STONYHURST COLLEGE OBSERVATORY.

RESULTS

OF

METEOROLOGICAL, MAGNETICAL,

AND

SOLAR OBSERVATIONS

BY THE

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

1891.

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Stonyhurst Observatory.

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

METEOROLOGICAL REPORT.

JANUARY, 1891.

Results of Observations taken during the Month.		Mean for the last 44 Years.
Mean Reading of the Barometer	29·658	29·439
Highest ,, on the 14th	30·299	30·290
Lowest ,, on the 20th	28·927	28·570
Range of Barometer Readings	1·372	1·720
Highest Reading of a Max. Therm. on the 29th	50·4	51·6
Lowest Reading of a Min. Therm. on the 17th	11·0	20·9
Range of Thermometer Readings	39·4	30·7
Mean of all the Highest Readings	40·7	42·3
Mean of all the Lowest Readings	28·5	32·6
Mean Daily Range	12·2	9·7
Deduced Monthly Mean (from Mean of Max. and Min.)	34·4	37·1
Mean Temperature from dry bulb	34·4	37·1
Adopted Mean Temperature	34·4	37·1
Mean Temperature of Evaporation	33·1	36·0
Mean Temperature of Dew Point	30·9	33·8
Mean elastic force of Vapour	0·173in	0·221in
Mean weight of Vapour in a cubic foot of air	2·1gr	2·4gr
Mean additional weight required for saturation	0·3gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·86	0·86
Mean weight of a cubic foot of air	556·8gr	544·4gr
Fall of Rain	3·137in	4·182in
Number of days on which Rain fell	15	19·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	9	0	0	3	8	8	1
Mean Velocity in miles per hour	9·2	3·9	0	0	6·2	12·1	9·0	13·0
Total No. of miles for each Direction	430	832	0	0	447	2331	1723	313

The total number of miles registered during the month was 6076.

The max. Velocity of the mind was 39 miles per hour. Direction S. on the 30th at 4 a.m.

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

In the month of January, the highest reading of the Barometer during 44 years, was on the 18th, in 1882, and was ..... 30·480

The lowest ,, ,, 26th, 1884.... 27·803

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

The Lowest ,, ,, 15th, 1881.... 4·6

The highest adopted mean temperature of the month .. .. .. 1875.... 42·5

The lowest ,, ,, 1881.... 29·2

The readings of the Barometer were generally high until the 20th, when a rapid fall took place, and the lower pressure lasted to the end of the month. The month was colder than usual, the mean temperature being 2°·7 below the average. The rain was less by $\frac{1}{4}$th of the average, and fell mostly during the latter part of the month. Snow fell on the 4th, 5th, and 16th, but hardly enough to measure; more fell on the 19th, 21st, and 22nd, but there was no heavy fall. The 26th and 31st were the only days without frost on the ground. Fog prevailed on the 3rd, 12th, 13th, and 29th.

FEBRUARY, 1891.

Results of Observations taken during the month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·997	29·513
Highest ,, on the 4th	30·286	30·063
Lowest ,, on the 26th	29·496	28·702
Range of Barometer Readings	0·790	1·361
Highest Reading of a Max. Therm. on the 27th	56·0	52·0
Lowest Reading of a Min. Therm. on the 19th	25·2	22·8
Range of Thermometer Readings	30·8	29·2
Mean of all the Highest Readings	48·6	44·3
Mean of all the Lowest Readings	33·7	33·7
Mean Daily Range	14·9	10·6
Deduced Monthly Mean (from Mean of Max. and Min.)	40·7	38·4
Mean Temperature from dry bulb	39·5	38·3
Adopted Mean Temperature	40·1	38·3
Mean Temperature of Evaporation	38·4	36·9
Mean Temperature of Dew Point	36·2	34·7
Mean elastic force of Vapour	0·214in	0·193in
Mean weight of Vapour in a cubic foot of air	2·5g	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	556·5gr	548·8gr
Fall of Rain	0·614 in	3·434in
Number of Days on which rain fell	7	17·0

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	1	9	0	0	1	3	13	1
Mean Velocity in miles per hour	5·1	6·7	0	0	7·0	4·3	8·6	5·1
Total No. of miles for each direction	112	1288	0	0	157	313	2696	113

The total number of miles registered during the month was 4679. The max. Velocity of the wind was 35 miles per hour. Direction W. by S. at 7 p.m. on the 11th.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			6·6
In the month of February, the highest reading of the Barometer during 44 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

The mean reading of the barometer is the highest on record, and the range was very small; showing that a continuously high pressure was maintained throughout the month. The rainfall was only one-fifth of the average amount, and the temperature was nearly two degrees above the average, although there were only only ten days without ground frost. Fog on the 4th and 20th.

MARCH, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·366	29·467
Highest ,, on the 3rd ..	29·901	30·081
Lowest ,, on the 15th ..	28·761	28·687
Range of Barometer Readings	1·140	1·394
Highest Reading of a Max. Therm. on the 22nd	53·2	56·8
Lowest Reading of a Min. Therm. on the 11th	20·1	22·5
Range of Thermometer Readings	33·1	34·3
Mean of all the Highest Readings	45·2	47·0
Mean of all the Lowest Readings	31·3	34·1
Mean Daily Range	13 9	12·9
Deduced Monthly Mean from Mean of Max. and Min.	37·5	39·7
Mean Temperature from Dry Bulb.....	38·6	39·9
Adopted Mean Temperature.....	38·1	39·8
Mean Temperature of Evaporation.....	35·7	37 9
Mean Temperature of Dew Point	32·5	35·3
Mean elastic force of Vapour	0·160in	0·205in
Mean weight of Vapour in a cubic foot of air	2·1gr	2·4gr
Mean additional weight required for saturation	0·6gr	0·5gr
Mean degree of Humidity (saturation 1·00)	0·80	0·85
Mean weight of a cubic foot of air	540·8gr	546·6gr
Fall of rain	1·926in	3·154in
Number of Days on which rain fell	12	17·7

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	6	6	1	1	0	8	5	4
Mean Velocity in miles per hour	8·9	8·0	3·2	10·4	0	18·9	23·3	10·1
Total No. of miles for each Direction	1284	1159	76	250	0	3620	2800	970

The total number of miles registered during the month was 10159.
The max. Velocity of the wind was 39 miles per hour. Direction W. by S, on the 4th, at 3 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			8·0
In the month of March, the highest reading of the Barometer during 44 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 ,,	,,	6th, 1886..	11·5
The highest adopted mean temperature of the month,		1871..	44·0
The lowest ,,	,,	1855..	35·6

The high barometric pressure of the last month continued till the 5th of March, and rain fell during these first days of the month. The following depression was a cold dry current, and no rain fell till the 15th, when the mercury suddenly dropped to the lowest reading of the month. The total rainfall was less than usual by one-third of the average amount

Hail fell with north westerly winds on the 2nd, 8th, 23rd, 25th, and 27th.

Snow on the 3rd, 8th, 14th, 26th, and 27th.

Thunder with hail and snow on the 26th.

Aurora Borealis on the 16th.

APRIL, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·566	29·477
Highest ,, on the 20th	29·943	29·962
Lowest ,, on the 30th	29·024	28·783
Range of Barometer Readings	0·919	1·179
Highest Reading of a Max. Therm. on the 27th	56·9	65·9
Lowest Reading of a Min. Therm. on the 17th	27·1	28·3
Range of Thermometer Readings	29·8	37·6
Mean of all the Highest Readings	50·5	55·8
Mean of all the Lowest Readings	34 3	37·8
Mean Daily Range	16·2	18·0
Deduced Monthly Mean (from Mean of Max. and Min.	40·9	44·3
Mean Temperature from dry bulb	42 2	44·4
Adopted Mean Temperature	41·6	44·4
Mean Temperature of Evaporation	38·3	41·6
Mean Temperature of Dew Point	34·2	38·1
Mean elastic force of Vapour	0·211 in	0·235in
Mean weight of Vapour in a cubic foot of air	2·3 gr	2·7gr
Mean additional weight required for saturation	0·8gr	0·7gr
Mean degree of Humidity (saturation 1·00)	0·76	0·80
Mean weight of a cubic foot of air	547 0gr	542·0gr
Fall of rain	2·116in	2·303in
Number of days on which Rain fell	11	14 7

	N	NE	E	SE	S	SW	W	NW
No of days in the month on which the prevailing wind was	4	13	4	2	0	3	2	2
Mean Velocity in miles per hour	79	8·7	14·8	7·1	0	3·0	15·5	5·6
Total No. of miles for each Direction	759	2707	1414	340	0	711	745	270

The total number of miles registered during the month was 6946. The max. Velocity of the wind was 36 miles per hour. Direction W.S.W. on the 16th, at 2 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 44 years, was on the	17th,	in 1887, and was....	30·251
The lowest ,,	,,	20th, 1868....	28·358
The highest Temperature ,,		14th, 1852....	74·1
The lowest ,,	,,	4th, 1885....	21·1
The highest adopted mean temperature of the month,		1865....	48·5
The lowest ,,	,,	1879....	40·7

The character of the weather, as illustrated by rainfall, and barometric pressure is almost the reverse of that of the last month. The pressure was low during the first seven days, and the last four days, and the rain was confined to these days of low pressure, excepting the 15th, when there was a fall of ·08 inch with a high and steady barometer. The month was generally cold, with ground frost on 20 days, snow on the 2nd and 8th, and fog on the 15th.

MAY, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·356	29·501
Highest ,, on the 12th	29·850	29·937
Lowest ,, on the 1st	28·921	28·930
Range of Barometer Readings	0·929	1·007
Highest Reading of a Max. Therm. on the 12th	75·6	71·9
Lowest Reading of a Min. Therm. on the 17th	24·9	31·3
Range of Thermometer Readings	50·7	40·6
Mean of all the Highest Readings	57·8	59·6
Mean of all the Lowest Readings	39·9	42·1
Mean Daily Range	17·9	17·5
Deduced Monthly Mean (from Mean of Max. and Min.	47·2	49·0
Mean Temperature from dry bulb	47·5	49·5
Adopted Mean Temperature	47·4	49·3
Mean Temperature of Evaporation	43·6	46·0
Mean Temperature of Dew Point	39·4	42·5
Mean elastic force of Vapour	0·241in	0·276in
Mean weight of Vapour in a cubic foot of air	2·8gr	2·2gr
Mean additional weight required for saturation	1·0gr	0·9gr
Mean degree of Humidity (saturation 1·00)	0·75	0·76
Mean weight of a cubic foot of air	536·6gr	537·0gr
Fall of Rain	3·097in	2·558in
Number of days on which Rain fell	18	15·3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	6	7	1	2	4	7	1	3
Mean Velocity in miles per hour	6·2	9·7	10·9	10·7	12·7	10·7	8·0	10·4
Total No. of miles for each Direction	894	1645	262	512	1226	1799	193	752

The total number of miles registered during the month was 7283.
The max. Velocity of the wind was 28 miles per hour. Direction W. by N., on the 2nd, at 1 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			7·3
In the month of May, the highest reading of the Barometer during 44 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

The barometer showed a changing pressure during the first half of the month, between high and low readings, and remained low from the 15th to the end of the month. A steady rise set in on the 28th, which continued through the greater part of June. The changes of temperature were considerable as shown by the great range of 10° above the average. The warmest parts of the month were from the 10th to the 14th with a high and rising barometer, and from the 27th to the 31st with a low and rising barometer. The cold period began with the 15th and lasted to the 25th; with ground frost on five days, and snow on the 16th and 17th. Hail on the 15th. Thunder on the 15th, 20th, and 23rd.

JUNE, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·625	29·539
Highest ,, on the 12th	29·977	29·886
Lowest ,, on the 29th	29·176	29·034
Range of Barometer Readings	0·801	0·852
Highest Reading of a Max. Therm. on the 19th	77·9	76·9
Lowest Reading of a Min. Therm. on the 10th	35·0	38·9
Range of Thermometer Readings	42·9	38·0
Mean of all the Highest Readings	68·0	65·7
Mean of all the Lowest Readings	48·3	47·9
Mean Daily Range	19·7	17·8
Deduced Monthly Mean (from Mean of Max. and Min.)	56·4	54·9
Mean Temperature from dry bulb	56·3	55·0
Adopted Mean Temperature	56·4	55·0
Mean Temperature of Evaporation	52·3	52·0
Mean Temperature of Dew Point	48·5	48·6
Mean elastic force of Vapour	0·343 in	0·356in
Mean weight of Vapour in a cubic foot of air	3·9gr	3·9gr
Mean additional weight required for saturation	1·2gr	0·9gr
Mean degree of Humidity (saturation 1·00)	0·75	0·79
Mean weight of a cubic foot of air	531·3gr	542·4gr
Fall of rain	1·479 in	3·626in
Number of Days on which Rain fell	12	16 2

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	9	0	1	4	7	2	0
Mean Velocity in miles per hour	8·5	12·3	0	7·9	13·5	7·2	13·4	0
Total No. of miles for each Direction	1432	2659	0	189	1297	1216	641	0

The total number of miles registered during the month was 7434
The max. Velocity of the wind was steady at 25 miles per hour, from noon to 3 p.m., on the 3rd. Direction N.E. by E. at noon, E.N.E. at 1, 2, and 3 p.m.

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 44 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

The steady rise of the barometer, which began on the 28th of last month, continued with small variations to the 12th. The pressure remained generally high from 11th to the 24th, and was above the annual mean on all the days except the 2nd, 4th, and the last four days of the month. The rainfall was less than half the average amount.

A fine solar halo was seen on the 9th, with the colours very distinct; and another, but less coloured on the 19th; and both were followed by fine sunny weather.

Thunder on the 24th and 25th.

JULY, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·481	29·501
Highest ,, on the 14th	29·917	29·876
Lowest ,, on the 7th	28·996	28·993
Range of Barometer Readings	0·921	0·883
Highest Reading of a Max. Therm. on the 17th	77·1	78·8
Lowest Reading of a Min. Therm. on the 31st	44·1	42·0
Range of Thermometer Readings	33·0	36·8
Mean of all the Highest Readings	67·0	67·8
Mean of all the Lowest Readings	50·3	50·7
Mean Daily Range	16·7	17·1
Deduced Monthly Mean (from Mean of Max. and Min.)	56·8	57·7
Mean Temperature from dry bulb	56·9	57·8
Adopted Mean Temperature	56·9	57·8
Mean Temperature of Evaporation	53·6	54·8
Mean Temperature of Dew Point	50·5	52·2
Mean elastic force of Vapour	0·368in	0·390in
Mean weight of Vapour in a cubic foot of air	4·1gr	4·5gr
Mean additional weight required for saturation	1·1gr	1·0gr
Mean degree of Humidity (saturation 1·00)	0·79	0·82
Mean weight of a cubic foot of air	528·1gr	527·3gr
Fall of Rain	3·143in	4·257in
Number of days on which Rain fell	18	18·2

No. of days in the month of which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	0	0	1	4	16	5	3
Mean Velocity in miles per hour	6·3	0	0	9·0	8·0	9·5	13·0	9·0
Total No. of miles for each Direction	304	0	0	216	759	3664	1561	641

The total number of miles registered during the month was 7145. The max. Velocity of the wind was 25 miles per hour. Direction W. by S., on the 27th, at 2 p.m., and the same velocity, direction W.S.W., on the 28th, at 4 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0		8·2
In the month of July, the highest reading of the Barometer during 44 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 ,,	,, 1888....	54·5

The barometer was generally unsteady throughout the month, and represented a series of short atmospheric waves. The rainfall was less by one-quarter of the average amount. Thunder on the 6th, 8th, 17th, 21st, and 30th.

AUGUST, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·309	29·487
Highest ,, on the 7th ..	29·668	29·885
Lowest ,, on the 26th..	28·592	28·950
Range of Barometer Readings	1·076	0·935
Highest Reading of a Max. Therm. on the 18th	69·2	77·0
Lowest Reading of a Min. Therm. on the 29th	40·8	41·4
Range of Thermometer Readings.....	28·4	35·6
Mean of all the Highest Readings	64 2	67·1
Mean of all the Lowest Readings.....	49·9	50·4
Mean Daily Range	14·3	16·7
Deduced Monthly Mean (from Mean of Max. and Min.)	55·4	57·1
Mean Temperature from dry bulb	55·7	57·5
Adopted Mean Temperature.....	55·6	57·3
Mean Temperature of Evaporation.....	53·2	54·5
Mean Temperature of Dew Point.....	51·0	51·8
Mean elastic force of Vapour.....	0·375 in	0·388in
Mean weight of Vapour in a cubic foot of air	4·2gr	4 3gr
Mean additional weight required for saturation	0·8gr	0·9gr
Mean degree of Humidity (saturation 1·00)..	0·85	0·82
Mean weight of a cubic foot of air.....	526·3gr	525·1gr
Fall of Rain	9·869 in	4·922in
Number of days on which Rain fell.....	27	19 0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	0	0	2	4	17	3	2
Mean Velocity in miles per hour	7·2	0	0	10·6	11·9	10·9	9 9	4·2
Total No. of miles for each Direction.	518	0	0	507	1118	4466	713	201

The total number of miles registered during the month was 7523. The max. Velocity of the wind was 42 miles per hour. Direction S.W., on the 26th, at 6 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			9·0
In the month of August, the highest reading of the Barometer during 44 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	,,	,, 13th, 1887....	33·4
The highest adopted mean temperature of the month, 1857 & '84			61·0
The lowest	,,	,, 1848....	52·5

The Barometer was very unsteady throughout the month, and generally low. The rainfall was quite double the average, and is the greatest recorded fall for August. There were only four rainless days; the 6th and 16th with a comparatively high and rising barometer, the 18th with a low and falling barometer, and the 22nd with a low rising barometer. The heaviest rain was 1·8 inch on the 13th, with a comparatively high barometer. Thunder on the 2nd, 4th, 10th, 21st, 28th, and 29th.

SEPTEMBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·498	29·516
Highest ,, on the 16th	29·823	30·028
Lowest ,, on the 1st	28·747	28·845
Range of Barometer Readings	1·076	1·183
Highest Reading of a Max. Therm. on the 10th	79 1	72·5
Lowest Reading of a Min. Therm. on the 2nd	42·2	36·5
Range of Thermometer Readings	36·9	36 0
Mean of all the Highest Readings	63·8	62·2
Mean of all the Lowest Readings	49·8	47·1
Mean Daily Range	14·0	15 1
Deduced Monthly Mean (from Mean of Max. and Min.)	55·5	53·4
Mean Temperature from dry bulb	56·2	54·1
Adopted Mean Temperature	55·9	53·8
Mean Temperature of Evaporation	52·1	51·0
Mean Temperature of Dew Point	48·5	48·4
Mean elastic force of Vapour	0·344in	0·340in
Mean weight of Vapour in a cubic foot of air	3·8gr	4·0gr
Mean additional weight required for saturation	1·2gr	0·8gr
Mean degree of Humidity (saturation 1·00)	0·77	0·82
Mean weight of a cubic foot of air	529·5gr	532·4gr
Fall of Rain	5·003in	4·608in
Number of days on which Rain fell	19	18·0

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	1	6	0	0	5	10	7	1
Mean Velocity in miles per hour	10·4	5·2	0	0	9·6	14·0	10·5	17·3
Total No. of miles for each Direction	250	748	0	0	1157	3364	1766	415

The total number of miles registered during the month was 7700.
The max. Velocity of the wind was 43 miles per hour, Direction S.W., on the 1st at 3 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)		7·1
In the month of September, the highest reading of the Barometer during 44 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, and 30th, 1888..	29·8
The highest adopted mean temperature of the month, 1865		59·1
The lowest	,, ,, 1863	50·9

The barometer showed a steady rise from its lowest reading on the 1st to the 11th, with the exception of a sudden dip between the 5th and 6th; and was very unsteady throughout the rest of the month. The rainfall was a little above the average, and the heaviest rains were between the 5th and 6th, and between the 19th and 20th, with sudden falls of the barometer. The mean temperature was 2° above the average and a little above the mean temperature of last month. Hail on the 2nd.

OCTOBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·270	29·425
Highest ,, on the 31st	30 286	30 014
Lowest ,, on the 13th	28 242	28·648
Range of Barometer Readings	2·044	1·366
Highest Reading of a Max. Therm. on the 9th	62·8	64·3
Lowest Reading of a Min. Therm. on the 24th	29·8	29 3
Range of Thermometer Readings	33 0	35·0
Mean of all the Highest Readings	55·7	54·5
Mean of all the Lowest Readings	41·2	41·8
Mean Daily Range	14·5	12·7
Deduced Monthly Mean (from Mean of Max. and Min.	47·5	47·2
Mean Temperature from dry bulb	47·7	47·8
Adopted Mean Temperature	47·6	47·6
Mean Temperature of Evaporation	45·1	45 3
Mean Temperature of Dew Point	42·4	42·9
Mean elastic force of Vapour	0 270in	0 276in
Mean weight of Vapour in a cubic foot of air	3·1gr	2·9gr
Mean additional weight required for saturation	0 7gr	0·6gr
Mean degree of Humidity (saturation 1·00)	0·83	0·84
Mean weight of a cubic foot of air	534·6gr	540·4gr
Fall of Rain	3·900in	5·014in
Number of days on which Rain fell	20	21·9

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	1	6	1	2	9	9	3	0
Mean Velocity in miles per hour	3·9	8·2	11·1	17·7	17·2	11·3	11·1	0
Total No. of miles for each Direction	93	1187	286	851	3711	2450	796	0

The total number of miles registered during the month was 9374.
The max. Velocity of the wind was 51 miles per hour ; direction S.S.E. on the 13th at 5 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0			7·0
In the month of October, the highest reading of the Barometer			
during 44 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, and 1st, 1888	23·1
The highest adopted mean temperature of the month,		1861 & '76	51·6
The lowest ,,	,,	1880....	43·1

The readings of the barometer were generally low, notably between the 5th and 24th. They were below 29 in. on 10 days of the month, and oscillated almost daily until the 21st, when a very steady rise commenced from 28, 7 to 30, 3 inches on the 31st. The lowest reading of the barometer on the 13th was reached at 5 p.m., by a rapid fall of 0·7 inches in eight hours. It was followed by a heavy rainfall on the 14th. The weather was fine, dry, and cold, with the rising barometer of the last week of the month.

Thunder on the 12th and 14th. Hail on the 14th. Ground frost on four days.

NOVEMBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·379	29·307
Highest ,, on the 5th	30·265	30·051
Lowest ,, on the 11th	27·938	28·557
Range of Barometer Readings	2·327	1·494
Highest Reading of a Max. Therm. on the 18th	54·2	55·6
Lowest Reading of a Min. Therm. on the 26th	23·0	25·2
Range of Thermometer Readings	31·2	30·4
Mean of all the Highest Readings	47·3	46·9
Mean of all the Lowest Readings	35·9	36·2
Mean Daily Range	11·4	10·7
Deduced Monthly Mean (from Mean of Max. and Min.	41·2	41·2
Mean Temperature from dry bulb	40·8	41·5
Adopted Mean Temperature	41·0	41·4
Mean Temperature of Evaporation	39·7	39·0
Mean Temperature of Dew Point	38·0	37·7
Mean elastic force of Vapour	0·229 in	0·227 in
Mean weight of Vapour in a cubic foot of air	2·6gr	2·6gr
Mean additional weight required for saturation	0·4gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·90	0 87
Mean weight of a cubic foot of air	544·3gr	544·9gr
Fall of Rain	4·510 in	4·304 in
Number of days on which Rain fell	18	19·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	7	3	1	6	4	3	1
Mean Velocity in miles per hour	3·1	7·0	15·1	17·6	11·2	10·6	4·9	0·8
Total No. of miles for each Direction	376	1174	1090	422	1612	1020	352	19

The total number of miles registered during the month was 6365. The max. Velocity of the wind was 42 miles per hour. Direction S.W. by W. on the 11th at 4 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0	9·0
In the month of November, the highest reading of the Barometer during 44 years, was on the 12th, in 1857, and was....	30·350
The lowest ,, ,, 11th, 1891....	27·938
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

The high barometric pressure reached at the end of last month, was maintained through the first week, with small variations not falling below 30 inches. But the decline began on the 5th, and the mercury stood at 29·0 at 9 a.m. on the 9th, having fallen one inch in two days. It then halted for over 30 hours, with a gentle rise before the storm of the 11th. The following table shows the atmospheric disturbance before and during the gale.

		Barometer	Wind	
Nov. 9	9 p.m.	28·92	light S.W.	steady
,, 10	9 a.m.	29·06	,,	,,
,,	11 a.m.	29·11	,,	backing at 3 p.m.
,,	4 p.m.	29·06	,, S.	backing
,,	9 p.m.	28·90	,, E.S.E.	backing
,,	11 p.m.		fresh g E.	
,,	1 p.m.		steady	half gale from E. till 6 a.m.
,, 11	9 a.m.	28·05	falling E.	backing at 11 a.m.
,,	1 p.m.	27·94	light N.E.	backing
,,	2 p.m.		gale W.N.W.	slowly backing
,, 12	9 a.m.	28·91	breeze S.S.W.	11 a.m. calm

The gale opened suddenly and synchronously with the beginning of a very rapid rise of the barometer, and held on, slowly falling and slowly backing to a S.W. fresh breeze at 2 a.m of the 12th.

DECEMBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer	29·431	29·458
Highest ,, on the 21st..	30·218	30·071
Lowest ,, on the 10th..	28·387	28·599
Range of Barometer Readings.....	1·851	1·472
Highest Reading of a Max. Therm. on the 3rd	57·0	53·0
Lowest Reading of a Min. Therm. on the 24th	14·0	20·2
Range of Thermometer Readings	43·0	32·8
Mean of all the Highest Readings	44·5	42·9
Mean of all the Lowest Readings	31·8	32·9
Mean Daily Range	12·7	10 0
Deduced Monthly Mean (from Mean of Max. and Min.)	38·2	37·9
Mean Temperature from dry bulb.....	38·2	38·6
Adopted Mean Temperature.....	38·2	38·3
Mean Temperature of Evaporation	36·9	36·7
Mean Temperature of Dew Point	35·1	34·9
Mean elastic force of Vapour	0·240 in	0·205in
Mean weight of Vapour in a cubic foot of air	2·4gr	2·4gr
Mean additional weight required for saturation	0·4gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·89	0·87
Mean weight of a cubic foot of air	547·9 gr	540·6gr
Fall of Rain	8·712in	5·299in
Number of days on which Rain fell.....	20	9·2

	N	NE	E	SE	S	SW	W	NW
No. of days in the month on which the prevailing wind was	4	1	1	0	5	10	7	1
Mean Velocity in miles per hour	2·6	2·3	16·0	0	14·2	15·0	14·7	0·3
Total No. of miles for each Direction.	267	55	373	0	1701	3602	2562	8

The total number of miles registered during the month was 8568. The max. Velocity of the wind was 46 miles per hour. Direction W. at midnight on the 11th. Calm on the 24th and 25th.

Mean amount of Cloud (an overcast sky being indicated by 10·0			6·6
In the month of December, the highest reading of the Barometer during 44 years, was on the	22nd	in 1849, and was	30·378
The lowest	,,	,, 8th, 1886....	27·350
The highest Temperature	,,	9th, 1876....	58·1
The lowest	,,	,, 24th, 1860....	6·7
The highest adopted mean temperature of the month,		1857	44·6
The lowest	,,	,, 1878....	30·3

The barometer was very unsteady between 6th and 14th, changing half an inch daily. An extra depression began on the 9th, accompanied with rough and wet weather. It reached the lowest reading of the month at 9 p.m. of the 11th, and the wind freshened to a gale, which registered its maximum velocity of 48 miles per hour between 1 and 2 a.m, while the mercury was making its most rapid rise. A sudden shift of the wind during the breeze of the 9th and 10th from S.W. to N.W. was coincident with a rise of the barometer of 0·06 inch in about 6 minutes at 4-20 a.m. The rainfall was great, and was over half-an-inch on the 5th, 9th, 12th, 13th, 15th, 28th and 30th.

Summary of Observations

FOR 1891.

		Mean for the last 44 years
Mean Reading of the Barometer	29·513	29·487
Highest ,, on January 14th...	30·299	30·279
Lowest ,, on November 11th...	27.938	28·261
Range of Barometer Readings..... ..	2·361	2·018
Highest Reading of a Max. Therm. on Sep. 10th	79·1	81·4
Lowest Reading of a Min. Therm. on Jan. 17th	11·0	15·6
Range of Thermometer Readings.....	68·1	65·8
Mean of all the Highest Readings.....	54·4	54·7
Mean of all the Lowest Readings.....	39·6	40·7
Mean Daily Range	14·8	14·0
Deduced yearly Mean (from Mean of Max & Min)	46·0	46·8
Mean Temperature of dry bulb.....	46·2	46·7
Adopted Mean Temperature.....	46·1	46·8
Mean Temperature of Evaporation.....	43·6	44·5
Mean Temperature of Dew Point.....	40·6	42·2
Mean elastic force of Vapour.....	0.264 in	0·273in
Mean weight of Vapour in a cubit foot of air	3·0gr	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 cubit foot of air.....	539·9grs	539·6grs
Total fall of rain in the Year	48·506 in	47·154in
Number of days per Month on which Rain fell	16·4	18·1

The Maximum monthly mean height of the Barometer was in February, 1891, and was .... 29·997
The Minimum ,, ,, in December, 1868, and was... 28·984
The Maximum yearly mean height of the Barometer was in 1887, and was .... 29·582
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 44 years, was on January 18th, 1882, and was .....30·480
The lowest ,, ,, on December 8th, 1886, and was27·350
Extreme range ..... 3·130
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 ....13·437in
The least ,, ,, ,, March, 1852... 0·047
The greatest number of days on which rain fell in one month } July, 1861, Dec. 1868 31
The least ,, ,, ,, March, 1852... 3

	N	NE	E	SE	S	SW	W	NW
No. of days in the year on which the prevailing wind was.....	42	73	11	12	45	102	59	19
Mean Velocity in miles per hour	6·7	7·7	13·3	11·4	12·2	11·7	11·7	8·1
Total No. of miles for each Direction.....	6719	13454	3501	3287	13185	28556	16548	3702

The total No. of miles registered during the year was 88·952.

The max. Velocity of the wind was 51 miles per hour; direction S.S.E., at 5 p.m., on October 13th.

DATES OF OCCASIONAL PHENOMENA.

1891.	Frost	Hoar Frost	Snow	Hail
January	1—26, 27—31	6	4, 5, 16, 19, 21, 22	4, 21, 22
February	1—3, 9, 12, 13, 15—30	18, 19, 25—27		
March	3, 7—24, 26, 27, 29—31	30, 31	3, 8, 14, 15, 26, 27	2, 8, 23, 26, 27
April	1, 2, 7, 8, 11—15, 17—30	17	2, 8	
May	16—21, 22		16, 17	15
June	11			
July				
August				
September				2
October	24, 25, 27, 29—31	23, 28, 29		14, 17
November	10, 14, 18, 22—30	22, 29	26	9, 26
December	8, 12, 15—29	16, 19, 20, 24	11, 12	11, 29, 31

DATES OF OCCASIONAL PHENOMENA.

(Continued).

1891.	Heavy Rain	Fog	Thunder	Lightning	Lunar Halo	Solar Halo
January	24	3, 12, 13, 29				
February		4, 20				
March			26			
April	29	15				
May			15, 20, 23			
June			24, 25	24		9, 19
July	6, 21		6, 8, 17, 21			
August	2, 8, 13, 24, 25, 27		4, 10, 21, 28, 29	2	23	
September	5, 19					
October	14, 18		12, 14	17	15	
November		24, 26, 27			13, 14, 17	
December	5,9,12,13,15,28,30	15, 23, 24, 25	27	27	14	

A Lunar Rainbow was seen at 7-0 p.m. on November 17th.
Aurora Borealis was seen at 10-30 p.m. on March 16th.
" " " 8-30 p.m. on November 21st.

SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in Each Month.

1891	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings, 10¼ inches to diameter.	Other Drawings and Notes.	Entire Chromosphere Measured,	Chromosphere partially measured.	Spot spectra observed.
January	16	51·1	7	6	1		
February	19	73·7	8	5	5		
March ..	23	92·7	5	8			
April	25	101·4	5	3	1		
May	27	159·3	12	1	3		
June	27	189·0	16		6		
July	30	149·9	13		4		
August ..	24	88·4	8		2		2
Septemb'r	27	128·5	17		7		6
October	28	111·4	17		7	1	
Novemb'r	15	18·5	8				
Decemb'r	16	23·4	9		2	1	
Totals ..	277	1187·3	125	23	38	2	8

Dates of Solar Drawings, of Notes, of Observations of Chromosphere, and of Spot Spectra.

The figures express, in hundredths of a day, the Greenwich Civil time at which the drawing was made.
c denotes chromosphere, *s* spot spectra.

1891	January.	February.	March.	April.	May.	June.	July.	August.	Septem.	October.	Novem.	Decem.
1		·50,c			·44		·39					
2	·42							·70	·68,c			·58
3					·40	·66			·35,c,s			
4					·39,c		·43,c		·41,c,s	·45		
5	·40											
6						·39	·50		s			
7					·50				·42,c,s	·34		
8					·41	·66,c	·78			·45		
9			·40			·41,c	·48		·48	·42		·38
10				·56	·52	·34,c	·71	c	·40,c		·35	
11					·51	·44,c		·76	·45			
12		·59			·48,c	·68,c			·38	·35,c	·59	
13	c				·37,c		·72		·43,c			
14					·40	·74	·65		·74	·34		·45,c
15		·49,c				·77			·64			
16					·38	·68	·72			·34,c		
17	·55						c					
18	·53	·60,c			·44		·66	·33,c,s		·53		
19		·56				·46				·52	·38	
20				·44		·38,c				·33		·47
21	·60	·62				·50		·66		·42,c	·47	·46,c
22			·50							·34		·50
23		·60		·36		·44	·72		·33,s		·60	
24							·59			c		
25		·61,c							·65	·45	·38	
26				·36				·53	·38			
27	·56	c		·44		·76	·64,c			·35,c		·45,c
28				c				·75	·40,c,s	·35,c		·48
29			·73			·34	c	·70	·68	·35,c	·46	
30			·49					·37,s	·38	·51,c	·46	·55
31	·58		·41									

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	1·5	0	0·6	5·4	2·8	2·2	0	0	0	0	0	4·0	5·0	0 6	0	5·0
February	6·6	0	0	0	0·3	0	0	0	2·0	0	0·6	5·1	1·0	0	7·1	1·0	0
March	0	4·5	4·0	0	0	0	2·2	4·0	6·1	1·3	7·7	7·9	2·4	0	0	0	0·6
April	4·2	0	2·7	0	0·1	0	3·7	0	4·4	2·5	4·2	2·2	4·0	4·6	4·1	5·0	11·8
May	0·5	9·9	1·1	13·3	0	8·4	4·6	5·6	0	2·7	7·3	14·0	9·2	5·2	2·8	6·9	7·9
June	13·1	0	6 0	0·1	2·1	7·3	0·2	8·2	7·2	13·0	15·0	12·5	3·5	2·8	4·9	9·2	0
July	4·6	6·2	11·3	13·0	0·8	4·5	1·5	8·5	3·9	7·7	0	0·1	6·6	6·9	3·2	2·7	10·5
August	0	9·3	2·0	4·1	0·8	5·5	0·7	0·1	1·2	5·6	0	5 0	3·7	0	5·3	2·1	2·0
September	3·5	5·6	8·5	6·7	0·9	3 9	10·1	0·3	7·9	11·1	7.2	10·0	9·1	2·3	4·9	0	0
October	0	4·6	3·0	6·1	1·6	0	5·1	5·9	4·4	0	0·7	4·1	0·1	2·5	1·4	4·6	3·1
November	0·2	1·1	0	0·1	0	0	0	0	0·6	0·5	0	2·2	0	0	0	0	1·8
December	0	1·1	0	1·1	0	1·6	0	1·4	0.9	0	0·7	0	0	3·0	0	0·4	1·4

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.	Per centage each month.
January.....	4·2	0	0	4·0	3·0	0	0	2·5	0	3·3	0	0	2·4	4·6	51·1	19·7
February.....	4·9	4·9	4·4	2·4	0·9	6·3	3·9	7·1	6·5	6·7	2·0	0	0	0	73·7	26·5
March	4·8	0·5	5·8	1·6	4·5	0	1·7	3·2	4·0	5·3	2·9	6·8	5·8	5·1	92·7	25·3
April	2·9	6·0	3·9	0·4	6·2	11·6	3·0	0·7	4 0	1·7	6·9	0	0·6	0	101·4	24·4
May.....	9·5	5·2	2·9	1·5	0	6·9	3·2	0·9	0	2·0	0·5	8·4	8·9	10·0	159·3	33·1
June.....	1·4	9·0	14·1	15·2	8·3	9·7	5·5	0·5	4·6	2·8	0	6·3	6·5	0	189·0	38·3
July.....	3·4	4·1	1·9	0·5	1·5	4·8	5·0	4·9	8·4	9·2	6·6	5·2	1·2	1·2	149·9	30·2
August.....	9·8	7·1	1·7	3·1	0	1·9	1·0	0	2·0	0	5·7	2·9	5·8	0	88·4	19·5
September.....	5·0	1·2	0	0·1	0·5	4·4	2·1	3·2	4·2	5·7	6·5	0·6	3·0	0	128·5	34·1
October	2·2	2·8	6·1	4·4	0·4	0·4	7·3	5·5	2·5	7·9	7·7	7·8	3·0	6·2	111·4	33·8
November.....	0	1·3	0·2	2·8	2·3	0·7	0	0·5	0·2	0	0	4·0	0	0	18·5	7·0
December.....	0	0	1·7	4·7	0·4	0·4	0	0	0	2·5	1·5	0	0	0·6	23·4	9·7

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	0·7	7·4	8·8	10 1	9·3	8·2	5·9	0·7	0	0	0	0	0
February.....	0	0	0	0·2	5·1	10·6	11·7	12·0	12·0	10·5	7·4	4·0	0·2	0	0	0	0
March.....	0	0	1·5	6·6	9·6	11·7	12·8	13·5	11·2	7·9	8·0	6·2	2·5	1·2	0	0	0
April.....	0	0·7	4·6	10·1	14·1	12·6	12·2	7·3	6·1	5·4	7·3	6·7	8·5	4·6	1·8	0	0
May.....	0·3	3·9	9·2	10·0	13·0	13·2	12·9	14·3	14·4	15·1	12·9	13·5	11·9	7·2	6·4	1·1	0
June....., ...	2·7	9·0	13·2	12·9	12·1	12·3	12·1	13·2	11·1	14 1	14·6	15·5	15·3	13·5	12·6	4·8	0
July.....	0·3	4·3	6·5	7·8	9·5	6·8	10·1	12·7	12·7	12·5	12·6	15·0	13·9	12·9	10·3	2·0	0
August.....	0	0·4	3·8	5·0	5·5	7·5	7·8	7 7	7·8	8·6	6·7	9·3	9·6	7·0	1·7	0	0
September.....	0	0	1·1	7·2	10·9	11·9	12·7	13·9	16·4	14·2	12·2	12·9	12·2	2·9	0	0	0
October.....	0	0	0	0·5	7·6	12·5	14·7	16·9	18·8	17·2	12·3	8·7	2·2	0	0	0	0
November.....	0	0	0	0	0	0·2	1·6	2·9	4·2	5·2	4·0	0·6	0	0	0	0	0
December.....	0	0	0	0	0	0·7	3·6	6·9	5·4	5·4	1·4	0	0	0	0	0	0
Total.....	3.3	18·3	39·9	60·3	88·1	107·4	121·0	131·4	129·4	124·3	105·3	93·1	76·3	49·3	32·8	7·9	0

OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date. 1891.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6).	Direction.	Force. (0—12).	
January 2	Noon.	N.E.	2	N.E.	1	N.E.
,, 2	1 p.m.	N.N.E.	1	N.E.	1	N.E.
Feb. 12	Noon.	W.N.W.	1	S.E. by E.	0	W. by N.
,, 12	2 p.m.	N W.	2	W.	1	W.
,, 15	9-30 a.m.	S.S.E.	1	N.W.	1	N.W.
,, 26	9 a.m.	W.S.W.	1	N.E. by N.	1	
March 9	11 a m.	E.N.E.	3	N.E. by E.	2	N. by E.
,, 9	Noon.	N.E.	2	E.N.E.	3	N.E.
,, 25	9 a.m.	S.W.	3	W. by S.	5	S.W.
,, 28	Noon.	N.W.	1	N.W.by N.	2	N. by W.
April 13	9-15 a.m.	E. by S.	1	E.	1	E.
,, 15	5-15 p.m.	N. by W.	2	W. by S.	3	
,, 16	2 p.m.	W.S.W.	3	W.S.W.	7	W.
,, 16	4-20 p.m.	W.N W.	2	W. by S.	5	W.
,, 16	5-25 p.m.	N.W.	3	W. by S.	5	W.
,, 17	3 p.m.	W.N.W.	2	W. by S.	3	N.W.
,, 17	5 p.m.	N.W.	1	W. by N.	3	N.
,, 28	1-30 p.m.	N.W.	3	W. by S.	4	W.
,, 28	4-15 p.m.	N.W.byW.	3	W.	4	W.
,, 28	5 p.m.	N.W.	2	W. by S.	4	
May 11	5 p.m.	N.N.E.	1	N.E.	3	N.E.
,, 12	2-15 p.m.	W. by S.	1	W.S.W.	2	N.E.
,, 12	5-30 p.m.			S.W.by W.	2	
,, 12	7-30 p.m.	W.N.W.	1	S.W. by S.	1	
,, 13	8 a.m.	W.S.W.	2	S.S.W.	2	S.W.
,, 13	11 a.m.	W.N.W.	2	W.S.W.	3	N.W.
,, 30	9-20 a.m.	S.W. by S.	1	S.	1	S. by W.
,, 30	10 a.m.	S.	1	S.	1	S.W.byS.
,, 30	Noon.	S. by W.	1	S. by W.	2	S.S.W.
,, 31	2 p.m.	E.N.E.	2	E.	3	E.
,, 31	4 p.m.	N.E.	1	S.E.	4	E.
June 1	9 a.m.	S. by E.	1	N.E. by N.	1	
,, 1	11 a.m.	S.	1	E.N.E.	3	
,, 1	Noon.	N.E.	2	E.N.E.	4	E. by N.
,, 3	2-45 p.m.	N.E.	2	E.N.E.	5	E.N.E.
,, 3	4 p.m.	E. by S.	2	N E. by E.	4	
,, 6	8 a.m.	W.	2	N.E. by N.	3	N.E.
,, 8	4 p.m.	N.N.E.	2	N.E by E.	4	
,, 8	5 p.m.	N.N.E.	1	E.N.E.	4	N.E.

OBSERVATIONS OF UPPER CLOUDS *(Continued)*.

Date. 1891.	G.M.T.	Cloud.		Wind.		Direction of Lower Clouds
		Direction.	V'locity (0—6)	Direction.	Force (0—12)	
June 9	11-30 a.m.	N.E.	1	N.E.	1	N.N.E.
,, 11	Noon.	N. by E.	1	S.	1	
,, 11	3 p m.	W. by N	1	S.W. byW.	2	
,, 16	3-30 p.m.	W.	2	S.W. byW.	3	W. by N.
,, 21	Noon.	N.N.E.	2	N.E. by E.	2	
,, 21	1 p.m.	N.N.E.	2	N.E. by E.	1	
,, 26	11-30 a.m.	S.	1	S.E. by S.	2	S.
July 3	2 p.m.	S.S.W.	1	S.W.	2	S.W.
,, 10	5-30 p m.	W. by S.	1	S.W.	2	W.
,, 10	7 p.m.	W.S.W.	1	S.S.E.	2	W.
,, 14	7 p.m.	E.N.E.	1	N.E. by N.	3	N.E.
,, 14	8 p.m.	N.E.	1	N.N.E.	1	
,, 23	6 p.m.	W. by N.	2	W. by S.	3	W.
,, 24	Noon.	W.N.W.	3	S.W. byW.	4	W.
,, 27	11 a.m.	S.W.	1	W.	3	W.N.W.
,, 27	12-30 a.m.	W.S.W.	1	W.	4	W.N.W.
,, 27	4-30 p.m.	W. by S.	1	W. by S	4	N.W.
,, 27	5 p.m.	S.W.	1	W.	4	N.W.
August 6	3 p.m.	N.N.W.	1	W.S.W.	3	W.
,, 6	4 p.m.	N.	2	W.S.W.	3	W. by N.
,, 6	5-30 p.m.	N.E.	2	W.S.W.	3	W.
,, 13	9 a.m.	S.W. byW.	1	W.	3	W.
,, 19	9 a.m.	S. by W.	1	S.S.E.	3	S.
,, 22	8 p.m.	N.	2	N. by E.	1	E.
,, 26	Noon.	S.W.	3	S.W byW.	4	SW by W
,, 26	2 p.m.	S.W.	2	S.W. byW.	3	W.S.W.
,, 26	4-30 p.m.	S.W.	2	S.W.	2	S.W.
,, 30	10 a.m.	W.	2	S.S.E.	1	S.S.W.
Sept. 3	9-30 a.m.	S.W.	1	S.S.W	1	S.W.byS.
,, 3	Noon.	S.S.W.	1	S.	2	S.W.
,, 3	4 p.m.	S.S.W.	2	S.E.	1	
,, 7	4 p.m.	W.S.W.	2	W.S.W.	1	
,, 7	5 p.m.	W.S.W.	1	W. by S.	0	
,, 9	10 a.m.	S. by W.	1	S. by E.	2	
,, 9	2 p.m.	S.S.W.	2	S. by E.	3	S.S.W.
,, 11	9 a.m.	N.N.E.	1	N.N.E.	0	
October 4	10 a.m.	W.S.W.	1	S. by W.	3	S.W.
,, 4	11 a.m.	W.S.W.	2	S.S.W.	3	S.S.W.
,, 8	7-30 a.m.	S.W.	1	S.W.	0	
,, 8	2 p.m.	S.W.	2	S. by W.	3	S. by W.

OBSERVATIONS OF UPPER CLOUDS *(Continued)*.

Date 1891	G.M.T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6)	Direction.	Force. (0—12).	
October 9	9 a.m.	S.W. by S.	2	S.W.	3	S.W.
,, 19	3 p.m.	W. by S.	3	W. by S.	2	S.W.
Nov. 21	Noon.	W.	2	N.	1	N. by W.
,, 29	10-5 a.m.	S.	2	W.S.W.	1	SW by W
Dec. 14	Noon.	N.N.W.	3	W. by N.	2	NW by W
,, 28	2 p.m.	N. by W.	4	S.W. by W.	1	W.S.W.

Monthly Magnetical Observations

taken at the

College Observatory, Stonyhurst, 1891.

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 or readings.

In deducing from these observations the ratio and product of the magnetic moment m of the magnet, and the earth's horizontal magnetic intensity X, the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1·5s 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 15′·5 of arc.

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

The value of the constant P was found to be 0·00564.

The Declination observations have been taken once a week.

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

Month.	G. M. T. (Civil Day).	Temperature.	Time of one vibration.	G. M. T.	Temperature.	Observed Deflection at 1·0 ft. / at 1·3 ft.
	D. H. M.	°		D. H. M.	°	° ′ ″
January	15th 12 35	39·0	5 84500	15th 13 27	43·0	12 38 27
February	26th 10 47	47·5	5·85600	26th 11 55	50·5	12 36 48
				,, 12 17	50·9	5 43 30
March ..	28th 18 41	48·0	5·85750	27th 14 17	45·0	12 38 43
				,, 14 30	46 0	5 43 44
April	23rd 10 57	49·0	5·86442	23rd 11 42	50·0	12 39 12
				,, 11 56	51 0	5 43 36
May	28th 10 30	49·5	5·90890	28th 11 42	57 0	12 33 20
				,, 11 53	58·0	5 43 11
June	11th 13 59	64·0	5·83830	11th 14 36	64·0	12 35 37
				,, 14 50	65·0	5 41 55
July	15th 11 13	66·0	5·90977	15th 12 14	68·0	12 33 0
				,, 12 21	68·0	5 40 50
August ..	10th 10 6	63 5	5 89609	10th 11 22	63·0	12 32 2
				,, 11 46	63·0	5 40 27
Septemb'r	23rd 15 43	60·0	5·90375	24th 9 30	51·8	12 32 14
				,, 9 56	52·0	5 38 11
October	15th 10 44	50·1	5·89966	15th 12 45	57·0	5 38 54
Novemb'r	14th 9 53	39·9	5·89653	15th 12 10	47·9	5 30 38
Decemb'r	17th 10 2	37·9	5·96440	17th 11 54	41·0	12 8 51

DIP OBSERVATIONS.			MAGNETIC INTENSITY.		
MONTH	G. M. T. (CIVIL DAY)	DIP	X. or HORIZONTAL FORCE	Y. OR VERTICAL FORCE	TOTAL FORCE
	D. H. M.	° ′ ″			
January ..	15th 12 35	69 4 56	3·7055	9·6947	10·3787
February	28th 15 39	69 6 25	3 7043	9·7043	10·3873
March	27th 10 50	69 10 34	3·7017	9·7327	10·4129
April	21st	68 56 49	3·6972	9·6050	10·2919
May	29th 17 20	69 4 48	3·6759	9·6162	10 2950
June			3·7226		
July	17th 10 49	69 10 9	3·6860	9·6880	10·3656
August....	28th 16 4	69 17 30	3 6977	9·7814	10·4571
September	24th 12 45	69 14 18	3·7017	9·7645	10·4427
October ..	16th 11 0	68 59 12	3·6990	9·6295	10·3156
November	14th 12 0	69 23 49	3·7481	9·9699	10·6513
December	18th 10 30	69 10 43	3·7075	9·7490	10·4292
Means		69 9 1	3 7039	9·7214	10·4025

DECLINATION OBSERVATIONS.

Month.	G.M.T. (Civil Day).	West Declination	
		Observation	Monthly Mean
	D. H. M.	° ′ ″	° ′ ″
January	5th.. 9 30	19 10 24	
	13th.. 9 15	19 15 14	
	20th.. 9 13	19 26 14	
	26th.. 9 17	19 11 24	19 15 49
February	3rd.. 9 14	18 53 14	
	16th.. 9 12	19 15 29	
	23rd.. 8 57	19 12 9	
	24th.. 8 46	19 6 4	19 6 44
March	2nd.. 8 54	19 7 34	
	9th.. 8 53	19 0 9	
	16th.. 9 1	19 3 34	
	24th.. 9 5	19 6 34	
	31st.. 9 12	18 46 59	19 0 58
April	6th.. 9 12	19 0 24	
	13th.. 8 53	18 46 44	
	21st.. 8 53	19 2 44	
	27th.. 9 3	19 9 4	18 59 44
May	4th.. 8 58	19 2 19	
	11th.. 9 14	18 59 49	
	18th.. 9 7	19 5 29	
	26th.. 8 54	18 59 9	19 1 42

DECLINATION OBSERVATIONS *(Continued).*

Month.	G.M.T. (Civil Day).	West Declination	
		Observation	Monthly Mean
	D. H. M.	° ′ ″	° ′ ″
June	1st.. 9 3	19 2 59	
	8th.. 8 58	18 59 24	
	16th.. 9 2	19 8 19	
	23rd.. 8 57	18 44 39	
	30th.. 9 2	19 4 9	18 59 54
July	7th.. 9 9	19 5 29	
	14th.. 9 11	19 2 19	
	27th..10 35	18 57 54	19 1 54
August	10th.. 9 18	18 58 24	
	17th.. 9 3	18 49 24	
	24th.. 8 54	19 2 19	18 56 42
September.. ..	1st.. 9 30	18 53 16	
	28th.. 9 3	18 56 49	18 55 3
October	5th.. 9 3	18 55 29	
	19th.. 9 3	18 50 59	
	26th.. 9 2	19 3 14	18 56 34
November.. ..	2nd.. 9 32	18 59 49	
	9th.. 9 7	19 0 54	
	16th.. 9 45	19 2 29	
	23rd.. 9 12	18 57 34	
	30th.. 9 3	18 52 39	18 58 41
December.. ..	7th.. 9 12	18 41 59	
	14th.. 9 2	19 16 59	
	21st.. 9 17	19 0 49	
	28th.. 9 10	18 55 24	18 58 48
Yearly Mean ..			19 1 3

DATES OF MAGNETIC DISTURBANCES.

The disturbances are divided into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter c denotes *calm*. The days are reckoned astronomically, from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands, with or without an initial letter.

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

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APPENDIX.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

St. IGNATIUS' COLLEGE, MALTA,

BY THE

Rev. J. SCOLES, S.J.

1891.

ST. IGNATIUS' COLLEGE,
MALTA.

Lat. 35° 55′ N. Long. 14° 29′ E. Barometer Readings reduced to 32° F. at sea level.

METEOROLOGICAL REPORT.
1891.
JANUARY.

Results of Observations taken during the Month.		Mean for the last 5 Years.
Mean Reading of the Barometer	inches 30·035	30 051
Highest ,, on the 31st ,,	30·456	30·415
Lowest ,, on the 22nd ,,	29·620	29·538
Range of Barometer Readings ..... ,,	0·836	0·877
Highest Reading of a Max. Therm. on the 8th	63·0	63·9
Lowest Reading of a Min. Therm. on the 20th	37·8	41·6
Range of Thermometer Readings.....	25·2	22·3
Greatest range in 24 hours on the 25th	19·0	18·4
Mean of all the Highest Readings	56·5	58·4
Mean of all the Lowest Readings	46·0	47·8
Mean Daily Range	10·5	10·6
Mean Temperature (deduced from Max & Min.)	50·5	52·5
Mean Temperature (deduced from Dry Bulb)	50·0	52·1
Adopted Mean Temperature.....	50·3	52·3
Mean Temperature of Evaporation	45·4	48·1
Mean Temperature of Dew Point	41·8	44·9
Mean elastic force of Vapour .....inches	0 265	0·298
Mean weight of Vapour in a cub. ft. of air grains	3·0	3·4
Mean additional weight required for saturation ,,	0·9	0·9
Mean degree of Humidity	78	80
Mean weight of a cubic foot of air ....grains	548·3	542·9
Fall of Rain .....inches	4·519	3·329
Number of days on which Rain fell	17	12
Mean amount of Clouds (an overcast sky=10)	6·0	4·6
Total number of miles of Wind indicated	9730	8336
Mean Velocity of Wind per hour .....miles	13·1	11·2

FEBRUARY.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer ..... inches	30·185	30·064
Highest ,, on the 24th .,	30·482	30·334
Lowest ,, on the 14th ,,	29·753	29·690
Range of Barometer Readings ..... ,,	0·729	0·644
Highest Reading of a Max. Therm. on the 27th	61·5	67·0
Lowest Reading of a Min. Therm. on the 20th	37·7	42·0
Range of Thermometer Readings.....	23·8	25·0
Greatest Range in 24 hours on the 27th.....	20·4	18·8
Mean of all the Highest Readings	56·0	60·7
Mean of all the Lowest Readings.....	44·5	49·0
Mean Daily Range	11·5	11·7
Mean Temperature (deduced from Max. & Min.).	49·2	53·9
Mean Temperature (deduced from Dry Bulb)	49·8	54·0
Adopted Mean Temperature	49·5	54·0
Mean Temperature of Evaporation.....	45·0	50·0
Mean Temperature of Dew Point	41·6	47·3
Mean elastic force of Vapour .....inches	0·263	0·327
Mean weight of Vapour in a cub. ft. of air grains	3·0	3·7
Mean additional weight required for saturation ,,	0·8	0·8
Mean degree of Humidity	79	83
Mean weight of a cubic foot of air.....grains	548·3	541·1
Fall of Rain .....inches	3·799	1·483
Number of days on which Rain fell.....	12	9
Mean amount of Cloud (an overcast sky=10)..	5·7	4·0
Total number of miles of Wind indicated....	7030	6893
Mean Velocity of Wind per hour .....miles	10·5	10·1

MARCH.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer .... inches	30·036	30·008
Highest ,, on the 6th ,,	30·400	30·404
Lowest ,, on the 13th ,,	29·648	29·513
Range of Barometer Readings ..... ,,	0·752	0·891
Highest Reading of a Max. Therm. on the 11th	71·1	74·6
Lowest Reading of a Min. Therm. on the 4th	39·8	44·2
Range of Thermometer Readings	31·3	30·4
Greatest Range in 24 hours on the 11th	24·6	23·4
Mean of all the Highest Readings	62·4	63·6
Mean of all the Lowest Readings	49·0	51·2
Mean Daily Range	13·4	12·4
Mean Temperature (deduced from Max. & Min.)	55·0	56·6
Mean Temperature (deduced from Dry Bulb)	53·8	56·0
Adopted Mean Temperature.....	54·4	56·3
Mean Temperature of Evaporation	50·0	52·5
Mean Temperature of Dew Point	46·6	49·4
Mean elastic force of Vapour ..... inches	0·318	0·354
Mean weight of Vapour in a cub. ft. of air grains	3·5	4·0
Mean additional weight required for saturation ,,	1·1	1·0
Mean degree of Humidity	77	79
Mean weight of a cubic foot of air ..grains	539·8	536·7
Fall of Rain .....inches	0·173	0·692
Number of days on which Rain fell.....	4	6
Mean amount of Cloud (an overcast sky=10)	4·6	4·2
Total number of miles of Wind indicated	6670	7886
Mean Velocity of Wind per hour .....miles	9.0	10·6

APRIL.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer ..... inches	29·934	29·930
Highest ,, on the 18th ,,	30·196	30·246
Lowest ,, on the 28th ,,	29·605	29·460
Range of Barometer Readings..... ,,	0·591	0·786
Highest Reading of a Max. Therm. on the 9th	84·5	75.1
Lowest Reading of a Min. Therm. on the 23rd	49·0	47·9
Range of Thermometer Readings	35·5	27·2
Greatest Range in 24 hours on the 8th.....	30·0	20·9
Mean of all the Highest Readings	67·0	67·5
Mean of all the Lowest Readings	53·7	54.2
Mean Daily Range	13·3	13·3
Mean Temperature deduced from Max. & Min.)	59·4	59·8
Mean Temperature (deduced from Dry Bulb.)	58·4	59·8
Adopted Mean Temperature.....	58·9	59·8
Mean Temperature of Evaporation.....	54·5	55.9
Mean Temperature of Dew Point	51·0	52·3
Mean elastic force of Vapour ..... inches	0·374	0·393
Mean weight of Vapour in a cub. ft. of air grains	4·2	4·4
Mean additional weight required for saturation ,,	1·3	1·4
Mean degree of Humidity	77	77
Mean weight of a cubic foot of air .... grains	532·6	530·6
Fall of Rain ..... inches	1·180	0·606
Number of days on which Rain fell	11	5
Mean amount of Cloud (an overcast sky=10)	4·7	4·0
Total nnmber of miles of Wind indicated....	8830	7869
Mean Velocity of Wind per hour ..... miles	12·3	10·9

MAY.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer ....inches	29·906	30·033
Highest ,, on the 20th ,,	30·195	30·197
Lowest ,, on the 11th ,,	29·371	29·651
Range of Barometer Readings ..... ,,	0·824	0·546
Highest Reading of a Max. Therm. on the 5th	76·6	84·0
Lowest Reading of a Min. Therm. on the 20th	50·4	51·1
Range of Thermometer Readings	26·2	32·9
Greatest Range in 24 hours on the 5th	21·1	25·2
Mean of all the Highest Readings	70·5	73·3
Mean of all the Lowest Readings	57·1	58·3
Mean Daily Range	13·4	15·0
Mean Temperature (deduced from Max. & Min.)	62·8	64·4
Mean Temperature (deduced from Dry Bulb)	61·6	64·5
Adopted Mean Temperature.....	62·2	64·5
Mean Temperature of Evaporation.....	58·2	60·3
Mean Temperature of Dew Point	54·8	56·3
Mean elastic force of Vapour .....inches	0·430	0·456
Mean weight of Vapour in a cub. ft. of air grains	4·8	4·9
Mean additional weight required for saturation ,,	1·5	1·9
Mean degree of Humidity	77	73
Mean weight of a cubic foot of air ..grains	527·9	527·2
Fall of rain .....inches	0·255	0·273
Number of Days on which rain fell	4	3
Mean amount of Cloud (an overcast sky=10)	4·3	2·8
Total number of miles of Wind indicated....	7770	6996
Mean Velocity of Wind per hour .....miles	10·4	9·4

JUNE.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer ..... inches	30·033	29·998
Highest ,, on the 15th ,,	30·195	30·179
Lowest ,, on the 6th ,,	29·879	29·799
Range of Barometer Readings..... ,,	0·316	0·380
Highest Reading of a Max. Therm. on the 7th	99·6	88·2
Lowest Reading of a Min. Therm. on the 2nd	58·3	59·3
Range of Thermometer Readings	41·3	28·9
Greatest Range in 24 hours on the 6th	35·9	23·2
Mean of all the Highest Readings	83·0	79·2
Mean of all the Lowest Readings.....	64·5	64 4
Mean Daily Range	18·5	14·8
Mean Temperature (deduced from Max. & Min.)	73·5	71·1
Mean Temperature (deduced from Dry Bulb)	71·1	70·6
Adopted Mean Temperature	72·3	70·9
Mean Temperature of Evaporation	64·8	65 6
Mean Temperature of Dew Point	59·6	61·6
Mean elastic force of Vapour..... inches	0·511	0·548
Mean weight of Vapour in a cub. ft. of air grains	5·6	5 9
Mean additional weight required for saturation ,,	2·8	2·3
Mean degree of Humidity	66	72
Mean weight of a cubic foot of air.... grains	520·0	520·0
Fall of Rain ..... inches	0·020	0·140
Number of days on which Rain fell	1	2
Mean amount of Cloud (an overcast sky 10)	2·7	2·2
Total number of miles of Wind indicated....	5195	6549
Mean Velocity of Wind per hour..... miles	7·2	9·1

JULY.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer .....inches	36·003	30·025
Highest ,, on the 19th ,,	30·072	30·177
Lowest ,, on the 11th ,,	29·852	29·876
Range of Barometer Readings..... ,,	0·220	0·301
Highest Reading of a Max. Therm. on the 10th	97·2	96·1
Lowest Reading of a Min. Therm. on the 28th	65·2	64·9
Range of Thermometer Readings	32·0	31·2
Greatest Range in 24 hours on the 10th	25·8	25·8
Mean of all the Highest Readings	88·0	86·5
Mean of all the Lowest Readings	70·0	69·6
Mean Daily Range	18·0	16·9
Mean Temperature (deduced from Max. & Min.)	78·5	77·5
Mean Temperature (deduced from Dry Bulb.)	76·9	77·0
Adopted Mean Temperature.....	77·7	77·3
Mean Temperature of Evaporation.....	70·5	70·3
Mean Temperature of Dew Point	65·7	65·4
Mean elastic force of Vapour ..... inches	0·633	0·627
Mean weight of Vapour in a cub. ft. of air grains	6·8	6·7
Mean additional weight required for saturation ,,	3·3	3·4
Mean degree of Humidity.....	67	67
Mean weight of a cubic foot of air ....grains	513·1	514·1
Fall of Rain .....inches	..	..
Number of days on which Rain fell.....	..	..
Mean amount of Cloud (an overcast sky=10)	0·5	0·5
Total number of miles of Wind indicated....	5425	5212
Mean Velocity of Wind per hour .....miles	7·3	7·0

AUGUST.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer .....inches	30·019	29·994
Highest ,, on the 28th ,,	30·124	30·142
Lowest ,, on the 6th ,,	29·897	29·862
Range of Barometer Readings ..... ,,	0·227	0·280
Highest Reading of a Max. Therm. on the 7th	97·8	95·5
Lowest Reading of a Min. Therm. on the 23rd	67·8	66·7
Range of Thermometer Readings.....	30·0	28·8
Greatest Range in 24 hours on the 19th	27·2	25·1
Mean of all the Highest Readings	88·5	87·1
Mean of all the Lowest Readings.....	71·1	71·7
Mean Daily Range	17·4	15·4
Mean Temperature (deduced from Max. & Min.)	79·0	78·5
Mean Temperature (deduced from Dry Bulb.)	78·4	78·8
Adopted Mean Temperature.....	78·7	78·7
Mean Temperature of Evaporation	72·1	71·8
Mean Temperature of Dew Point.....	67·5	67·0
Mean elastic force of Vapour .....inches	0·673	0·662
Mean weight of Vapour in a cub. ft. of air grains	7·2	7·1
Mean additional weight required for saturation ,,	3·3	3·5
Mean degree of Humidity	69	68
Mean weight of a cubic foot of air ....grains	511·8	511·7
Fall of rain.....	..	0·192
Number of days on which Rain fell.....	..	1
Mean amount of Cloud (an overcast sky=10)	1·5	1·3
Total number of miles of Wind indicated	5215	5631
Mean Velocity of Wind per hour.....miles	7·0	7·6

SEPTEMBER.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer .... inches	30·101	30·052
Highest ,, on the 14th ,,	30·270	30·248
Lowest ,, on the 21st ,,	29·994	29·825
Range of Barometer Readings ..... ,,	0·276	0·423
Highest Reading of a Max. Therm. on the 8th	96·6	92·3
Lowest Reading of a Min. Therm. on the 27th	63·9	63·7
Range of Thermometer Readings	32 7	28·6
Greatest Range in 24 hours on the 8th	22·4	22 7
Mean of all the Highest Readings.....	84·4	82·9
Mean of all the Lowest Readings	70·4	68·8
Mean Daily Range	14·0	14·1
Mean Temperature (deduced from Max. & Min.	76·4	75·1
Mean Temperature (deduced from dry bulb)	75·2	75·3
Adopted Mean Temperature.....	75·8	75·2
Mean Temperature of Evaporation	69·5	69·2
Mean Temperature of Dew Point	65·3	64·8
Mean elastic force of Vapour ..... inches	0·624	0·615
Mean weight of Vapour in a cub. ft. of air grains	6·7	6·7
Mean additional weight required for saturation ,,	2·8	2·8
Mean degree of Humidity	71	70
Mean weight of a cubic foot of air ....grains	516·7	516·3
Fall of Rain ..... inches	0·650	1·134
Number of days on which Rain fell	4	5
Mean amount of Cloud (an overcast sky=10	2·6	2·3
Total number of miles of Wind indicated....	5290	6001
Mean Velocity of Wind per hour .....miles	7·3	8·3

OCTOBER.

Results of Observations taken during the Month.		Mean for the last 5 years.
Mean Reading of the Barometer ....inches	29·977	30·048
Highest ,, on the 18th ,,	30·135	30·292
Lowest ,, on the 28th ,,	29·710	29·700
Range of Barometer Readings..... ,,	0·425	0·592
Highest Reading of a Max. Therm. on the 6th	88·4	87·8
Lowest Reading of a Min. Therm. on the 24th	57·5	55·8
Range of Thermometer Readings	30·9	32·0
Greatest Range in 24 hours on the 3rd	21·4	19·5
Mean of all the Highest Readings	77·5	75·5
Mean of all the Lowest Readings.....	65·4	64·1
Mean Daily Range	12·1	11·4
Mean Temperature (deduced from Max. & Min.)	70·6	68·9
Mean Temperature (deduced from Dry Bulb)	69·0	68·4
Adopted Mean Temperature.....	69·8	68·7
Mean Temperature of Evaporation.....	65·5	63·8
Mean Temperature of Dew Point	62·8	60·1
Mean elastic force of Vapour.....inches	0·572	0·521
Mean weight of Vapour in a cub. ft. of air grains	6·2	5·7
Mean additional weight required for saturation ,,	1·5	1·9
Mean degree of Humidity	81	76
Mean weight of a cubic foot of air.....grains	521·4	523·5
Fall of rain .....inches	1·850	3·323
Number of Days on which Rain fell	10	8
Mean amount of Cloud (an overcast sky=10)	3·8	4·4
Total number of miles of Wind indicated....	6817	6843
Mean Velocity of Wind per hour .....miles	9·2	9·2

NOVEMBER.

Results of Observations taken during the month.		Mean for the last 5 years.
Mean Reading of the Barometer .... inches	30·050	30·052
Highest ,, on the 19th ,,	30·313	30·276
Lowest ,, on the 6th ,,	29·818	29·675
Range of Barometer Readings..... ,,	0·495	0·601
Highest Reading of a Max. Therm. on the 14th	74·8	74·6
Lowest Reading of a Min. Therm. on the 2nd	49·3	49·8
Range of Thermometer Readings	25·5	24·8
Greatest Range in 24 hours on the 13th....	19·1	17·9
Mean of all the Highest Readings	70·2	67·8
Mean of all the Lowest Readings	58·2	57·0
Mean Daily Range	12·0	10·8
Mean Temperature (deduced from Max. & Min.)	62·2	61·5
Mean Temperature (deduced from dry bulb)	63·0	61·0
Adopted Mean Temperature.....	62·6	61·3
Mean Temperature of Evaporation.....	59·1	57·0
Mean Temperature of Dew Point.....	57·1	53·9
Mean elastic force of Vapour..... inches	0·467	0·416
Mean weight of Vapour in a cub. ft. of air grains	5·1	4·7
Mean additional weight required for saturation ,,	1·0	1·3
Mean degree of Humidity	86	79
Mean weight of a cubic foot of air grains	530·7	532·1
Fall of Rain ..... inches	1·360	4·130
Number of Days on which rain fell	7	11
Mean amount of cloud (an overcast sky=10)	4·8	4·9
Total number of miles of wind indicated ..	5450	6786
Mean velocity of wind per hour..... miles	7·6	9·4

DECEMBER.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....inches	30·185	30·054
Highest ,, on the 25th ,,	30·506	30·383
Lowest ,, on the 18th ,,	29·792	29·572
Range of Barometer Readings ..... ,,	0·714	0·811
Highest Reading of a Max. Therm. on the 1st	69·1	67·9
Lowest Reading of a Min. Therm. on the 21st	40·3	43·7
Range of Thermometer Readings.....	28·8	24·2
Greatest Range in 24 hours on the 21st	15·5	17·0
Mean of all the Highest Readings	62·6	61·6
Mean of all the Lowest Readings.....	53·8	51·8
Mean Daily Range	8·8	9·8
Mean Temperature (deduced from Max. & Min.)	57·3	56·1
Mean Temperature (deduced from Dry Bulb)	57·5	55·4
Adopted Mean Temperature.....	57·4	55·7
Mean Temperature of Evaporation.....	53·1	51·6
Mean Temperature of Dew Point.....	49·9	48·4
Mean elastic force of Vapour.....inches	0·360	0·341
Mean weight of Vapour in a cub. ft. of air grains	4·0	3·8
Mean additional weight required for saturation ,,	1·1	1·0
Mean degree of Humidity	78	79
Mean weight of a cubic foot of air ....grains	539·0	539·1
Fall of Rain .....inches	3·404	3·264
Number of days on which Rain fell.....	11	13
Mean amount of Cloud (an overcast sky=10)	5·6	5·0
Total number of miles of Wind indicated....	9226	8608
Mean Velocity of Wind per hour .....miles	12·4	11·6

Summary of Observations
FOR 1891.

Results of Observations taken during the Year.			Mean for the last 5 years
Mean Reading of the Barometer	inches	30·039	30·031
Highest ,, on December 25th	,,	30·506	30·520
Lowest ,, on May 11th	,,	29·371	29·363
Range of Barometer Readings	,,	1·135	1·157
Highest Reading of Max. Therm. on June 7th		99·6	98·0
Lowest Reading of Min. Therm. on Feb. 20th		37·7	41·1
Range of Thermometer Readings.....		61·9	56·9
Greatest Range in 24 hours on the 6th June		35·9	27·6
Mean of all the Highest Readings.....		72·2	72·4
Mean of all the Lowest Readings.....		58·6	59·2
Mean Daily Range		13·6	13·2
Mean Temperature (deduced from Max & Min)		64·6	64·9
Mean Temperature (deduced from dry bulb)		63·7	64·6
Adopted Mean Temperature.....		64·2	64·8
Mean Temperature of Evaporation.....		59·0	59·8
Mean Temperature of Dew Point.....		55·3	56·1
Mean elastic force of Vapour	inches	0·437	0·451
Mean weight of Vapour in a cub. ft. of air	grains	5·0	5·1
Mean additional weight required for saturation	,,	1·8	1·8
Mean degree of Humidity		76	75
Mean weight of a cubic foot of air	grains	529·1	527·8
Total fall of rain in the Year	inches	17·210	17·620
Number of days per Month on which Rain fell		81	72
Mean amount of cloud (an overcast sky=10)		3·9	3·4
Total number of miles of wind indicated		82648	83144
Mean velocity o wind per hour	miles	9·4	9·5

The maximum monthly mean height of the Barometer was in November, 1889, and was ....inches 30·249

The minimum ,, ,, in January, 1886, and was ,, 29·844

The maximum yearly mean height of the Barometer was in 1884, and was	inches	30·057
The minimum ,, ,, in 1885, and was	,,	30·009
The greatest monthly range of the Barometer was in January, 1886, and was	,,	1·201
The least ,, ,, in August, 1883, and was	,,	0·188
The highest reading of the Barometer, during 5 years, was on January 26th, 1887, and was	,,	30·627
The lowest ,, ,, on the 17th January, 1886, and was	,,	29·155
Extreme range	,,	1·472
The highest temperature was on July 20th, 1889, and was	,,	104·1
The lowest ,, ,, February 20th, 1891	,,	37·7
The highest mean temperature of a month was in August, 1885, and was		83·2
The lowest ,, ,, February, 1891, and was		49·5
The greatest monthly mean weight of vapour in a cubic foot of air was in August, 1885, and was	grains	7·9
The least ,, January and February, 1891, and was	,,	3·0
The highest observed Dew-point was on the 30th August, 1885, and was		78·7
The lowest ,, ,, 19th January, 1891, and was		28·6
The greatest fall of rain in a month, was in December, 1889, and was	inches	8·952
The greatest number of days on which rain fell in one month was in January, 1889	days	24
The highest temperature registered in sunshine was on the 20th July, 1889, and was		158·8
The lowest temperature registered on ground was on the 25th January, 1891, and was		32·5
The highest observed sea temperature was on the 5th August, 1887, and was		85·0
The lowest ,, ,, 23rd January, 1891, and was		56·0
The smallest mean amount of cloud observed in one month was in August, 1890, and was		0·0
The greatest ,, ,, in December, 1888, and was		6·4

NOTES FOR THE SEPARATE MONTHS.

JANUARY.

THE Dew-point ranged between 50·7° on the 2nd & 28·6° on the 19th.
In Sunshine, the highest reading was 116·5° on the 26th.
On Ground, the lowest reading was 32·5° on the 25th.
The Sea has fallen from 60·5° to 56·0°.
Thunderstorms passed on the 11th.
Lightning was seen on the 13th and 15th.
Hail fell on the 11th, 16th, 17th, 18th, 19th, 20th, 21st & 22nd.
Total Rainfall since last June 17·120 inches;
the average of 5 years, 15·362 inches.

Temperature in Screen fell below 40·0 on 6 days, and remained below 47·0 in the house for 4 days.

The coldest month known for more than 10 years.

Standing water on the Marsa behind Valetta was frozen over on the 25th, and snow, not hail nor sleet, fell during a period of 8 hours at Notabile and Dingli about the 19th of the month.

FEBRUARY.

Dew-point ranged between 48·9° on the 11th & 29·4° on the 20th.
In Sunshine, the highest reading was 127·8° on the 24th.
On ground, the lowest reading was 33·9° on the 21st.
The Sea has risen from 56·8° to 58·0°
Lightning was seen on the 11th and 14th.
Hail fell on the 8th and 19th.
Total Rainfall since last June 20·919 inches.
the average of 5 years, 16·845 inches.

On the 15th a gale from N.E. averaged 32 miles per hour for 24 hours, and raised a very heavy sea which caused great damage in the harbour. Pressure has been much above, and temperature much below the average.

On the 25th January shallow water was frozen over in some of the valleys, and snow was reported for the middle of that month in the hills.

MARCH.

Dew-point ranged between 37·3° on the 3rd & 54·9° on the 21st.
In Sunshine, the highest reading was 135·3° on the 27th.
On Ground, the lowest reading was 33·0° on the 4th.
The Sea has risen from 57·9° to 61·1°.
Hail fell on the 3rd.
Total Rainfall since last June, 21·092 inches.
the average of 5 years, 17·537 inches.

APRIL.

The Dew-point ranged between 41·3° on the 3rd and 57·5° on the 30th.
In Sunshine, the highest reading was 144·5° on the 9th.
On Ground, the lowest reading was 41·7° on the 23rd.
The Sea has risen from 61 1° to 61·3°.
Thunderstorms passed on the 13th and 28th.
Lightning was seen on the 24th.
Total Rainfall since last June 22·272 inches;
the average of 5 years, 18·143 inches.

MAY.

The Dew-point ranged between 43·6° on the 18th and 60·3° on the 23rd.
In Sunshine, the highest reading was 134·4° on the 12th.
On Ground, the lowest reading was 42·9 on the 19th.
The Sea has risen from 63·0° to 67·5°.
Thunderstorms passed on the 6th.
Hail fell on the 6th.
Total Rainfall since last June 22·527 inches;
the average of 5 years, 18·416 inches.
Temperatures are still below the average and the range of pressure is unusually great.

JUNE.

The Dew-point ranged between 68·7 on the 24th and 47·6° on the 25th.
In Sunshine, the highest reading was 155·7° on the 8th.

On Ground, the lowest reading was 50·0° on the 2nd.

The Sea has risen from 66·5° to 75·5°.

Lightning was seen on the 18th.

Temperature in Screen above 90° on 5 days. In Sunshine above 150° on 5 days.

JULY.

The Dew-point ranged between 52·5° on the 4th and 72·3° on the 31st.

In Sunshine, the highest reading was 151·6 on the 10th.

On Ground, the lowest reading was 59·5° on the 28th.

The Sea has risen from 80·0° to 82·2°.

AUGUST.

The Dew-point ranged between 74·3° on the 5th and 56·6° on the 17th.

In Sunshine, the highest reading was 150·6° on the 5th.

On Ground, the lowest reading was 59·5° on the 11th.

The Sea has fallen from 82·5° to 81·0 .

Lightning was seen on the 23rd.

SEPTEMBER.

The Dew-point ranged between 72·6° on the 16th and 53·4° on the 24th.

In Sunshine, the highest reading was 148·6° on the 8th.

On Ground, the lowest reading was 57·0° on the 27th.

The Sea has fallen from 81·0° to 76·0°.

Thunderstorms passed on the 19th and 20th.

Lightning was seen on the 6th, 18th, 21st, and 28th.

OCTOBER.

The Dew-point ranged between 71·8° on the 6th & 47·5° on the 31st

In Sunshine, the highest reading was 144·0° on the 3rd.

On Ground, the lowest reading was 51·2 on the 24th.

The Sea has fallen from 76·3° to 71·0° .

Thunderstorms passed on the 6th, 13th, 22nd, 26th, and 28th.

Lightning was seen on the 3rd, 4th, 5th, 7th, 8th, 9th, 10th, & 27th.

Total Rainfall since last June 2·500 inches.

the average of 5 years, 4·659 inches.

NOVEMBER.

The Dew-point ranged between 44·5° on the 1st, & 66·2 on the 6th.
In Sunshine, the highest reading was 130·0° on the 16th.
On Ground, the lowest reading was 45·5° on the 3rd.
The Sea has fallen from 71·0° to 67·3°.
Thunderstorms passed on the 3rd and 10th.
Lightning was seen on the 1st, 6th, 7th, and 8th.
Total Rainfall since last June 3·860 inches.
the average of 5 years, 8·769 inches.

DECEMBER.

The Dew-point ranged between 59·0° on the 1st & 35.8° on the 19th
In Sunshine, the highest reading was 116·8° on the 9th.
On Ground, the lowest reading was 33·3° on the 21st.
The Sea has fallen from 67·3° to 61·5°.
Lightning was seen on the 1st.
Hail fell on the 19th.
Total Rainfall since last June 7·264 inches.
the average of 5 years, 12·033 inches.

NOTES FOR THE YEAR.

Dewpoint ranged between 28·6° on the 19th January, and 74·3° on the 5th August.

In Sunshine, the highest reading was 155·7° on the 8th June.

On Ground, the lowest reading was 32·5° on the 25th January.

The Sea has varied from 56·0° in January to 82·5° in August.

Thunderstorms passed on 13 days.

Lightning was seen on 20 days.

Hail fell on 14 days.

Snow fell on the hills once in January. Standing water froze during the same month.

J. SCOLES, S.J.

St. Ignatius' College.