STONYHURST COLLEGE

OBSERVATORY.

RESULTS

OF

METEOROLOGICAL AND MAGNETICAL OBSERVATIONS,

BY THE

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INTRODUCTION.

THE routine work of the Observatory, which has undergone no important change during the past twelve months, is sufficiently described in the introductory remarks of previous reports, and therefore need not be repeated here. The continuous photographic and other automatic records of the meteorological and magnetic changes are complete for the year; and in addition to former publications of results, monthly meteorological tables are now sent to the *Naturalist*.

The comparison of the magnetic curves of Kew and Stonyhurst formed the subject of a paper read before the Royal Society in December, 1885. Copies of the traces of the magnetic Declination were forwarded to Professor W. G. Adams for collation with the curves from other observatories throughout the world; and a number of absolute magnetic determinations were sent to M. Schürk, of Hamburg, for publication.

A large amount of time has been devoted as usual to solar physics, and the data collected in past years is in course of reduction in view of future distribution. Complete drawings of the solar spots and faculæ have been

made on 230 different days, the scale being invariably 10½ inches to the diameter. A paper published in the *Astronomical Register* embodies some of the conclusions deduced from the daily solar drawings, and from a special study of the general surface of the sun.

The series of observations of the Phenomena of Jupiter's satellites, and of occultations of stars by the moon, has been continued; and the comets of Fabry and Bernard, as well as the changes in the new stars of Andromeda and Taurus, have been followed as well as the weather permitted. The Upper glow has been carefully noted by one of the assistants.

A large solar prism by Hilger, with a Dawes eye-piece, has been presented to the Observatory by the President of the Liverpool Astronomical Society, J. Roberts, Esq.; and a stellar spectroscopic eye-piece, consisting of a fine Hoffmann object-vision prism and cylindrical lens, has been added to our list of instruments.

Stonyhurst Observatory.

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

METEOROLOGICAL REPORT.

January, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·414	29·433
Highest ,, on the 1st	29·926	30·039
Lowest ,, on the 11th	28·349	28·567
Range of Barometer Readings	1·577	1·472
Highest Reading of a Max. Therm. on the 29th	52·3	51·6
Lowest Reading of a Min. Therm. on the 20th	22·5	21·3
Range of Thermometer Readings	29·8	30·3
Mean of all the Highest Readings	41·3	42·2
Mean of all the Lowest	31·5	32·7
Mean Daily Range	9·8	9·5
Deduced Monthly Mean (from Mean of Max. and Min.)	36·2	37·8
Mean Temperature from dry bulb	36·9	37·2
Adopted Mean Temperature	36·6	37·6
Mean Temperature of Evaporation	34·9	36·0
Mean Temperature of Dew Point	32·5	33·9
Mean elastic force of Vapour	0·185 in	0·197 in
Mean weight of Vapour in a cubic foot of air	2·1 gr	2·3 gr
Mean additional weight required for saturation	0·6 gr	0·4 gr
Mean degree of Humidity (saturation 1·00)	0·85	0·86
Mean weight of a cubic foot of air	549·9 gr	549·0 gr
Fall of Rain	3·517 in	4·214 in
Number of days on which Rain fell	14·0	19·5
Amount of Evaporation	1·010 in	0·484 in

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	5	9	1	5	5	2	3
Mean Velocity in miles per hour	4·2	7·7	10·6	3·9	13·4	12·4	14·9	17·2
Total No. of miles for each Direction	340	920	2285	93	1602	1482	717	1237

The total number of miles registered during the month was 8336.

The max. Velocity of the wind was 44 miles per hour; direction S.S.E. on the 31st at 1 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			8·7
In the month of January, the highest reading of the Barometer during 38 years, was on the 18th, in 1882, and was			30·480
The lowest	,,	,, 26th, 1884	27·803
The highest Temperature	,,	7th, 1877	59·9
The lowest	,,	,, 15th, 1881	4·6
The highest adopted mean temperature of the month, 1875			42·5
The lowest	,,	,, 1881	29·2

The mean reading of the Barometer was almost identical with the average. The range of Barometer readings was slightly in excess of the average. The mean Temperature of the month was not quite a degree lower, and the range of Temperature was very close to the mean of previous years. The Rainfall was light, and the number of days on which rain fell was small. The prevailing wind was S.S.W.

February, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·171	29·476
Highest ,, on the 28th	29·721	30·047
Lowest ,, on the 2nd	28·565	28·652
Range of Barometer Readings	1·156	1·395
Highest Reading of a Max. Therm. on the 24th	56·9	51·9
Lowest Reading of a Min. Therm. on the 20th	19·1	23·1
Range of Thermometer Readings	37·8	28·8
Mean of all the Highest Readings	46·6	44·3
Mean of all the Lowest	33·9	34·1
Mean Daily Range	12·7	10·2
Deduced Monthly Mean (from Mean of Max. and Min.)	39·9	38·8
Mean Temperature from dry bulb	40·6	38·6
Adopted Mean Temperature	40·3	38·7
Mean Temperature of Evaporation	38·5	37·1
Mean Temperature of Dew Point	36·2	35·1
Mean elastic force of Vapour	0·214 in	0·193 in
Mean weight of Vapour in a cubic foot of air	2·5 gr	2·4 gr
Mean additional weight required for saturation	0·5 gr	0·4 gr
Mean degree of Humidity (saturation 1·00)	0·86	0·87
Mean weight of a cubic foot of air	541·2 gr	548·1 gr
Fall of Rain	3·079 in	3·724 in
Number of days on which Rain fell	23	18·3
Amount of Evaporation	0·975 in	0·982 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	3	1	1	8	8	6	1
Mean Velocity in miles per hour	0	4·0	9·5	17·3	19·1	12·6	11·7	9·3
Total No. of miles for each Direction	0	285	229	415	3668	2420	1682	223

The total number of miles registered during the month was 8922.

The max. Velocity of the wind was 56 miles per hour; direction S. by E. on the 2nd at 4 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...			8·7
In the month of February, the highest reading of the Barometer during 38 years, was on the 11th, in 1849, and was			30·452
The lowest	,,	,, 6th, 1867	28·208
The highest Temperature	,,	8th, 1877	58·3
The lowest	,,	,, 1st, 1855	10·1
The highest adopted mean temperature of the month, 1869			44·0
The lowest	,,	,, 1855	28·6

Barometer readings were low, and the range was small. Temperature was rather high. Both the amount of rain and the number of wet days exceeded the average. The prevailing wind was from S.S.W.

March, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·643	29·472
Highest ,, on the 14th	30·227	30·079
Lowest ,, on the 3rd	29·898	28·704
Range of Barometer Readings	1·329	1·375
Highest Reading of a Max. Therm. on the 12th	54·1	56·7
Lowest Reading of a Min. Therm. on the 2nd	22·9	23·3
Range of Thermometer Readings	31·2	33·4
Mean of all the Highest Readings	46·5	47·1
Mean of all the Lowest	31·0	34·4
Mean Daily Range	15·5	12·7
Deduced Monthly Mean (from Mean of Max. and Min.)	37·8	39·8
Mean Temperature from dry bulb	38·8	40·1
Adopted Mean Temperature	38·3	40·0
Mean Temperature of Evaporation	36·2	38·1
Mean Temperature of Dew Point	33·4	35·5
Mean elastic force of Vapour	0·191 in	0·208 in
Mean weight of Vapour in a cubic foot of air	2·2gr	2·5gr
Mean additional weight required for saturation	0·4gr	0·5gr
Mean degree of Humidity (saturation 1·00)	0·83	0·85
Mean weight of a cubic foot of air	552·1gr	546·6gr
Fall of Rain	3·793 in	3·144 in
Number of days on which Rain fell	18	15·0
Amount of Evaporation	1·947 in	1·736 in

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	12	1	1	2	2	10	2
Mean Velocity in miles per hour	5·1	5·9	12·5	8·8	13·0	12·2	13·8	3.5
Total No. of miles for each Direction	363	1703	301	212	624	585	3303	169

The total number of miles registered during the month was 7260.

The max. Velocity of the wind was 41 miles per hour, direction W.N.W. on the 20th at 4 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...	7·9
In the month of March, the highest reading of the Barometer during 38 years, was on the 6th, in 1852, 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

Barometer readings agreed closely with the mean of past years. The Temperature was low, and the range of Temperature great. The Rainfall exceeded the average. The prevailing wind was W.

April, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·373	29·474
Highest ,, on the 19th	29·919	29·964
Lowest ,, on the 25th	28·707	28·773
Range of Barometer Readings	1·212	1·191
Highest Reading of a Max. Therm. on the 20th	63·3	66·3
Lowest Reading of a Min. Therm. on the 4th	21·1	28·6
Range of Thermometer Readings	42·2	37·7
Mean of all the Highest Readings	53·5	54·1
Mean of all the Lowest	35·6	38·1
Mean Daily Range	17·9	16·0
Deduced Monthly Mean (from Mean of Max. and Min.)	43·1	44·7
Mean Temperature from dry bulb	44·6	44·7
Adopted Mean Temperature	43·9	44·7
Mean Temperature of Evaporation	42·2	41·9
Mean Temperature of Dew Point	40·1	38·5
Mean elastic force of Vapour	0·249 in	0·239 in
Mean weight of Vapour in a cubic foot of air	2·9gr	2·7gr
Mean additional weight required for saturation	0·6gr	0·7gr
Mean degree of Humidity (saturation 1·00)	0·87	0·80
Mean weight of a cubic foot of air	540·7gr	541·6gr
Fall of Rain	1·744 in	2·322 in
Number of days on which Rain fell	16	17·9
Amount of Evaporation	2·083 in	2·465 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	1	10	3	1	4	1	7	3
Mean Velocity in miles per hour	13·5	8·4	10·0	10·4	17·4	11·6	6·9	9·5
Total No. of miles for each Direction	323	2018	723	249	1674	279	1154	682

The total number of miles registered during the month was 7102.

The max. Velocity of the wind was 45 miles per hour, direction S., on the 25th at 5 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...			7·6
In the month of April, the highest reading of the Barometer during 38 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 ,,	,,	4th, 1885	21·1
The highest adopted mean temperature of the month, 1865			48·5
The lowest ,,	,,	1879	40·7

Barometer readings were close to average. The mean Temperature was also close to that of previous years; but the range of Temperature during the month was large, and the reading of the minimum Thermometer on the 4th was the lowest ever recorded for the month of April. The Rainfall exceeded the average. The prevailing wind was from the W.

May, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·340	29·502
Highest ,, on the 11th	29·770	29·959
Lowest ,, on the 21st	28·839	28·936
Range of Barometer Readings	0·931	1·023
Highest Reading of a Max. Therm. on the 28th	65·7	71·8
Lowest Reading of a Min. Therm. on the 13th	27·2	31·4
Range of Thermometer Readings	38·5	40·4
Mean of all the Highest Readings	55·7	59·7
Mean of all the Lowest	37·2	42·1
Mean Daily Range	18·5	17·6
Deduced Monthly Mean (from Mean of Max. and Min.)	44·8	49·2
Mean Temperature from dry bulb	46·2	49·5
Adopted Mean Temperature	45·5	49·4
Mean Temperature of Evaporation	42·5	46·2
Mean Temperature of Dew Point	39·0	42·7
Mean elastic force of Vapour	0·239 in	0·275 in
Mean weight of Vapour in a cubic foot of air	2·7 gr	3·2 gr
Mean additional weight required for saturation	0·8 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)	0·79	0·76
Mean weight of a cubic foot of air	538·4 gr	537·0 gr
Fall of Rain	2·097 in	2·524 in
Number of days on which Rain fell	22	15·1
Amount of Evaporation	2·429 in	3·535 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	5	0	1	7	2	13	3
Mean Velocity in miles per hour	0	8·1	0	8·8	10·0	8·2	12·7	10·9
Total No. of miles for each Direction	0	976	0	210	1676	395	3960	786

The total number of miles registered during the month was 8003.

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

Mean amount of Cloud (an overcast sky being indicated by 10·0)...			8·9
In the month of May, the highest reading of the Barometer during 38 years, was on the 22nd, in 1855, and was			30·124
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

Barometer readings were rather low, and the range small. Temperature was low; the adopted mean Temperature of the month only exceeded the lowest ever recorded by half a degree. Although the number of days on which rain fell was large, the amount of rain was less than the mean for the month. Prevailing wind West.

June, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·627	29·526
Highest ,, on the 10th	29·973	29·875
Lowest ,, on the 20th	28·956	29·010
Range of Barometer Readings	1·017	0·865
Highest Reading of a Max. Therm. on the 3rd and 4th	75·0	76·6
Lowest Reading of a Min. Therm. on the 9th	36·4	39·1
Range of Thermometer Readings	38·6	37·5
Mean of all the Highest Readings	65·5	65·3
Mean of all the Lowest	45·5	48·0
Mean Daily Range	20·0	17·3
Deduced Monthly Mean (from Mean of Max. and Min.)	53·7	54·8
Mean Temperature from dry bulb	54·4	54·7
Adopted Mean Temperature	54·1	54·8
Mean Temperature of Evaporation	50·1	52·0
Mean Temperature of Dew Point	46·2	48·7
Mean elastic force of Vapour	0·311 in	0·357 in
Mean weight of Vapour in a cubic foot of air	3·5gr	3·9gr
Mean additional weight required for saturation	0·9gr	0·9gr
Mean degree of Humidity (saturation 1·00)	0·74	0·79
Mean weight of a cubic foot of air	533·9gr	543·4gr
Fall of Rain	3·936 in	3·781 in
Number of Days on which Rain fell	12	17·0
Amount of Evaporation	3·756 in	3·679 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	9	1	2	0	3	14	1
Mean Velocity in miles per hour	0	6·2	4·5	5·6	0	7·5	9·4	8·3
Total No. of miles for each Direction	0	1342	107	269	0	542	3164	198

The total number of miles registered during the month was **5622.**

The max. Velocity of the wind was 34 miles per hour, direction W. at noon on the 21st.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...	7·0
In the month of June, the highest reading of the Barometer during 38 years, was on the 15th, in 1874, and was	30·219
The lowest ,, ,, 12th, 1862	28·632
The highest Temperature ,, 27th, 1878	87·2
The lowest ,, ,, 30th, 1856	34·2
The highest adopted mean temperature of the month, 1858	59·0
The lowest ,, ,, 1856 and 1860	52·2

Barometer readings were rather high, and the range large. Mean Temperature was close to that of previous years, but the range of Temperature was rather larger than usual. Rainfall very close to average amount; but the number of wet days was small. The prevailing wind was from the West.

July, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·752	29·507
Highest ,, on the 22nd	30·029	29·876
Lowest ,, on the 18th	29·263	29·006
Range of Barometer Readings	0·766	0·870
Highest Reading of a Max. Therm. on the 26th	80·8	79·0
Lowest Reading of a Min. Therm. on the 13th	38·9	42·2
Range of Thermometer Readings	41·9	36·8
Mean of all the Highest Readings	68·9	67·9
Mean of all the Lowest	49·3	51·0
Mean Daily Range	19·6	16·9
Deduced Monthly Mean (from Mean of Max. and Min.)	57·2	57·6
Mean Temperature from dry bulb	58·0	58·0
Adopted Mean Temperature	57·6	57·8
Mean Temperature of Evaporation	54·6	55·0
Mean Temperature of Dew Point	51·9	52·5
Mean elastic force of Vapour	0·386 in	0·395 in
Mean weight of Vapour in a cubic foot of air	4·3gr	4·5gr
Mean additional weight required for saturation	0·7gr	1.0gr
Mean degree of Humidity (saturation 1·00)	0·82	0·82
Mean weight of a cubic foot of air	532·2gr	527·2gr
Fall of Rain	2·402 in	4·236 in
Number of days on which Rain fell	10	18·1
Amount of Evaporation	2·902 in	4·014 in

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	5	1	1	1	3	19	0
Mean Velocity in miles per hour	4·4	5·1	6·3	8·6	4·6	12·6	6·9	0
Total No. of miles for each Direction	116	615	152	206	110	906	3163	0

The total number of miles registered during the month was 5273.

The max. Velocity of the wind was 24 miles per hour, direction S. on the 7th at 11 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 38 years, was on the 24th, in 1868, and was	30·112
The lowest ,, ,, 15th, 1877	28·564
The highest Temperature ,, 22nd, 1873	88·2
The lowest ,, ,, 1st, 1857	36·0
The highest adopted mean temperature of the month, 1852	63·0
The lowest ,, ,, ,, 1879	54·7

Barometer readings were high. The mean Temperature was very nearly identical with the average for July during the past 38 years. The range of Temperature was great. The Rainfall was nearly two inches below the average, and the number of rainy days was very small. The prevailing wind was W. by S.

August, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·562	29·489
Highest ,, on the 15th	29·911	29·890
Lowest ,, on the 10th	28·980	28·955
Range of Barometer Readings	0·931	0·935
Highest Reading of a Max. Therm. on the 25th	74·1	77·3
Lowest Reading of a Min. Therm. on the 14th	36·9	41·7
Range of Thermometer Readings	37·2	35·6
Mean of all the Highest Readings	64·0	67·3
Mean of all the Lowest	46·1	50·5
Mean Daily Range	17·9	16·8
Deduced Monthly Mean (from Mean of Max. and Min.)	53·4	57·2
Mean Temperature from dry bulb	54·7	57·5
Adopted Mean Temperature	54·1	57·4
Mean Temperature of Evaporation	50·8	54·7
Mean Temperature of Dew Point	47·6	52·0
Mean elastic force of Vapour	0·328 in	0·391 in
Mean weight of Vapour in a cubic foot of air	3·7 gr	4·3 gr
Mean additional weight required for saturation	1·1 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)	0·78	0·83
Mean weight of a cubic foot of air	532·9 gr	527·3 gr
Fall of Rain	2·604 in	4·791 in
Number of days on which Rain fell	10	18·8
Amount of Evaporation	2·786 in	3·026 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	2	13	3	0	2	2	6	3
Mean Velocity in miles per hour	5·8	6·2	6·7	0	16·8	15·0	9·2	10·0
Total No. of miles for each Direction	276	1933	481	0	753	715	1319	720

The total number of miles registered during the month was 6197.

The max. Velocity of the wind was 37 miles per hour; direction S. by W. on the 10th, at 2 p.m.

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 38 years, was on the	21st,	in 1874, and was	30·114
The lowest ,,	,,	31st, 1876	28·555
The highest Temperature ,,		2nd, 1868	88·0
The lowest ,,	,,	21st, 1864 & 1869	36·0
The highest adopted mean temperature of the month,		1857 & 1884	61·0
The lowest ,,	,,	1848	52·5

Barometer readings close to average. Temperature low, and range of Temperature great. Rainfall two inches below average, and number of wet days small. Prevailing wind N.E., but the strongest winds were from S.S.W.

September, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·406	29·501
Highest ,, on the 21st	29·877	30·026
Lowest ,, on the 30th	28·900	28·829
Range of Barometer Readings	0·977	1·197
Highest Reading of a Max. Therm. on the 3rd	68·2	72·0
Lowest Reading of a Min. Therm. on the 25th	29·8	36·7
Range of Thermometer Readings	38·4	35·3
Mean of all the Highest Readings	60·8	62·3
Mean of all the Lowest	43·4	47·0
Mean Daily Range	17·4	15·3
Deduced Monthly Mean (from Mean of Max. and Min.)	50·8	53·4
Mean Temperature from dry bulb	51·9	54·1
Adopted Mean Temperature	51·4	53·8
Mean Temperature of Evaporation	48·6	51·1
Mean Temperature of Dew Point	45·7	48·5
Mean elastic force of Vapour	0·309 in	0·342 in
Mean weight of Vapour in a cubic foot of air	3·5gr	3·9gr
Mean additional weight required for saturation	0·8gr	0·8gr
Mean degree of Humidity (saturation 1·00)	0·78	0·82
Mean weight of a cubic foot of air	532·8gr	532·1gr
Fall of Rain	5·642 in	4·575 in
Number of days on which Rain fell	22	18·5
Amount of Evaporation	3·948 in	2·334 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	4	1	1	1	1	10	11	1
Mean Velocity in miles per hour	6·0	5·2	4·5	9·3	7·6	12·1	9·5	11·0
Total No. of miles for each Direction	573	125	107	223	183	2903	2507	265

The total number of miles registered during the month was 6886.

The max. Velocity of the wind was 40 miles per hour, direction S. on the 30th at 11 a.m.

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 38 years, was on the 15th, in 1851, and was			30·274
The lowest	,,	,, 2nd, 1883	28·323
The highest Temperature		,, 6th, 1868	85·0
The lowest	,,	,, 25th, 1885	29·8
The highest adopted mean temperature of the month, 1865			59·1
The lowest	,,	,, 1863	50·9

The mean reading of the Barometer was rather low. The Thermometer readings were low. The Rainfall exceeded the average for the month by more than an inch. The prevailing wind was S.W. by W.

October, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·278	29·418
Highest ,, on the 18th	29·804	30·001
Lowest ,, on the 26th	28·523	28·647
Range of Barometer Readings	1·281	1·354
Highest Reading of a Max. Therm. on the 17th	56·8	64·2
Lowest Reading of a Min. Therm. on the 29th	26·9	29·5
Range of Thermometer Readings	29·9	34·7
Mean of all the Highest Readings	50·2	54·6
Mean of all the Lowest	36·7	41·9
Mean Daily Range	13·5	16·7
Deduced Monthly Mean (from Mean of Max. and Min.)	43·0	47·3
Mean Temperature from dry bulb	44·2	47·9
Adopted Mean Temperature	43·6	47·6
Mean Temperature of Evaporation	40·8	45·4
Mean Temperature of Dew Point	36·8	42·9
Mean elastic force of Vapour	0·219 in	0·278 in
Mean weight of Vapour in a cubic foot of air	2·5gr	3·0gr
Mean additional weight required for saturation	0·5gr	0·6gr
Mean degree of Humidity (saturation 1·00)	0·76	0·84
Mean weight of a cubic foot of air	539·4gr	543·2gr
Fall of Rain	5·723 in	5·219 in
Number of days on which Rain fell	23	21·4
Amount of Evaporation	1·712 in	1·736 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	5	10	0	1	0	3	10	2
Mean Velocity in miles per hour	10·3	8·6	0	9·2	0	11·0	15·1	7·6
Total No. of miles for each Direction	1235	2066	0	220	0	794	3632	366

The total number of miles registered during the month was 8313.

The max. Velocity of the wind was 35 miles per hour; direction N.W. on the 27th at 2 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...	8·3
In the month of October, the highest reading of the Barometer during 38 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 ,, ,, 21st, 1880	23·1
The highest adopted mean temperature of the month, 1861 and 1876	51·6
The lowest ,, ,, 1880	43·1

Barometer readings were pretty close to average. Temperature was very low, and range of Temperature small. The Rainfall was large. Prevailing Wind W.S.W.

November, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·467	29·452
Highest ,, on the 18th	30·030	30·048
Lowest ,, on the 28th	28·607	28·587
Range of Barometer Readings	1·423	1·461
Highest Reading of a Max. Therm. on the 3rd	56·0	55·6
Lowest Reading of a Min. Therm. on the 22nd	26·9	25·6
Range of Thermometer Readings	29·1	30·0
Mean of all the Highest Readings	46·5	46·9
Mean of all the Lowest	36·3	36·1
Mean Daily Range	10·2	10·8
Deduced Monthly Mean (from Mean of Max. and Min.)	41·3	41·1
Mean Temperature from dry bulb	42·0	41·3
Adopted Mean Temperature	41·7	41·2
Mean Temperature of Evaporation	39·9	38·9
Mean Temperature of Dew Point	37·7	37·6
Mean elastic force of Vapour	0·227 in	0·225 in
Mean weight of Vapour in a cubic foot of air	2·6gr	2·6gr
Mean additional weight required for saturation	0·6gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·87	0·87
Mean weight of a cubic foot of air	545·2gr	545·0gr
Fall of Rain	3·825 in	4·155 in
Number of days on which Rain fell	13	18·9
Amount of Evaporation	1·447 in	1·459 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	0	7	8	2	0	4	8	1
Mean Velocity in miles per hour	0	6·9	9·4	5·0	0	10·3	11·3	5·5
Total No. of miles for each Direction	0	1166	1806	241	0	992	2170	132

The total number of miles registered during the month was 6507.

The max. Velocity of the wind was 35 miles per hour; direction N.W. at 2 p.m. on the 28th.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...			7·9
In the month of November, the highest reading of the Barometer during 38 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, 1881.....			47·0
The lowest	,,	,, 1851.....	36·7

Both Barometer and Thermometer readings were very close to the average. The fall of Rain and the number of wet days were a little below the mean. The prevailing wind was West.

December, 1885.

Results of Observations taken during the month.		Mean for the last 38 years.
Mean Reading of the Barometer	29·740	29·451
Highest ,, on the 23rd	30·210	30·059
Lowest ,, on the 4th	28·974	28·612
Range of Barometer Readings	1·236	1·447
Highest Reading of a Max. Therm. on the 22nd	56·3	53·1
Lowest Reading of a Min. Therm. on the 10th	16·1	20·4
Range of Thermometer Readings	40·2	32·7
Mean of all the Highest Readings	44·1	43·0
Mean of all the Lowest	31·3	33·3
Mean Daily Range	12·8	9·7
Deduced Monthly Mean (from Mean of Max. and Min.)	37·7	38·2
Mean Temperature from dry bulb	38·1	38·8
Adopted Mean Temperature	37·9	38·5
Mean Temperature of Evaporation	36·3	37·3
Mean Temperature of Dew Point	34·1	35·3
Mean elastic force of Vapour	0·197 in	0·207 in
Mean weight of Vapour in a cubic foot of air	2·3gr	2·4gr
Mean additional weight required for saturation	0·3gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·87	0·87
Mean weight of a cubic foot of air	554·2gr	547·9gr
Fall of Rain	2·697 in	5·490 in
Number of days on which Rain fell	14	20·0
Amount of Evaporation	1·564 in	1·021 in

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	3	7	1	0	1	1	15	3
Mean Velocity in miles per hour	2·9	3·9	7·1	0	5·6	13·8	12·5	18·3
Total No. of miles for each Direction	211	653	170	0	135	331	4505	1315

The total number of miles registered during the month was 7320.

The max. Velocity of the wind was 38 miles per hour; direction W.N.W. at 2 p.m. on the 29th.

Mean amount of Cloud (an overcast sky being indicated by 10·0)...	7·7
In the month of December, the highest reading of the Barometer during 38 years, was on the 22nd, in 1849, and was	30·378
The lowest ,, ,, 5th, 1876	28·028
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

Barometer readings were high. Temperature was rather low, and the range of Temperature great. The Rainfall and number of days on which rain fell was very small.

Summary of the Observations

FOR 1885.

		Mean for the last 38 years.
Mean Reading of the Barometer	29·510	29·483
Highest ,, on October 5th	30·227	30·288
Lowest ,, on January 26th	28·349	28·263
Range of Barometer Readings	1.878	2·025
Highest Reading of a Max. Therm. on July 26th	80·8	81·6
Lowest Reading of a Min. Therm. on Nov. 19 and 29	16·1	15·8
Range of Thermometer Readings	64·7	65·8
Mean of all the Highest Readings	53·6	54·7
Mean of all the Lowest	38·2	40·8
Mean Daily Range	15·4	13·9
Deduced Yearly Mean (from Mean of Max. and Min.)	44·9	46·8
Mean Temperature of dry bulb	45·9	46·9
Adopted Mean Temperature	45·4	46·9
Mean Temperature of Evaporation	42·9	44·6
Mean Temperature of Dew Point	40·1	42·1
Mean elastic force of Vapour	0·255 in	0·275 in
Mean weight of Vapour in a cubic foot of air	2·9gr	3·3gr
Mean additional weight required for saturation	0·7gr	0·7gr
Mean degree of Humidity (saturation 1·00)	0·82	0·84
Mean weight of a cubic foot of air	541·1gr	539·2gr
Total Fall of Rain in the Year	41·059 in	47·558 in
Number of days per Month on which Rain fell	16·4	18·3
Amount of Evaporation	26·559 in	27·799 in

The Maximum monthly mean height of the Barometer was in January, 1880, and was	29·928
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 January, 1884, and was		2·409
The least ,, ,, in July, 1852, and was		0·505
The highest reading of the Barometer, during 38 years, was on January 18th, 1882, and was		30·480
The lowest ,, ,, on January 26th, 1884, and was		27·803
Extreme range		2·677
The highest temperature was on July 15th, 1868, and was		88·2
The lowest ,, ,, January 15th, 1881		4.6
The highest adopted mean temperature of a month, July 1868		62·4
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	July, 1852	5·1
The least ,, ,, ,, February, 1855		1·4
The greatest fall of rain in a month, was in October, 1870, and was		13·437 in
The least ,, ,, ,, March, 1852		0·047
The greatest number of days on which rain fell in one month	July, 1861, December, 1868	31
The least ,, ,, March, 1852		3

DATES OF OCCASIONAL PHENOMENA.

1885.	Frost.	Hoar frost only.	Snow.	Hail.
January	1—9, 11—16, 18—25	21, 22	14	
February	3—5, 7, 14—22, 28	3, 18, 19	5, 17, 18	5, 18
March	1, 5—18, 20—23, 27, 30, 31	1, 11, 13, 14, 21, 22	18	5, 18, 21, 27
April	1—4, 7, 8, 13—19, 23, 26, 27, 29	1, 2, 3, 12, 13		
May	5—7, 9, 10—14, 18	6, 12, 13, 14, 18		7, 8, 9, 10, 11
June				
July				
August				
September	25—27	25, 26		30
October	6, 10, 11, 19, 24, 25, 29, 31	12, 30		5, 28
November	4, 5, 8, 13—18, 22, 23, 28	14, 15, 16, 18, 22		5
December	1, 2, 4—11, 14, 15, 18, 19, 21—23, 26, 28—30	5, 6, 7, 15, 22, 30	9, 29	28, 29

1885.	Heavy Rain.	Fog.	Thunder.	Lightning.	Lunar Halo.	Solar Halo.
January				31	22	
February	27		1, 27	27	25	20
March	31				25	
April			26	26		
May	15		22, 29	22		12
June		6	7	7		
July		3, 14, 25	20			
August	6, 12	18, 25	6, 12	6, 12		
September	9, 30	8	4, 30	3, 4, 30	22	
October		17		27		
November						
December		22, 23				

SUN OBSERVATIONS AT STONYHURST IN 1885.

	Sunshine recorded on	Amount of Sunshine recorded.	Drawings of Sun, 10½ inch to diameter on	Other drawings of Sun and Solar notes on	Entire Chromosphere measured on	Chromosphere partially measured on	Spot spectra observed on
January	9 days	14·9 hours	15 days	... days	5 days	... days	... days
February	16 ,,	35·5 ,,	17 ,,	... ,,	5 ,,	... ,,	1 ,,
March	22 ,,	98·0 ,,	19 ,,	... ,,	10 ,,	1 ,,	... ,,
April	23 ,,	135·9 ,,	21 ,,	... ,,	8 ,,	... ,,	2 ,,
May	29 ,,	153·0 ,,	26 ,,	1 ,,	3 ,,	... ,,	... ,,
June	25 ,,	196·5 ,,	24 ,,	2 ,,	10 ,,	... ,,	2 ,,
July	26 ,,	216·9 ,,	24 ,,	1 ,,	13 ,,	1 ,,	1 ,,
August	28 ,,	131·4 ,,	21 ,,	... ,,	9 ,,	... ,,	1 ,,
September	27 ,,	130·7 ,,	24 ,,	... ,,	4 ,,	... ,,	1 ,,
October	22 ,,	63·8 ,,	16 ,,	4 ,,	3 ,,	... ,,	... ,,
November	12 ,,	37·0 ,,	11 ,,	... ,,	3 ,,	... ,,	2 ,,
December	13 ,,	36·8 ,,	12 ,,	1 ,,	6 ,,	... ,,	... ,,
Totals	252 ,,	1250·4 ,,	230 ,,	9 ,,	79 ,,	2 ,,	10 ,,

N.B.—Satisfactory sketches of the solar surface can sometimes be made when the heat is not strong enough to char the card of the sunshine recorder.

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January	0	0	0	0	0	1·0	0	0	0	0	0·6	2·3	4·2	3·0	0	0	0
February.....	0	1·5	0·1	0·1	1·7	0	1·0	0	0·7	0	0·7	0	0	1·8	0	0	0
March	8·4	0·2	0	0	0	5·3	7·9	0·2	3·2	0·7	1·0	5·3	1·8	7·5	5·5	2·9	0
April	0	10·0	9·3	9·4	8·7	0	2·5	3·6	6·4	0·2	0	0	2·7	2·2	2·4	0	11·2
May.....	0·8	5·1	7·9	0	2·5	2·7	9·7	8·5	5·4	10·1	11·3	11·5	5·1	9·7	5·2	8·1	2·1
June.....	9·2	9.7	11·9	13·5	0·6	10·8	0	0	13·9	8·1	8·2	10·7	14·4	3·7	7·5	0·7	4·6
July	9·0	6·5	4·3	8·8	7·9	12·6	0	7·5	8·8	13·7	7·3	13·4	6·7	13·2	0·9	0	2·3
August.....	8·3	0·6	1·8	0·9	2·0	2·6	1·3	1·4	0	8·2	0·3	1·9	10·9	12·9	13·4	12·6	1·1
September	4·4	0	6·9	3·9	2·5	5·9	0·6	1·7	7·1	6·5	7·1	0	5·5	0	0·6	8·2	6·8
October	2·9	0	5·3	3·1	6·0	1·2	8·6	1·7	0·8	1·2	8·9	3·0	1·2	2·1	2·4	0·4	0·4
November	3·9	0	0	1·5	1·0	0	0	0	0	0	0	0	0	0	7·3	6·0	5·8
December	4·5	0	0	0·2	2·9	0	5·9	5·4	0	0	5·9	0	0	0	3·8	0	0

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(*Continued.*)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Approximate per centage each Month.
January	0	0	0	0	1·9	1·0	0	0·8	0	0·1	0	0	0	0	14·9	8·0
February.....	0·1	4·9	6·2	0·8	0·2	0	5·0	3·6	0	0	7·1	0	0	0	35·5	15·8
March	3·1	5·7	1·5	5·3	5·6	9·4	0	0	0	7·0	8·4	0	0	2·1	98·0	31·0
April	11·3	9·7	1·3	0·1	0	8·2	0	7·1	3·9	11·9	4·3	3·7	5·8	0	135·9	37·8
May.....	2·9	0·8	0	3·0	5·1	4·0	6·9	4·7	1·2	0·8	2·9	3·2	7·6	4·2	153·0	35·3
June.....	5·6	0	3·5	5·8	0·5	0	0	4·3	15·0	14·7	5·9	5·5	8·2	0	196·5	43·1
July	0	1·5	4·2	8.6	0	1·7	12·0	10·3	10·8	0	10·9	14·0	7·4	12·6	216·9	48·3
August.....	4·5	10·0	6·6	5·4	6.5	3·0	1·4	6·2	0·6	3·0	0	0·8	3·2	0	131·4	32·6
September	5·6	1·5	2·8	7·1	7·2	4·5	6·8	4·0	8·2	9·0	0·1	5·8	0·4	0	130·7	41·3
October	0	0	0	0	0	0	0	4·1	3.4	3.1	0·5	·3·4	0·1	0	63·8	24·7
November	4·5	0·2	0	0·2	0	2·7	0	0	0	0·7	0	0	3·2	0	37·0	17·6
December	0	0	0	1·8	0·4	0·1	0	0	4·2	0	0·6	1·1	0	0	36·8	19·8

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	0·2	2·8	4·8	3·2	2·7	1·2	0	0	0	0	0	0
February	0	0	0	1·0	3·3	4·3	5·4	5·6	5·4	5·7	4·0	0·8	0	0	0	0	0
March	0	0	0	3·7	9·8	12·5	11·5	13·4	11·9	12·1	10·1	7·8	5·0	0·2	0	0	0
April	0	4	8·4	11·9	14·3	13·3	13·6	12·2	12·5	12·9	12·4	11·4	7·0	1·9	0	0	0
May	1·8	8.9	11·4	11·6	14·9	11·9	11·0	15·5	15·3	14·2	13·3	10·5	7.9	4·7	0·3	0	0
June	1·0	4·5	7·8	10·9	12·1	13·0	15·0	17·9	17·8	17·0	15·7	15·1	14·8	15·5	12·4	5·0	0
July	0·3	4·8	8·2	10·3	13·5	15·1	16·2	15·2	18·1	19·2	19·0	20·5	19·2	18·6	14·7	4·0	0
August	0	4·3	8·2	8·5	9·3	10·5	11·4	11·7	12·7	10·9	13·0	9·9	9·7	10·8	7·3	0	0
September	0	0	0·7	6·9	11·9	12·7	15·1	13·4	14·8	12·1	15·2	14·9	9·3	3·7	0	0	0
October	0	0	0	2·3	6·3	8·6	8·0	7·9	5·6	6·9	6·6	8·1	3·6	4·0	0	0	0
November	0	0	0	0	0·6	4·0	5·8	6·2	5·9	6·8	6·1	1·6	0.	0	0	0	0
December	0	0	0	0	0·2	4·1	7·5	7·6	7·5	5·8	4·1	0	0	0	0	0	0
Total	3·1	20·0	40·8	66·1	96·2	110·2	123·3	131·4	130·7	126·3	120·7	100·6	76·5	59·4	34·7	9·0	0

OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date.	G. M. T.	Cloud Direction.	Velocity. 0—6.	Wind.		Direction of Lr. Clds.
				Direction.	Force (0—12).	
January 5	4 p.m.	E.	3	S.W.	2	S.W.
,, 7	9.45 a.m.	N.E.	2	W.S.W.	1	S.W.
,, 12	11 a.m.	S.S.E.	1	N.W.	3	W.
,, 14	3.30 p.m.	N.E.	2	N.E.	1	N.E.
,, 23	11.15 a.m.	E.	1	E.	1	...
February 7	4 p.m.	N.E.	2	S.W.	3	W.S.W.
,, 19	8.30 a.m.	S.W.	1	N.W.	0	...
,, 20	10 a.m.	N.E.	2	E.N.E.	3	...
,, 20	Noon.	E.	2	E.	3	...
,, 20	2 p.m.	E.	2	E.	2	...
,, 20	4 p.m.	E.	2	E.	2	...
,, 27	Noon.	S.E.	1	S.S.W.	3	W.S.W.
,, 27	2 p.m.	S.E.	2	S.	3	W.
March 1	Noon.	E.	2	N.E.	2	...
,, 1	2 p.m.	N.E.	2	N.E.	2	...
,, 12	10 a.m.	N. by E.	3	N.N.E.	0	...
,, 16	9 a.m.	N.W.	1	N.W.	2	N.W.
,, 16	10 a.m.	N.E.	2	W.N.W.	2	N.E.
,, 17	4 p.m.	N.E.	2	W.S.W.	4	N.E.
,, 23	11 a.m.	S. by E.	2	S.	1	W.
,, 23	1.30 p.m.	S.S.E.	1	W.	1	W.N.W.
,, 27	10.30 a.m.	E.	2	N.W.	5	W.S.W.
,, 28	5 p.m.	N.N.W.	1	W.S.W.	1	S.W.
April 2	4 p.m.	N.E.	1	W.N.W.	3	W.
,, 5	10 a.m.	E.	1	S.E.	3	E.
,, 21	4 p.m.	S.	2	S.W.	2	S.
,, 23	4 p.m.	W.	2	W.	2	W.
,, 28	9 a.m.	E.S.E.	2	S.S.E.	3	E.S.E.
,, 28	10 a.m.	E.S.E.	1	S.	5	E.S.E.
,, 28	Noon.	S.E.	2	S.S.E.	6	S.E.
,, 29	3 p.m.	N.E.	2	W.N.W.	1	W.S.W.
May 8	10.30 a.m.	W.	1	W.	3	W.
,, 8	5 p.m.	W.N.W.	1	W.S.W.	3	N. by E.
,, 12	2 p.m.	N.W.	1	W.	2	N.E.
,, 15	8.15 a.m.	W.S.W.	2	W.N.W.	2	N.E.
,, 30	4 p.m.	N.W.	3	W.	3	N.
June 2	10 a.m.	W.	2	W.S.W.	2	W.
,, 2	Noon.	W.	2	W.	3	W.
,, 2	2 p.m.	W.	1	W.	3	W.
,, 2	4 p.m.	W.	1	W.	3	W.
,, 3	9 a.m.	W.S.W.	2	S.S.W.	2	S. by W.
,, 3	10 a.m.	S.W.	1	S.W.	2	S.W.
,, 3	Noon.	S. by W.	1	S.W.	2	S. by W.
,, 3	2 p.m.	N.W.	2	S.	2	S.W.
,, 6	2 p.m.	E.N.E.	2	S.W.	1	S.W.

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date.	G. M. T.	Cloud Direction.	Velocity. 0—6.	Wind.		Direction of Lr. Clds.
				Direction.	Force (0—12).	
June 6	4 p.m.	N.E.	2	W.	1	S.S.W.
,, 11	10 a.m.	N. by W.	2	S.W.	9	...
,, 11	Noon.	N.W.	1	W.S.W.	2	...
,, 11	2 p.m.	W.N.W.	2	W.	2	...
,, 11	4 p.m.	N. by W.	2	W.	1	...
,, 20	11 a.m.	N. by E.	1	W.S.W.	4	S.S.W.
,, 25	5 p.m.	N.E.	1	N.E.	1	N.E.
,, 26	7.30 a.m.	E.N.E.	2	N.E.	1	N.E.
,, 26	11.30 a.m.	N.	1	N.E.	1	E.N.E.
,, 30	7.30 p.m.	E.S.E.	2	W.S.W.	1	N.
July 1	8 a.m.	N.E.	2	W.	2	W.
,, 1	3.30 p.m.	N.N.E.	1	W.	1	W.
,, 2	5 p.m.	E.	2	W.S.W.	1	N.W.
,, 6	4 p.m.	N.E.	1	W.	2	W.
,, 8	6.30 p.m.	W.	2	S.W.	1	W.
,, 10	3 p.m.	W.	3	W.S.W.	1	W.
,, 14	4 p.m.	N.E.	2	W.	2	W.S.W.
,, 21	8.30 a.m.	S.W.	3	N.E.	1	N.
,, 26	11.15 a.m.	W.	3	S.W.	1	W.
,, 29	11 a.m.	N.N.E.	1	E.N.E.	1	N.N.E.
,, 30	1.30 p.m.	N.E.	2	E.	1	N.E.
August 1	9.40 a.m.	N.E.	2	E.N.E.	1	N.E.
,, 14	3 p.m.	E.N.E.	1	W.	2	W.
,, 18	4 p.m.	N.N.E.	2	N.E.	1	W.
,, 21	4 p.m.	E.	1	N.E.	1	E.
,, 23	7.25 a.m.	W.	1	E.	0	S.E.
,, 27	9 a.m.	E.N.E.	2	E.N.E.	2	E.N.E.
Sept. 3	2.30 p.m.	S.W.	1	W.S.W.	2	S.W.
,, 11	9 a.m.	S.S.W.	1	N.W.	2	S.S.W.
,, 16	3 p.m.	N.N.W.	2	W.S.W.	3	N.W.
,, 22	10 a.m.	W.	1	W.S.W.	2	N.
,, 22	Noon.	W.	1	W.S.W.	2	W.
,, 22	2 p.m.	W.N.W.	1	W.	1	W.N.W.
,, 22	4 p.m.	N.W.	1	W.	1	N.W.
,, 23	2 p.m.	W.S.W.	2	W.	3	W.
,, 23	4 p.m.	W.	1	W.N.W.	2	W.
,, 29	2 p.m.	N.	2	W.N.W.	2	S.W.
,, 29	4 p.m.	N.	1	N.W.	2	S.W.
Oct. 12	9.30 a.m.	N.E.	1	N.	1	W.
,, 21	1 p.m.	N.N.E.	2	N.E.	1	N.N.E.
,, 29	10.45 a.m.	E.S.E.	2	N.	2	N.
Nov. 5	1.30 p.m.	W.	1	W.	1	W.
,, 18	3 p.m.	E.	2	E.	1	E.
,, 23	9 a.m.	E.S.E.	1	N.E.	0	S.E.
,, 23	4 p.m.	S.	1	E.	0	S.E.

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date.	G.M.T.	Cloud Direction.	Velocity. 0—6.	Wind.		Direction of Lr. Clds.
				Direction.	Force (0—12)	
Nov. 27	1.45 p.m.	E.N.E.	2	W.	4	W.
Dec. 3	9 a.m.	W.	1	W.	1	W.
,, 8	12.15 p.m.	E.N.E.	2	N.E.	1	N.E.
,, 23	Noon.	N.E.	2	N.	0	N.E.
,, 29	Noon.	W.	2	W.	3	W.
,, 29	1 p.m.	E.N.E.	1	W.	4	W.
,, 29	3.30 p.m.	N.E.	1	N.W.	6	W.

AGRICULTURAL NOTES.

JANUARY, with the exception of the last few days, was cold and dull, and very little work was done on the land.

FEBRUARY was warm, but wet and dull. Vegetation progressed very slowly. Wheat was well above ground by the 10th. Ploughing had begun in most places by the middle of the second week. Very few wild flowers were in blossom before the end of the month.

MARCH was rather cold, and although the first and last weeks were wet, the weather during the month was favourable for working the land. Ploughing was finished in most places in the neighbourhood before the 20th, and a good deal of corn was sown by the end of the month.

APRIL.—Rather cold, but dry, and favourable for agricultural operations generally. All the oats were sown by the end of the first week. Potatoes were all in the ground by the 28th.

MAY was dull and cold, with not much sun. Vegetation appeared very backward until very late in the month. Green crops were all sown by the 18th or 20th.

JUNE was brighter and warmer, and by the middle of the month things looked much improved. Towards the end of the third week green fly made its appearance in greater numbers than usual. The turnip fly also did great damage to the plants during this month.

JULY.—Insect pests did great damage to the fruit trees. Apples, currants, and gooseberries especially suffered from their attacks, and the quantity of fruit was in consequence much smaller than usual. Strawberries, although very late, were quite up to average both in quantity and quality, and raspberries yielded a large quantity of excellent fruit. Hay was first cut early in the month, but was not all housed at the end. Wheat and oats looked well towards the close of the month.

AUGUST.—Most of this month was cloudy and dull, the second week being wet. The last of the hay was got in about the 20th. A few oats were cut towards the end of the month.

SEPTEMBER.—This month was very changeable. Wheat and oats were housed in most places by the 21st. The amount of grain was about average, but straw was short.

OCTOBER.—Cold, but favourable for gathering the crops. Potatoes were lifted by the 12th, and green crops generally by the 26th. With the exception of turnips, which were very small, the yield was very good.

NOVEMBER.—Generally favourable for work. Wheat all in the ground by the 18th.

DECEMBER.—Owing to the severity of the weather very little agricultural work was done.

OBSERVATIONS OF CROPS.

GRAIN, ETC.					GREEN CROPS.			
Name.	When Sown.	In Flower.	In Ear.	When Cut.	Name.	When Sown.	Above Ground.	Stored.
Wheat	Nov.	June	July 10th	Sept.	Potatoes	April—May	May 15th	Sept.—Oct.
Oats	Mar.—Apl.	June	July 10th	Aug.—Sept.	Turnips	May	May 17th	October.
Beans	March	June 11th		Sept.	Beet	May	May 17th	October.
					Mangel	May	May 19th	Oct.—Nov.

OBSERVATIONS OF TREES AND SHRUBS.

FOREST TREES, ETC.			FRUIT TREES, ETC.			SHRUBS.	
Name.	In Bud.	In Leaf.	Name.	In Blossom.	Ripe.	Name.	In Blossom.
Field Elm	May 4th	May 21st	Apple	May 3rd	Aug. 19th	Lilac	May 29th
Oak	May 22nd	May 31st	Pear	Mar. 27th	Aug. 20th	Syringa	June 5th
Sycamore	Ap. 19th	May 11th	Cherry	Ap. 25th	July 26th	Laburnum	May 24th
Lime	Ap. 10th	May 7th	Red Currant	Ap. 25th	July 20th	Red Flowering Currant	Ap. 6th
Ash	May 15th	May 26th	Black Currant	Ap. 30th	July 27th	Dog Rose	June 5th
Beech	Ap. 24th	May 9th	Strawberry	May 9th	July 15th	Guelder-Rose	June 20th
Horse Chesnut	Ap. 13th	Ap. 30th	Gooseberry	Ap. 19th	Aug. 25th	Woodbine	June 17th
						Portugal Laurel	June 21st
						Elderberry	June 15th
						Yellow Azalea	May 16th

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885.

RANUNCULACEÆ.		
Anemone nemorosa	Wood anemone	April 2
Ranunculus Ficaria	Lesser celandine	March 7
R. acris	Meadow crowfoot	May 19
R. repens	Creeping buttercup	May 17
R. bulbosus	Bulbous buttercup	May 29
R. auricomus	Wood crowfoot	May 10
R. lingua	Great spearwort	June 12
R. hederaceus	Ivy-leaved crowfoot	May 25
Caltha palustris	Marsh marigold	April 23
Trollius Europæus	Globe flower	May 11
NYMPHÆACEÆ.		
Nymphæa alba	White water lily	June 21
Nuphar lutea	Yellow water lily	June 29
PAPAVERACEÆ.		
Papaver rhæas	Red poppy	July 2
Chelidonium majus	Common celandine	June 20
CRUCIFERÆ.		
Nasturtium officinale	Common watercress	April 30
Arabis hirsuta	Hairy rock cress	April 6
Cardamine amara	Large bitter cress	May 12
C. pratensis	May flower	April 30
C. hirsuta	Hairy bitter cress	March 19
Sisymbrium officinale	Hedge mustard	May 10
Alliaria officinalis	Garlic mustard	May 12
Brassica campestris	Common wild navew	May 20
Cochlearia Armoracia	Horse radish	June 28
C. officinalis	Scurvy grass	May 18
RESEDACEÆ.		
Reseda luteola	Dyer's rocket	June 5
VIOLACEÆ.		
Viola canina	Dog violet	March 28
V. odorata	Sweet violet	March 8
V. palustris	Marsh violet	May 3
POLYGALACEÆ.		
Polygala vulgaris	Milkwort	May 6
CARYOPHYLLACEÆ.		
Lychnis vespertina	Evening campion	June 15
L. diurna	Red robin	May 5

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

L. Githago	Corn cockle	July 10
L. Flos cuculi	Ragged robin	June 14
Sagina procumbens	Procumbent pearlwort	June 26
Saponaria officinalis	Common soapwort	July 19
Arenaria serpyllifolia	Thyme-leaved sandwort	June 4
A. trinervis	Three-nerved sandwort	May 20
Cerastium vulgatum	Mouse-ear chickweed	March 6
Stellaria aquatica	Water starwort	May 19
S. nemorum	Wood starwort	May 5
S. graminea	Lesser starwort	May 20
S. holostea	Great starwort	May 5
S. media	Chickweed	Feb. 27
S. uliginosa	Bog starwort	May 23
HYPERICACEÆ.		
Hypericum perforatum	Common St. John's wort	July 15
H. quadrangulum	Square-stalked St. John's wort	July 12
H. humifusum	Trailing St. John's wort	July 11
H. Androsæmum	Tutsan	July 10
H. pulchrum	Slender St. John's wort	July 14
H. hirsutum	Hairy St. John's wort	July 17
LINACEÆ.		
Linum catharticum	Cathartic flax	June 4
MALVACEÆ.		
Malva sylvestris	Common mallow	June 9
GERANIACEÆ.		
Geranium sanguineum	Bloody crane's-bill	May 20
G. Phæum	Dusky crane's-bill	May 15
G. sylvaticum	Wood crane's-bill	May 17
G. pratense	Meadow crane's-bill	July 1
G. Robertianum	Herb Robert	May 29
G. lucidum	Shining crane's-bill	May 10
G. molle	Dove's-foot crane's-bill	June 28
G. dissectum	Jagged-leaved crane's-bill	June 20
Oxalis acetosella	Wood sorrel	April 17
PAPILIONACEÆ.		
Ononis arvensis	Rest harrow	July 15
Medicago lupulina	Black medic	June 4
Trifolium pratense	Purple clover	May 27
T. repens	White clover	June 4
T. procumbens	Lesser clover	June 6
Lotus corniculatus	Bird's-foot trefoil	June 4
Vicia cracca	Tufted vetch	June 1

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

V. sepium	Bush vetch	May 25
V. sativa	Common vetch	May 24
Lathyrus pratensis	Meadow pea	June 20
ROSACEÆ.		
Spiræa ulmaria	Meadow sweet	July 2
Geum urbanum	Common avens	May 16
G. rivale	Water avens	April 30
G. intermedium	Intermediate avens	May 16
Fragaria vesca	Wood strawberry	May 8
Potentilla fragariastrum	Barren strawberry	Feb. 15
P. reptans	Creeping cinque-foil	June 4
P. tormentilla	Tormentil cinque-foil	May 19
P. verna	Spring cinque-foil	May 29
P. Comarum	Marsh cinque-foil	June 30
P. anserina	Silver weed cinque-foil	June 4
Alchemilla vulgaris	Lady's mantle	April 23
A. arvensis	Parsley piert	June 4
Sanguisorba officinalis	Great burnet	July 8
Poterum sanguisorba	Salad burnet	
Agrimonia eupatoria	Common agrimony	July 25
Pyrus communis	Pear	April
Cratægus oxyacantha	Hawthorn	June 2
ONAGRACEÆ		
Epilobium montanum	Common willow-herb	June 19
E. palustre	Marsh willow-herb	June 21
E. parviflorum	Hoary willow-herb	June 25
E. tetragonum	Square willow-herb	June 25
Circæa lutetiana	Enchanter's nightshade	July 10
LYTHRARCEÆ		
Lythrum salicaria	Purple loosestrife	
RIBESIACEÆ		
Ribes grossularia	Gooseberry	April 19
R. rubrum	Red currant / White currant	April 26
R. nigrum	Black currant	April 30
SAXIFRAGACEÆ.		
Saxifraga hypnoides	Mossy saxifrage	May 1
S. umbrosa	London pride	May 16
Chrysosplenium oppositifolium	Opposite leaved golden saxifrage	Mar. 7
C. alternifolium	Alternate leaved	Mar. 15

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

UMBELLIFERÆ.		
Sanicula europæa	Wood sanicle	June 2
Pimpinella magna	Greater sanicle	July 2
Caucalis anthriscus	Hedge parsley	July 25
CAPRIFOLIACEÆ.		
Adoxa moschatellina	Tuberous moscatel	April 12
Lonicera periclymenum	Honeysuckle	July 2
ARALIACEÆ.		
Hedera Helix	Common ivy	Oct. 10
STELLATÆ.		
Galium cruciatum	Crosswort	May 15
G. verum	Yellow bedstraw	
G. palustre	Marsh bedstraw	
G. uliginosum	Swamp bedstraw	May 23
G. saxatile	Heath bedstraw	June 12
G. aparine	Cleavers	June 15
Asperula odorata	Sweet woodruff	May 10
VALERIANEÆ.		
Valeriana dioica	Marsh valerian	May 14
V. officinalis	Common valerian	July 1
DIPSACEÆ.		
Scabiosa arvensis	Field scabious	July 2
COMPOSITÆ.		
Eupatorium cannabinum	Hemp agrimony	
Tussilago farfara	Common colt's-foot	
Bellis perennis	Common daisy	All the year.
Chrysanthemum leucanthemum	Ox-eye daisy	June 20
C. inodorum	Scentless chrysanthemum	June 4
Achillea ptamica	Common sneezewort	
A. millefolium	Common yarrow	June 28
Gnaphalium uliginosum	Marsh cudweed	July 25
Senecio vulgaris	Groundsel	Feb. 25
S. jacobæa	Ragwort	July 23
Arctium lappa	Common burdock	Aug. 10
Carduus Lanceolatus	Spear thistle	July 15
A. acanthoides	Welled thistle	June 28
C. palustris	Marsh thistle	June 25
Centaurea nigra	Black knapweed	July 2
Leontodon hispidus	Common hawkbit	June 14
Hypochæris radicata	Cat's-ear	June 29
Sonchus oleraceus	Common sow thistle	July 2
Taraxacum dens-leonis	Common dandelion	Mar. 11

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

Hieracium pilosella	Mouse-ear hawkweed	June 4
H. murorum	Wall hawkweed	June 23
H. umbellatum	Smooth-leaved hawkweed	Aug. 11
Crepis virens	Smooth crepis	July 8
C. paludosa	Marsh crepis	June 23
Lapsana communis	Nipplewort	June 26
CAMPANULACEÆ.		
Campanula latifolia	Giant bell-flower	July 27
C. rapunculoides	Creeping bell-flower	Aug. 2
C. rotundifolia	Harebell	July 25
ERICACEÆ.		
Vaccinium myrtillus	Bilberry	April 26
Erica tetralix	Cross-leaved heath	July 2
PRIMULACEÆ.		
Primula vulgaris	Common primrose	Feb. 3
P. veris	Cowslip	May 10
Lysimachia vulgaris	Great yellow loosestrife	May 13
L. nemorum	Yellow pimpernel	May 12
Anagallis arvensis	Pimpernel	July 23
LENTIBULARIACEÆ.		
Pinguicula vulgaris	Common butterwort	June 28
AQUIFOLIACIÆ.		
Ilex aquifolium	Common holly	June 4
APOCYNACEÆ.		
Vinca minor	Lesser periwinkle	Mar. 19
GENTIANACEÆ.		
Menyanthes trifoliata	Common buckbean	June 29
POLEMONIACEÆ.		
Polemonium cœruleum	Jacob's ladder	June 5
CONVOLVULACEÆ.		
Convolvulus sepium	Large convolvulus	Aug. 1
BORAGINACEÆ.		
Myosotis sylvatica	Forget-me-not	April 28
M. arvensis	Field myosote	June 4
Symphytum officinale	Common comfrey	
Borago officinalis	Common borage	June 28

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

SOLANACEÆ.		
Solanum dulcamara	Bittersweet	June 25
OROBANCHACEÆ.		
Lathræa squamaria	Toothwort	April 17
SCROPHULARINEÆ.		
Verbascum thapsus	Great mullein	June 28
Scrophularia nodosa	Common figwort	June 20
S. aquatica	Water figwort	July 2
Mimulus luteus	Yellow mimulus	June 20
Linaria cymbalaria	Ivy-leaved toadflax	May 16
Digitalis purpurea	Foxglove	June 25
Veronica serpyllifolia	Thyme-leaved speedwell	May 17
V. officinalis	Common speedwell	June 20
V. anagallis	Water speedwell	
V. beccabunga	Brooklime speedwell	June 5
V. montana	Mountain speedwell	May 12
V. chamædrys	Germander speedwell	May 18
Bartsia odontites	Red bartsia	July 27
B. alpina	Alpine bartsia	April 3
Euphrasia officinalis	Eyebright	
Rhinanthus crista galli	Yellow rattle	June 6
Pedicularis sylvatica	Lousewort	May 19
Melampyrum pratense	Cow-wheat	July 2
LABIATÆ.		
Calamintha Clinopodium	Wild basil	July 13
Nepeta Glechoma	Ground ivy	April 19
Prunella vulgaris	Self-heal	June 25
Stachys betonica	Betony	July 12
S. sylvatica	Hedge woundwort	June 28
S. palustris		
Lamium purpureum	Purple dead-nettle	April 25
L. album	White dead-nettle	
Teucrium scorodonia	Wood sage	July 19
Ajuga reptans	Bugle	
PLANTAGINACEÆ.		
Plantago major	Greater plantain	June 19
P. lanceolata	Ribwort	May 6
CHENOPODIACIÆ		
Chenopodium bonus Henricus	Good King Henry	June 8
Atriplex patula	Common orache	July 21

DATES OF THE FLOWERING OF PLANTS AT STONYHURST IN 1885 (*continued*).

POLYGONACEÆ.		
Rumex obtusifolius	Broad dock	June 14
R. crispus	Curled dock	July 8
R. conglomeratus	Clustered dock	July 20
R. acetosa	Sorrel	May 16
Polygonum aviculare	Knotgrass	July
P. bistorta	Snakeweed	June 5
P. persicaria	Common persicaria	July 20
P. convolvulus	Black bindweed	July 21
EUPHORBIACEÆ.		
Mercurialis perennis	Dog's mercury	May 5
URTICACEÆ.		
Urtica dioica	Common nettle	June 18
AROIDEÆ.		
Arum maculatum	Common arum	May 16
NAIADACEÆ.		
Potamogeton natans	Broad pondweed	July 5
ALISMACEÆ.		
Alisma plantago	Water plantain	July 2
Triglochin palustre	Arrow grass	July 16
ORCHIDACEÆ.		
Epipactis latifolia	Helleborine	July 30
Listera ovata	Twayblade	June 2
Orchis mascula	Early orchis	May 3
O. maculata	Spotted orchis	June 4
O. pyramidalis	Pyramidal orchis	June 15
IRIDACEÆ.		
Iris pseudacorus	Yellow iris	June 25
Crocus vernus	Spring crocus	June 24
AMARYLLIDEÆ.		
Narcissus pseudonarcissus	Daffodil	Mar. 27
Galanthus nivalis	Snowdrop	Feb. 3
LILIACEÆ.		
Paris quadrifolia	Herb Paris	May 10
Scilla nutans	Bluebell	April 30
Allium ursinum	Broad-leaved garlic	May 14

THE UPPER GLOWS IN 1885.

THE character of these glows in 1885 has been identical with that described in the report of last year, and there has been no falling off in their intensity. In the description of the phenomena seen in 1884 the following correction was unfortunately omitted. Instead of the words "the pink or salmon colour extended from the sun to a distance of 18° or 20°," read "the pink or salmon colour was present in the outer portion of the glow, which was traceable to a distance of 25° to 30° from the sun."

On two occasions in 1885 a recurrence of the after-glow took place some forty minutes after the first display had wholly disappeared. The following are the dates on which the fore and after glows were observed.

January 5, 6, 12.
February 9.
March 6, 9, 11, 12, 22.
April 29.
June 3, 4, 8, 9, 12, 13, 15, 25, 27, 28.
July 5, 9, 13, 25, 26, 28, 29, 30, 31.
August 1, 13, 14, 15, 16, 18, 19, 21, 22, 24, 26.
September 3, 4, 5, 6, 13, 25, 26, 27.
October 4, 7, 12, 13, 14, 15, 24, 26.
November 5, 15, 16, 17, 18, 30.
December 1, 4, 8, 10, 11, 16, 19, 23, 26.

The moon was surrounded by a glow, similar to that which now continuously accompanies the sun, on the following dates: February 2, 28, April 19, August 21, 22, October 24, 26, and November 20, 21.

1885.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	·41,c.	·48	·41,c			·46,c	·49,c	·50,c	·51	·60	·40	·41,c
2			·46	·45,c	·39	·39	·61					
3		·66		·44,c	·41	·38,c	·67	·76	·42	·38		·39
4		·46		·35,c		·41,c	·44	·73,c	·44	·41	·52	n
5	·63	·51		·41	·43	·35	·62		·68	·38	·65	·43
6	·42		·43			·37,c,s	·45	·56	·45	n		
7	·41	·41	·50,c	·58	·35					·38,c		·44,c
8	·65			·40	·37		·62,c	·74	·39			·51,c
9		·37	·44	·49	·36	·30,c,s	·45,c		·41	·66		
10					·37	·30	·42,c	·36	·41			·42,c
11	·60	·53	·50		·36,c	·39	·44		·40	·47,c		
12	·42,c		·41,c		·35,c	·44,c	·36	·60		·66		
13	·49,c		c	·66	·36	·36,c	·67	·39,c	·49			
14	·49	·46	·41,c	·40	·38	·29	·35,c	·34,c		·67		·53
15			·45,c	·29	·37	·45		·38,c,s	·49	·58	·41,c	·44,c
16			·40		·42	·76		·46,c	·31,c		·41,c,s	
17				·35,c	·43	·37	·79		·67	n	·44,c,s	
18		·44	·40	·34,c,s	·39	·44		·46	·39,c		·44	
19		·46,c	·36	·35,c,s			·44	·37			·65	·45
20		·38,c	·60		·79	·50	·69	·75,c	·41	·46		
21	·57	·37	·39,c	·69	·31	·47	·38,c	·52	·39	·45		
22	·47,c	·66	·41,c		·39			·40,c	·39			·43
23	·49,c		·44,c	·45,c	·38		c		·51		·42	
24		·36,c			·72		·42,c	·46	·40	n		
25	·45	·65,c		·38	·64	·67	·42,c,s	·40,c	·51	·42,c		
26				·47		·36,c	·62,c	·76	·38,c,s	·66		·43,c
27	·46	·41	·46,c	·38,c	·74	·42,c		·31	·41,c	·47	·50	
28		·49,c,s	·39,c	·40	·30	·72	·41,c					
29				·67	·37	·75	·35,c		·51	·41		·46
30				·39	·35	·51,c	64,c	·41	·65	n	·42	
31	·43		·48		·40,c		·31,c					

Monthly Magnetical Observations taken at the College Observatory, Stonyhurst, 1885.

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 $q(t°-35°)+q'(t°-35°)^2$, where t° is the observed temperature and 35° Fahr. the adopted standard temperature. The values of the co-efficients q and q' are respectively 0·0001128 and 0·000000436.

The induction co-efficient μ is 0·000244.

The correction for error of graduation of the Deflection bar at 1·0 foot is +0·00004 ft., at 1·3 + 0·000064 ft.

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

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 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 arc of vibration, the former having been always under 2s.5, 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 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 0·002319.

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.

OBSERVATIONS OF DEFLECTION FOR ABSOLUTE MEASURE OF HORIZONTAL FORCE.

Month.	G. M. T.	Distances of centres of Magnets.	Temperature.	Observed Deflection.	$\frac{m}{X}$ Log
	D. H. M.	FOOT.	°	° ′ ″	
January ...	19th 11 15 a.m.	1·0	42·3	13 23 7	9·06494
	,, 11 38 a.m.	1·3	45·1	6 3 5	9·06478
February...	16th 11 30 a.m.	1·0	45·2	13 22 43	9·06477
	,, 0 14 p.m.	1·3	46·2	6 2 50	9·06456
March ...	20th 11 45 a.m.	1·0	48·0	13 22 20	9·06488
	,, 0 20 p.m.	1·3	49·5	6 2 15	9·06408
April	22nd 11 50 a.m.	1·0	50·1	13 22 10	9·06488
	,, 0 21 p.m.	1·3	53·0	6 2 22	9·06329
May	15th 11 59 a.m.	1·0	53·2	13 21 30	9·06476
	,, 0 20 p.m.	1·3	53·5	6 2 28	9·06411
June	18th 11 35 a.m.	1·0	60·6	13 21 26	9·06486
	,, 0 4 p.m.	1·3	61·7	6 2 26	9·06552
July.....	23rd 11 5 a.m.	1·0	59·5	13 22 5	9·06573
	,, 11 38 a.m.	1·3	60·2	6 2 20	9·06493
August ...	17th 11 52 a.m.	1·0	61·0	13 21 35	9·06536
	,, 0 20 p.m.	1·3	62·8	6 2 29	9·06575
September.	16th 11 15 a.m.	1·0	56·5	13 20 40	9·06454
	,, 11 39 a.m.	1·3	58·2	6 1 50	9·06416
October ...	22nd 11 53 a.m.	1·0	51·3	13 21 10	9·06446
	,, 0 19 p.m.	1·3	51·8	6 2 7	9·06344
November.	17th 11 10 a.m.	1·0	41·2	13 20 17	9·06336
	,, 0 31 p.m.	1·3	42·5	6 1 33	9·06272
December.	21st 0 10 p.m.	1·0	44·8	13 20 44	9·06407
	,, 0 35 p.m.	1·3	45·2	6 1 45	9·06331

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.	Temperature.	Time of one vibration.	Log m X	Value of m.
	D. H. M.	°			
January ...	19th...10 25 a.m.	41·5	5·73998	0·19732	0·42765
February...	16th...10 45 a.m.	45·0	5·73999	0·19809	0·42794
March	20th...10 50 a.m.	46·2	5·74012	0·19758	0·42759
April	22nd...11 14 a.m.	50·7	5·74001	0·19795	0·42758
May.....	15th...11 25 a.m.	52·0	5·74012	0·19802	0·42777
June	18th...10 41 a.m.	60·9	5·73920	0·19835	0·42849
July.....	23rd...10 20 a.m.	59·1	5·74002	0·19838	0·42861
August ...	17th...11 5 a.m.	60·4	5·73995	0·19835	0·42551
September.	16th...10 47 a.m.	55·8	5·74012	0·19802	0·42775
October ...	22nd...11 20 a.m.	50·2	5·74001	0·19780	0·42759
November.	17th...10 39 a.m.	41·1	5·74102	0·19714	0·42662
December.	21st...11 11 a.m.	42·0	5·74053	0·19724	0·42660

DIP OBSERVATIONS.				MAGNETIC INTENSITY.		
Month.	G. M. T.	Needle.	Dip.	X. or Horizontal Force.	Y, or Vertical Force.	Total Force.
	D. H. M.		° ′ ″			
January .	20th...10 35 a.m.	1	69 14 38	3·6849	9·7177	10·3930
	,, ...11 10 a.m.	3	69 13 20			
February.	17th...10 40 a.m.	1	69 16 10	3·6874	9·7340	10·4092
	,, ...11 5 a.m.	3	69 14 15			
March ...	21st...10 55 a.m.	1	69 14 40	3·6858	9·7214	10·3965
	,, ...11 30 a.m.	3	69 13 45			
April ...	23rd...10 21 a.m.	1	69 15 30	3·6907	9·7342	10·4105
	,, ...10 56 a.m.	3	69 12 58			
May	16th...11 20 a.m.	1	69 14 22	3·6880	9·7314	10·3975
	,, ...11 52 a.m.	3	69 12 40			
June	19th...10 23 a.m.	1	69 13 42	3·6868	9·7142	10·3830
	,, ...11 14 a.m.	3	69 12 17			
July	24th...11 20 a.m.	1	69 14 10	3·6845	9·7123	10·3877
	,, ...11 45 a.m.	3	69 12 50			
August...	18th...10 37 a.m.	1	69 13 30	3·6847	9·7132	10·3864
	,, ...11 11 a.m.	3	69 14 8			
Sept. ...	17th...11 5 a.m.	1	69 15 52	3·6871	9·7242	10·3765
	,, ...11 35 a.m.	3	69 12 18			
October..	23rd...11 15 a.m.	1	69 14 3	3·6879	9·7199	10·3957
	,, ...11 45 a.m.	3	69 12 33			
Nov.....	18th...10 40 a.m.	1	69 12 50	3·6906	9·7242	10·4012
	,, ...11 7 a.m.	3	69 13 15			
Dec.	22nd...11 9 a.m.	1	69 14 35	3·6871	9·7190	10·3911
	,, ...11 40 a.m.	3	69 11 40			
Means ...	.....	...	69 13 28	3·6871	9·7223	10·3940

DECLINATION OBSERVATIONS.

Month.	G. M. T.	Uncorrected. Observation.	Uncorrected. Monthly Mean.	Corrected. Observation.	Corrected. Monthly Mean.
	D. H. M.	° ′ ″	° ′ ″	° ′ ″	° ′ ″
January ...	5th... 9 10 a.m.	19 49 20		19 49 54	
	12th... 8 59	48 10		49 18	
	19th... 9 3	49 30		49 45	
	26th... 9 7	48 8	19 48 47	49 51	19 49 42
February..	2nd... 9 0	47 56		49 39	
	9th... 9 3	48 12		49 48	
	17th... 9 7	48 40		49 53	
	23rd... 9 11	47 45	19 47 58	50 37	19 49 59
March ...	2nd.. 8 56	49 6		47 40	
	9th... 9 5	44 55		49 17	
	16th... 9 3	47 37		50 2	
	23rd... 9 8	46 5		49 49	
	30th... 9 7	44 20	19 46 33	50 54	19 49 33
April	6th... 8 59	45 17		49 1	
	13th... 8 56	49 52		46 44	
	21st ... 9 7	48 23		51 15	
	27th... 9 3	47 15	19 47 42	49 55	19 49 14
May	4th... 9 1	44 55		49 46	
	11th... 9 9	49 47		47 47	
	18th... 9 5	42 10		48 27	
	25th... 9 8	43 27	19 45 5	49 44	19 48 56
June	1st... 9 3	42 13		46 48	
	8th... 9 5	46 20		47 28	
	15th... 8 55	40 33		49 8	
	22nd.. 9 14	42 15		45 40	
	29th... 9 2	44 10	19 43 6	47 18	19 47 12
July	6th... 9 0	40 7		46 41	
	13th... 9 11	45 10		46 56	
	20th... 9 4	38 50		47 41	

DECLINATION OBSERVATIONS (*Continued*).

Month.	G. M. T.	Uncorrected. Observation.	Uncorrected. Monthly Mean.	Corrected. Observation.	Corrected. Monthly Mean.
	D. H. M.	° ′ ″	° ′ ″	° ′ ″	° ′ ″
July	27th... 9 6 a.m.	19 41 33	19 41 23	19 45 6	19 46 36
August ...	3rd .. 9 2	45 13		(45 13)	
	10th... 9 5	47 25		(47 25)	
	18th... 9 8	45 30		47 13	
	25th... 9 4	44 55		46 3	
	31st... 8 54	45 27	19 45 42	46 35	19 46 26
September	8th... 8 56	45 37		45 52	
	14th... 9 1	42 12		45 38	
	21st... 9 3	42 15		44 32	
	29th... 9 7	42 20	19 43 6	45 11	19 45 18
October ...	5th... 9 13	38 5		43 31	
	12th... 9 3	38 37		44 3	
	20th... 9 7	39 16		42 50	
	26th... 9 6	44 39	19 40 9	44 56	19 43 50
November	2nd .. 9 9	44 7		44 24	
	9th... 9 1	41 3		43 38	
	16th... 9 7	40 56		43 41	
	23rd .. 9 10	40 43		42 26	
	30th... 9 3	41 9	19 41 36	41 43	19 43 10
December.	7th... 9 7	42 56		43 48	
	15th... 9 0	41 39		42 13	
	21st... 9 2	41 10		43 10	
	28th... 8 57	42 8	19 41 58	42 15	19 42 52
Yearly mean		19 44 26			19 46 59

MAGNETIC DISTURBANCES.

JANUARY.—The first day of the year was remarkably quiet, but there were signs of the presence of a disturbing force at 4 a.m. on the 2nd. During the following afternoon, and particularly at night, the oscillations of the Declination Needle were of considerable extent. The Horizontal Force Magnet was irregular in its movements from 6 a.m. on the 2nd to the same hour on the 3rd; and the principal disturbance of the Vertical Force Magnet was one long oscillation, the maximum being reached at 7.53 p.m., and the minimum at 3.7 the next morning. The magnets then remained very steady until 5 p.m. on the 8th, when the V.F. increased gradually and then fell rapidly, the minimum occurring at 3.30 a.m. on the 9th. The irregularities in the other curves between the 8th and the 11th were of no great extent. From the 17th to the 22nd the D. needle always moved abnormally about 10 p.m., the disturbance between 9 and 10 on the 20th being reproduced in an exaggerated form on the 21st. On the 22nd the increase in Declination between 8.14 p.m. and 8.31 was 46′59″·0, the movements from 4 p.m. to 10 being generally very rapid. The H.F. was most disturbed between 8 and 10, and the V.F., increasing gradually at 4 p.m., and very rapidly afterwards, attained its maximum at 7.57, and the following minimum at 1 a.m., its range being 0·00292 in British units. The whole of the 26th and the morning of the 27th were exceedingly quiet, and then a gradual rise and fall of the V.F. magnet occurred during the evening of the 27th, followed on the 29th by a rather sudden fall, commencing about 11.30 p.m.

FEBRUARY.—This month opened with an absolutely quiet magnet, and only very slight irregularities were noticed previous to the afternoon of the 5th. Between 6 p.m. on the 5th and 6 a.m. on the following day considerable disturbances of the Declination and H.F. took place. At 4.20 p.m. the V.F. ordinate was increasing, and attained its maximum at 8.18; it then fell rather rapidly. The early afternoon and the night of the 10th, with the whole of the 12th, were disturbed, the H.F. being much affected on the 12th, and the fall of

the V.F. magnet was exceedingly rapid between 2.30 and 2.45 a.m. The nights of the 18th and 21st were abnormal. Irregularities appeared on the curves of the 27th, the maximum of the V.F. occurring about 4 p.m. The Range of the V.F. between 7.15 p.m. on the 28th and 2.40 a.m. the following day was 0·00235 in British units. The Declination was very changeable at the end of the month.

MARCH.—The disturbance gradually subsided on the first day, and a calm succeeded which lasted until the evening of the 12th. The afternoon of the 13th was rather abnormal, and on the morning of the 14th a storm began, which reached its greatest height between 3 p.m. and 6 a.m. of the 15th. The most rapid movements of the Declination were a decrease of 36′57″·36 between 4.20 and 4.23 p.m.; followed by an increase of 39′32″.05 from 10 to 10.9. The total range of the H.F. between 4.20 and 11.15 p.m. was 0·02527, whilst that of the V.F. was greater than 0·01071, the maximum between 4.10 and 4.25 p.m. was too great to be photographically recorded, but the minimum occurred at 11.24 p.m. The most rapid movements of the V.F. were recorded between 3.48 and 4.28, and from 9.57 to 10.8. The storm died out during the morning of the 16th. The night of the 20th was remarkable for large but regular waves of disturbance.

APRIL.—A slight disturbance on the morning of the 1st, when the V.F. fell slightly before 6.30, and then rose gradually to a maximum at 6 p.m.; another disturbance during the afternoon of the 3rd, the maximum of the V.F. occurring about 5.30; and a third on the morning of the 8th, the V.F. falling considerably, and only reaching its minimum at 6.8 p.m., were the only irregularities of any moment before the 13th, which was somewhat abnormal. One or two disturbed movements on the afternoon of the 15th, a sudden rise and fall between 4 and 7 a.m. on the 17th, and a fall and rise about 10 p.m. on the 18th were the only conspicuous changes in the curve of the Declination between the 13th and 27th. On the morning of the 27th the fall of the V.F. was well marked, and the Declination irregular; the following morning the oscillations of the D. needle were more rapid but less extended.

MAY.—This month started quietly, and it was not until the night of the 11th that there were any considerable movements of the Declination magnet, although the H.F. was much disturbed between 1 and 3 p.m. on the 10th, when the V.F. was a good deal diminished. The range of the V.F. was rather large on the 11th, 12th, diminishing 0·00278 between 6.45 p.m. on the 11th to 4.20 a.m. on the 12th. From 6 p.m. on the 13th to 3 a.m. of the following day the presence of a disturbing

force was strongly felt, but there were no oscillations of extreme rapidity. The total range of the Declination was 53′51″·49, and it decreased 34′5″·47 between 9.32 and 9.53 p.m. The H.F. altered 0·02179 from 6.18 to 9.42 p.m., and there were two great movements of the V.F. magnet, the component of the force decreasing very rapidly from about 8.40 p.m. to 9.38, and from 10.57 to 11.28, the total range was 0·00729. This short storm was followed by a long period of calm, but between 1 p.m. and 4 on the 25th there were again signs of the presence of a strong disturbing element. The irregularities of the H.F. trace were very marked, but there was only a slight tremulous motion of the V.F. magnet. During the mornings of the three following days the needle was greatly agitated and displaced, but the most extended movement of the Declination magnet was a decrease of 39′32″·05 from 0.47 to 1.37 a.m. on the 28th. A rapid diminution of the H.F., followed immediately by an increase of greater extent, was the most remarkable change of this component of the Intensity that had so far occurred in 1885, the whole range from 7.52 to 8.17 a.m. on the 26th was 0·02255. The V.F. curve was very irregular from the 26 to the 28th, a rapid decrease occurring at 2.6 a.m. on the 26th, but the general movements of this magnet were more violent on the 27th and 28th. The range from 4.42 p.m. on the 27th to 1.17 on the 28th was 0·00451.

JUNE.—The Declination trace was rather irregular during the whole of the 4th, but resumed its normal appearance in the course of the following morning. The V.F. however was more disturbed in the early part of the afternoon of the 5th than it had been at the same hour on the 4th, and the form of the curve was very similar. The night of the 10th was slightly abnormal, as were also both the morning and night of the 15th. Similar movements of the D. needle were recorded on the mornings of the 19th and 20th, but the latter were about an hour nearer noon than the former. The afternoon of the 20th, and the night of the 22nd were also disturbed. The increase of the H.F. was very rapid between 1 and 2 p.m. on the 20th, the maximum occurring at 1.47. The traces of the D. and H.F. were remarkably similar. The V.F. also increased considerably at the same time on the 20th. On the 22nd this component fell somewhat about midnight. At 10.32 p.m. on the 24th a storm began suddenly, and lasted for about thirty-four hours. At the commencement of the storm the rise of the H.F. and the fall of the V.F. were both very abrupt. Between 10.42 a.m. and 5.13 p.m. the H.F. increased by 0·01740. The range of the V.F. was large, the readings during the early morning hours being very low on both the 25th and 26th. The fall between 6.2 p.m. on the 25th and 3.15 a.m. on the 26th was 0·00718.

JULY.—A disturbance began between 5 and 6 on the morning of the 1st, and gradually disappeared about 10 p.m. It was felt by the H.F. principally between 2 and 4 p.m., after which the V.F. increased considerably until about 7 p.m. On the morning of the 4th the Declination needle was rather tremulous; on the following day this tremour had increased very much, and was succeeded on the 6th by a very irregular trace. The night of the 17th, and the whole of the 18th, were abnormal. On the afternoon of the 25th the H.F. was rather irregular, and the V.F. rose for some hours.

AUGUST.—On the 1st of the month the D. and H.F. showed abnormal curves, and the V.F. trace consisted of one long wave of disturbance, the maximum occurring before 5 p.m., and the minimum after 3 a.m. the next day. The V.F. fell rapidly between 8 and 10 p.m. on the 7th, with a minimum at 9.30. On the mornings of the 20th and 21st the presence of a disturbing force was apparent. The night of the 25th was not very quiet, but the first real disturbance of the month began shortly after 10 p.m. on the 27th. The V.F. commenced falling at 10.26, but rose again at once to its normal position: between noon however on the 28th, and noon of the 29th, the V.F. curve consisted of one long wave of disturbance. With the exception of a partial lull on the 30th, the disturbing force was observable until the end of the month.

SEPTEMBER.—At 6.43 p.m. on the 4th the D. magnet began to oscillate very rapidly, and continued to move abnormally until noon of the following day, the oscillations being large at first, but after 4 a.m. the magnet merely trembled. Between 11.30 p.m. and 12.15 on the night of the 4th the magnet moved eastwards through 34′36″·41. The H.F. felt the disturbing force principally during the afternoon and night of the 4th, whilst the V.F. diminished 0·00467 between 6.22 p.m. and 11.36, remained below its average for about four hours, and regained its normal position about 6 a.m. There was a good deal of unsteadiness in the D. needle on the night of the 12th, and the curve was very irregular from the earliest hours of the 15th until 2 a.m. on the 17th. The afternoons of the 15th and 16th were the most disturbed times of the H.F. The V.F. movement consisted of one long oscillation, increasing during the afternoon of the 15th, and then decreasing, at first slowly and regularly, but afterwards very irregularly, smaller waves of disturbance being apparently superposed on the larger one. The movements of the D. magnet from 6 to 9 p.m. on the 22nd and on the 23rd were very similar, and from noon on the 22nd the trace was very erratic until noon of the 25th, with the sole exception of the afternoon of the 24th. The abnormal oscillations of the H.F. magnet during the afternoons of the 22nd and 23rd were not very extensive,

and the curves of the V.F. followed the Declination in their similarity to each other on these two days, although the night hours of the 23rd show greater disturbance of the V.F. On the 27th the Declination was rather troubled during the afternoon, and there was a rapid fall of the V.F. between 9 and 10 p.m.

OCTOBER.—The Declination magnet was a little unsteady during the early hours of the 3rd, 9th, and 10th, and also the late hours of the 11th and 12th. On the 12th the magnitude of the V.F. was somewhat increased. From noon of the 13th until the afternoon of the 16th there was some disquiet, and during the afternoon of the 18th the V.F. was above its normal value, the same occurring on the 28th. From the 22nd to the 25th was a disturbed period, as were also the last three days of the month.

NOVEMBER.—The disturbance that had been noticed during the last days of October continued on the 1st of the present month: from 2 to 6 p.m. the V.F. increased and then diminished, the H.F. being only slightly affected. During the night of the 7th the disturbing force interfered considerably with the H.F., and the V.F. was much below its normal value. Shortly before 8 p.m. on the 10th the principal disturbance of the month commenced, and the needle did not come to rest until the morning of the 12th. The H.F. was most affected during the early hours of the afternoon both on the 10th and the 11th. On the 10th the V.F. increased from noon until about 4 p.m., and then gradually diminished until midnight; on the 11th this component of the intensity was very high during the afternoon. Irregularities again showed them on the curves from 10 a.m. on the 18th until the morning of the 20th. The H.F. was most affected between 8 and 10 p.m. on the 18th, and from 4 p.m. on the 18th to 4 a.m. on the 19th the V.F. was considerably above the mean. The H.F. was unsteady from noon on the 24th until the morning of the 27th, but the movements were not of any great extent.

DECEMBER.—On the 1st the magnet moved a little westward between 2 and 4 p.m., and then eastward between 8 and 10. There was a very slight tremour of the needle between 10 and 11 p.m. on the 5th, and this gradually developed into a storm, which lasted until nearly 2 p.m. on the 10th. The V.F. increased very rapidly between 4 and 6 p.m. on the 6th, attaining its maximum about 5.50. Several very sharp movements of the Declination needle are recorded on the afternoon of the 7th, but the angular displacement of the magnet was never very large. The afternoon of the 28th was a little disturbed. The month as a whole was remarkably quiet.

AURORÆ OBSERVED DURING THE YEAR 1885.

FEBRUARY 5th.—An auroral glow was observed from 9 to 10.30 p.m. Its position was due N., and it reached an altitude of 30°. The scintillation of the stars seen through the glow was very marked.

MARCH 6th.—At 9 p.m. an auroral glow, altitude 30°, was observed in the N.W.

MAY 14th.—An auroral light in the N.W. at 11 p.m.

AUGUST 13th.—From 9.30 to 10.30 p.m. an auroral glow extended from W. to N.

SEPTEMBER 11th.—At 6.50 p.m. a cloud of peculiar appearance was noticed N.N.W., from the W. edge of which greenish-white streamers were beginning to ascend.

At 7.5 the streamers appeared more to the W. and reached almost to the zenith. These were succeeded by an auroral glow, the brightest portion being almost due W.

At 8 p.m. more streamers were seen stretching through Ursa Majoris and Cassiopeia, and passing the zenith into Cygnus.

The zodiacal light was well seen on March 11th.

Although there are but few observations of auroræ this year to compare with the sun-pictures, yet the comparison serves to strengthen what was stated in previous reports, that auroræ are not visible during periods of solar quiet. Thus, after the lull in solar activity which occurred in January, during which no auroræ were observed, we find auroræ coincident with the solar wave of February and March, and again with the commencement of the greatest disturbance of the year, which extended from May to July. The auroræ of August 13th was seen during a smaller wave of disturbance, and that of September 11th was synchronous with one of the large spots of the year.

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APPENDIX.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE,

MALTA,

BY THE

REV. J. SCOLES, S.J.

1885.

ST. IGNATIUS' COLLEGE, MALTA.

Lat. 35° 55′ N. Long. 14° 29′ E. Barometer Readings reduced to 32° at Sea Level.

METEOROLOGICAL REPORT.

January—February, 1885.

Results of Observations taken during the Month.	January.	February.
Mean Reading of Barometer ..... inches	29·959	30·082
Highest ,, ,, ,,	30·189	30·304
Lowest ,, ,, ,,	29·575	29·666
Range of Barometer Readings ..... ,,	0·614	0·638
Highest Reading of Max. Therm.	65·5	73·5
Lowest ,, Min. Therm.	40·7	42·2
Range of Thermometer Readings	24·8	31·3
Greatest Range in 24 hours	19·7	20·1
Mean of all the highest Readings	57·8	62·8
Mean of all the lowest Readings	47·2	51·1
Mean Daily Range	10·6	11·7
Mean Temperature (deduced from Max. and Min.)	51·8	56·0
Mean Temperature (deduced from Dry Bulb)	51·7	55·9
Adopted Mean Temperature	51·8	56·0
Mean Temperature of Evaporation	47·8	51·5
Mean Temperature of Dew-point	44·9	48·8
Mean Elastic force of Vapour ..... inches	0·298	0·345
Mean Weight of Vapour in a cubic foot of air...grains	3·4	3·9
Mean additional weight required for saturation ,,	0·8	0·8
Mean degree of Humidity	81	83
Mean Weight of a cubic foot of air ..... grains	542·8	539·8
Fall of Rain ..... inches	4·277	0·332
Number of days on which Rain fell	14	5
Mean amount of Cloud (an overcast sky=10).....	4·1	3·1
Total number of miles of Wind indicated	8245	7572
Mean Velocity of Wind per hour ..... miles	11·1	11·3

March—April.

Results of Observations taken during the Month.	March.	April.
Mean Reading of Barometer ..... inches	29·976	29·872
Highest ,, ,, ,,	30·391	30·179
Lowest ,, ,, ,,	29·520	29·460
Range of Barometer Readings .... ,,	0·871	0·719
Highest Reading of Max. Therm.	82·2	74·2
Lowest ,, Min. Therm.	46·6	47·8
Range of Thermometer Readings	35·6	26·4
Greatest Range in 24 hours	28·6	20·7
Mean of all the highest Readings	65·7	67·3
Mean of all the lowest Readings	52·1	53·6
Mean Daily Range	13·6	13·7
Mean Temperature (deduced from Max. and Min.)...	58·2	59·4
Mean Temperature (deduced from Dry Bulb)	56·8	59·5
Adopted Mean Temperature	57·5	59·5
Mean Temperature of Evaporation	52·8	55·4
Mean Temperature of Dew-point	49·3	51·8
Mean Elastic force of Vapour ..... inches	0·352	0·385
Mean Weight of Vapour in a cubic foot of air...grains	4·0	4·3
Mean additional weight required for saturation ,,	1·1	1·4
Mean degree of Humidity	77	76
Mean Weight of a cubic foot of air ..... grains	535·3	530·3
Fall of Rain ..... inches	0·167	0·592
Number of days on which Rain fell	5	6
Mean amount of Cloud (an overcast sky = 10)	2·5	3·2
Total number of miles of Wind indicated	7181	7556
Mean Velocity of Wind per hour ..... miles	9·7	10·5

May—June.

Results of Observations taken during the month.	May.	June.
Mean Reading of Barometer ..... inches	30·012	29·986
Highest ,, ,, ,,	30·075	30·136
Lowest ,, ,, ,,	29·511	29·843
Range of Barometer Readings ..... ,,	0·564	0·293
Highest Reading of Max. Therm.	84·3	90·4
Lowest ,, Min. Therm.	51·1	58·8
Range of Thermometer Readings	33·2	31·6
Greatest Range in 24 hours	26·2	24·6
Mean of all the highest Readings	74·3	79·9
Mean of all the lowest Readings	58·2	64·8
Mean Daily Range	16·1	15·1
Mean Temperature (deduced from Max. and Min.)...	65·5	71·6
Mean Temperature (deduced from Dry Bulb)	64·5	70·6
Adopted Mean Temperature	65·0	71·1
Mean Temperature of Evaporation	59·7	65·6
Mean Temperature of Dew-point	55·3	61·5
Mean Elastic force of Vapour ..... inches	0·437	0·546
Mean Weight of Vapour in a cubic foot of air...grains	4·8	5·9
Mean additional weight required for saturation ,,	2·0	2·4
Mean degree of Humidity	72	71
Mean Weight of a cubic foot of air ..... grains	526·9	519·5
Fall of Rain ..... inches	—	—
Number of days on which Rain fell	—	—
Mean amount of Cloud (an overcast sky = 10)	2·6	1·4
Total number of miles of Wind indicated	6443	6828
Mean Velocity of Wind per hour .... miles	8·7	9·5

July—August.

Results of Observations taken during the month.	July.	August.
Mean Reading of Barometer ..... inches	30·039	29·947
Highest ,, ,, ,,	30·282	30·040
Lowest ,, ,, ,,	29·871	29·785
Range of Barometer Readings..... ,,	0·411	0·255
Highest Reading of Max. Therm.	94·8	103·9
Lowest ,, Min. Therm.	65·2	71·9
Range of Thermometer Readings	29·6	32·0
Greatest Range in 24 hours	24·7	28·7
Mean of all the highest Readings	87·3	92·0
Mean of all the lowest Readings	69·6	76·0
Mean Daily Range	17·7	16·0
Mean Temperature (deduced from Max. and Min.) ...	78·0	83·2
Mean Temperature (deduced from Dry Bulb)	77·5	83·1
Adopted Mean Temperature	77·8	83·1
Mean Temperature of Evaporation	70·7	75·6
Mean Temperature of Dew-point	65·7	70·5
Mean Elastic force of Vapour ..... inches	0·633	0·746
Mean Weight of Vapour in a cubic foot of air...grains	6·8	7·9
Mean additional weight required for saturation ,,	3·5	4·2
Mean degree of Humidity	66	66
Mean Weight of a cubic foot of air ..... grains	513·2	505·7
Fall of Rain ..... inches	0·050	0·350
Number of days on which Rain fell	1	1
Mean amount of Cloud (an overcast sky = 10)	0·4	1·5
Total number of miles of Wind indicated	4350	5664
Mean Velocity of Wind per hour ..... miles	5·8	7·6

September—October.

Results of Observations taken during the month.	September.	October.
Mean Reading of Barometer ..... inches	30·073	30·009
Highest ,, ,, ,,	30·325	30·270
Lowest ,, ,, ,,	29·837	29·591
Range of Barometer Readings ..... ,,	0·488	0·679
Highest Reading of Max. Therm.....	95·1	88·4
Lowest ,, Min. Therm.....	63·1	55·7
Range of Thermometer Readings	32·0	32·7
Greatest Range in 24 hours	22·9	20·9
Mean of all the highest Readings	84·0	76·4
Mean of all the lowest Readings	69·3	63·7
Mean Daily Range	14·7	12·7
Mean Temperature (deduced from Max. and Min.)...	75·7	69·0
Mean Temperature (deduced from Dry Bulb)	76·2	68·4
Adopted Mean Temperature	76·0	68·7
Mean Temperature of Evaporation	68·3	63·6
Mean Temperature of Dew-point	62·6	59·8
Mean Elastic force of Vapour ..... inches	0·568	0·514
Mean Weight of Vapour in a cubic foot of air...grains	6.2	5·6
Mean additional weight required for saturation ,,	3·6	1·9
Mean degree of Humidity	63	76
Mean Weight of a cubic foot of air ..... grains	515·8	523·0
Fall of Rain ..... inches	0·384	3·178
Number of days on which Rain fell	2	8
Mean amount of Cloud (an overcast sky=10).....	1·4	4·4
Total number of miles of Wind indicated.....	5730	6815
Mean Velocity of Wind per hour ..... miles	8·0	9·2

November—December.

Results of Observations taken during the month.	November.	December.	Year.
Mean Reading of Barometer ..... inches	30·047	30·110	30·009
Highest ,, ,, ,,	30·269	30·463	30·463
Lowest ,, ,, ,,	29·571	29·529	29·460
Range of Barometer Readings ..... ,,	0·698	0·934	1·003
Highest Reading of Max. Therm.....	76·9	·69·1	103·9
Lowest ,, Min. Therm.....	51·2	40·6	40·6
Range of Thermometer Readings	25·7	28·5	63·3
Greatest Range in 24 hours	18·4	17·9	28·7
Mean of all the highest Readings	68·3	60·5	73·0
Mean of all the lowest Readings	57·0	51·0	59·5
Mean Daily Range	11·3	9·5	13·5
Mean Temperature (deduced from Max. and Min.)	61·5	55·0	65·4
Mean Temperature (deduced from Dry Bulb)	61·1	54·7	65·0
Adopted Mean Temperature	61·3	54·9	65·2
Mean Temperature of Evaporation	57·5	50·4	59·9
Mean Temperature of Dew-point	55·0	47·0	56·0
Mean Elastic force of Vapour ... inches	0·433	0·323	0·449
Mean Weight of Vapour in a cubic foot of air ..... grains	4·9	3·6	5·1
Mean additional weight required for saturation ..... grains	1·2	1·1	2·0
Mean degree of Humidity	83	77	74
Mean Weight of a cubic foot of air...grs.	532·3	540·9	527·1
Fall of Rain ..... inches	3·801	2·355	15·486
Number of days on which Rain fell	9	12	63
Mean amount of Cloud (an overcast sky=10)	4·8	5·2	2·9
Total number of miles of Wind indicated	6980	8547	81911
Mean Velocity of Wind per hour	9·7	11·5	9·3

NOTES FOR THE SEPARATE MONTHS.

JANUARY.

DEW-POINT, highest 59·7° on the 17th, lowest 30·4° on the 20th.

The wind attained a velocity of 40 miles per hour on the 25th.

In Sunshine, highest 117·2° on the 30th.

On ground, lowest 33·8°on the 15th.

The sea fell from 63° to 60°.

A thunderstorm passed on the 16th, and hail fell on the 8th and 16th. On the 22nd there was a slight fog.

FEBRUARY.

Dew-point, highest 55·9° on the 21st, lowest 33·1° on the 14th.

Wind, highest 35 miles per hour from 8 a.m. to 3 p.m. on the 11th.

Sunshine, highest 126·0° on the 18th and 22nd.

On ground, lowest 37·4° on the 15th.

The sea fell to 58° on the 15th, but rose again to 62° on the 21st, and remained at 62° till the end of the month.

Hail fell on the 10th.

MARCH.

Dew-point, highest 56·7° on the 13th, lowest 40·8° on the 26th.

Wind, highest 37 miles per hour, 2 p.m. to 4 p.m., on the 19th.

Sunshine, highest 131·3 on the 11th, and 131·2° on the 22nd.

On ground, lowest 41·1° on 17th, and 41·9° on the 4th.

The sea fell from 62° to 61°.

APRIL.

Dew-point, the highest 59·0° on the 3rd, the lowest 42·2° on the 12th.

Wind, the highest averaged 26 miles per hour from 8 a.m. to 6 p.m. on the 7th.

In Sunshine the highest was 130·3° on the 19th.

On ground the lowest was 40·8° on the 2nd.

The sea rose from 61° to 64°.

A thunderstorm passed on the 11th, and lightning was seen on the 3rd, 4th, and 17th.

MAY.

Dew-point, the highest 64·4° on the 30th, the lowest 44·2° on the 16th.

Wind, the highest 31 miles per hour from 4 to 6 p.m. on the 5th.

Sunshine, the highest 138·0° on the 5th.

On ground the lowest 46·0° on the 18th.

The sea rose from 64° to 70°.

JUNE.

Dew-point, highest 69·1° on the 30th, lowest 50·6° on the 23rd.

Wind, highest 34 miles per hour from 8 a.m. to 3 p.m. on the 22nd.

Sunshine, highest 140·6° on the 19th, and 139.7° on the 27th.

The sea rose from 70° to 77°.

JULY.

Dew-point, the highest was 73·0° on the 5th, the lowest was 58·2° on the 12th.

Wind, the average velocity is unusually low.

In Sunshine 147·6° was reached on the 12th, add 147·2° on the 29th.

The sea has risen from 76° to 83°.

A thunderstorm passed on the 8th.

The total rainfall since July, 1884, is 17·382 inches.

The temperature rose above 90° on ten days during the month.

AUGUST.

Dew-point, the highest was 78·7° on the 30th, the lowest 57·4° on the 6th.

The temperature exceeded 100° on two days, the 3rd and the 8th.

The highest mean daily temperatures were 89·5 on the 8th, and 87·5° on the 6th.

In Sunshine 150·7° was reached on the 8th.

The sea rose to 85° and afterwards fell to 82°.

A thunderstorm passed on the 16th.

SEPTEMBER.

Dew-point, highest 70°·9 on the 7th, lowest 50.8° on the 30th.

Wind, highest 20 miles per hour, 8 a.m. to 4 p.m., on the 12th.

In Sunshine, highest 143·9° on the 8th.

On ground the lowest was 60·0° on the 14th.

The sea maintained a temperature of 78°.

A thunderstorm passed on the 9th.

OCTOBER.

Dew-point, the highest 70·4° on the 16th, the lowest 47·3° on the 30th.

The wind averaged 20 miles per hour from 8 a.m. on the 14th to 8 a.m. on the 15th, and from noon to 4 p.m. on the 25th and 30th.

Sunshine, 137·1° on the 2nd.

On ground, 49·5° on the 13th.

The sea fell from 78° to 73°.

Thunderstorms passed on the 7th, 10th, and 25th.

The maximum temperature on the 14th was reached after 8 p.m. during the night.

NOVEMBER.

Dew-point, the highest 65·0° on the 2nd, the lowest 48·8° on the 24th.

Sunshine, the highest 126·0° on the 23rd.

On ground the lowest 46·0° on the 1st.

The sea fell from 73° to 66°.

Thunderstorms passed on the 4th, 7th, 21st, and 23rd.

Total rainfall since June 7·763 inches; last year it amounted to 7·099 inches.

DECEMBER.

Dew-point, the highest was 59·5° on the 9th, the lowest 32·7° on the 15th.

In Sunshine the highest was 118·7° on the 2nd.

On ground the lowest was 34·8 on the 14th.

The sea fell from 66° to 61°.

A thunderstorm passed on the 15th.

Hail fell on the 11th and 15th.

Total rainfall since June 10·118 inches; last year it measured 11·964 inches.

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