mean for the last 28 Years.	
Mean Reading of the Barometer	29·534	29·482
Highest ,, on March 18th....	30·226	30·281in
Lowest ,, on Jan. 24th....	28·436	28·280in
Range of Barometer Readings	1·790	2·001in
Highest Reading of a Max. Therm. on Aug. 16th	77·7	81·5
Lowest Reading of a Min. Therm. on Jan. 21st	23·6	16·0
Range of Thermometer Readings	54·1	65·5
Mean of all the Highest Readings.....	55·1	54·7
Mean of all the Lowest	42·0	41·0
Mean Daily Range	13·1	13·7
Deduced Yearly Mean (from Mean of Max. and Min.)	47·5	46·8
Mean Temperature of dry bulb	47·9	47·0
Adopted Mean Temperature.....	47·7	46·9
Mean Temperature of Evaporation.....	45·3	44·7
Mean Temperature of Dew Point	42·9	42·2
Mean elastic force of Vapour.....	0·285in	0·277in
Mean weight of Vapour in a cubic foot of air.....	3·2gr	3·2gr
Mean additional weight required for saturation....	0·7gr	0·6gr
Mean degree of Humidity, (saturation 1·00)	0·85	0·84
Mean weight of a cubic foot of air.....	539·1gr	538·7gr
Total Fall of Rain in the Year	45·182in	46·923in
Number of days per Month on which Rain fell.....	18·7	18·4
Amount of Evaporation	26·454in	27·289in

The Maximum monthly mean height of the Barometer was in March, 1854, and was.....29·861

The Minimum ,, in December, 1868, and was...28·984

The Maximum yearly mean height of the Barometer was in 1858, and was.....29·544

The Minimum ,, ,, ,, in 1866, and was...29·389

The greatest monthly range of the Barometer was in November, 1859, and was	2.290
The least " " in July, 1852, and was	0.505
In 1859, on Nov. 1st, at 1 p.m., the Barometer stood at 28.035, and on Nov. 2nd, at 1 p.m., it stood at 29.263, this was the greatest range of the Barometer, in 24 hours and was.....	1.228
The highest reading of the Barometer, during 28 years, was on February 11th, 1849, and on March 4th, 1854, and was ...	30.452
The lowest Jan. 14, 1865, and on July 22nd, 1873, and was ...	27.939
Extreme range	2.513
The highest temperature was on July 15th, 1868, and was ...	88.2
The lowest " " Dec. 24th, 1860,	6.7
The highest adopted mean temperature of a month	} July, 1868, 62.4
The lowest " " Feb., 1855, .....		28.6
The highest adopted mean temperature of a year 1868,	49.1
The lowest " " 1855,	44.6
The greatest monthly mean weight of vapour, in a cubic foot of air.....	} July, 1852, 5.1
The least " " Feb., 1855, .....		1.4
The greatest fall of rain in a month, was in Oct., 1870, and was..	13.357
The least " " May, 1853, and May, 1859.....	0.3
The greatest number of days on which rain fell in one Month	} July, 1861, Dec. 1868..... 31
The least " " March, 1852....		3

The range of Barometer readings for the year is small, whilst for the Thermometer the yearly range is more than 11° below the average.

THERMOMETER READINGS.

HOURS OF MAXIMA AND MINIMA.

The Observations of the maxima and minima of the thermometer have a twofold interest. 1° They afford an easy method of determining the mean temperature of the 24 hours. 2° They tell us still more directly and surely what are the extremes of heat and cold, and therefore the range of temperature, to which we may be exposed. It is principally with the view of throwing more light upon the former of these two points that the following tables have been drawn up, and the monthly curves traced from the figures in the tables. No attempt is made to show the value of the maxima or minima, but the time only, at which the highest or lowest temperature occurs, is taken into account.

The continuous lines give the mean results from eight years observations; and the dotted lines belong exclusively to the year 1875. As might be expected the former are more regular than the latter, though the yearly curves are almost identical, and there is seldom any very marked difference in the character of the two monthly ones.

The hour of the maximum is generally more decided in 1875 than in the mean monthly curves. The maxima in 1875 differ most from the mean of previous years in the months of March and November. The maxima in March were distributed last year nearly equally between one and three p.m., instead of being decidedly at three p.m., as is generally the case. In November the maximum was frequently anticipated in 1875 by three hours, falling at the early hour of 11 a.m.

From April to September the maximum rarely, if ever, falls between the hours of nine p.m. and eight a.m., but in the winter months the distribution of the maxima is much more general.

The yearly mean curve shows that two p.m. is the true time of highest temperature, and that the general distribution of the maxima is remarkably simple and regular. There exist however a well marked annual oscillation in this time of maximum. Starting from the mean in January and February, it grows later as the year advances, falling at three p.m. in March, April, and May, and at four p.m. in June and July. It then returns more rapidly towards the earlier hours, being at two or three p.m. in August and September, decidedly at two in October, between one and two p.m. in November, and finally coinciding with midday in December.

In passing from the curves of highest to those of lowest temperatures, the first thing that strikes the eye, is the change from a single to a double inflexion. The highest readings are decidedly at two p.m., whereas the lowest fall either at midnight or some four or five hours later. The midnight maximum frequency of lowest readings is constant throughout the year, but there is an annual change of the secondary maximum following the sun almost as regularly as in the curves of highest readings. Thus in January this secondary maximum occurs at nine a.m.; then at seven in February; at six in March and April; and at four in May and June. It then returns to five a.m. in July and August, and thence to six in September, and seven in October, and it is often as late as eight or nine a.m. in November and December.

August is the only month in which the number of lowest readings is not oftenest at midnight; and the only case of a summer minimum falling shortly after midday occurs in July.

Summary of hours of maximum readings of thermometer in 1875.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.
Jan.	0	0	0	0	0	1	0	0	1	0	0	6	4	6	3	1	3	0	1	1	0	1	1	3
Feb.	1	0	0	0	0	0	0	0	0	0	0	4	4	7	6	2	0	0	0	0	1	1	0	1
Mar.	1	0	0	0	0	0	0	0	0	1	1	2	8	3	8	6	1	0	0	0	0	0	0	0
Apr.	0	0	0	0	0	0	0	0	0	2	2	2	3	6	6	6	2	0	0	0	0	0	0	0
May.	0	0	0	0	0	0	0	0	1	0	1	4	4	9	4	4	2	2	0	0	0	0	0	0
June.	0	0	0	0	0	0	0	0	2	1	1	4	3	4	9	4	1	0	0	0	0	0	0	3
July.	0	0	0	0	0	0	0	0	0	0	1	0	6	8	6	7	3	0	0	0	0	0	0	0
Aug.	0	0	0	0	0	0	0	0	0	3	2	3	5	9	4	3	2	0	0	0	0	0	0	0
Sep.	0	0	0	0	0	0	0	0	0	0	2	4	4	11	7	2	0	0	0	0	0	0	0	0
Oct.	0	0	0	0	1	0	0	0	0	0	5	4	7	7	4	1	0	1	0	0	0	1	0	0
Nov.	0	1	0	0	1	0	0	0	0	0	9	8	3	2	3	0	0	0	0	1	0	1	0	1
Dec.	2	0	0	0	1	0	0	0	1	0	6	9	3	3	0	2	0	2	0	0	0	0	1	0
Totals.	4	1	0	0	3	1	0	0	5	7	30	50	54	75	60	38	14	5	1	2	1	4	2	8
Means.	0.33	0.08	0	0	0.25	0.08	0	0	0.42	0.58	2.50	4.17	4.50	6.25	5.00	3.17	1.17	0.42	0.08	0.17	0.08	0.33	0.17	0.67

Summary of Hours of Minimum Readings of Thermometer during eight years.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.
1868	17	23	25	35	42	30	19	9	7	2	0	1	1	0	0	1	3	3	3	4	7	19	23	89
1869	16	13	27	30	39	26	15	17	6	1	0	1	1	0	2	1	1	3	6	6	8	13	27	101
1870	14	10	30	41	41	28	15	9	8	5	0	0	0	2	3	0	0	3	6	6	11	13	22	98
1871	13	15	23	49	35	29	18	10	3	2	0	0	0	0	0	1	0	4	4	6	5	14	25	77
1872	22	25	24	31	35	33	16	16	9	1	0	1	0	0	0	1	3	2	4	6	5	15	25	93
1873	17	17	27	36	41	32	17	11	1	5	0	0	0	0	0	1	0	4	3	5	8	12	26	99
1874	25	24	32	42	31	31	15	13	7	0	1	0	0	0	1	1	1	0	4	4	9	9	26	88
1875	23	17	20	37	43	36	17	13	6	1	0	0	0	1	0	0	0	2	6	6	3	9	31	92
Sums.	147	144	208	301	307	245	132	98	47	17	1	3	2	3	6	6	8	21	36	43	56	104	205	737
Means.	18.4	18.0	26.0	37.6	38.4	30.6	16.5	12.3	6.0	2.1	0.1	0.4	0.3	0.4	0.8	0.8	1.0	2.6	4.5	5.4	7.0	13.0	25.6	92.1

Summary of Hours of Maximum Readings of Thermometer during eight years.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.
1868	9	6	2	3	2	1	1	1	3	9	11	35	45	75	65	46	15	4	5	4	1	9	4	8
1869	5	2	0	0	3	1	1	1	4	14	9	42	52	75	53	48	11	3	3	0	0	7	5	24
1870	2	1	1	2	0	3	4	2	1	3	11	52	35	73	73	42	21	7	3	4	0	1	3	10
1871	1	2	0	1	2	0	0	0	1	2	13	43	55	86	69	43	19	6	5	2	3	0	3	7
1872	1	2	0	2	0	1	0	2	1	6	15	49	75	77	53	32	8	7	6	1	5	0	5	7
1873	2	2	1	3	1	1	1	2	1	6	18	51	65	69	75	39	5	3	3	2	2	1	2	10
1874	2	3	0	1	0	2	2	0	3	4	13	49	53	79	71	35	16	3	5	4	3	2	3	7
1875	4	1	0	0	3	1	0	0	5	7	30	50	54	75	60	38	14	5	1	2	1	4	2	8
Sums.	26	19	4	12	11	10	9	8	19	51	120	371	434	609	519	323	109	38	31	19	15	24	27	81
Means.	3.3	2.3	0.5	1.5	1.4	1.3	1.1	1.0	2.3	6.4	15.0	46.4	54.3	76.1	64.8	40.3	13.6	4.8	4.0	2.4	2.0	3.0	3.4	10.1

Monthly Tables of Hours of Maximum Readings of Thermometer during eight years.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.
Jan.	4	6	0	2	0	3	0	1	0	2	7	37	34	49	31	14	5	2	4	4	4	7	7	19
Feb.	1	3	1	2	1	2	4	2	1	1	3	33	37	59	30	10	3	2	6	0	3	2	3	14
Mar.	2	0	1	2	2	0	0	0	2	2	4	32	35	50	66	33	8	4	1	1	0	1	0	1
April.	2	0	0	0	0	0	0	0	2	4	8	20	29	51	62	43	12	0	2	1	0	2	2	0
May.	1	1	0	0	0	0	0	0	2	6	17	29	23	50	54	40	17	5	1	1	0	0	0	0
June.	0	0	0	0	0	0	0	2	3	6	13	17	35	41	37	44	20	4	2	1	0	0	0	0
July.	1	0	0	0	0	0	0	0	3	11	8	32	25	39	44	50	22	4	1	0	0	1	0	0
Aug.	2	0	0	0	0	2	0	0	1	7	7	18	34	64	55	39	11	4	2	1	2	0	0	0
Sept.	1	0	0	0	0	0	0	1	1	2	11	33	37	59	60	22	3	3	1	2	0	0	1	5
Oct.	1	2	0	2	2	0	0	1	1	3	18	28	54	61	40	12	3	2	2	1	1	4	2	8
Nov.	6	5	0	3	3	2	2	0	1	4	14	28	52	53	25	6	1	1	5	4	2	3	5	16
Dec.	5	2	2	1	3	1	3	1	2	3	10	64	39	33	15	10	4	7	4	3	3	4	7	18
Sums.	26	19	4	12	11	10	9	8	19	51	120	371	434	609	519	323	109	38	31	19	15	24	27	81

Summary of hours of minimum readings of thermometer in 1876.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.
Jan.	4	1	0	2	0	2	2	3	1	0	0	0	0	0	0	0	0	0	2	1	0	1	6	6
Feb.	2	0	1	2	3	1	3	0	2	0	0	0	0	0	0	0	0	1	1	1	0	2	3	6
Mar.	1	0	1	4	1	5	4	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	8
Apr.	2	0	0	2	1	11	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	9
May.	2	3	2	4	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6
June.	4	2	3	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
July.	1	1	1	6	8	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	13
Aug.	1	1	4	4	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	5
Sep.	2	2	3	2	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4	4
Oct.	2	4	0	3	4	2	1	2	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	8
Nov.	2	3	3	0	1	1	2	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	3	11
Dec.	0	0	2	1	4	1	4	2	1	0	0	0	0	0	0	0	0	1	1	0	1	1	3	9
Totals.	23	17	20	37	43	36	17	13	6	1	0	0	0	0	1	0	0	2	6	6	3	9	31	92
Means.	1.92	1.42	1.67	3.13	3.59	3.00	1.42	1.08	0.50	0.08	0	0	0	0	0.08	0	0	0.17	0.50	0.50	0.25	0.75	2.67	7.67

Monthly Tables of Hours of Minimum Readings of Thermometer during eight years.

	1	2	3	4	5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	9	10	11	Mid.	
Jan.	11	11	5	14	8	15	9	17	20	5	0	0	0	1	4	3	1	4	6	3	4	16	11	69	
Feb.	14	7	7	9	7	16	18	9	10	0	0	0	0	2	0	0	1	3	6	4	4	11	25	57	
Mar.	10	14	14	15	17	37	22	13	0	0	0	0	0	0	0	1	0	2	6	3	5	6	20	59	
April.	9	8	23	28	34	38	6	2	0	2	0	0	0	0	0	0	0	0	0	1	2	4	6	22	58
May.	13	14	30	51	42	5	0	3	0	2	0	0	0	0	0	0	0	2	0	1	0	5	10	78	
June.	15	20	38	53	19	6	2	10	0	1	0	0	0	0	0	0	1	0	0	1	0	5	13	65	
July.	7	13	27	44	48	10	0	1	0	0	0	1	0	0	0	0	0	1	0	1	3	2	13	71	
Aug.	10	10	19	29	60	20	4	8	0	0	0	0	0	0	0	0	0	0	1	0	5	6	18	59	
Sept.	7	15	14	20	29	40	9	1	0	1	0	0	0	0	0	1	0	0	1	2	7	10	18	52	
Oct.	20	11	6	15	16	29	31	8	2	3	0	0	0	0	0	0	1	1	6	7	8	14	10	58	
Nov.	13	12	15	15	9	14	16	12	5	1	1	0	1	0	1	1	2	2	4	11	8	13	27	54	
Dec.	18	9	10	8	18	12	15	14	10	2	0	2	0	0	1	0	2	6	5	8	8	10	18	67	
Sums.	147	144	208	301	307	245	132	98	47	17	1	3	2	3	6	6	8	21	36	43	56	104	205	747	

HOURS OF MAXIMUM READINGS.

MID 1 2 3 4 5 6 7 8 9 10 11 NOON 1 2 3 4 5 6 7 8 9 10 11 MID

APRIL

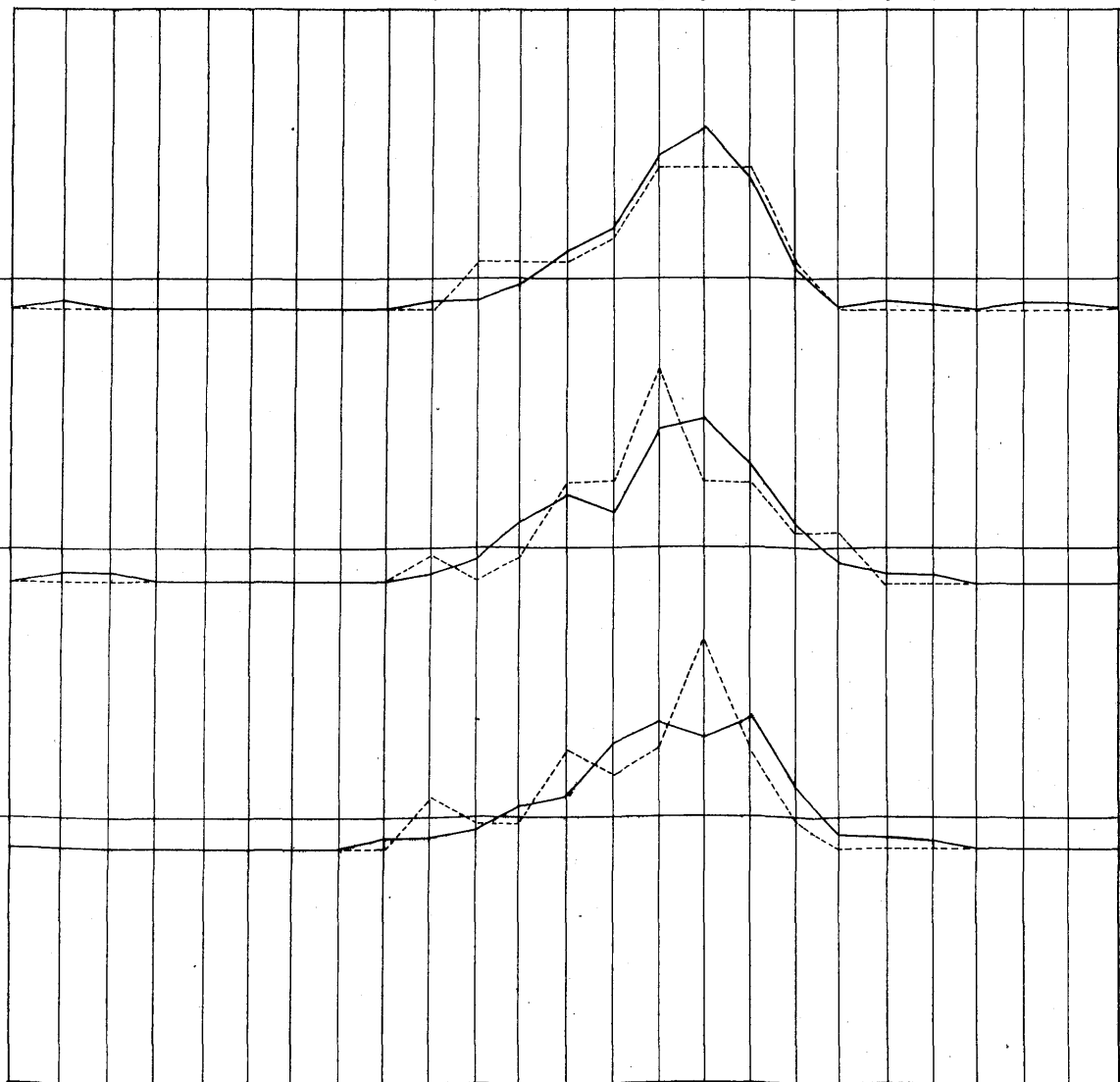
Mean

MAY

Mean

JUNE

Mean

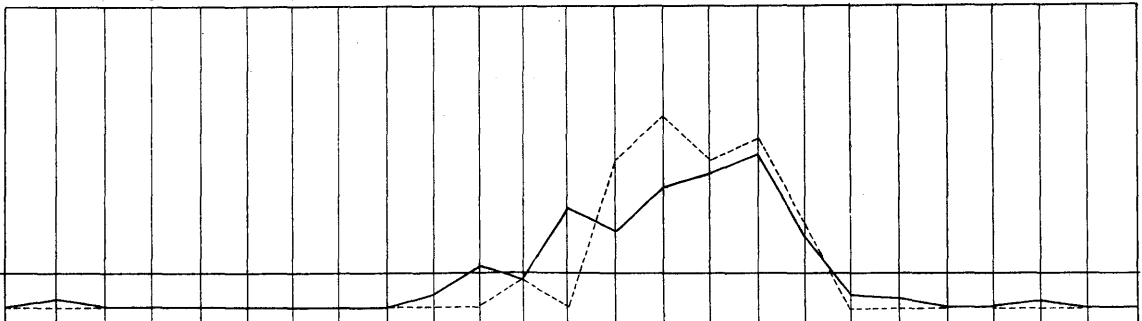


HOURS OF MAXIMUM READINGS.

MID 1 2 3 4 5 6 7 8 9 10 11 NOON 1 2 3 4 5 6 7 8 9 10 11 MID

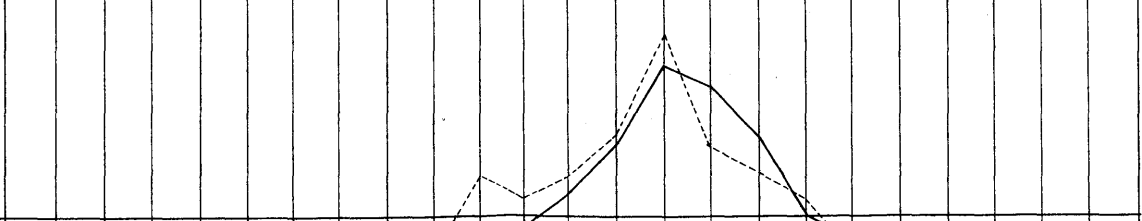
JULY

Mean



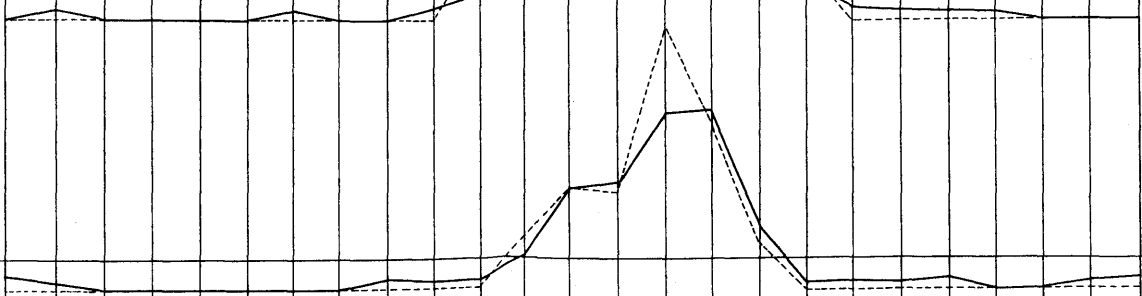
AUGUST

Mean

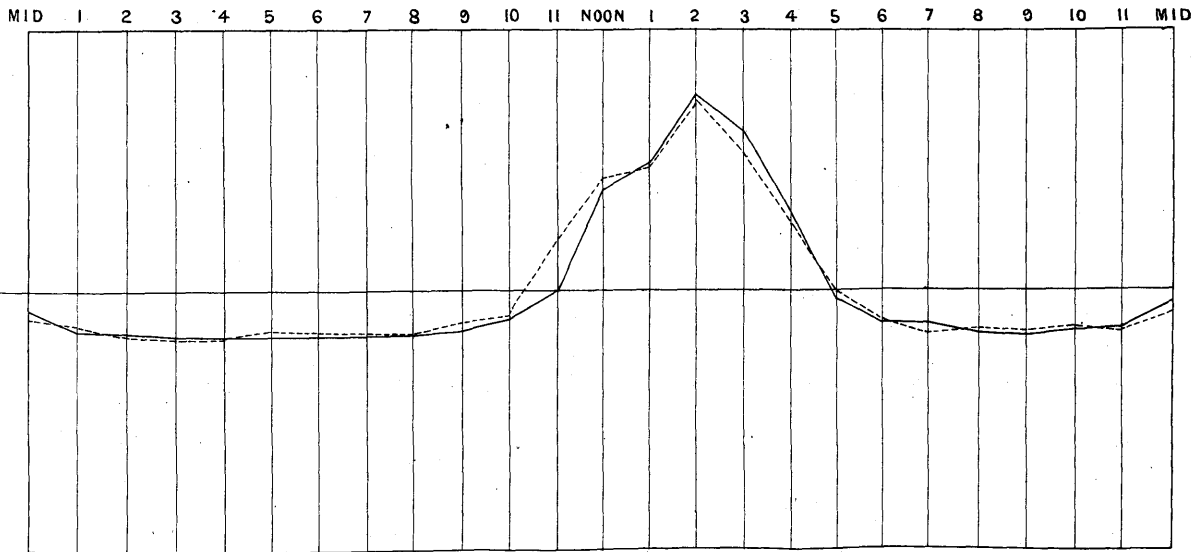


SEPTEMBER

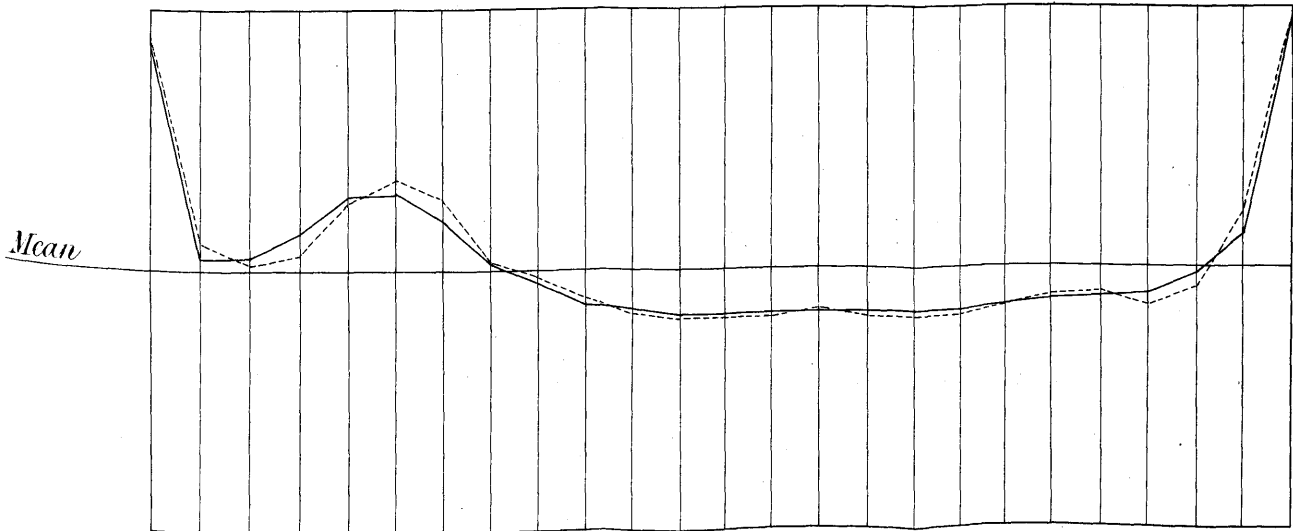
Mean



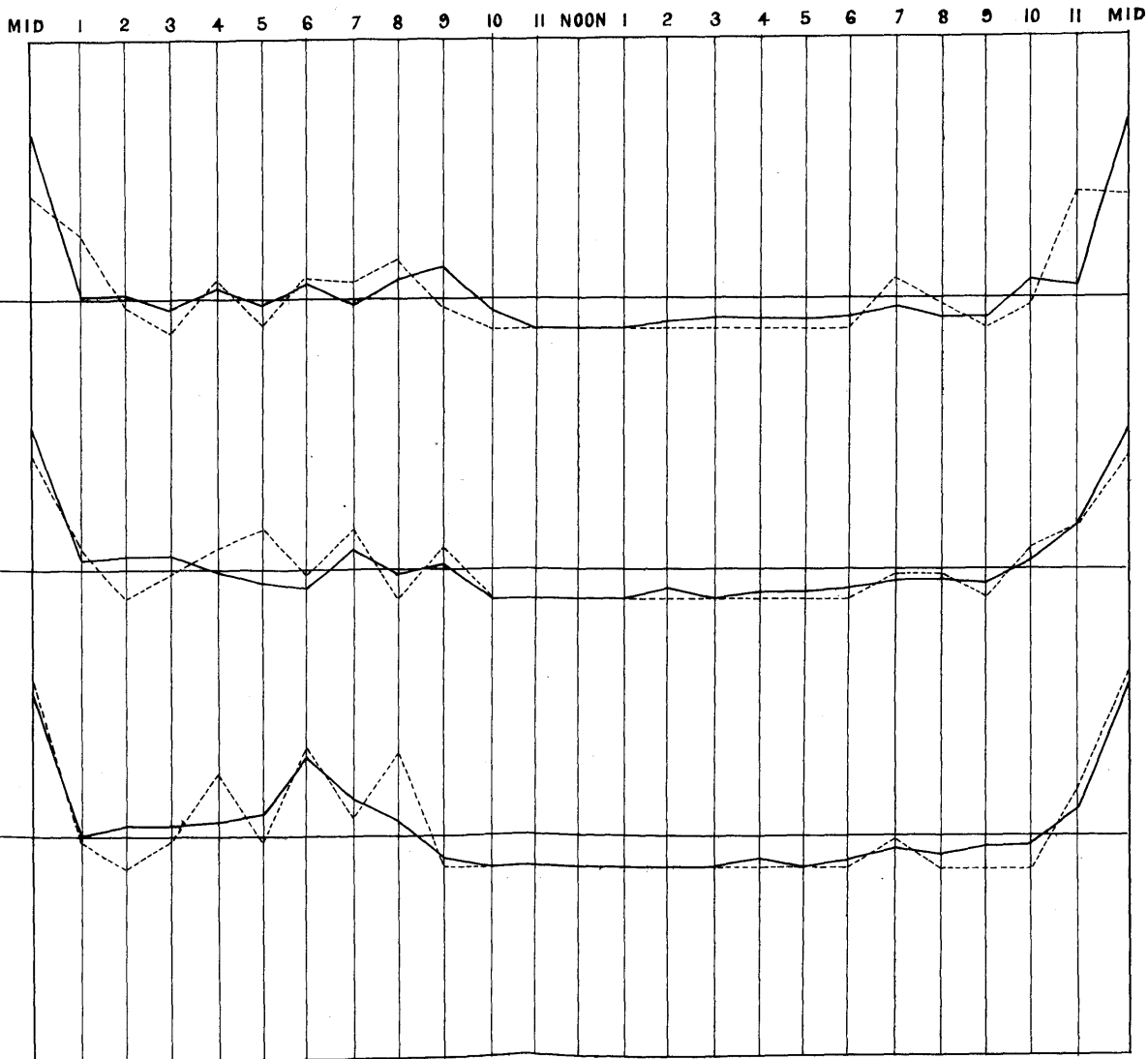
YEARLY MEANS OF HOURS OF MAXIMUM READINGS.



YEARLY MEANS OF HOURS OF MINIMUM READINGS.



HOURS OF MINIMUM READINGS.





Monthly Magnetical Observations taken at the College Observatory, Stonyhurst, 1875.

THE Horizontal, Vertical, and Total forces are calculated to English measure; one foot, one second of mean solar time, and one grain being assumed as the units of space, of time, and of mass.

The Vertical and Total forces are obtained from the absolute measures of the Horizontal force and of the Dip.

In the observations of Deflection and Vibration, taken each month for absolute measure of Horizontal force, the same magnet has always been employed.

The moment of inertia of the magnet with its stirrup, for different degrees of temperature, and the co-efficients in the corrections required for the effects of temperature and of terrestrial magnetic induction on the magnetic moment of the magnet, were determined at the Kew Observatory by the late Mr. Welsh.

The moment of inertia of the magnet with its stirrup, using the grain and foot as the units of mass and of linear measure, is 5.27303 . Its rate of increase for increase of temperature is 0.00073 for every 10° of Fahr.

The weight of the magnet with its stirrup is approximately 825 grains, and the length of the magnet is nearly 3.94 inches. The moment of inertia was determined, independently of the weight and dimensions, by the method of vibration, with and without a known increase of the moment of inertia.

The temperature corrections have always been obtained from the formula $q(t^{\circ}-35^{\circ}) + q'(t^{\circ}-35^{\circ})^2$, where t° is the observed temperature and 35° Fahr. the adopted standard temperature. The values of the co-efficients q and q' are respectively $.0001128$ and 0.000000436 .

The induction co-efficient μ is 0.000244 .

The correction for error of graduation of the Deflection bar at 1.0 foot is $+0.00004$ ft., at 1.3 $+0.000064$ ft.

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

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 100 or of 200 vibrations.

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

In deducing from these observations the ratio and product of the magnetic moment m of the magnet, and the earth's horizontal magnetic intensity X , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the are of vibration, the former having been always under 4^s , and the latter always under $81'$.

The average deflection of the magnet caused by a twist of the torsion circle through 90° , has been about $7'0$ of arc.

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

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

The value of the constant P was found to be -0.0033544 .

The Declination observations have been taken once a week. Each reading has been corrected by the photographic curves for all irregular disturbances, as well as for daily and monthly range.

The Deflection observations taken at 1.0 foot in May were evidently so imperfect that they have been entirely discarded. The observations were unfortunately not reduced at all at the time, and it was subsequently impossible to rectify any error. The results at 1.0 for February, March, and April, are not much more satisfactory than those of May, but I have been unable to ascertain the cause of these discrepancies.

Observations of Deflection for Absolute measure of
Horizontal Force.

Month.	G. M. T.			Distances of centres of Magnets.	Tem- pera- ture-	Observed Deflection.	$\log \frac{m}{X}$
	D	H	M				
January ...	19th...	10	55 a.m.	1·0	54·2	14 16 0	9·09329
	,, ...	11	20 a.m.	1·3	54·8	6 26 42	9·09295
February..	12th..	11	8 a.m.	1·0	46·0	14 16 24	9·09294
	,, ...	11	43 a.m.	1·3	50·3	6 25 22	9·09115
March.....	23rd...	12	0	1·0	49·5	14 18 2	9·09398
	,, ...	12	21 p.m.	1·3	49·9	6 26 9	9·09200
April	26th...	11	1 a.m.	1·0	56·1	14 11 33	9·09122
	,, ...	11	23 a.m.	1·3	57·5	6 25 8	9·09138
May.....	20th...	11	31 a.m.	1·3	59·5	6 24 49	9·09117
June.....	26th...	9	49 a.m.	1·0	59·2	14 11 46	9·09154
	,, ...	10	35 a.m.	1·3	60·5	6 24 41	9·09109
July.....	8th...	8	31 a.m.	1·0	59·2	14 10 47	9·09105
	,, ...	8	56 a.m.	1·3	60·5	6 24 53	9·09118
August ...	25th...	9	10 a.m.	1·0	54·1	14 10 3	9·09032
	,, ...	9	35 a.m.	1·3	56·0	6 24 30	9·09057
September.	22nd...	11	23 a.m.	1·0	53·7	14 9 38	9·09009
	,, ...	11	47 a.m.	1·3	54·8	6 23 34	9·08943
October ...	25th...	9	18 a.m.	1·0	44·3	14 10 12	9·08973
	" ...	9	38 a.m.	1·3	45·0	6 24 36	9·08993
November.	29th..	11	27 a.m.	1·0	36·9	14 10 55	9·08963
	,, ...	11	47 a.m.	1·3	37·6	6 24 32	9·08938
December .	30th...	12	48p.m.	1·0	48·0	14 7 19	9·08854
	,, ...	1	13p.m.	1·3	48·3	6 23 21	9·08874

m represents the Magnetic moment of the Deflecting Magnet.
 X represents the Earth's Horizontal Magnetic Intensity.

Vibration Observations for Absolute measure of
Horizontal Force.

Month.	G. M. T.		Tem- pera- ture.	Time of one vibra- tion.	Log m X	Value of m.
January ...	D 19th...	H M 9 15 a.m.	52·3	5·61421	0·21750	0·45218
February ..	11th...	10 48 a.m.	45·6	5·62277	0·21535	0·45052
March	23rd...	11 0 a.m.	49·3	5·62900	0·21454	0·45013
April ...	26th...	9 57 a.m.	57·4	5·63108	0·21490	0·44988
May..	20th...	11 29 a.m.	60·6	5·63031	0·21530	0·45002
June	22nd...	9 31 a.m.	59·8	5·63862	0·21394	0·44940
July.....	8th...	9 31 a.m.	55·3	5·64004	0·21328	0·44892
August ...	25th...	10 38 p.m.	59·3	5·63654	0·21364	0·44879
September.	22nd...	8 56 a.m.	54·7	5·63092	0·21481	0·44905
October ..	25th...	11 20 a.m.	45·7	5·63948	0·21317	0·44823
November.	29th...	9 46 a.m.	35·1	5·62888	0·21389	0·44844
December..	30th...	10 45 a.m.	46·0	5·63867	0·21332	0·44769

Dip Observations.				Magnetic Intensity.			
Months.	G. M. T.		Needle.	Dip.	X, or Horizontal Force.	Y, or Vertical Force.	Total Force.
January ...	D	H M					
	21st...10	55 a.m.	1	69° 25' 19"	3·6492	9·7303	10·3921
	,, ...11	40 a.m.	3	69 27 45	.....	.....	.....
February ..	20th...10	10 a.m.	1	69 23 10	3·6447	9·6759	10·3396
	,, ...11	30 a.m.	3	69 20 0	.....	.....	.....
March.....	12th...10	59 a.m.	1	69 22 31	3·6414	9·6934	10·3547
	,, ...11	48 a.m.	3	69 26 46	.....	.....	.....
April	29th...11	30 a.m.	1	69 20 11	3·6459	9·6645	10·3293
	,, ...12	30 p.m.	3	69 19 45	.....	.....	.....
May.....	21st...11	7 a.m.	1	69 24 9	3·6481	9·6852	10·3495
	,, ...11	50 a.m.	3	69 19 4	.....	.....	.....
June.....	23rd...10	30 a.m.	1	69 22 10	3·6418	9·6682	10·3300
	,, ...11	15 a.m.	3	69 21 0	.....	.....	.....
July.....	9th...11	10 a.m.	1	69 21 30	3·6399	9·6508	10·3123
	,, ...11	59 a.m.	3	69 18 45	.....	.....	.....
August ...	26th...10	45 a.m.	1	69 24 11	3·6442	9·6811	10·3443
	,, ...11	45 a.m.	3	69 20 31	.....	.....	.....
September.	23rd...11	27 a.m.	1	69 26 0	3·6524	9·7182	10·3819
	,, ...12	15 p.m.	3	69 22 15	.....	.....	.....
October ...	26th...11	0 a.m.	1	69 20 31	3·6448	9·6525	10·3177
	,, ...11	55 a.m.	3	69 17 4	.....	.....	.....
November.	30th...10	44 a.m.	1	69 21 10	3·6492	9·6740	10·3394
	,, ...11	45 a.m.	3	69 18 45	.....	.....	.....
December..	29th...11	30 a.m.	1	69 23 16	3·6504	9·6929	10·3575
	,, ...12	20 p.m.	3	69 20 19	.....	.....	.....
Means.				69 21 55	3·6460	9·6823	10·3457

Declination Observations.

			Uncorrected,		Corrected.	
Month.	G. M. T.		Observation	Monthly Mean.	Observation	Monthly Mean.
January ..	D.	H. M.		° ' "		° ' "
	4th... 9	4a.m.	21 8 20 w.		21 8 20	
	12th .. 9	0	21 4 52		21 4 52	
	20th... 8	58	21 6 11	21 6 28	21 7 40	21 6 57
February ..	1st ... 9	5	21 6 39		21 6 12	
	9th... 9	6	21 5 13		21 3 54	
	15th... 8	53	21 8 54		21 10 44	
	22nd... 9	13	21 10 13	21 7 45	21 12 54	21 8 20
March.	1st... 9	3	21 4 48		21 5 36	
	9th... 8	59	21 2 27		21 5 33	
	15th... 9	4	21 1 38		21 5 1	
	23rd... 8	57	21 1 3		21 6 9	
	29th . 9	3	20 58 58	21 1 47	21 2 21	21 4 57
April 5th... 9	1		21 0 35		21 5 32	
	13th... 9	8	20 59 59		21 3 48	
	19th... 9	2	20 57 39		21 59 27	
	27th .. 8	58	21 0 3	20 59 34	21 4 25	21 3 17
May	3rd... 8	55	20 53 34		20 58 5	
	10th... 9	4	20 55 38		20 59 35	
	17th... 9	0	20 51 38		20 53 17	
	24th... 8	57	20 53 15		20 54 20	
	31st . 9	8	20 57 41	20 54 21	21 1 55	20 57 27
June	7th... 8	55	20 58 34		21 1 46	
	15th .. 9	8	21 0 24		21 4 58	
	21st.. 9	3	20 58 24		21 1 19	
	29th... 9	0	21 0 21	20 59 26	21 2 8	21 2 37

Declination Observations.—continued.

			Uncorrected.		Corrected.	
Month.	G. M. T.		Observation	Monthly Mean.	Observation.	Monthly Mean.
	D.	H. M.		° ' "	° ' "	° ' "
July	5th	9 5a.m.	20 59 22 w.		21 2 3	
	12th	9 8	21 1 3		21 3 44	
	19th	9 5	20 54 2		20 56 9	
	26th	9 4	20 53 59	20 57 7	20 57 15	20 59 38
August	2nd	9 0	20 55 11		20 56 14	
	9th	9 8	20 57 15		20 59 44	
	16th	8 55	20 52 4		20 54 16	
	23rd	8 59	20 53 11		20 56 15	
	30th	9 4	20 55 47	20 54 41	20 57 25	20 56 47
September	7th	9 13	20 57 43		20 59 31	
	14th	8 55	21 0 55		21 2 43	
	21st	8 59	21 0 25		21 3 22	
	28th	8 53	21 1 8	21 0 3	21 4 39	21 2 34
October	4th	9 4	20 56 18		21 3 31	
	11th	9 13	21 4 57		21 7 18	
	18th	8 58	21 1 51		21 4 12	
	26th	9 9	21 3 5	21 1 33	21 3 43	21 4 41
November	1st	9 7	20 55 57		20 57 26	
	8th	9 3	20 58 23		20 59 35	
	16th	9 5	20 52 38		20 53 33	
	22nd	8 54	20 54 39		20 51 51	
	30th	9 5	20 44 8	20 53 9	20 45 3	20 53 30
December	6th	9 2	20 48 34		20 48 15	
	13th	9 7	20 45 14		20 45 47	
	21st	9 3	20 49 5		20 50 46	
	27th	9 10	20 53 2	20 48 59	20 55 1	20 49 57
Yearly mean				20 58 44		21 0 54

MAGNETIC DISTURBANCES.

The year 1875 is remarkable for the almost total absence of magnetic storms and of Auroral displays.

The only occasions on which there have been any very marked perturbation of the self-recording magnets were on the following dates: Feb. 26th, 27th, and 28th, April 27th, and September 16th and 17th.

Of lesser disturbances the greater number seem to occur during the night hours. At about 10 p.m. there is often a slight irregular movement of the needle towards the east, particularly noticeable in the January curves, and not unfrequently an abnormal tendency towards the west between midnight and 4 a.m.

The month of January was unusually calm, which probably made the systematic irregularities, just noticed, more apparent.

February presents two periods of disturbance. One commenced early on the 11th, and ended about 2 a.m. on the 14th. The other was the principal storm of the year, and its advent was heralded by two days of unsteady movements. At about 10 p.m. on the 26th, there were three oscillations of the Declination needle, the first movement being eastward, and each vibration lasting rather less than two hours. These were accompanied by a diminution of the Horizontal and Vertical Components of the Intensity, the minimum being reached shortly after 1 a.m. on the 27th. Not long afterwards the Declination magnet began a series of quick short movements, which lasted for more than two days. Between 1 and 2 p.m. on the 27th the oscillations were very rapid, the westerly excursion being considerable and accompanied by a great increase of both H. F. and V. F., whose curves were very similar.

In March the Declination was somewhat irregular on the mornings of the 3rd and 17th, and from midday on the 19th until the same hour on the 21st.

The irregular movements of April began on the morning of the 7th, and continued for two days. The greatest oscillation of the Declination magnet occurred at 11 p.m., and the V. F. was considerably increased at 4-15 and 7-45 p.m., but diminished at midnight. On the 27th, at 1 a.m., there was a sudden movement of the needle towards the west, the angle increasing $24' 4''$ in 25 minutes, and then diminishing $23' 22''$ in the next 51 minutes. This was followed by a continuous tremor of the magnet for several hours. There was also a simultaneous increase of the H. F., and a diminution of the V. F.

In May there were some irregularities in the magnetic curves on the 5th and 6th, and throughout the 10th and 11th, and the morning of the 12th. Also from the afternoon of the 22nd until the morning of the 24th.

The June curves are very regular with the exception of a slight modulation between the 4th and 5th, a tremulous motion on the 18th and 19th, and one bold inflexion towards the east shortly after 10 p.m. on the 29th.

There was scarcely the slightest abnormal tendency in the July curves previous to the morning of the 14th, when an easterly movement began, and the magnets were subsequently somewhat disturbed for several days. Just before midnight on the 26th the Declination magnet moved a little to the west, and then swept slowly eastwards for more than an hour. An exactly similar movement took place at the same time on the 28th, and another rather earlier on the 30th. The decrease of the V.F. was strongly marked on the 28th.

A series of undulations occur in the Declination magnetograph for August between the 12th and 13th, but there are no oscillations of any considerable extent.

The tremulous motion of the Declination magnet in the morning hours is very striking in the September curves. The disturbance on September the 16th and 17th was most strongly marked on the V.F. curves, this component of the intensity decreasing so rapidly that the

magnet was thrown off its balance at 4 a.m. The Declination was then also most disturbed, but the H.F. was not much affected. Before the following noon the V.F. was increasing rapidly, and attained its maximum between 3 and 4 p.m.

The chief disturbances in October occurred on the evening of the 2nd, and the morning of the 5th. But the most remarkable feature of the Declination curves of this month was the continual reproduction of a similar inflexion towards the east, from the beginning until the 18th of the month. A simultaneous increase of the V. F., and decrease of the H. F. is less well marked.

A gradual decrease of westerly Declination on the evening of the 2nd, some irregularities on the 13th, and a diminution of westerly Declination between 6 and 8 p.m. on the 21st, followed by a less abrupt increase about eight o'clock next morning, were the only peculiarities of November.

The December curves are regular with the exception of an extended oscillation on the 17th, and a few undulations on the 26th.



PRESENTS RECEIVED.

DONOR.

<p>Greenwich Observations</p> <p>Greenwich Meteorological and Magnetic Observations</p> <p>Greenwich Astronomical Results</p> <p>Quarterly Returns of the Registrar General</p> <p>Daily Weather Charts</p> <p>Quarterly Weather Report</p> <p>Proceedings of the R. S.</p> <p>Memoirs of the R. A. S.</p> <p>Monthly Notices of the R. A. S.</p> <p>Journal of the Scottish Meteorological Society.</p> <p>Report of Meteorological Committee of the R. S.</p> <p>Report of the British Association.</p> <p>Smithsonian Reports.</p> <p>Daily Bulletin of the Signal Service U. S. A.</p> <p>Monthly record of the Melbourne Observations.</p> <p>Abstracts and Results of Magnetic and Meteorological Observations at the Magnetic Observatory, Toronto, Canada.</p> <p>Meteorological and Magnetic Report, Toronto.</p> <p>Astronomical Observations; Melbourne.</p> <p>Catalogue of 1227 Stars from 1870.</p> <p>Radcliffe Observations.</p> <p>Meteorological and Nautical Observations, Flagstaff Observatory.</p> <p>Meteorological Return, St Francis Xavier's College, Calcutta.</p> <p>Meteorological Report, New York Observatory.</p> <p>Meteorological Observations, Juggarow Observatory, Vizagapatam.</p> <p>Meteorological Observations N. S. W.</p>	<p>R. A. S.</p> <p>Royal Observatory.</p> <p>Royal Observatory.</p> <p>Registrar General.</p> <p>Meteorological Office.</p> <p>Meteorological Office.</p> <p>R. S.</p> <p>R. A. S.</p> <p>R. A. S.</p> <p>Scottish Meteorol. Society.</p> <p>Meteorological Office.</p> <p>British Association.</p> <p>Smithsonian Institution.</p> <p>War Department U. S. A.</p> <p>Melbourne Observatory.</p> <p>Toronto Observatory.</p> <p>Toronto Observatory.</p> <p>Melbourne Observatory.</p> <p>Melbourne Observatory.</p> <p>Radcliffe Trustees.</p> <p>Melbourne Observatory.</p> <p>The Observatory.</p> <p>The Observatory.</p> <p>The Observatory.</p> <p>J. Tebbutt.</p>
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La Societe Meteorologique.

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Chas. S. C. Deville.

L'Observatoire.

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Cav. G. Cacciatore.

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Meteorological Office.

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The Author.

The Author.

The Author.

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The Observatory.

P. Braun.

E. Heis.

F. Terby.

F. Terby.

F. Terby.

F. Terby.

A. d'Abbadie.

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