



STONYHURST COLLEGE

OBSERVATORY.

RESULTS

OF

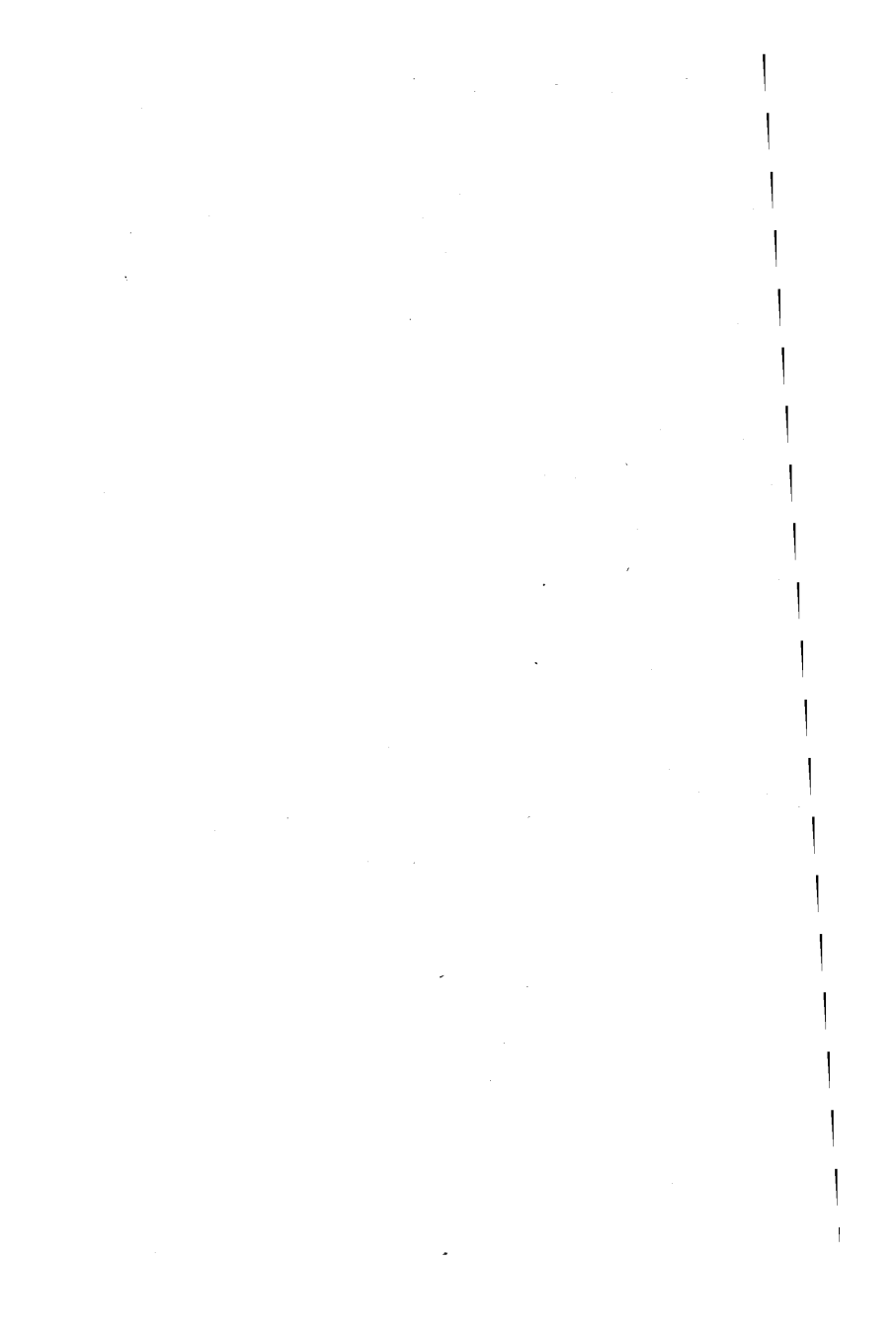
METEOROLOGICAL AND MAGNETICAL

OBSERVATIONS.

1873.

PRESTON :

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



Stonyhurst Observatory.

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

METEOROLOGICAL REPORT

For January, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·212	29·387
Highest " on the 31st	29·775	29·972
Lowest " on the 19th	27·990	28·512
Range of Barometer Readings	1·805	1·461
Highest Reading of a Max. Therm. on the 13th	52·6	51·3
Lowest Reading of a Min. Therm. on the 20th ..	18·7	20·8
Range of Thermometer Readings.....	33·9	30·5
Mean of all the Highest Readings.....	44·8	42·1
Mean of all the Lowest.....	36·3	32·8
Mean Daily Range ..	8·5	9·3
Deducted Monthly Mean (from Mean of Max. } and Min.)	40·4	37·3
Mean Temperature from dry bulb.....	40·1	37·4
Adopted Mean Temperature	40·3	37·4
Mean Temperature of Evaporation	38·8	35·9
Mean Temperature of Dew Point.....	36·9	33·9
Mean elastic force of Vapour.....	0·219in	0·197in
Mean weight of Vapour in a cubic foot of air	2·5gr	2·3gr
Mean additional weight required for saturation ...	0·4gr	0·4gr
Mean degree of Humidity, (saturation 1·00).....	0·88	0·87
Mean weight of a cubic foot of air	541·3gr	548·0gr
Fall of Rain	6·173in	4·137in
Number of days on which Rain fell.....	28	20·8
Amount of Evaporation	1·335	0·815

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	2	4	0	9	13	2	1
Mean Velocity in miles per hour	0	7·9	9·9	0	18·3	15·9	8·0	7·7
Total No. of miles for each Direction	0	381	951	0	3948	4960	384	185

The total number of miles registered during the month was 10809.

The max. Velocity of the wind was 46 miles per hour; direction S. on the 18th, at 3 p.m.

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

In the month of January, the highest reading of the Barometer during 26 years, was on the 8th, in 1859, and was 30·310

The lowest " " 15th, 1865 27·939

The highest Temperature " 30th, 1872 56·2

The lowest " " 13th, 1867 9·2

The highest adopted mean temperature of } 1869 41·3
the month

The lowest " " 1871 39·0

Thunder storms occurred on the 2nd, 3rd, 19th, and 20th.

Hail fell on the 2nd, 18th, 19th, and 20th.

Snow on the 20th, 21st, and 22nd. At 10 a.m. on the 22nd, the depth of snow on the ground was 4ⁱⁿ.62.

Lunar Halo visible on the 6th at 8^h 55^m. p.m. G.M.T.

The Aurora on the 7th was first observed at 10-20 p.m., when the sky was clear, with the exception of a few very light cirrus clouds, and a long strip of dark stratus near the NNW. horizon. A few pale greenish streamers from N. by W. to NW. by N., were succeeded after a few minutes by puffs of white vapour moving rapidly from the N. horizon to the zenith. Five or six minutes later red patches were visible in the N. and NW. by N. Shortly after 10.30 cirro-cumulus clouds rapidly obscured the heavens, but the red colour was observable until 11 p.m., when only the slightest trace of the Auroral tinge could be seen through the heavy cumulus that completely covered the sky.

At the beginning of the year the Declination needle was slightly agitated, and its movements became much more irregular on the afternoon of the 3rd. At 9 p.m. on the 5th, the V.F. magnet was thrown off its balance by a rapid diminution of the earth's magnetic intensity. The disturbances continued until the 7th, when they culminated in a storm, which commenced shortly after 8 p.m. For a few minutes after midnight the vibrations of the Declination needle were so rapid that they scarcely left a trace on the photographic paper. The Vertical Force magnet had previously been again thrown off its balance at 10-30 p.m. The minimum of the Horizontal Force curve occurred at 12^h.8^m. a.m. on the 8th. Both components of the intensity were diminished. With the exception of occasional short irregularities the magnets were tolerably quiet after the storm until the evening of the 18th, when two days of disturbance were followed by three or four of rest. From the afternoon of the 24th till the night of the 30th, the irregular movements were much more continuous than usual, but none were of a very exaggerated character.

Stonyhurst Observatory.

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

METEOROLOGICAL REPORT

For February, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·695	29·493
Highest " on the 18th	30·312	30·100
Lowest " on the 26th	28·368	28·665
Range of Barometer Readings	1·944	1·435
Highest Reading of a Max. Therm. on the 18th	44·8	51·1
Lowest Reading of a Min. Therm. on the 23rd ..	12·3	22·8
Range of Thermometer Readings	32·5	28·3
Mean of all the Highest Readings	40·4	44·0
Mean of all the Lowest.....	31·3	33·9
Mean Daily Range	9·1	10·1
Deduced Monthly Mean (from Mean of Max. } and Min.)	35·5	38·6
Mean Temperature from dry bulb.....	34·7	38·6
Adopted Mean Temperature	35·1	38·6
Mean Temperature of Evaporation	33·9	36·6
Mean Temperature of Dew Point.....	31·8	34·8
Mean elastic force of Vapour.....	0·181in	0·197in
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).....	0·88	0·87
Mean weight of a cubic foot of air	556·3gr	548·5gr
Fall of Rain	0·821in	3·794in
Number of days on which Rain fell.....	13	17·2
Amount of Evaporation	0·416	0·882

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	4	2	1	0	2	9	5
Mean Velocity in miles per hour	11·1	7·9	22·8	10·7	0	6·4	5·2	11·1
Total No. of miles for each Direction	1333	755	1094	256	0	306	1114	1332

The total number of miles registered during the month was 6190.

The max. Velocity of the wind was 34 miles per hour; direction E. by S. on the 2nd, at 5 a.m.

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

In the month of February, the highest reading of the Barometer during 26 years, was on the 11th, in 1849, and was 30·452

The lowest " " 6th, 1867 28·208

The highest Temperature " 5th, 1869 57·5

The lowest " " 1st, 1855 10·1

The highest adopted mean temperature of }
the month } 1869 44·0

The lowest " " 1855 28·6

Snow fell on the 2nd, 8th, 10th, 11th, 22nd, 23rd, 25th, 27th & 28th.

Fog prevailed on the 14th and 20th.

Lunar halos were seen on the 3rd and 12th.

With the exception of a few short disturbances the self-recording magnets remained very quiet during the month. The only perturbations of any considerable extent or duration occurred between 7 p.m. of the 8th, and 2 a.m. of the 10th.

At 7 p.m., on the 22nd, two faint bands of light were seen stretching from the W. horizon across the heavens on either side of the ecliptic. The distance between the bands was about 10° , and the inner edge of each was fairly defined, the colour of the sky appearing deeper between the bands than in other parts of the heavens. Both bands were strongest near the horizon, the N. one being traceable through almost 90° , and the other only through 72° . The twilight was still strong, and the greatest intensity of the bands was not more than one third of that of the Milky Way on a clear night. The width of each band would have been about 3° , and each was curved, being concave to the ecliptic, and slightly widening out as the altitude increased.

A precisely similar phenomenon was visible at 6-30 on the 28th, γ Pegasi and the moon shining out brightly from contrast in the dark space between the bands. The persistence of the details makes it more probable that these were observations of the Zodiacal light.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For March, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·387	29·447
Highest " on the 25th	29·798	30·060
Lowest " on the 11th	28·602	28·688
Range of Barometer Readings	1·196	1·372
Highest Reading of a Max. Therm. on the 30th	60·7	56·7
Lowest Reading of a Min. Therm. on the 13th ..	28·8	23·7
Range of Thermometer Readings	31·9	33·0
Mean of all the Highest Readings	47·6	46·8
Mean of all the Lowest.....	35·8	34·5
Mean Daily Range	11·8	12·3
Deduced Monthly Mean (from Mean of Max. } and Min.).....	40·7	39·7
Mean Temperature from dry bulb.....	40·3	39·9
Adopted Mean Temperature	40·5	39·8
Mean Temperature of Evaporation	37·9	37·9
Mean Temperature of Dew Point.....	34·5	35·5
Mean elastic force of Vapour.....	0·20lin	0·209in
Mean weight of Vapour in a cubic foot of air	2·3gr	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	544·5gr	546·2gr
Fall of Rain	3·399in	3·013in
Number of days on which Rain fell.....	21	18·0
Amount of Evaporation	1·584	1·721

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		0	14	7	0	2	4	3	1
Mean Velocity in miles per hour	0	10·3	9·3	0	9·3	13·3	13·9	6·8
Total No. of miles for each Direction	0	3455	1565	0	447	1279	1001	162

The total number of miles registered during the month was 7909.

The max. Velocity of the wind was 33 miles per hour; direction S. on the 9th, at 3 a.m.

Mean amount of Cloud, (an overcast sky being indicated by 10·0) 7·3

In the month of March, the highest reading of the Barometer during 26 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

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Snow fell on the 1st, 9th, 10th, 11th, 13th, 15th, 16th, 17th, and 21st, and hail on the 7th, 10th, and 21st.

Lunar halos were visible on the 4th, 7th, and 8th. That on the 8th was only a few degrees in diameter, but slightly within it was a second halo of very vivid colours.

The magnetic disturbance, which commenced on the evening of the 8th, became much more violent at 8 a.m. on the 9th, but did not attain its maximum until 8 p.m. The V.F. magnet was thrown off its balance shortly after 10 p.m., but the oscillations of the H.F. magnet were comparatively slight. There were some considerable irregular movements of the Declination magnet between 7 p.m. and midnight on the 10th connected with the same storm.

The Declination magnet was also somewhat disturbed from the evening of the 10th until the morning of the 28th. The rest of the month was calm.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	14	1	1	1	1	6	5
Mean Velocity in miles per hour	12·0	9·5	11·5	3·4	9·0	9·7	14·4	12·0
Total No. of miles for each Direction	287	3191	275	82	215	232	2074	1434

The total number of miles registered during the month was 7790.

The max. Velocity of the wind was 35 miles per hour; direction W. N. W. on the 28th, at 3 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10·0) 6·2

In the month of April, the highest reading of the Barometer during 26 years, was on the 22nd, in 1855, and was 30·191

The lowest ,, ,, 20th, 1868 28·358

The highest Temperature ,, 14th, 1852 74·1

The lowest ,, ,, 12th, 1862 24·7

The highest adopted mean temperature of } 1865 48·5
the month

The lowest ,, ,, 1841 40·8

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Hail fell on the 6th, and snow on the 6th, 24th, and 25th. Lightning was seen on the 15th and 16th, and Lunar Halos on the 3rd and 5th. The swallows arrived on the 21st.

Aurora Borealis was observed on the 1st, 18th, 19th, 20th, and 22nd. On the 19th the streamers in the NNE extended 10° above the horizon at 11-50 p.m.

The Aurora on the night of the 18th was the most striking. At 9-15 a number of bluish-white streamers stretched from the NE and NW horizon almost to the Zenith, and three wave-like flashes crossed the streamers from E towards W, at intervals of two or three minutes. At 9-20 a broad band of light connected the NW horizon and the Zenith, and then a succession of wave movements set in from the NNW. A quarter of an hour later the streamers were very bright and steady, and the waves of light, that continually passed over them, appeared quite distinct from the streamers. Red, bluish-white, and pale green were the prevailing colours, but none of these were very decided. There were two or three dark stratus clouds in the NNW, and some bright bands were seen very distinctly in front of the clouds. At 9-45 the display was fainter, but there was a fresh outburst towards 10-15.

The month opened with a considerable magnetic disturbance on the 1st and 2nd, which was shown principally by the Vertical Force magnet. A slight perturbation was also visible between noon on the 3rd and 9 a.m. of the following day. But on the evening of the 18th a succession of irregular oscillations commenced which lasted for several days. The greatest movements of the magnets occurred always a little before 10 p.m., the disturbing force producing always a deviation of the Declination magnet towards the E, and a diminution of the two components of the Intensity. Subsequent to this the magnets were generally regular in their movements until the end of the month.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For May, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·536	29·518
Highest „ on the 29th	29·984	29·938
Lowest „ on the 5th	28·900	28·964
Range of Barometer Readings	1·084	0·974
Highest Reading of a Max. Therm. on the 31st	69·2	72·5
Lowest Reading of a Min. Therm. on the 13th ...	32·4	31·6
Range of Thermometer Readings	36·8	40·9
Mean of all the Highest Readings	58·2	59·7
Mean of all the Lowest.....	41·3	42·5
Mean Daily Range	16·9	17·2
Deduced Monthly Mean (from Mean of Max. } and Min.)	48·1	49·4
Mean Temperature from dry bulb	47·5	49·8
Adopted Mean Temperature	47·8	49·6
Mean Temperature of Evaporation	45·4	46·4
Mean Temperature of Dew Point	42·8	42·9
Mean elastic force of Vapour.....	0·275in	0·278in
Mean weight of Vapour in a cubic foot of air	3·1gr	3·2gr
Mean additional weight required for saturation ...	0·7gr	0·9gr
Mean degree of Humidity, (saturation 1·00).....	0·84	0·76
Mean weight of a cubic foot of air	538·8gr	536·6gr
Fall of Rain	2·854in	2·447in
Number of days on which Rain fell.....	20	15·0
Amount of Evaporation	2·800	3·808

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	7	3	0	1	3	16	1
Mean Velocity in miles per hour	0	5·7	11·9	0	4·9	8·7	11·7	2·8
Total No. of miles for each Direction	0	953	858	0	116	623	4482	68

The total number of miles registered during the month was 7100.

The max. Velocity of the wind was 31 miles per hour; direction W. by N. on the 1st, at 1 p.m.

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

In the month of May, the highest reading of the Barometer during 26 years, was on the 22nd, in 1855, and was 30·124

The lowest ,, ,, 1st, 1858 28·564

The highest Temperature ,, 19th, 1864 82·5

The lowest ,, ,, 4th, 1855 23·5

The highest adopted mean temperature of } 1848 55·1
the month

The lowest ,, ,, 1855 45·0

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Thunder storms on the 3rd and 7th.—Thunder on 8th and 28th.—
A slight fall of snow on the 18th. The cuckoo arrived on the 3rd.

The self-recording magnets were undisturbed during the first half of the month, but on the 15th a little before midnight, the Vertical Force magnet commenced a rapid movement, which led to the trace being lost two hours later. The same magnet was also thrown off its balance by a violent disturbance on the 23rd just before midnight. The Declination magnet was most disturbed on the 16th and 23rd, and the similarity of movements at the same hour on successive days is very noticeable.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		0	5	2	0	1	7	14	1
Mean Velocity in miles per hour	0	7.7	8.3	0	5.8	10.6	10.4	7.2
Total No. of miles for each Direction	0	923	396	0	139	1776	3492	172

The total number of miles registered during the month was 6898.

The max. Velocity of the wind was 33 miles per hour; direction W.N.W. on the 25th, at 3 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 7.9

In the month of June, the highest reading of the Barometer during 26 years, was on the 27th, in 1867, and was 30.206

The lowest ,, ,, 12th, 1862 28.632

The highest Temperature ,, 28th, 1857 84.6

The lowest ,, ,, 30th, 1856 34.2

The highest adopted mean temperature of the month } 1858 59.0

The lowest ,, ,, 1856. & 1860 52.2

— 0 —

Thunder was heard on the 3rd, 13th, 17th, 18th and 29th.

Lightning seen on the 3rd. Aurora on the 25th at 11 p.m. Remarkably heavy rain fell on the 29th, 1.256 inch in 12 hours, the greater part falling in the space of 20 minutes.

The only remarkable magnetic disturbance during the month commenced on the 26th at 10 p.m., the Declination magnet at this time increasing its ordinate, and after several vibrations attained its minimum ordinate about 11 p.m. and its maximum at about 3.40 a.m. on the 27th. The disturbance on the following day was similar in character but of smaller range.

The V.F. Force magnet shewed great disturbance on the above dates, but the H.F. magnet was comparatively quiet.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	0	0	0	6	9	16	0
Mean Velocity in miles per hour	0	0	0	0	9.6	9.6	9.7	0
Total No. of miles for each Direction	0	0	0	0	1385	2072	3712	0

The total number of miles registered during the month was 7169.

The max. Velocity of the wind was 31 miles per hour; direction N.W. by W. on the 18th, at 4 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 7.8

In the month of July, the highest reading of the Barometer during 26 years, was on the 24th, in 1868, and was 30.112

The lowest ,, ,, 14th, 1853 28.670

The highest Temperature ,, 22nd, 1873 88.2

The lowest ,, ,, 1st, 1857 36.0

The highest adopted mean temperature of the month } 1852 63.0

The lowest ,, ,, 1851 & 1853 55.5

— 0 —

Thunder storms occurred on the 4th, 12th, 15th, 22nd, and 27th. Thunder was also heard on the 13th, 14th, and 23rd. Fog prevailed on the 8th.

The magnetical curves show no disturbances till the 10th between 0 and 4 a.m., when the Declination Magnet oscillated with a general easterly deflection, and the Vertical Force was notably diminished. Similar disturbances occurred between 10 p.m. on the 12th, and 4 a.m. on the 13th; and between 11 p.m. on the 20th and 6 a.m. on the 21st. Sudden easterly deflections of the Declination Magnet with simultaneous small increments of Vertical and Horizontal Force, were indicated on the 14th at 7.30 p.m., on the 16th at 6.30 p.m., on the 23rd at 4.40 p.m. and 6.40 p.m., and on the 28th at 2 a.m.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For August, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29.444	29.498
Highest ,, on the 2nd	29.827	29.886
Lowest ,, on the 28th	29.108	28.968
Range of Barometer Readings	0.719	0.918
Highest Reading of a Max. Therm. on the 15th	71.8	76.7
Lowest Reading of a Min. Therm. on the 30th ...	44.4	41.5
Range of Thermometer Readings.....	27.4	35.2
Mean of all the Highest Readings	65.9	67.2
Mean of all the Lowest.....	51.6	50.9
Mean Daily Range	14.3	16.3
Deduced Monthly Mean (from Mean of Max. } and Min.)..... }	57.1	57.4
Mean Temperature from dry bulb.....	57.6	57.4
Adopted Mean Temperature	57.4	57.4
Mean Temperature of Evaporation	55.1	54.6
Mean Temperature of Dew Point.....	53.0	52.1
Mean elastic force of Vapour.....	0.403in	0.391in
Mean weight of Vapour in a cubic foot of air	4.5gr	4.2gr
Mean additional weight required for saturation ...	0.8gr	0.9gr
Mean degree of Humidity, (saturation 1.00).....	0.85	0.83
Mean weight of a cubic foot of air	526.4gr	527.5gr
Fall of Rain	6.377in	4.727in
Number of days on which Rain fell.....	29	19
Amount of Evaporation	3.404	3.501

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
		0	2	0	1	3	10	14	1
Mean Velocity in miles per hour	0	12·6	0	6·2	13·8	11·5	11·2	5·3
Total No. of miles for each Direction	0	606	0	149	997	2766	3778	126

The total number of miles registered during the month was 8422.

The max. Velocity of the wind was 29 miles per hour; direction W on the 13th, at 11 a.m.

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

In the month of August, the highest reading of the Barometer during 26 years, was on the 28th, in 1854, and was 30·111

The lowest ,, ,, 26th, 1853 28·637

The highest Temperature ,, 2nd, 1868 88·0

The lowest ,, ,, 21st, 1864 & 1869 36·0

The highest adopted mean temperature of }
the month } 1857 61·0

The lowest ,, ,, 1848 52·5

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Thunder storms occurred on the 18th, 19th, 25th, 26th and 28th. On the 26th, 0·60 inch of rain fell in the space of 20 minutes. An aurora was seen on the 18th.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For September, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.
Mean Reading of the Barometer.....	29.496
Highest ,, on the 22nd	30.137
Lowest ,, on the 15th	28.831
Range of Barometer Readings	1.306
Highest Reading of a Max. Therm. on the 27th	70.4
Lowest Reading of a Min. Therm. on the 28th	32.0
Range of Thermometer Readings.....	38.4
Mean of all the Highest Readings	60.8
Mean of all the Lowest.....	44.8
Mean Daily Range	16.0
Deducted Monthly Mean (from Mean of Max. } and Min.).....	51.5
Mean Temperature from dry bulb.....	52.3
Adopted Mean Temperature	51.9
Mean Temperature of Evaporation	49.2
Mean Temperature of Dew Point.....	46.5
Mean elastic force of Vapour.....	0.317in
Mean weight of Vapour in a cubic foot of air	3.7gr
Mean additional weight required for saturation ...	0.8gr
Mean degree of Humidity, (saturation 1.00).....	0.82
Mean weight of a cubic foot of air	533.5gr
Fall of Rain	2.822in
Number of days on which Rain fell.....	25
Amount of Evaporation	2.164
	2.260

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	2	2	1	4	9	7	5
Mean Velocity in miles per hour	0	6·4	7·0	4·0	7·1	15·2	10·1	7·2
Total No. of miles for each Direction	0	306	334	95	680	3291	1693	863

The total number of miles registered during the month was 7262.

The max. Velocity of the wind was 37 miles per hour; direction S. W. by W. on the 17th, at 1 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10·0) 6·3

In the month of September, the highest reading of the Barometer during 26 years, was on the 15th, in 1851, and was 30·274

The lowest ,, ,, 22nd, 1863 28·371

The highest Temperature ,, ,, 6th, 1868 85·0

The lowest ,, ,, 6th, 1855 30·7

The highest adopted mean temperature of }
the month } 1865 59·1

The lowest ,, ,, 1863 50·9

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There were thunder storms on the 11th and 14th. Slight fog on the 7th.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For October, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·378	29·403
Highest ,, on the 27th	30·092	29·980
Lowest ,, on the 23rd	28·511	28·647
Range of Barometer Readings	1·581	1·333
Highest Reading of a Max. Therm. on the 3rd	68·0	64·5
Lowest Reading of a Min. Therm. on the 26th ...	27·0	29·9
Range of Thermometer Readings.....	41·0	34·6
Mean of all the Highest Readings	54·2	54·7
Mean of all the Lowest.....	38·8	42·2
Mean Daily Range	15·4	12·5
Deducted Monthly Mean (from Mean of Max. } and Min.)	45·5	47·5
Mean Temperature from dry bulb.....	45·6	48·0
Adopted Mean Temperature	45·6	47·8
Mean Temperature of Evaporation	43·7	45·6
Mean Temperature of Dew Point.....	41·5	43·2
Mean elastic force of Vapour.....	0·263in	0·282in
Mean weight of Vapour in a cubic foot of air ...	3·0gr	3·2gr
Mean additional weight required for saturation ...	0·5gr	0·6gr
Mean degree of Humidity, (saturation 1·00).....	0·86	0·85
Mean weight of a cubic foot of air	538·5gr	536·1gr
Fall of Rain	8·680in	5·459in
Number of days on which Rain fell.....	31	21·7
Amount of Evaporation	1·611	1·497

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	1	0	0	6	11	9	0
Mean Velocity in miles per hour	5.3	6.0	0	0	8.3	9.7	8.6	0
Total No. of miles for each Direction	508	142	0	0	1196	2566	1851	0

The total number of miles registered during the month was 6313.

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

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 6.9

In the month of October, the highest reading of the Barometer during 26 years, was on the 29th, in 1849, and was 30.238

The lowest " " 19th, 1862 28.139

The highest Temperature " 9th, 1869 72.8

The lowest " " 21st, 1859 25.2

The highest adopted mean temperature of }
the month } 1861 51.6

The lowest " " 1850 44.8

— o —

There were slight falls of snow on the 23rd and 24th. Thunder storms occurred on the 24th and 25th. Hail fell on the 14th, 20th and 23rd.

Stonhurst Observatory.

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

METEOROLOGICAL REPORT

For November, 1873.

Results of Observations taken during the month.	Mean for the last 26 Years.	
Mean Reading of the Barometer.....	29·451	29·465
Highest ,, on the 16th ...	30·143	30·071
Lowest ,, on the 1st ...	28·488	28·612
Range of Barometer Readings	1·655	1·459
Highest Reading of a Max. Therm. on the 26th ...	54·6	55·1
Lowest Reading of a Min. Therm. on the 15th ...	26·8	25·3
Range of Thermometer Readings.....	27·8	29·8
Mean of all the Highest Readings.....	47·5	46·6
Mean of all the Lowest.....	37·9	36·1
Mean Daily Range.....	9·6	10·5
Deduced Monthly Mean (from Mean of Max. } and Min.)..... }	42·3	41·0
Mean Temperature from dry bulb.....	42·7	41·1
Adopted Mean Temperature	42·5	41·1
Mean Temperature of Evaporation	40·8	38·6
Mean Temperature of Dew Point.....	38·7	37·5
Mean elastic force of Vapour.....	0·236in	0·223in
Mean weight of Vapour in a cubic foot of air	2·7gr	2·6gr
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	543·1gr	544·9gr
Fall of Rain	3·869in	3·945in
Number of days on which Rain fell.....	22	18·7
Amount of Evaporation	1·014	1·149

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	11	1	0	3	4	7	3
Mean Velocity in miles per hour	2·9	10·6	8·8	0	5·9	13·3	22·7	7·3
Total No. of miles for each Direction	70	2786	212	0	424	1275	3806	529

The total number of miles registered during the month was 9102.

The max. Velocity of the wind was 44 miles per hour; direction W. on the 29th, at 7 p.m.

Mean amount of Cloud, (an overcast sky being indicated by 10·0) 7·4

In the month of November, the highest reading of the Barometer during 26 years, was on the 12th, in 1857, and was 30·350

The lowest " " 1st, 1859 28·007

The highest Temperature " 6th, 1872 61·9

The lowest " " 17th, 1861 19·1

The highest adopted mean temperature of }
the month } 1857 & 1863 43·8

The lowest " " 1851 36·7

— o —

Lightning was seen on the 1st. Auroras on the 12th and 13th.
Lunar Halo on the 5th. Hail fell on the 1st, and snow on the 9th.

Stonbury Observatory.

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

METEOROLOGICAL REPORT

For December, 1873.

Results of Observations taken during the month.	Mean for the Last 26 Years.	
Mean Reading of the Barometer.....	29.754	29.453
Highest ,, on the 12th	30.214	30.061
Lowest ,, on the 30th	28.942	28.619
Range of Barometer Readings	1.272	1.442
Highest Reading of a Max. Therm. on the 15th ...	52.9	53.3
Lowest Reading of a Min. Therm. on the 11th ...	24.9	20.7
Range of Thermometer Readings	28.0	32.6
Mean of all the Highest Readings	45.8	43.5
Mean of all the Lowest.....	37.5	34.0
Mean Daily Range	8.3	9.5
Deduced Monthly Mean (from Mean of Max. } and Min.)..... }	41.6	38.8
Mean Temperature from dry bulb.....	41.9	39.4
Adopted Mean Temperature	41.8	39.1
Mean Temperature of Evaporation	40.4	38.0
Mean Temperature of Dew Point.....	38.7	36.2
Mean elastic force of Vapour.....	0.236in	0.215in
Mean weight of Vapour in a cubic foot of air	2.7gr	2.5gr
Mean additional weight required for saturation ...	0.3gr	0.3gr
Mean degree of Humidity, (saturation 1.00).....	0.90	0.88
Mean weight of a cubic foot of air	549.6gr	546.8gr
Fall of Rain	2.394in	4.473in
Number of days on which Rain fell.....	28	20.3
Amount of Evaporation	0.241	0.885

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	1	1	1	2	18	4	4
Mean Velocity in miles per hour	0	2.2	11.3	9.2	23.8	14.2	7.2	3.9
Total No. of miles for each Direction	0	52	272	220	1144	6132	687	376

The total number of miles registered during the month was 8883.

The max. Velocity of the wind was 52 miles per hour; direction W. on the 16th, at noon.

Mean amount of Cloud, (an overcast sky being indicated by 10.0) 7.9

In the month of December, the highest reading of the Barometer during 26 years, was on the 22nd, in 1849, and was 30.376

The lowest " " 8th, 1872 28.143

The highest Temperature " 6th, 1856 58.0

The lowest " " 24th, 1860 5.7

The highest adopted mean temperature of the month } 1857 44.6

The lowest " " 1869 33.3

— o —

Hail fell on the 22nd and 31st.

Summary of the Observations

FOR 1873.

	Mean for the last 26 Years.	
Mean Reading of the Barometer	29·501	29·479
Highest ,, on Feb. 18th....	30·312	30·267in
Lowest ,, on Feb. 26th....	28·368	28·278in
Range of Barometer Readings	1·944	1·989in
Highest Reading of a Max. Therm. on July 22nd	88·2	81·6
Lowest Reading of a Min. Therm. on Feb. 23rd	12·3	15·9
Range of Thermometer Readings	75·9	65·7
Mean of all the Highest Readings.....	54·5	54·7
Mean of all the Lowest	41·4	41·0
Mean Daily Range	13·1	13·7
Deduced Yearly Mean (from Mean of Max. and Min.)	46·9	46·8
Mean Temperature of dry bulb	46·9	46·9
Adopted Mean Temperature.....	46·9	46·9
Mean Temperature of Evaporation.....	44·8	44·6
Mean Temperature of Dew Point	42·5	42·2
Mean elastic force of Vapour.....	0·282in	0·276in
Mean weight of Vapour in a cubic foot of air.....	3·2gr	3·2gr
Mean additional weight required for saturation....	0·6gr	0·6gr
Mean degree of Humidity, (saturation 1·00)	0·85	0·84
Mean weight of a cubic foot of air.....	539·1gr	538·7gr
Total Fall of Rain in the Year	47·029in	46·825in
Number of days per Month on which Rain fell.....	23·3	18·3
Amount of Evaporation	24·218in	27·186in

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

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

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

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

The greatest monthly range of the Barometer was in November, 1859, and was	2.290
The least " " in July, 1852, and was	0.505
In 1859, on Nov. 1st, at 1 p.m., the Barometer stood at 28.035, and on Nov. 2nd, at 1 p.m., it stood at 29.263, this was the greatest range of the Barometer, in 24 hours and was.....	1.228
The highest reading of the Barometer, during 26 years, was on February 11th, 1849, and on March 4th, 1854, and was	30.452
The lowest " " on July 22nd, 1873, and was	27.939
Extreme range	2.513
The highest temperature was on July 15th, 1868, and was	88.2
The lowest " " Dec. 24th, 1860,	6.7
The highest adopted mean temperature of a month { July, 1868,	62.4
The lowest " " Feb., 1855,	28.6
The highest adopted mean temperature of a year 1868,	49.1
The lowest " " 1855,	44.6
The greatest monthly mean weight of vapour, in a cubic foot of air..... { July, 1852,	5.1
The least " " Feb., 1855,	1.4
The greatest fall of rain in a month, was in Oct., 1870, and was.	13.357
The least " " May, 1853, and May, 1859,	0.3
The greatest number of days on which rain fell in one Month { July, 1861, Dec. 1868	31.
The least " " March, 1852,	3.

Monthly Magnetical Observations taken at the College Observatory, Stonyhurst, 1873.

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

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

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

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

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

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

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

The induction co-efficient μ is 0.000244.

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

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

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

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

In deducing from these observations the ratio and product of the magnetic moment m of the magnet, and the earth's horizontal magnetic intensity X , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been nearly always under 5^s , and the latter always under $72'$.

The average deflection of the magnet caused by a twist of the torsion circle through 90° , has been about $5'9$ 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 -0.0068968 .

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. FOOT.	Tem- pera- ture.	Observed Deflection.	$\log \frac{m}{X}$
	D	H	M				
January ...	25th...	9	52 a.m.	1.0	27.9	14 28 46	9.09945
	,,	10	42 a.m.	1.3	33.8	6 32 14	.....
February ..	21st ..	10	18 a.m.	1.0	31.5	14 27 26	9.09899
	,,	11	15 a.m.	1.3	33.6	6 32 20	.....
March	23rd...	9	12 a.m.	1.0	42.5	14 28 44	9.10032
	,,	9	42 a.m.	1.3	43.4	6 32 59	.....
April	19th...	12	12 p.m.	1.0	61.3	14 22 33	9.09857
	,,	12	46 p.m.	1.3	63.4	6 29 32	.....
May.....	13th...	9	35 a.m.	1.0	54.3	14 22 53	9.09825
	,,	10	3 a.m.	1.3	56.8	6 30 16	.....
June.....	16th...	10	5 a.m.	1.0	63.8	14 21 56	9.09845
	,,	10	29 a.m.	1.3	66.0	6 30 20	.....
July.....	16th...	9	55 a.m.	1.0	58.9	14 23 9	9.09870
	,,	10	28 a.m.	1.3	60.1	6 29 34	.....
August ...	22nd...	11	12 a.m.	1.0	61.6	14 20 7	9.09739
	,,	11	42 a.m.	1.3	63.5	6 29 11	.....
September.	29th...	11	43 a.m.	1.0	58.6	14 22 13	9.09821
	,,	12	8 p.m.	1.3	61.3	6 30 6	.....
October ...	24th...	11	40 a.m.	1.0	55.1	14 19 11	9.09647
	,,	12	25 p.m.	1.3	57.7	6 29 9	.....
November.	22nd...	11	36 a.m.	1.0	50.9	14 21 12	9.09717
	"	12	5 p.m.	1.3	51.0	6 29 30	.....
December .	18th...	12	0 noon	1.0	61.9	14 17 51	9.09628
	,,	12	43 p.m.	1.3	63.4	6 28 1	.....

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

Vibration Observations for Absolute measure of
Horizontal Force.

Month.	G. M. T.			Tem- pera- ture.	Time of one vibra- tion.	Log m X	Value of m.
	D	H	M				
January ...	25th	12	51 p.m.	39·2	5·60013	0·21898	0·45627
February ..	21st	12	41 p.m.	52·5	5·60013	0·21953	0·45631
March	23rd	11	31 a.m.	43·1	5·60500	0·21816	0·45629
April ...	19th	11	9 a.m.	56·7	5·60687	0·21851	0·45555
May	13th	11	53 a.m.	55·7	5·60182	0·21933	0·45582
June	16th	11	39 a.m.	61·9	5·60998	0·21860	0·45554
July	16th	8	40 a.m.	57·4	5·60756	0·21858	0·45566
August ...	25th	10	5 a.m.	64·2	5·61521	0·21798	0·45466
September.	29th	9	40 a.m.	48·8	5·60540	0·21828	0·45525
October ...	24th	9	54 a.m.	53·9	5·61133	0·21786	0·45412
November.	22nd	3	42 p.m.	50·5	5·61571	0·21693	0·45399
December..	18th	11	15 a.m.	57·5	5·61817	0·21732	0·45373

Dip Observations.				Magnetic Intensity.			
Months.	G. M. T.		Needle.	Dip.	X, or Horizontal Force.	Y, or Vertical Force.	Total Force.
	D	H M					
January ...	26th	11 5 a.m.	1	69° 29' 43"	3·6289	9·7098	10·3658
	,,	11 50 a.m.	3	69 31 12	.....	.....	.....
February ..	15th	11 25 a.m.	1	69 30 2	3·6330	9·7308	10·3869
	,,	12 20 p.m.	3	69 33 10	.....	.....	.....
March	24th	10 55 a.m.	1	69 31 43	3·6218	9·6897	10·3445
	,,	12 3 p.m.	3	69 28 56	.....	.....	.....
April ...	23rd	11 50 a.m.	1	69 28 49	3·6305	9·7036	10·3605
	,,	12 40 p.m.	3	69 29 36	.....	.....	.....
May	28th	11 0 a.m.	3	69 30 20	3·6353	9·7418	10·3979
	,,	11 48 a.m.	1	69 34 0	.....	.....	.....
June	23rd	11 30 a.m.	1	69 30 30	3·6314	9·7143	10·3709
	,,	12 25 p.m.	3	69 29 51	.....	.....	.....
July	17th	9 55 a.m.	1	69 28 19	3·6303	9·6973	10·3545
	,,	11 0 a.m.	3	69 28 49	.....	.....	.....
August ...	26th	11 12 a.m.	1	69 33 0	3·6333	9·7501	10·4050
	,,	12 2 p.m.	3	69 34 30	.....	.....	.....
September.	26th	10 54 a.m.	1	69 30 17	3·6311	9·7119	10·3685
	,,	11 40 a.m.	3	69 29 43	.....	.....	.....
October ..	25th	11 38 a.m.	1	69 30 32	3·6366	9·7233	10·3811
	,,	12 26 p.m.	3	69 28 42	.....	.....	.....
November.	25th	10 40 a.m.	1	69 29 0	3·6298	9·7104	10·3667
	,,	11 40 a.m.	3	69 31 30	.....	.....	.....
December..	19th	11 5 a.m.	1	69 34 21	3·6351	9·7494	10·4050
	,,	12 10 p.m.	3	69 31 50	.....	.....	.....
Means.....				69 30 46	3·6314	9·7194	10·3756

Declination Observations.

		Uncorrected.			Corrected.		
Month.	G. M. T.	Observation	Monthly Mean.	Observation	Monthly Mean.		
January	D. 4th... 9 23a.m.	21 35 33 w.	° ' "	21 14 37	° ' "		
	11th... 9 7	21 22 32		21 13 55			
	18th... 9 4	21 20 40		21 16 55			
	25th... 9 15	21 36 28	21 28 18	21 29 51	21 18 50		
February	1st... 9 2	21 35 48		21 34 55			
	8th... 9 18	21 31 50		21 27 48			
	15th... 9 8	21 24 33		21 21 22			
	22nd... 9 2	21 26 27	21 29 40	21 26 8	21 27 33		
March	1st... 9 4	21 30 9		21 26 24			
	8th... 9 22	21 21 44		21 22 34			
	15th... 9 4	21 21 45		21 20 52			
	22nd... 8 59	21 21 29		—			
	30th... 8 53	21 22 29	21 23 31	21 23 36	21 23 22		
April	7th... 9 4	21 21 28		21 25 27			
	14th... 9 16	21 21 32		21 23 13			
	20th... 9 6	21 18 56		21 17 28			
	26th... 9 5	21 20 50	21 20 42	21 23 16	21 22 21		
May	3rd... 9 6	21 18 27		21 21 52			
	10th... 9 5	21 26 35		21 23 24			
	17th... 9 4	21 22 38		21 24 19			
	24th... 9 3	21 17 41		21 17 39			
	31st... 9 17	21 22 5	21 21 29	21 18 18	21 21 6		
June	7th... 8 57	21 21 31		21 21 29			
	14th... 9 4	21 21 46		21 26 19			
	21st... 9 5	21 19 21		21 20 45			
	28th... 9 1	21 20 9	21 20 42	21 24 8	21 23 10		

Declination Observations.—continued.

			Uncorrected.		Corrected.	
Month.	G. M. T.		Observation	Monthly Mean.	Observation	Monthly Mean.
July	D.	H. M.	21° 17' 43" w.	° ' "	21° 22' 16"	° ' "
	7th... 9	6a.m.				
	14th...	9 11	21 18 2		21 20 35	
	20th...	9 5	21 18 51		21 21 46	
	28th...	9 7	21 19 19	21 18 29	21 20 26	21 21 16
August ...	10th..	11 5	21 28 5		21 29 29	
	16th...	9 8	21 21 31		21 24 38	
	25th...	9 0	21 20 16	21 23 17	21 25 6	21 26 24
September.	1st...	9 48	21 18 47		21 22 12	
	8th...	9 3	21 19 18		21 22 8	
	15th .	9 4	21 18 11		21 21 53	
	22nd..	9 2	21 18 34		21 24 16	
	29th...	9 7	21 16 44	21 18 19	21 23 18	21 22 45
October ...	6th...	9 0	21 16 12		21 22 46	
	13th...	9 7	21 16 36		21 22 18	
	20th...	9 3	21 14 52		21 21 43	
	27th...	9 5	21 14 58	21 15 40	21 21 23	21 22 3
November.	2nd...	9 3	21 13 20		21 19 36	
	8th...	9 4	21 20 41		21 26 6	
	17th...	8 57	21 13 54		21 20 28	
	24th ..	9 7	21 20 11	21 17 2	21 27 2	21 23 18
December .	8th ..	9 4	21 18 16		21 25 24	
	15th...	9 0	21 21 28		—	
	22nd ...	9 3	21 20 6		21 28 6	
	29th...	9 5	21 22 4	21 20 29	21 29 12	21 27 34
Yearly mean				21 21 28		21 23 19

Curves I and II represent the mean values for five and twenty years ; (1848—1872),—III and IV those for 1873.

The rise in the Barometer is preceded by a diminution in the Rainfall, the Barometer being above its mean height from April to September both included, whereas the Rainfall is small from February to July.

The difference between January and October is very marked in the mean curves, the barometer being equally low in both, whilst the Rainfall, which attains its maximum in October, is scarcely above the mean in January,

The curves for 1873 present an exaggerated example of this general rule.

The temperature curves are remarkably regular and simple, having only a single inflection.

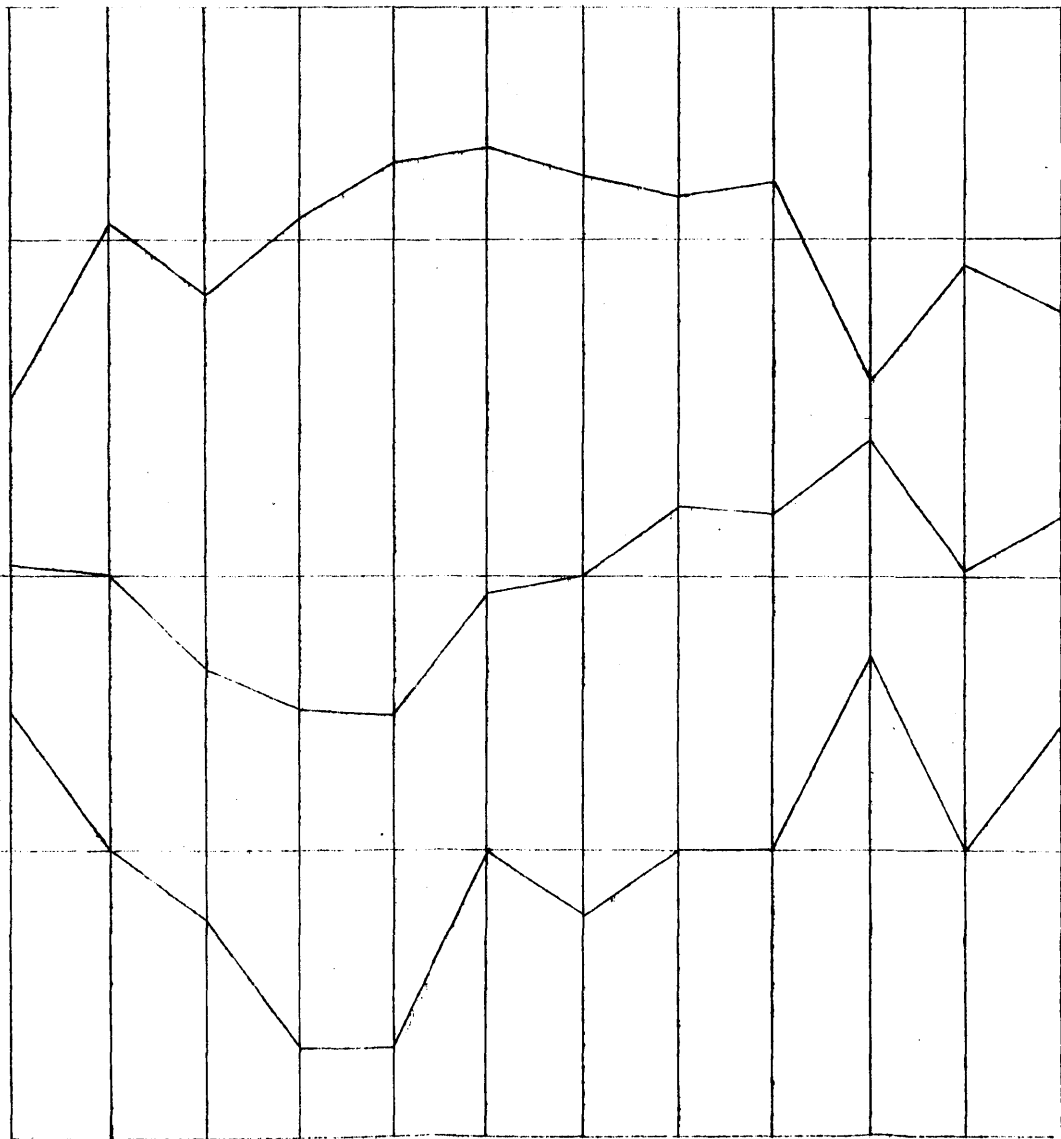
In the Humidity curve for 1873 there is a striking feature, absent entirely from the mean curve, and consisting of a gradual increase of Humidity from April to June with a decline from July to September.

Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.

Mean Barometer
29.478.

Mean Monthly Rainfall
3.9.

*Average number of days per
Month on which at least 0.01
of Rain-fall, 16.*



Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.

Adjusted Mean Temperature

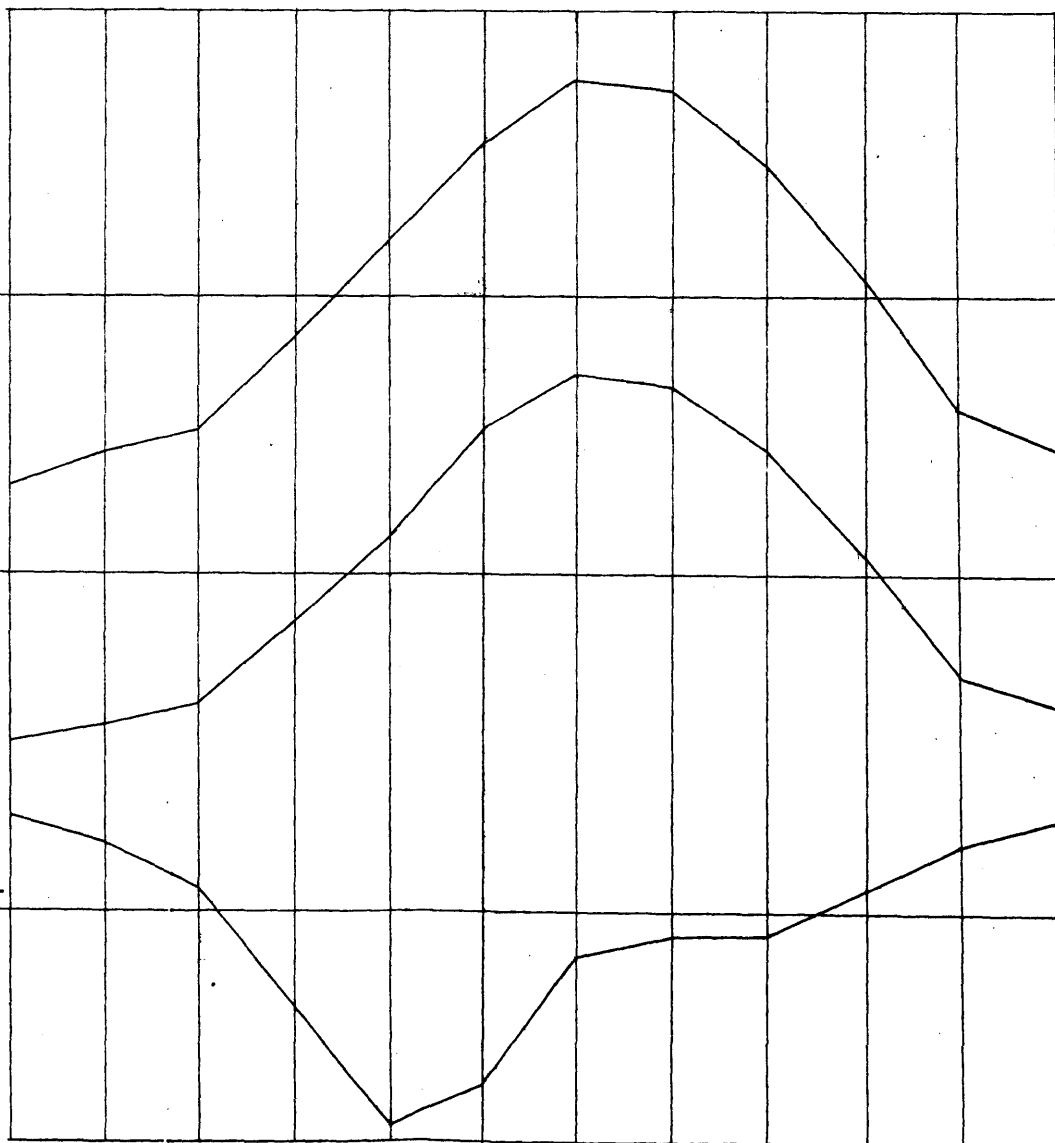
46°9.

Mean Temperature of

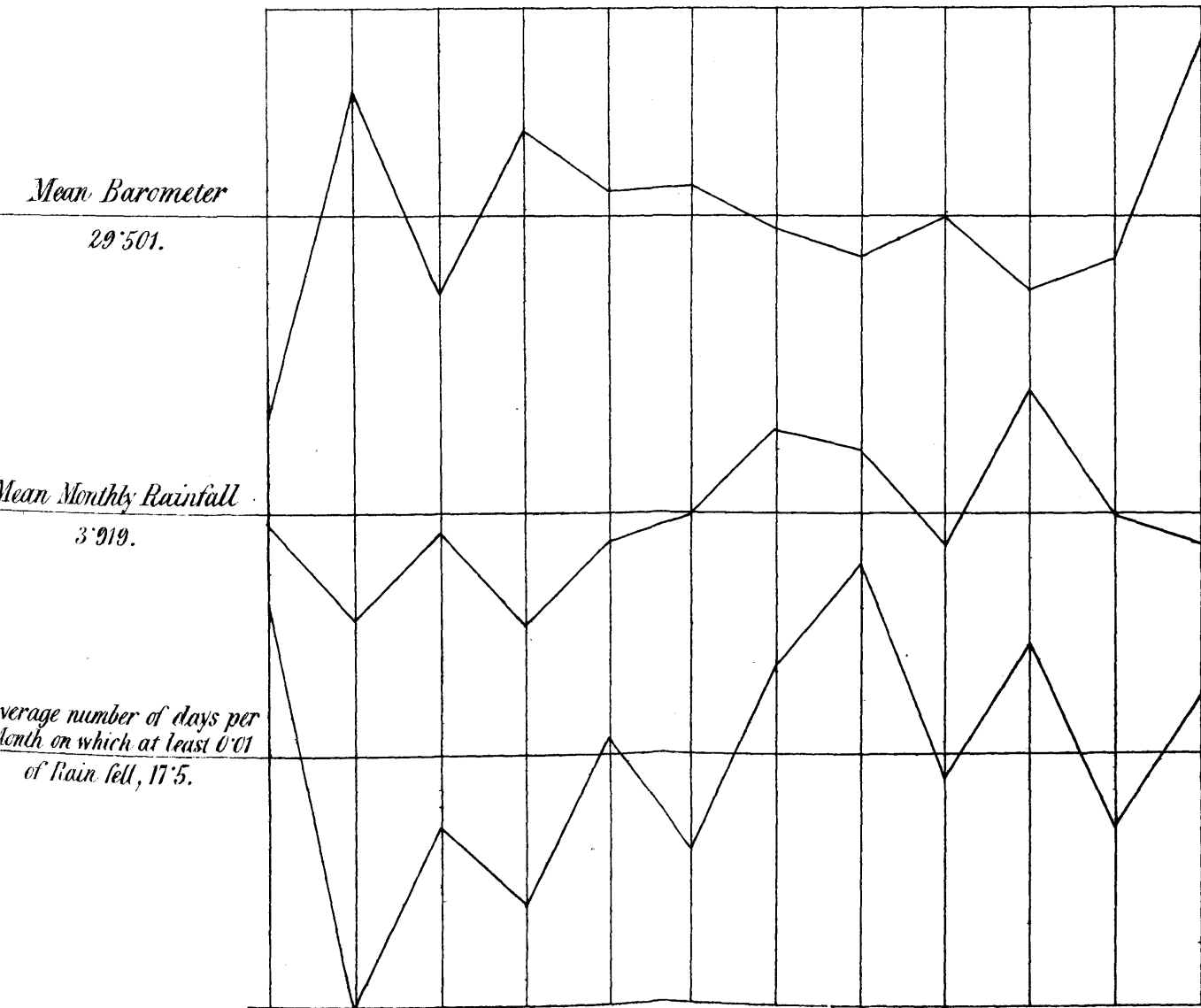
Evaporation 44°6.

Mean degree of

Humidity 0°84.



Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.



Mean Barometer

29.501.

Mean Monthly Rainfall

3.919.

Average number of days per month on which at least 0.01 of Rain fell, 17.5.

Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.

adopted Mean Temperature

46·9.

*Mean Temperature of
Evaporation 44·8.*

*Mean degree of
Humidity 0·85.*

