

XXIX. *Sequel to a paper on the Reduction of the Thermometrical Observations made at the Apartments of the Royal Society. By JAMES GLAISHER, Esq., F.R.S., of the Royal Observatory, Greenwich.*

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IN a paper which the Royal Society did me the honour to publish in the last volume of its Transactions, I gave the results found from all the thermometrical observations which have been taken at the Apartments of this Society; and I stated that I had made some progress in the connection of this series of results with those deduced from the observations at the Royal Observatory, Greenwich. Since that time I have reduced the two series of observations to one and the same series, and I have now the honour to lay the results from their combination before the Society.

In my former paper I stated that no observations had been taken between the years 1781 and 1786. Had the particulars of these years been about their average values, their omission would not have materially affected the final results, but on examination I found that those years were distinguished by very severe weather, and that their omission would have a sensible effect; I have therefore supplied these particulars, as detailed below.

I also stated that it was doubtful whether the temperatures, as determined for Somerset House, were influenced by local causes. I have endeavoured to collect information upon this subject, and of which I shall speak presently.

I shall adopt the same plan in the arrangement of the final results, which I pursued in my former paper, and present them for monthly, quarterly and yearly periods. The numbering of the Tables is continued from the former paper. It may tend to clearness if I speak of each preliminary investigation separately.

*Determination of the Mean Temperature of the Air at Lyndon in Rutlandshire, the longitude of which place is 0° 3' East of Greenwich and the latitude is 52° 32' North, for every month in the years from 1771 to 1799.*

The results of meteorological observations taken by THOMAS BARKER, Esq., at Lyndon in Rutlandshire, and which seems to have been taken with care, were published in the volumes of the Philosophical Transactions for the years 1772 to 1799. From these papers I have determined the mean monthly temperatures of the air, and which are shown in the following Table:—

TABLE VIII.—Mean monthly temperature of the Air at Lyndon in Rutlandshire, from the year 1771 to the year 1798.

Year.	January.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	December.
1771.	30·5	34·0	35·0	40·0	56·2	56·6	61·5	59·7	52·7	47·5	41·2	41·2
1772.	32·8	34·8	38·8	43·5	50·3	62·0	62·0	61·0	55·7	52·7	43·7	39·3
1773.	37·5	35·5	41·2	45·5	49·2	58·2	60·5	62·2	54·5	48·5	39·5	38·0
1774.	31·2	37·8	41·0	46·5	51·5	60·2	61·0	61·2	54·2	48·2	39·0	35·8
1775.	38·7	42·5	41·5	49·7	55·0	62·7	64·0	59·7	57·8	47·5	37·8	37·5
1776.	27·5	38·2	43·2	47·8	52·0	59·2	63·8	60·0	55·2	49·8	41·2	38·8
1777.	33·5	34·2	43·2	45·0	54·0	57·7	61·5	61·5	57·7	49·8	42·7	35·2
1778.	34·5	35·8	40·0	46·0	55·5	62·2	66·0	62·5	52·2	44·8	43·2	42·0
1779.	36·0	44·5	44·2	49·2	54·0	58·2	65·5	65·0	59·0	50·8	40·8	36·7
1780.	29·5	35·0	45·5	43·0	55·8	58·8	63·5	64·0	58·5	48·5	38·0	36·7
1781.	34·0	40·7	43·0	48·5	53·2	63·5	64·5	64·0	57·5	48·8	42·0	40·8
1782.	39·5	35·0	39·0	42·0	49·8	60·5	61·2	58·0	56·2	45·5	35·0	36·0
1783.	37·5	39·8	38·0	49·2	50·0	61·0	67·7	62·0	55·3	49·3	42·8	34·8
1784.	29·8	32·5	36·5	43·3	58·5	58·8	61·5	57·5	58·0	44·2	41·0	30·8
1785.	36·7	31·0	34·2	47·5	54·2	62·0	64·2	58·8	57·5	47·2	40·5	35·0
1786.	36·5	36·8	34·5	46·0	54·0	62·2	61·0	60·2	52·0	45·0	37·0	Ther. broken.
1787.	37·2	42·5	44·2	46·0	53·8	60·0	62·5	61·8	59·0	50·2	38·8	39·0
1788.	38·5	39·0	39·0	50·8	59·3	61·5	65·5	62·0	57·5	50·2	42·0	34·2
1789.	34·5	40·5	36·0	47·0	56·8	60·0	63·0	63·0	56·8	48·0	39·8	42·0
1790.	39·0	42·8	44·8	43·8	55·2	61·5	63·0	62·5	55·2	50·2	42·2	40·8
1791.	.....	39·8	43·2	50·5	52·0	59·8	61·5	63·0	58·0	47·8	42·2	33·0
1792.	36·5	38·8	43·2	51·5	52·2	57·8	62·5	64·2	54·0	48·8	44·8	40·2
1793.	36·5	40·5	40·2	43·0	53·2	60·0	68·2	62·5	55·0	53·8	43·2	41·0
1794.	34·5	45·5	45·2	52·0	53·5	62·5	69·0	61·8	54·8	49·5	43·5	37·2
1795.	26·8	32·8	39·8	46·8	54·5	58·0	60·2	64·5	61·8	54·0	41·0	44·5
1796.	44·8	40·5	40·5	51·2	51·0	60·5	62·5	62·5	60·0	47·2	40·5	32·0
1797.	38·0	38·2	40·0	45·8	55·0	57·8	66·8	63·0	55·0	48·0	41·2	40·2
1798.	38·5	38·8	41·2	51·5	56·8	65·8	64·5	64·2	58·5	51·0	40·5	33·2

During twenty of these years simultaneous observations were taken at the Apartments of this Society. The following Table of comparison of results is formed by comparing the numbers in the preceding Table with those for the same months in Table I. of my paper in the Philosophical Transactions, Part II., 1849.

TABLE IX.—Comparison of the mean monthly temperature of the Air at the Apartments of the Royal Society, with the mean monthly temperature of the Air at Lyndon.

Years.	January.			February.			March.			April.			May.			June.		
	Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.		
	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.
1774.	33.1	31.2	+1.9	39.4	37.8	+1.6	43.9	41.0	+2.9	47.9	46.5	+1.4	52.2	51.5	+0.7	61.0	60.2	+0.8
1775.	42.0	38.7	+3.3	43.3	42.5	+0.8	42.8	41.5	+1.3	50.8	49.7	+1.1	55.2	55.0	+0.2	63.5	62.7	+0.8
1776.	28.6	27.5	+1.1	41.4	38.2	+3.2	44.8	43.2	+1.6	48.3	47.8	+0.5	51.7	52.0	-0.3	59.6	59.2	+0.4
1777.	35.5	33.5	+2.0	37.2	34.2	+3.0	45.7	45.2	+0.5	45.1	45.0	+0.1	53.4	54.0	-0.6	57.2	57.7	-0.5
1778.	36.4	34.5	+1.9	37.0	35.8	+1.2	41.2	40.0	+1.2	48.0	46.0	+2.0	55.9	55.5	+0.4	62.2	62.2	0.0
1779.	36.4	36.0	+0.4	46.7	44.5	+2.2	48.1	44.2	+3.9	51.8	49.2	+2.6	55.8	54.0	+1.8	58.9	58.2	+0.7
1780.	30.2	29.5	+0.7	36.7	35.0	+1.7	50.3	45.5	+4.8	44.7	43.0	+1.7	57.2	55.8	+1.4	60.0	58.8	+1.2
1781.	37.8	34.0	+3.8	41.7	40.7	+1.0	43.7	43.0	+0.7	47.2	48.5	-1.3	54.2	53.2	+1.0	63.4	63.0	-0.4
1787.	38.3	37.2	+1.1	40.9	42.5	-1.6	43.9	44.2	-0.3	45.5	46.0	-0.5	52.4	53.8	-1.4	58.7	60.0	-1.3
1788.	39.0	38.5	+0.5	40.1	39.0	+1.1	39.7	39.0	+0.7	50.6	50.8	-0.2	57.4	59.3	-1.9	59.5	61.5	-2.0
1789.	35.0	34.5	+0.5	41.3	40.5	+0.8	35.5	36.0	-0.5	45.2	47.0	-1.8	54.3	56.8	-2.5	55.7	60.0	-4.3
1790.	40.2	39.0	+1.2	42.6	42.8	-0.2	44.3	44.8	-0.5	42.0	43.8	-1.8	53.7	55.2	-1.5	57.7	61.5	-3.8
1791.	No obs.	No obs.	.....	40.2	39.8	+0.4	43.2	43.2	0.0	49.9	50.5	-0.6	50.5	52.0	-1.5	58.5	59.8	-1.3
1792.	36.5	36.5	0.0	38.8	38.8	0.0	43.2	43.2	0.0	50.0	51.5	-1.5	50.7	53.2	-2.5	55.3	57.8	-2.5
1793.	36.9	36.5	+0.4	41.1	40.5	+0.6	40.4	40.2	+0.2	43.5	43.0	+0.5	51.8	53.2	-1.4	56.3	60.0	-3.7
1794.	34.9	34.5	+0.4	46.1	45.5	+0.6	45.4	45.2	+0.2	50.7	52.0	-1.3	51.7	53.5	-1.8	58.5	62.3	-3.8
1795.	25.5	26.8	-1.3	35.5	32.8	+2.7	39.7	39.8	-0.1	46.2	46.8	-0.6	53.0	54.5	-1.5	54.6	58.0	-3.4
1796.	46.9	44.8	+2.1	41.0	40.5	+0.5	40.1	40.0	+0.1	49.4	51.2	-1.8	51.2	57.0	+0.2	57.0	60.5	-3.5
1797.	37.0	38.0	-1.0	37.0	38.2	-1.2	39.0	40.0	-1.0	45.8	45.8	0.0	52.4	55.0	-2.6	55.7	57.8	-2.1
1798.	39.4	38.5	+0.9	39.3	38.8	+0.5	41.8	41.2	+0.6	50.3	51.5	-1.2	54.7	56.8	-2.1	62.1	65.8	-3.7
Years.	July.			August.			September.			October.			November.			December.		
	Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.		
	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.	Somerset House.	Lyndon.	Higher at Somerset House.
1774.	62.8	61.0	+1.8	61.5	61.2	+0.3	55.8	54.2	+1.6	50.1	48.2	+1.9	40.5	39.0	+1.5	38.5	35.8	+2.7
1775.	64.0	64.0	0.0	62.1	59.7	+2.4	59.5	57.8	+1.7	49.5	47.5	+2.0	41.5	37.8	+3.7	40.7	37.5	+3.2
1776.	63.8	63.8	0.0	62.0	60.0	+2.0	55.6	55.2	+0.4	52.8	49.8	+3.0	44.0	41.2	+2.8	41.5	38.8	+2.7
1777.	68.0	61.5	+6.5	63.7	61.5	+2.2	59.2	57.2	+2.0	52.6	49.8	+2.8	45.0	42.7	+2.3	37.2	35.2	+2.0
1778.	68.0	66.0	+2.0	64.8	62.5	+2.3	54.5	52.7	+1.8	47.3	44.8	+2.5	46.0	43.2	+2.8	44.2	42.0	+2.2
1779.	65.9	65.5	+0.4	65.2	65.0	+0.2	61.8	59.0	+2.8	53.2	50.8	+2.4	43.2	40.8	+2.4	41.6	36.7	+4.9
1780.	64.2	63.5	+0.7	67.0	64.0	+3.0	60.4	58.5	+1.9	51.3	48.5	+2.8	40.8	38.0	+2.8	38.0	36.7	+1.3
1781.	66.3	64.5	+1.8	64.3	64.0	+0.3	55.5	59.0	-3.5	49.9	50.2	-0.3	40.9	38.8	+2.1	41.0	39.0	+2.0
1787.	62.4	62.5	-0.1	62.4	61.8	+0.6	57.0	57.5	-0.5	50.4	50.2	+0.2	41.9	42.0	-0.1	30.4	34.2	-3.8
1788.	61.6	65.5	-3.9	61.2	62.0	-0.8	57.0	56.8	-0.2	48.1	48.0	+0.1	40.0	39.8	+0.2	43.0	42.0	+1.0
1789.	59.8	63.0	-3.2	61.5	63.0	-1.5	55.0	55.2	-0.2	50.8	50.2	+0.6	43.3	42.2	+1.1	40.4	40.8	-0.4
1790.	60.1	63.0	-2.9	61.2	62.5	-1.3	57.9	58.0	-0.1	47.9	47.8	+0.1	42.6	42.2	+0.4	36.2	33.0	+3.2
1791.	60.5	61.5	-1.0	62.7	63.0	-0.3	57.9	58.0	-0.1	50.0	48.8	+1.2	44.5	44.8	-0.3	41.4	40.2	+1.2
1792.	59.6	62.5	-2.9	63.5	64.2	-0.7	56.5	54.0	+2.5	47.9	48.8	-0.9	44.5	44.8	-0.3	41.4	40.2	+1.2
1793.	66.3	68.2	-2.3	60.3	62.5	-2.2	53.9	55.0	-1.1	53.2	53.8	-0.6	44.2	43.2	+1.0	38.2	37.2	+1.0
1794.	66.3	69.0	-2.7	60.7	61.8	-1.1	54.8	54.8	0.0	49.6	49.5	+0.1	44.6	43.5	+1.1	38.2	37.2	+1.0
1795.	59.9	60.2	-0.3	62.1	64.5	-2.4	61.9	61.8	+0.1	54.7	54.0	+0.7	42.0	41.0	+1.0	46.2	44.5	+1.7
1796.	59.6	62.5	-2.9	61.2	63.0	-1.8	60.2	60.0	+0.2	47.8	47.2	+0.6	41.6	40.5	+1.1	31.8	32.0	-0.2
1797.	64.3	66.8	-2.5	60.3	63.0	-2.7	55.7	55.0	+0.7	48.3	48.0	+0.3	42.7	41.2	+1.5	42.6	40.2	+2.4
1798.	62.2	64.5	-2.3	62.8	64.2	-1.4	57.6	58.5	-0.9	51.1	51.0	+0.1	41.3	40.5	+0.8	35.1	33.2	+1.9

By taking the means of the differences of the results, we find that the reading of the thermometer in air at the Apartments of the Royal Society in

January was higher than at Lyndon by . . . . .	1°0
February was higher than at Lyndon by . . . . .	0·8
March was higher than at Lyndon by . . . . .	0·8
April was lower than at Lyndon by . . . . .	0·2
May was lower than at Lyndon by . . . . .	0·6
June was lower than at Lyndon by . . . . .	1·7
July was lower than at Lyndon by . . . . .	1·0
August was higher than at Lyndon by less than . . . . .	0·1
September was higher than at Lyndon by . . . . .	0·4
October was higher than at Lyndon by . . . . .	1·0
November was higher than at Lyndon by . . . . .	1·0
December was higher than at Lyndon by . . . . .	1·6

*Determination of the Mean Temperature of each month at the Apartments of the Royal Society for those months when no observations were made there.*

By applying the above numbers to those in Table VIII. when no observations were taken at the Apartments of the Royal Society, the following Table is formed:—

TABLE X.—Showing the approximate mean monthly temperature of the Air at the Apartments of the Royal Society.

Year.	Approximate mean temperature of the air.											
	January.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1771.	31·5	34·8	35·8	39·8	55·6	54·9	60·5	59·7	53·1	48·5	42·2	42·8
1772.	33·8	35·6	39·6	43·3	49·7	60·3	61·0	61·0	56·1	53·7	44·7	40·9
1773.	38·5	36·5	42·0	45·3	48·6	56·5	59·5	62·2	54·9	49·5	40·5	39·6
1781.	.....	.....	.....	.....	.....	.....	.....	.....	57·9	49·8	43·0	42·4
1782.	40·5	35·8	39·8	41·8	49·2	58·8	60·2	58·0	56·6	46·5	36·0	37·6
1783.	38·5	40·6	38·8	49·0	49·4	59·3	66·7	62·0	55·7	50·3	43·8	36·4
1784.	30·8	33·3	37·3	43·1	57·9	57·1	60·5	57·5	58·4	45·2	42·0	32·4
1785.	37·7	31·8	35·0	47·3	53·6	60·3	63·2	58·8	57·9	48·2	41·5	36·6
1786.	37·5	37·6	35·3	45·8	53·4	60·5	60·0	60·2	52·4	46·0	38·0	

And these numbers may be considered as being very nearly the true values; they are reduced to the same zero as those in Table I. of my former paper, and form a part of that series of values.

*Determination of the Mean Temperature of the Air at Epping for every month from the year 1821 to 1840.*

Let us now proceed to compare the results of observations taken simultaneously towards the end of the Royal Society's series, made as nearly as possible under the

same circumstances as those at Lyndon at the beginning of that series, with the view of determining whether an agreement exists in the differences at those different epochs, and also for the purpose of assisting to determine whether London be really warmer than the country, as affirmed. The observations which most fully satisfy these conditions are those made by Mr. THOMAS SQUIRE of Epping. This gentleman, on my request to furnish me with the monthly means of his observations for comparison with those of this Society, most promptly and obligingly sent me the monthly mean from twenty-eight years' observations taken on every day at 8<sup>h</sup> in the morning.

The thermometer with which the observations were made was placed in the shade, at the height of 5 feet above the ground, facing the N.E., and an open country.

These numbers I have reduced to mean values by the application of corrections, for that purpose (see my paper in Philosophical Transactions, Part I. 1848) then I further reduced them to the elevation at Somerset House and for difference of latitude, and in this way the next Table was formed.

TABLE XI.—Mean monthly temperature of the Air at Epping reduced to the elevation and latitude of Somerset House, for the year 1821 to 1848.

Year.	January.	Feb.	March.	April.	May.	June.	July.	Augst.	Sept.	October.	Nov.	Dec.	Year.
1821.	38·5	34·8	43·0	50·2	49·4	53·1	58·4	64·1	62·7	50·7	47·3	43·5	49·6
1822.	39·0	43·0	46·9	48·9	57·6	65·3	64·1	62·7	58·1	52·6	46·6	33·9	51·6
1823.	31·5	38·3	41·5	47·1	57·1	56·8	60·3	61·5	57·1	48·4	43·8	39·6	48·6
1824.	38·0	38·8	41·6	46·2	52·1	56·8	62·9	61·9	59·9	51·0	46·7	42·2	49·8
1825.	38·9	38·2	41·7	51·0	56·7	60·6	65·4	64·3	62·6	51·8	41·0	40·2	51·0
1826.	31·8	42·3	43·4	50·6	53·1	63·9	66·3	66·1	59·8	53·7	40·2	42·7	51·2
1827.	33·8	32·3	44·9	50·6	56·0	59·8	64·2	61·3	59·2	53·8	42·5	41·2	50·2
1828.	40·7	41·8	44·7	49·8	57·0	61·9	62·8	61·5	60·1	50·7	44·8	45·2	51·8
1829.	31·9	38·8	40·3	46·0	56·7	60·5	60·8	58·9	54·4	49·0	38·9	32·4	47·3
1830.	31·4	34·4	46·4	50·7	56·8	56·2	63·9	59·1	55·2	52·1	43·1	35·3	48·7
1831.	34·9	41·2	45·5	51·3	54·7	60·3	62·1	63·8	58·2	56·2	42·7	42·3	50·2
1832.	36·8	37·0	41·8	48·9	53·4	59·8	61·1	61·8	58·3	52·2	53·6	43·1	50·3
1833.	35·2	42·9	38·9	47·9	60·4	59·8	60·7	57·9	55·0	51·6	43·1	45·8	49·9
1834.	45·6	40·1	45·1	47·6	57·7	61·5	64·0	63·2	60·5	51·9	44·4	41·3	51·9
1835.	38·6	41·4	42·3	48·8	54·7	60·7	64·2	64·5	58·9	48·8	43·7	35·7	50·2
1836.	37·9	37·0	44·5	46·1	52·6	61·0	62·6	60·3	55·6	49·7	42·1	40·4	49·2
1837.	38·4	40·1	37·4	42·4	50·4	60·7	62·5	62·3	57·6	51·5	39·5	41·9	48·7
1838.	28·6	32·9	42·5	44·8	53·7	60·2	62·4	62·1	57·5	51·1	40·4	38·7	47·9
1839.	37·2	39·0	41·3	45·1	51·3	61·7	62·6	61·0	57·7	50·7	46·3	40·1	49·5
1840.	39·2	38·0	39·4	50·1	56·4	62·1	61·0	64·2	54·2	46·4	42·6	32·6	48·9
1841.	33·6	36·3	46·5	48·8	59·1	58·1	60·9	62·6	60·2	49·8	42·2	40·0	49·8
1842.	33·1	40·1	44·8	47·3	55·1	64·7	62·4	67·3	59·4	44·9	42·4	44·1	50·4
1843.	39·6	35·9	43·1	49·5	54·5	58·0	62·6	64·5	62·1	48·0	43·1	44·1	50·4
1844.	38·5	33·9	42·3	51·8	54·4	62·0	63·6	59·4	59·2	47·9	43·5	33·9	49·3
1845.	38·9	32·2	36·8	47·7	51·2	62·8	61·6	59·3	56·5	50·1	44·6	40·0	48·5
1846.	42·7	42·2	43·9	48·4	56·1	67·3	65·4	64·5	60·6	50·5	44·4	31·2	51·5
1847.	35·0	35·0	40·8	45·4	57·0	58·3	64·9	61·7	54·2	52·8	45·3	41·8	49·4
1848.	35·0	42·6	43·0	48·9	59·4	60·1	62·5	59·3	56·6	51·7	40·5	41·9	50·2

During twenty-two of these years observations were taken at Somerset House, and the following Table exhibits the simultaneous results with their differences.

TABLE XII.—Comparison of the mean monthly temperature of the Air at Somerset House and at Epping.

Table with 6 columns for months (January to December) and 6 sub-columns for temperature differences (Higher at Somerset House, Somerset House, Epping, Mean temperature of the air at Somerset House, Higher at Somerset House, Mean temperature of the air at Somerset House). Rows represent years from 1821 to 1842.

By taking the mean of the numbers in each column of differences, we find that the temperature of the air at the Apartments of the Royal Society in

January was higher than at Epping reduced to the same level by . . .	1·3
February was higher than at Epping reduced to the same level by . . .	1·2
March was lower than at Epping reduced to the same level by less than . . .	0·1
April was lower than at Epping reduced to the same level by . . .	1·5
May was lower than at Epping reduced to the same level by . . .	1·0
June was lower than at Epping reduced to the same level by . . .	0·6
July was higher than at Epping reduced to the same level by . . .	0·2
August was lower than at Epping reduced to the same level by . . .	0·3
September was lower than at Epping reduced to the same level by . . .	1·0
October was higher than at Epping reduced to the same level by . . .	0·2
November was higher than at Epping reduced to the same level by . . .	1·4
December was higher than at Epping reduced to the same level by . . .	1·5

And the mean temperature of the whole period was nearly of the same value at both places.

Having obtained these results, and finding that during the time the sun was situated north of the equator the temperature at the Apartments of the Royal Society was lower than at Epping, and that it was higher during the time the sun had south declination, I requested Mr. SQUIRE to furnish me with full particulars with respect to the position of his instrument to the sun and to surrounding objects: the following is the information he gave me:—

“The thermometer hangs near the north angle of a small projecting pier of a wall, nearly close to the brickwork, facing the N.E., and an open country. At the back of the wall is a grape-vine, and when in leaf, it so shades the wall that its temperature is not much affected by the sun’s rays; but, before the vine is in leaf, it may raise the temperature a trifle; yet from some casual observations scattered over my journal as tests, I do not find that the said thermometer is sensibly influenced by the heat of the sun at 8 A.M., the time of reading the instrument. On the 13th of May, 1847, I moved the thermometer a few feet from its former position on the wall, with the same aspect, but, at the back of this part of the wall, there is a sort of grotto or summer-house, which is covered by thatch and completely interrupts the sun’s rays from the wall; hence its present situation may perhaps be considered more eligible for a mean temperature than its former position, but I do not find any difference worth notice.”

The general fact, however, of a higher winter temperature, and of a lower summer temperature at the Apartments of the Royal Society, is satisfactorily proved by both sets of comparisons, and it is evident that the same cause has been in operation at both times, and to the same amount. There can be no doubt that this cause is the vicinity of the river Thames to the locality of the observations.

*Determination of the Monthly Mean Temperature of the water of the Thames by night and by day, from the year 1846 to the year 1849.*

The observations to determine the temperature of the Thames water are made by Lieut. SANDERS, R.N. The instruments consist of one maximum thermometer and of one minimum thermometer, suspended from the sides of the Dreadnought Hospital Ship, in a perforated trunk placed at about 2 feet below the surface of the water. The range of temperature during the day is usually about 2°, and the simple arithmetic mean of the readings of the maximum and minimum thermometers shows the mean temperature of the water.

TABLE XIII.—Mean monthly temperature of the water of the Thames.

Month.	1846.		Mean temperature of the water.	1847.		Mean temperature of the water.	1848.		Mean temperature of the water.	1849.		Mean temperature of the water.
	Mean of all the readings in each month.			Mean of all the readings in each month.			Mean of all the readings in each month.			Mean of all the readings in each month.		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
January....	44·3	42·0	43·2	37·1	35·5	36·3	35·7	35·1	35·4	41·6	39·6	40·6
February...	45·3	42·5	43·9	38·9	37·2	38·1	41·8	40·3	41·1	44·2	42·6	43·4
March.....	48·2	46·3	47·3	42·1	41·4	41·8	.....	.....	.....	45·7	44·1	44·9
April .....	51·5	49·4	50·5	46·9	46·4	46·7	51·1	50·2	50·6	47·9	44·8	46·3
May .....	59·9	57·2	58·6	58·6	57·0	57·8	62·5	61·0	61·8	58·9	55·7	57·3
June .....	73·0	70·8	71·9	65·5	61·9	63·7	63·6	62·6	63·1	65·2	63·3	64·3
July .....	67·4	66·1	66·7	70·6	66·5	68·6	66·0	65·0	65·5	67·8	66·1	67·0
August ...	68·3	66·7	67·5	66·1	64·4	65·3	63·0	62·0	62·5	64·9	62·7	63·8
September.	64·7	63·5	64·1	57·0	56·5	56·8	59·5	58·8	59·1	61·4	58·7	60·0
October ...	54·2	52·8	53·5	53·3	53·0	53·2	53·7	50·8	52·2	52·8	49·5	51·2
November.	47·6	46·0	46·8	47·9	47·3	47·6	.....	.....	.....	47·1	44·1	45·6
December.	37·6	34·9	36·3	42·5	41·5	42·0	43·9	40·5	42·2	40·3	36·8	38·6

By comparing the means of these numbers for the four years, with the means of the readings of the maximum and minimum thermometers in air at the Royal Observatory, for the same months, we find that the mean lowest readings of the water were higher in the twelve months respectively by 3°·9; 4°·6; 7°·7; 12°·3; 11°·5; 16°·7; 12°·4; 10°·4; 10°·7; 6°·8; 6°·3 and 4°·9, than the mean of the lowest readings of the air; and it was lower than the mean maximum readings of the air by 3°·2; 4°·6; 5°·3; 9°·2; 6°·0; 7°·5; 8°·1; 6°·7; 7°·4; 6°·0; 4°·7 and 3°·0, in the respective months from January. These numbers are very large, and will fully account for the little higher temperature possessed by places in the vicinity of the river, and these differences of temperature are probably the fruitful source of the London fogs.

Mr. SANDERS, at my request, has taken daily observations of the temperature of the air at 32 feet above the water of the Thames at the hours of 6 A.M. and 6 P.M. during the years 1847 and 1848, and at the hours of 9 A.M. and 9 P.M. in the year 1849. The result of these observations, compared with simultaneous observations taken at the Royal Observatory, is as follows:—that the temperature of the air 32 feet above



the water, exceeds that at the observatory at 6 A.M. by 1°·6; 1°·0; 0°·8; 0°·3; 0°·6; 0°·7; 0°·9; 0°·8; 0°·2; 0°·0 and 0°·8, in the twelve months respectively; and at 6 P.M. by 1°·2; 0°·8; 1°·0; 0°·8; 0°·7; 0°·8; 0°·6; 0°·8; 1°·3; 1°·0; 1°·7 and 0°·9, in the twelve months respectively; that at 9 A.M. it was in excess in January by 1°·3; February by 1°·5; March by 0°·6; April by 0°·4; May by 2°·2; June by 0°·4; and in October by 0°·5; that it was of a lower temperature in July by 0°·7; August by 0°·5; and in September by 0°·1; that at 9 P.M. it was always of a higher temperature: the excesses were 0°·1; 0°·3; 0°·7; 0°·3; 1°·9; 2°·9; 1°·5; 3°·2; 1°·2 and 1°·3 respectively.

From these numbers, it seems that during the night hours, at all seasons of the year, the temperature of the air at the Dreadnought Hospital Ship is higher than at the Observatory, and that it is below only during the midday hours.

At times of extreme temperature the effect of the water upon the temperature of the air is very great. On February 12, 1847, the temperature of the air at my house, which is situated about one mile and a half from the river, was 6°·0; the lowest reading, 32 feet above the water of the Thames, was 16°·0; the temperature of the water was 33°; its heating effect upon the air in its immediate vicinity amounted to 10°; at the Observatory the reading was 10°·5; and the heat of the water of the Thames seems to have influenced the temperature of the air at the Observatory to the amount of 4°. Some time since, on comparing the temperatures of the air as recorded in the Philosophical Transactions in the year 1814, with corresponding temperatures as observed at Greenwich, I doubted the accuracy of the former in many instances, on account of their much higher values; these investigations have now led me to believe that the temperatures, as recorded in the Philosophical Transactions for that year, are correct.

TABLE XIV.—Comparison of the mean temperature of the Air at St. John's Wood, and at the Royal Observatory, Greenwich.

Month.	1841.			1842.			1843.		
	Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.		
	At Royal Observatory, Greenwich.	At St. John's Wood.	In excess at St. John's Wood.	At Royal Observatory, Greenwich.	At St. John's Wood.	In excess at St. John's Wood.	At Royal Observatory, Greenwich.	At St. John's Wood.	In excess at St. John's Wood.
January .....	33·6	32·3	+ 0·7	32·9	32·4	— 0·5	39·9	39·1	— 0·8
February ...	35·3	36·5	+ 1·2	40·8	40·3	— 0·5	36·0	36·1	+ 0·1
March .....	46·2	46·6	+ 0·4	44·9	44·3	— 0·6	42·9	42·9	0·0
April .....	47·0	46·6	— 0·4	45·2	46·3	+ 1·1	47·1	47·6	+ 0·5
May .....	56·8	57·0	+ 0·2	53·2	53·2	0·0	52·2	51·2	— 1·0
June .....	56·4	55·9	— 0·5	62·9	62·5	— 0·4	56·3	55·2	— 1·1
July .....	57·8	56·9	— 0·9	60·2	59·5	— 0·7	60·9	60·1	— 0·8
August .....	60·5	59·5	— 1·0	65·4	65·5	+ 0·1	62·1	61·9	— 0·2
September ...	58·5	57·8	— 0·7	56·4	56·2	— 0·2	59·5	60·3	+ 0·8
October .....	48·8	49·1	+ 0·3	45·4	45·8	+ 0·4	48·0	47·6	— 0·4
November ...	42·7	42·5	— 0·2	42·8	43·3	+ 0·5	43·8	43·9	+ 0·1
December ...	40·5	40·2	— 0·3	45·0	44·6	— 0·4	43·9	44·2	+ 0·3

TABLE XIV. (Continued.)

Month.	1844.			1845.			1846.		
	Mean temperature of the air.			Mean temperature of the air.			Mean temperature of the air.		
	At Royal Observatory Greenwich.	At St. John's Wood.	In excess at St. John's Wood.	At Royal Observatory, Greenwich.	At St. John's Wood.	In excess at St. John's Wood.	At Royal Observatory, Greenwich.	At St. John's Wood.	In excess at St. John's Wood.
January .....	39·1	36·9	-2·2	38·3	38·7	+0·4	43·7	43·1	-0·6
February ...	35·2	35·7	+0·5	32·7	32·9	+0·2	43·9	43·7	-0·2
March.....	41·5	41·6	+0·1	35·2	35·3	+0·1	43·3	44·0	+0·7
April .....	51·7	52·2	+0·5	46·3	47·5	+1·2	47·1	46·8	-0·3
May .....	52·9	52·5	-0·4	49·4	49·2	-0·2	54·6	55·6	+1·0
June .....	60·7	59·9	-0·8	60·7	60·6	-0·1	65·3	65·2	-0·1
July .....	61·4	61·0	-0·4	59·8	59·4	-0·4	64·5	63·6	-0·9
August .....	57·7	57·4	-0·3	57·3	57·6	+0·3	63·2	62·5	-0·7
September ...	56·9	57·4	+0·5	53·6	53·8	+0·2	60·1	60·1	0·0
October .....	49·5	49·2	-0·3	50·2	50·1	-0·1	50·5	49·9	-0·6
November ...	44·0	43·3	-0·7	45·8	45·3	-0·5	46·0	44·9	-1·1
December ...	33·0	33·8	+0·8	41·7	40·5	-1·2	32·9	32·7	-0·2

The observations at St. John's Wood consisted of one observation of the maximum thermometer and of one observation of the minimum thermometer, daily, as well as three observations at different times every day of other thermometers. They were made by GEORGE LEACH, Esq., to whom I am indebted for these results. The mean values for the month were obtained by the application of corrections from my tables. By examining the column of differences, no certain difference exists between the temperatures of the air at Greenwich and at St. John's Wood.

TABLE XV.—Mean monthly temperature of the Air at Fleet Street, London, as determined from observations taken by Mr. W. SIMMS, optician.

Year.	January.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1838.	°	°	°	°	°	°	°	°	°	52·6	42·3	39·9
1839.	38·5	40·4	40·4	41·2	50·8	61·2	61·5	62·0	57·1	51·1	43·6	41·3
1840.	41·4	38·9	39·8	52·3	55·5	58·9	59·4	65·1	54·8	48·9	45·8	36·6
1841.	35·0	36·2	.....	.....	.....	.....	.....	.....	.....	.....	.....	47·6
1842.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47·1
1843.	42·6	37·8	43·6	46·2	49·4	53·4	58·4	62·1	.....	47·3	45·9	47·1
1844.	43·6	35·8	43·5	49·3	50·0	58·2	60·8	56·8	57·5	50·4	44·8	36·7
1845.	41·8	35·2	37·0	46·0	46·9	55·6	58·6	56·2	54·3	51·2	47·8	44·3
1846.	46·1	45·4	47·8	45·9	53·9	62·3	.....	.....	.....	.....	.....	.....
1848.	35·9	44·3	43·0	47·9	57·9	55·9	63·4	57·4	58·0	52·1	44·1	45·0

These observations were taken with good instruments, and believed to be taken with every care: Mr. SIMMS very kindly lent me the original observations, from which I have deduced the above values. By comparison with the simultaneous observations taken at Greenwich, it seems that the temperature at Fleet Street upon the whole year is 0·7 higher than at Greenwich.

TABLE XVI.—Comparison of the temperature of the Air at Somerset House, and at the Royal Observatory, Greenwich, and deduction of the numbers in every month, necessary to be applied to reduce the mean values at one place to those at the other.

Year.	January.			February.			March.		
	Mean reading of the thermometer in air			Mean reading of the thermometer in air			Mean reading of the thermometer in air		
	At the Royal Observatory.	At Somerset House.	Higher at Somerset House.	At the Royal Observatory.	At Somerset House.	Higher at Somerset House.	At the Royal Observatory.	At Somerset House.	Higher at Somerset House.
1834.	44·1	46·0	1·9	40·5	41·6	1·1	43·8	45·1	1·3
1835.	37·7	39·6	1·9	41·0	42·6	1·6	41·2	42·1	0·9
1836.	38·5	38·8	0·3	37·1	38·3	1·2	43·7	44·8	1·1
1837.	38·3	38·8	0·5	41·2	41·7	0·5	36·0	36·9	0·9
1838.	28·3	30·5	2·2	32·1	34·3	2·2	41·6	42·6	1·0
1839.	36·6	38·8	2·2	39·6	40·5	0·9	38·4	40·1	1·7
1840.	39·6	40·6	1·0	37·0	39·5	2·5	37·2	38·7	1·5
1841.	33·6	36·1	2·5	35·3	36·6	1·3	46·2	47·9	1·7
1842.	32·9	34·8	1·9	40·8	42·2	1·4	44·9	45·4	0·5
1843.	39·9	41·3	1·4	36·0	37·5	1·5	42·9	43·6	0·7
	April.			May.			June.		
1834.	44·7	46·1	1·4	56·2	58·0	1·8	59·6	62·0	2·4
1835.	46·1	47·5	1·4	52·3	54·0	1·7	58·7	60·9	2·2
1836.	42·7	44·4	1·7	52·2	53·9	1·7	60·0	59·9	-0·1
1837.	39·6	40·2	0·6	48·6	48·9	0·3	60·9	59·0	-1·9
1838.	41·4	42·7	1·3	51·7	51·8	0·1	56·6	58·1	1·5
1839.	40·4	42·0	1·6	50·0	51·0	1·0	59·5	59·6	0·1
1840.	48·6	48·9	0·3	53·2	54·6	1·4	57·9	60·4	2·5
1841.	47·0	47·4	0·4	56·8	57·9	1·1	56·4	57·2	0·8
1842.	45·2	45·7	0·5	53·2	54·3	1·1	62·9	64·2	1·3
1843.	47·1	48·6	1·5	52·2	52·8	0·6	56·3	56·4	0·1
	July.			August.			September.		
1833.	59·7	62·1	2·4	56·9	58·8	1·9	53·0	54·6	1·6
1834.	64·0	65·1	1·1	61·5	63·6	2·1	57·0	59·4	2·4
1835.	63·9	65·4	1·5	63·0	64·6	1·6	57·6	58·2	0·6
1836.	62·8	63·9	1·1	59·8	60·2	0·4	53·7	54·5	0·8
1837.	.....	.....	.....	59·6	61·4	1·8	56·1	56·1	0·0
1838.	61·0	61·5	0·5	60·0	60·9	0·9	55·7	55·5	-0·2
1839.	60·8	61·2	0·4	58·6	60·2	1·6	55·5	56·7	1·2
1840.	59·3	59·0	-0·3	63·0	63·4	0·4	52·5	55·2	2·7
1841.	57·8	59·0	1·2	60·5	61·3	0·8	58·0	58·5	0·5
1842.	60·2	61·5	1·3	65·4	66·6	1·2	56·4	57·5	1·1
	October.			November.			December.		
1833.	50·5	49·6	-0·9	42·8	44·8	2·0	44·7	46·0	1·3
1834.	51·1	51·8	0·7	43·9	45·4	1·5	40·6	42·4	1·8
1835.	48·0	49·3	1·3	44·0	44·3	0·3	35·7	36·3	0·6
1836.	47·9	48·7	0·8	41·9	42·8	0·9	39·6	41·0	1·4
1837.	50·1	51·9	1·8	40·6	42·4	1·8	40·5	42·6	2·1
1838.	49·7	51·3	1·6	40·9	42·1	1·2	38·4	40·0	1·6
1839.	48·8	50·2	1·4	44·8	46·0	1·2	39·6	41·0	1·4
1840.	45·7	48·1	2·4	44·0	44·7	0·7	32·3	34·7	2·4
1841.	48·8	50·7	1·9	42·7	44·5	1·8	40·5	42·0	1·5
1842.	45·4	47·2	1·8	42·8	44·2	1·4	45·0	45·3	0·3

By taking the means of the numbers in each column of differences, we find that the temperature of the air at the Apartments of the Royal Society was

Higher than at the Royal Observatory, Greenwich, in January by . . .	1°6
Higher than at the Royal Observatory, Greenwich, in February by . . .	1°4
Higher than at the Royal Observatory, Greenwich, in March by . . .	1°1
Higher than at the Royal Observatory, Greenwich, in April by . . .	1°1
Higher than at the Royal Observatory, Greenwich, in May by . . .	1°1
Higher than at the Royal Observatory, Greenwich, in June by . . .	0°9
Higher than at the Royal Observatory, Greenwich, in July by . . .	1°0
Higher than at the Royal Observatory, Greenwich, in August by . . .	1°3
Higher than at the Royal Observatory, Greenwich, in September by . . .	1°1
Higher than at the Royal Observatory, Greenwich, in October by . . .	1°3
Higher than at the Royal Observatory, Greenwich, in November by . . .	1°3
Higher than at the Royal Observatory, Greenwich, in December by . . .	1°4

And upon the whole year the excess of temperature at Somerset House was 1°2; and to reduce readings taken at Somerset House to those at Greenwich, it is necessary to subtract the preceding numbers from them; and it is necessary to increase the readings of the Royal Observatory by the above numbers to make them comparable with those taken at the Royal Society.

One part of these differences is owing to the difference of elevation, and which will amount to about 0°3; the greater part of the remaining difference is most probably owing to the vicinity of the water of the Thames, whose temperature during the night hours, at all seasons of the year, is several degrees higher than that of the air (see remarks following Table XIII.).

The general result of the preceding investigations, with respect to the temperatures of London and the country is, that those parts of London situated near the river Thames, are somewhat warmer upon the whole year than the country, but that those parts of London which are situated at some distance from the river, do not enjoy higher temperatures than those due to their latitudes.

I proceed now to reduce the results at Somerset House to those of the Royal Observatory, Greenwich, by applying the numbers following the preceding Table to the numbers in Table I. of my former paper, and to those in Table X. till the year 1840. After this date the numbers are extracted from the several volumes of the Greenwich Meteorological Observations.



By taking the means of the numbers in each column, we find that

- The mean temperature of January from all the observations is . . . 35°7
- The mean temperature of February from all the observations is . . . 38·2
- The mean temperature of March from all the observations is . . . 40·9
- The mean temperature of April from all the observations is . . . 45·7
- The mean temperature of May from all the observations is . . . 52·6
- The mean temperature of June from all the observations is . . . 58·0
- The mean temperature of July from all the observations is . . . 61·3
- The mean temperature of August from all the observations is . . . 60·5
- The mean temperature of September from all the observations is . . . 56·3
- The mean temperature of October from all the observations is . . . 49·3
- The mean temperature of November from all the observations is . . . 42·4
- The mean temperature of December from all the observations is . . . 38·8

And the mean of all the monthly results is 48°·3.

TABLE XVIII.—Showing the Highest and Lowest monthly mean temperature in every year from 1771 to 1849, with the amount of difference of temperature.

Year.	Monthly mean temperature.		Difference between the hottest and coldest months.	Month of temperature.		Year.	Monthly mean temperature.		Difference between the hottest and coldest months.	Month of temperature.	
	Highest.	Lowest.		Highest.	Lowest.		Highest.	Lowest.		Highest.	Lowest.
1771.	59·5	29·9	29·6	July.	January.	1811.	61·0	32·8	28·2	July.	January.
1772.	60·0	32·2	27·8	July.	January.	1812.	57·4	35·1	22·3	July.	December.
1773.	60·9	34·9	26·0	August.	February.	1813.	58·9	34·4	24·5	July.	January.
1774.	62·4	31·5	30·3	August.	January.	1814.	61·1	26·9	34·2	July.	January.
1775.	63·0	39·3	23·7	July.	December.	1815.	62·3	31·9	30·4	September.	January.
1776.	62·8	27·0	35·8	July.	January.	1816.	58·9	36·6	22·3	September.	February.
1777.	62·4	33·9	28·5	August.	January.	1817.	59·1	37·1	22·0	June.	December.
1778.	67·0	34·8	32·2	July.	January.	1818.	66·2	35·8	30·4	July.	February.
1779.	64·9	34·8	30·1	July.	January.	1819.	63·8	37·0	26·8	August.	December.
1780.	65·7	28·6	37·1	August.	January.	1820.	59·5	31·7	27·8	July.	January.
1781.	65·3	36·2	29·1	July.	January.	1821.	61·7	36·0	25·7	August.	February.
1782.	59·2	34·4	24·8	July.	February.	1822.	62·6	36·4	26·2	June.	December.
1783.	65·7	35·0	30·7	August.	December.	1823.	59·8	31·8	28·0	August.	January.
1784.	59·5	29·2	30·3	July.	January.	1824.	62·5	36·2	26·3	July.	February.
1785.	62·2	30·4	31·8	July.	February.	1825.	65·2	38·1	27·1	July.	February.
1786.	59·6	35·9	23·7	June.	Jan. and Dec.	1826.	65·6	32·0	33·6	July.	January.
1787.	61·4	36·7	24·7	July.	January.	1827.	63·5	31·6	31·9	July.	February.
1788.	60·6	29·0	31·6	July.	December.	1828.	61·9	39·8	22·1	July.	January.
1789.	60·2	33·4	26·8	August.	January.	1829.	60·1	31·7	28·4	July.	January.
1790.	59·9	38·6	21·3	August.	January.	1830.	63·0	30·7	32·3	July.	January.
1791.	61·4	34·8	26·6	August.	December.	1831.	64·3	34·4	29·9	July.	January.
1792.	62·2	34·9	27·3	August.	January.	1832.	61·2	36·9	24·3	July.	February.
1793.	64·9	35·3	29·6	July.	January.	1833.	61·1	34·5	26·6	July.	January.
1794.	65·3	33·3	32·0	July.	January.	1834.	64·1	40·2	23·9	July.	February.
1795.	60·8	23·9	36·9	Aug. and Sept.	January.	1835.	64·4	34·9	29·5	July.	December.
1796.	59·9	30·4	29·5	August.	December.	1836.	62·9	36·9	26·0	July.	February.
1797.	63·3	35·4	27·9	July.	January.	1837.	61·3	35·8	25·5	July.	March.
1798.	61·5	33·7	27·8	August.	December.	1838.	60·5	28·9	31·6	July.	January.
1799.	59·8	32·8	27·0	July.	December.	1839.	60·2	37·2	23·0	July.	January.
1800.	63·7	34·1	29·6	August.	February.	1840.	62·1	33·3	28·8	August.	December.
1801.	62·5	36·1	26·4	August.	December.	1841.	60·5	33·6	26·9	August.	January.
1802.	64·8	32·9	31·9	August.	January.	1842.	65·4	32·9	32·5	August.	January.
1803.	63·7	33·4	30·3	July.	January.	1843.	62·1	36·0	26·1	August.	February.
1804.	60·2	35·6	24·6	July.	December.	1844.	61·4	35·0	28·4	July.	December.
1805.	61·7	34·5	27·2	August.	January.	1845.	60·7	32·7	28·0	June.	February.
1806.	61·4	40·6	20·8	August.	January.	1846.	65·3	32·9	32·4	June.	December.
1807.	63·7	36·6	27·1	August.	December.	1847.	65·4	35·1	30·3	July.	January.
1808.	65·7	36·0	29·7	July.	December.	1848.	61·5	34·6	26·9	July.	January.
1809.	59·6	35·4	24·2	July.	January.	1849.	62·9	39·1	23·8	August.	December.
1810.	60·9	34·4	26·5	July.	January.						

The mean of all the differences between the hottest and coldest months in every year is 28°·5.

In the year 1790 the difference was 21°·3 only, and in the year 1780 it was as large as 37°·1, these numbers being respectively the smallest and largest within the period of seventy-nine years.

The coldest month in the year has occurred in January forty-three times, in February fifteen, in December twenty-one, and in March once; this unusual circumstance took place in the year 1837.

The hottest month in the year has taken place five times in June, forty-seven times in July, twenty-five times in August, and three times in September.

The following are the values of the extreme mean temperatures in every month:—

In January	1795 the mean temperature was 23°·9, and in January	1796 it was 45°·3.
In February	1785 the mean temperature was 30°·4, and in February	1794 it was 44°·7.
In March	1785 the mean temperature was 33°·9, and in March	1780 it was 49°·2.
In April	1771 the mean temperature was 38°·7, and in April	1844 it was 51°·7.
In May	1773 the mean temperature was 47°·5, and in May	1848 it was 59°·7.
In June	1816 the mean temperature was 53°·1, and in June	1846 it was 65°·3.
In July	1816 the mean temperature was 54°·5, and in July	1778 it was 67°·0.
In August	1817 the mean temperature was 55°·4, and in August	1780 it was 65°·7.
In September	1786 the mean temperature was 51°·3, and in September	1815 it was 62°·3.
In October	1784 the mean temperature was 43°·9, and in October 1811 and 1831 it was 55°·0.	
In November	1782 the mean temperature was 34°·7, and in November	1822 it was 48°·2.
In December	1788 the mean temperature was 29°·0, and in December	1806 it was 46°·8.

It is clear from these numbers that observations for a few years only can never be of great importance, when we consider that the difference of the monthly means of the winter months may be as large as 20°, and of the summer months of 11° or 12°.

By taking the means of the numbers in the Table in different groups of years the next Table is formed.

TABLE XIX.—Showing the mean temperature of the Air at the Royal Observatory, Greenwich, in every month in successive groups of years.

Period.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
From 1771 to 1779.	33°·5	37°·7	41°·6	45°·6	52°·0	58°·4	62°·0	61°·2	55°·6	49°·5	41°·8	39°·4
From 1780 to 1789.	34°·9	36°·6	38°·8	44°·9	52°·8	58°·4	61°·5	60°·0	55°·7	47°·3	40°·5	36°·1
From 1790 to 1799.	35°·8	38°·5	40°·4	45°·9	50°·9	56°·3	60°·9	60°·1	55°·8	48°·9	41°·8	37°·5
From 1800 to 1809.	37°·0	38°·5	40°·6	45°·1	53°·7	57°·6	61°·3	62°·1	56°·6	49°·6	41°·8	39°·1
From 1810 to 1819.	35°·2	39°·2	41°·3	45°·6	51°·6	56°·8	59°·9	59°·4	57°·8	49°·9	42°·4	37°·8
From 1820 to 1829.	35°·4	38°·1	41°·8	46°·8	52°·6	58°·2	61°·8	60°·2	56°·7	49°·9	43°·3	40°·8
From 1830 to 1839.	36°·0	38°·5	41°·3	44°·5	52°·9	58°·8	62°·3	60°·3	55°·4	50°·1	43°·1	39°·9
From 1840 to 1849.	37°·6	38°·4	41°·9	46°·9	54°·3	59°·6	61°·2	61°·2	56°·8	49°·5	44°·0	39°·7

The next Table is formed by taking the difference between the mean temperature of each month, as found from all the years, and the mean temperature of the same month in every year.





By taking the means of the numbers in each column without respect to sign, we find that the variability of temperature is greatest in the winter months; its mean value in January is  $3^{\circ}1$ ; in both February and March is  $2^{\circ}6$ ; in April is  $2^{\circ}3$ ; in May and June is  $2^{\circ}0$ ; in the months of August, September and October, whose temperatures are the steadiest, it is  $1^{\circ}9$ ; in November it is  $2^{\circ}0$ , and in December it is  $3^{\circ}1$ , as in January.

The numbers in the preceding Table very clearly show that causes exist at different times, which raise or depress the temperature, and which continue through long periods.

As in the distribution of the positive and negative signs in the space of seventy-nine years, we perceive a gradual increasing preponderance of the positive signs over the negative signs, it seems that the temperature of the climate during this period has increased.

As the mean results from so long a series of observations may be considered as true, having the advantage of being free from errors of observation and from those arising from imperfect instruments, we may really consider the numbers in the above Table as abnormal values; yet as it seems most desirable to have those at the beginning of the series confirmed by the description of each year, made without instrumental means, for this purpose, as well as for the comparison of the character of the climate at the beginning and at the end of the series, I have collected the following brief particulars of every year till that of 1800; after this time the general characters of the years are well known.

1771.—There were frequent and very sharp frosts till April 20. On February 12 the reading of the thermometer was as low as  $4^{\circ}$ ; the month of May was warm; the summer was cool and dry; October was a wet and windy month, and the weather was mild to the end of the year. The severe weather of the beginning of the year caused a bad seed time, and the harvest was very late.

1772.—The beginning of the year was mild; from the middle of January frosts and great snows were frequent, and continued to the middle of March. The summer was very fine; the autumn was mild but wet, and there was no frost till December 22.

1773.—With the exception of the latter part of February, which was stormy and wet, there was much fine weather till the beginning of May; then many mornings were frosty, after which heavy rain fell frequently till June. The summer was fine; the autumn was wet. There were sharp frosts at the end of November and at the beginning of December.

1774.—The year began with severe frost, and for nearly two months the ground was frost-bound; occasionally there were great rains or snow; the weather was more moderate in April; the summer was cool with heavy rains. The autumnal months were wet, particularly in September. Some snow fell in November and beginning of December. This year was remarkably wet.

1775.—The weather was mild at the beginning of the year. The summer was dry

and hot; thunder-storms were frequent in autumn. The year was very fine, and grain was cheaper than it had been for many years past.

1776.—In January there fell a greater quantity of snow than had fallen for some years, and the frost was supposed to have been the most severe since 1740. The frost went away at the beginning of February, and the weather following was mild and wet; it became hot about the middle of April. May was cold and dry, with north winds; after this the weather was mostly fine till the end of December, when there was a sharp frost.

1777.—The year began with a sharp frost, and heavy falls of snow continued till towards the end of February; for a few days about the end of March the weather was unusually hot, the reading of the thermometer being nearly  $70^{\circ}$ ; after this the weather was windy and cold till June. The latter part of the summer and autumn was fine. The year ended with frost and snow.

1778.—There were frost and snow at the beginning of the year; the beginning of April was fine. The summer was fine and hot, supposed at the time to have been as fine a summer as that of 1762, if not as fine as the summer of 1750. Frosty mornings began in September, but were less frequent afterwards. On the last day of this year there was a violent storm, supposed by some to have been as violent as that of 1703.

1779.—After the beginning of January there was no frost; the spring months were remarkably warm. In February wall fruit flowered; the middle of April was quite hot, as was the summer and autumn; about the middle of November there was a little frost, and again on December 22: there was much sickness this year.

1780.—This year began with a frost almost as severe as that in 1772; there was not much snow, and the weather continued severe till near the end of February. The month of March was warm; it was hot from July to September, and mostly mild till Christmas, when a frost set in. The year was sickly.

1781.—There was a little frost at the beginning of the year; the spring was mild, the summer was hot, and the ground was much burned. Autumn was fine and pleasant, and there were only a few frosty mornings during the remainder of the year.

1782.—The beginning of the year was mild, but in February it was frosty, and the remainder of the winter was severe; the spring was cold; nearly 12 inches of rain fell in April and May; the weather was fine in June, but bad afterwards; the autumn was cold; it was severe in November, and during the first half of December.

1783.—The spring was pleasant, with frosty mornings very constant till near April. A remarkable haze was prevalent all over Europe during the summer. The autumn was fine, and the weather was mostly mild till the last week in December, when a great fall of snow took place.

1784.—There was steady frost with snow till February 21, and till the end of March the mornings were frosty; and at the end of March there were cold winds with snow. This weather continued till the middle of April; and till the first week in May frosty mornings were frequent, and the remainder of May was exceedingly hot. There

were a few hot days in July, but the weather was precarious throughout the autumn ; and in December the frost was as severe as it was in January.

1785.—The severe frost of the preceding month broke early in January, but on the last day of that month a second very severe frost set in and continued till the middle of March. This winter was most severe. The summer and part of autumn were showery ; a heavy fall of snow took place at Christmas, with severe frost.

1786.—The frosts at the beginning of the year were of short duration. From the beginning of March there was a severe frost of a fortnight's duration, and cold E. and N.E. winds were prevalent with frosty mornings till the beginning of May. June and July were moderately fine ; August was cold and showery ; and from this time to the end of the year there was a great deal of rain.

1787.—The year began with open weather. April was cold with N. winds, and vegetation was stopped ; during April and May frosty mornings were frequent, and there was a sharp frost on the morning of the 7th of June ; it was a cold summer ; the autumn was mild, and there was a heavy fall of snow and a week's frost at the end of the year.

1788.—January and February were mild, the latter month being wet ; there was a fortnight's frost in March ; there were several periods of hot weather in April, May and June. The summer was in general dry ; autumn was fine ; there was a gentle frost at the beginning of December, then an exceedingly severe frost set in with heavy falls of snow, which continued to the end of the year. This year was remarkable for abundance of fruits, &c.

1789.—Very heavy storms of wind and snow took place till the middle of January ; and large rivers were frozen over ; there was a great loss of fish in ponds from the severity of the cold. After the frost broke the weather was mild, but windy and wet. During March there were nearly constant N. winds, and heavy falls of snow were frequent with sharp frost. The summer was mostly wet ; August was fine, after which it was again wet, and continued so to the end of the year, with scarcely any frost.

1790.—The weather was mild and open till April, when the first snow fell in the year, and the weather, during the beginning of this month, was the most severe during the winter. The summer was cool, cloudy and windy ; autumn was fine and pleasant ; December was stormy with very changeable weather.

1791.—Till January 6th there was frost ; after this the weather was mild till towards the end of April ; there were many frosty mornings with cold N.E. winds in May. The former part of the summer was cold ; frosty mornings were frequent till the middle of June, the latter part of summer and autumn. During November and December there were frequent storms and falls of snow and frost.

1792.—There were frequent sharp frosts till March, with stormy and wet weather ; the beginning of March was mild, after this there was a frost of a week's duration. The summer was wet and cold ; the autumn was wet, and December was cloudy, with very little frost. This year was very wet.

1793.—January and February and beginning of March were mild; a frost set in at the end of March; there was a great fall of snow in the first week in April. The former part of the summer was cold, with frequent frosty mornings till June; July was wet; the autumn was fine, mild and calm, and there was no frost till the end of the year.

1794.—The year began with slight frost, which continued till the end of January; February was very mild; the spring was warm till May, which was cold; July was hot; the autumn was wet but mild, as was the first part of December, but the weather during the latter half of the month was severe with heavy snow.

1795.—The frost began about the middle of December 1794, was excessively severe in January, and continued till the end of March. There were very large falls of snow, and the consequent floods were so great that nearly all the bridges in England were injured. Some snow fell in April. The summer was cold, with frequent frosty mornings till June; there were some hot days in July, but it was generally cold; after this the weather was fine till autumn. In December much injury was done to shipping by the strong S. and S.W. winds; there was no frost.

1796.—January was remarkably warm, with occasional thunder-storms; there was no frost till March, and then of no long duration. The summer was cool; the autumn was fine with a few frosty mornings at the end of November; in December a severe frost set in, and the reading of the thermometer in many places on the 24th was below zero of FAHRENHEIT'S scale.

1797.—During a few days in January the frost continued; after this, till the end of March, scarcely any rain fell, and the weather was fine with frequent frost. From April to September there were frequent heavy rains. The summer was cold; there was some warm weather in July; the autumn in general fine, and the weather continued open till the end of the year.

1798.—With the exception of a few slight frosts, which occasionally occurred till March, the weather was open and mild. The summer was fine, as was autumn and the beginning of December; after this a very severe frost set in, and the reading of the thermometer was as low as 5°.

1799.—The severe frost which set in about the middle of the preceding month continued to the middle of January, and again set in towards the end of the month with much snow, which continued during the first week in February; some snow fell in March, and the mornings were frosty till the end of the month. From April to the middle of November was wet; December was foggy; and after the 17th a severe frost set in with snow falling. The whole year was remarkably cloudy.

If we compare the character of the preceding years with the abnormal differences shown for the same years in Table XX., the agreement is most satisfactory, and leaves no doubt upon the correctness of the numbers at the beginning of this series. I do not think it necessary to describe the years from that of 1800, as most of them are well described by LUKE HOWARD in his 'Climate of London.'

TABLE XXI.—Showing the mean temperature in quarterly periods, for the year, and the same for successive groups of years, at the Royal Observatory, Greenwich, from the year 1771 to 1849.

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
1771.	32·7	} 37·6	49·1	} 52·0	56·6	} 59·6	43·2	} 43·6	45·4	} 48·2
1772.	35·0		50·1		58·2		45·1		47·1	
1773.	37·6		49·1		57·7		41·9		46·6	
1774.	37·4		52·7		58·9		41·7		47·7	
1775.	41·3		55·5		60·7		42·6		50·0	
1776.	36·9		52·2		59·3		44·8		48·3	
1777.	38·1		50·9		60·3		43·6		48·2	
1778.	36·8	54·3	61·3	44·5	49·2					
1779.	42·4	54·5	63·2	44·7	51·2					
1780.	37·7	} 36·8	52·9	} 52·0	62·7	} 59·0	42·0	} 41·0	48·8	} 47·2
1781.	39·7		53·9		61·7		43·7		49·8	
1782.	37·3		48·9		57·1		38·7		45·5	
1783.	37·9		51·5		60·3		42·2		48·0	
1784.	32·4		51·7		57·7		38·5		45·1	
1785.	33·5		52·7		58·8		40·8		46·5	
1786.	35·4		52·2		56·4		39·1		45·8	
1787.	39·7		51·2		59·0		42·6		48·1	
1788.	38·2		54·8		58·8		39·6		47·9	
1789.	35·9		50·7		57·9		42·4		46·7	
1790.	41·0	} 38·3	50·1	} 51·1	57·6	} 58·9	43·5	} 42·7	48·1	} 47·8
1791.	40·2		51·9		59·2		40·9		48·1	
1792.	38·1		51·0		58·7		44·0		48·0	
1793.	38·1		49·5		58·9		45·3		47·9	
1794.	40·8		52·6		59·5		42·8		48·9	
1795.	32·2		50·2		60·2		46·3		47·2	
1796.	41·3		51·5		59·2		39·1		47·8	
1797.	36·3		50·3		59·0		43·2		47·2	
1798.	38·8		54·7		59·7		41·2		48·6	
1799.	35·6		48·9		57·2		41·0		45·7	
1800.	36·2	} 38·7	52·5	} 52·1	61·6	} 60·0	42·8	} 43·5	48·3	} 48·5
1801.	40·7		52·5		60·6		42·4		49·0	
1802.	37·7		52·1		59·4		42·6		48·0	
1803.	37·3		51·4		59·3		44·7		48·2	
1804.	40·4		53·9		59·8		43·7		49·5	
1805.	38·4		49·9		60·0		42·3		47·7	
1806.	40·9		52·6		59·9		48·5		50·5	
1807.	37·9		52·6		60·1		42·8		48·3	
1808.	36·8		52·5		61·2		42·0		48·1	
1809.	40·7		51·4		58·2		43·4		48·0	
1810.	38·4	} 38·5	51·5	} 51·3	60·3	} 59·1	44·4	} 43·3	48·7	} 48·1
1811.	38·8		54·2		59·1		46·4		49·6	
1812.	38·6		48·9		56·8		41·5		46·5	
1813.	39·7		50·5		57·2		41·4		47·2	
1814.	32·0		50·0		58·2		43·0		45·8	
1815.	39·4		53·1		60·9		42·4		49·0	
1816.	37·5		48·4		57·1		42·6		46·4	
1817.	41·1		50·3		56·2		43·0		47·7	
1818.	38·7		53·7		63·5		47·2		50·8	
1819.	41·4		52·9		61·2		41·8		49·3	

TABLE XXI. (Continued.)

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
1820.	36.6	} 38.4	52.5	} 52.5	57.5	} 59.6	42.8	} 44.7	47.4	} 48.8
1821.	38.8		51.3		59.7		47.4		49.3	
1822.	43.5		55.0		59.9		45.5		51.0	
1823.	36.6		50.9		58.1		43.5		47.3	
1824.	37.7		49.4		60.1		45.9		48.3	
1825.	38.3		53.7		62.3		44.2		49.6	
1826.	39.1		54.0		61.8		44.7		49.9	
1827.	36.0		52.4		59.8		45.8		48.5	
1828.	41.2		53.6		59.5		46.2		50.1	
1829.	36.4	52.4	57.0	40.6	46.6					
1830.	36.9	} 38.6	52.8	} 52.1	58.2	} 59.3	43.4	} 44.4	47.8	} 48.6
1831.	39.8		53.4		61.3		47.1		50.4	
1832.	38.2		52.6		59.6		45.8		49.1	
1833.	38.2		54.8		57.4		45.5		49.0	
1834.	42.9		54.3		61.6		45.2		51.0	
1835.	40.1		53.1		61.6		42.0		49.2	
1836.	39.3		51.7		58.4		42.8		48.1	
1837.	37.8		48.3		58.8		44.3		47.3	
1838.	34.4		49.8		58.2		43.1		46.4	
1839.	38.4	49.8	58.2	44.4	47.7					
1840.	38.2	} 39.3	53.6	} 53.6	58.1	} 59.7	41.2	} 44.4	47.8	} 49.2
1841.	38.4		53.5		58.8		44.0		48.7	
1842.	39.5		53.8		60.7		44.4		49.6	
1843.	39.6		51.9		60.8		45.2		49.4	
1844.	38.6		55.1		58.7		42.2		48.7	
1845.	35.4		52.1		56.9		45.9		47.6	
1846.	43.6		55.7		62.6		43.1		51.3	
1847.	37.2		53.2		60.6		47.5		49.6	
1848.	40.6		55.3		58.6		46.5		50.2	
1849.	41.9	51.7	61.3	44.8	49.9					

The mean temperature from all the observations

For the quarter ending March . 31 was 38.3,

„ June . 30 was 52.1,

„ September 30 was 59.4,

„ December 31 was 43.4,

and for the year from all the observations was 48.29.

By taking the difference between these numbers, and those contained in the preceding Table, the next Table is immediately formed.

TABLE XXII.—Showing the excess of the quarterly and yearly mean temperatures, in every year, and the same for groups of years, above the means from all the years.

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
1771.	-5.5	} -0.7	-3.0	} -0.1	-2.8	} +0.2	-0.2	} -0.2	-2.9	} -0.1
1772.	-3.3		-2.0		-1.2		+1.7		-1.2	
1773.	-0.6		-3.0		-1.7		-1.5		-1.7	
1774.	-0.9		+0.6		-0.5		-1.7		-0.6	
1775.	+3.1		+3.4		+1.3		-0.8		+1.7	
1776.	-1.4		+0.1		-0.1		+1.4		0.0	
1777.	-0.1		-1.2		+0.9		+0.2		-0.1	
1778.	-1.5		+2.2		+1.9		+1.1		+0.9	
1779.	+4.2		+2.4		+3.8		+1.3		+2.9	
1780.	-0.6	} -1.5	+0.8	} 0.0	+3.3	} -0.4	-1.4	} -2.4	+0.5	} -1.1
1781.	+1.5		+1.8		+2.3		+0.3		+1.5	
1782.	-1.0		-3.2		-2.3		-4.7		-2.8	
1783.	-0.3		+0.4		+0.9		-1.2		-0.3	
1784.	-5.9		-0.4		-1.7		-4.9		-3.2	
1785.	-4.7		+0.8		-0.6		-2.6		-1.4	
1786.	-2.9		+0.1		-3.0		-4.3		-2.5	
1787.	+1.5		-0.9		-0.4		-0.8		-0.2	
1788.	0.0		+2.7		-0.6		-3.8		-0.4	
1789.	-2.4		-1.4		-1.5		-1.0		-1.6	
1790.	+2.8	} 0.0	-2.0	} -1.0	-1.8	} -0.5	+0.1	} -0.7	-0.2	} -0.5
1791.	+1.9		-0.2		-0.2		-2.5		-0.2	
1792.	-0.1		-1.1		-0.7		+0.6		-0.3	
1793.	-0.2		-2.6		-0.5		+1.9		-0.4	
1794.	+2.6		+0.5		+0.1		-0.6		+0.6	
1795.	-6.0		-1.9		+0.8		+2.9		-1.1	
1796.	+3.1		-0.6		-0.2		-4.3		-0.5	
1797.	-2.0		-1.8		-0.4		-0.2		-1.1	
1798.	+0.5		+2.6		+0.3		-2.2		+0.3	
1799.	-2.6		-3.2		-2.2		-2.4		-2.6	
1800.	-2.0	} +0.4	+0.4	} 0.0	+2.2	} +0.6	-0.6	} +0.1	0.0	} +0.3
1801.	+2.4		+0.4		+1.2		-1.0		+0.7	
1802.	-0.5		0.0		0.0		-0.8		-0.3	
1803.	-1.0		-0.7		-0.1		+1.3		-0.1	
1804.	+2.2		+1.8		+0.4		+0.3		+1.2	
1805.	+0.1		-2.2		+0.6		-1.1		-0.6	
1806.	+2.7		+0.5		+0.5		+5.1		+2.2	
1807.	-0.4		+0.5		+0.7		-0.6		0.0	
1808.	-1.4		+0.4		+1.8		-1.4		-0.2	
1809.	+2.4		-0.7		-1.2		0.0		-0.3	
1810.	+0.2	} +0.2	-0.6	} -0.8	+0.9	} -0.4	+1.0	} -0.1	+0.4	} -0.2
1811.	+0.5		+2.1		-0.3		+3.0		+1.3	
1812.	+0.4		-3.2		-2.6		-1.9		-1.8	
1813.	+1.4		-1.6		-2.2		-2.0		-1.1	
1814.	-6.2		-2.1		-1.2		-0.4		-2.5	
1815.	+1.1		+1.0		+1.5		-1.0		+0.7	
1816.	-0.7		-3.7		-2.3		-0.8		-1.9	
1817.	+2.8		-1.8		-3.2		-0.4		-0.6	
1818.	+0.5		+1.6		+4.1		+3.8		+2.5	
1819.	+3.1		+0.8		+1.8		-1.6		+1.0	

TABLE XXII. (Continued.)

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
1820.	-1.6	} +0.2	+0.4	} +0.4	-1.9	} +0.2	-0.6	} +1.3	-0.9	} +0.5
1821.	+0.5		-0.8		+0.3		+4.0		+1.0	
1822.	+5.3		+2.9		+0.5		+2.1		+2.7	
1823.	-1.7		-1.2		-1.3		+0.1		-1.0	
1824.	-0.5		-2.7		+0.7		+2.5		0.0	
1825.	0.0		+1.6		+2.9		+0.8		+1.3	
1826.	+0.9		+1.9		+2.4		+1.3		+1.6	
1827.	-2.3		+0.3		+0.4		+2.4		+0.2	
1828.	+3.0		+1.5		+0.1		+2.8		+1.8	
1829.	-1.9		+0.3		-2.4		-2.8		-1.7	
1830.	-1.3	} +0.4	+0.7	} 0.0	-1.2	} -0.1	0.0	} +1.0	-0.5	} +0.3
1831.	+1.5		+1.3		+1.9		+3.7		+2.1	
1832.	0.0		+0.5		+0.2		+2.4		+0.8	
1833.	-0.1		+2.7		-2.0		+2.1		+0.7	
1834.	+4.7		+2.2		+2.2		+1.8		+2.7	
1835.	+1.8		+1.0		+2.2		-1.4		+0.9	
1836.	+1.1		-0.4		-1.0		-0.6		-0.2	
1837.	-0.5		-3.8		-0.6		+0.9		-1.0	
1838.	-3.8		-2.3		-1.2		-0.3		-1.9	
1839.	+0.1		-2.3		-1.2		+1.0		-0.6	
1840.	0.0	} +1.0	+1.5	} +1.5	-1.3	} +0.3	-2.2	} +1.0	-0.5	} +1.0
1841.	+0.1		+1.4		-0.6		+0.6		+0.4	
1842.	+1.3		+1.7		+1.3		+1.0		+1.3	
1843.	+1.3		-0.2		+1.4		+1.8		+1.1	
1844.	+0.4		+3.0		-0.7		-1.2		+0.4	
1845.	-2.9		0.0		-2.5		+2.5		-0.7	
1846.	+5.4		+3.6		+3.2		-0.3		+3.0	
1847.	-1.1		+1.1		+1.2		+4.1		+1.3	
1848.	+2.3		+3.2		-0.8		+3.1		+1.9	
1849.	+3.6		-0.4		+1.9		+1.4		+1.6	

The sign - denotes that the temperature of that period was below the average, and the sign + denotes that it was above the average.

These numbers do not at all confirm the idea that a hot summer is either preceded or followed by a cold winter, or *vice versa*; on the contrary, it would seem that any hot or cold period has been mostly accompanied by weather of the same character. The cold year of 1771 was followed by two cold years. The hot year of 1779 was preceded by one warm year and followed by two others. In 1780 the extreme cold of January was more than counterbalanced by the extreme heat of March. The cold year of 1782 was followed by a long series of cold years. The very cold year of 1799 was followed by a cold autumn and winter. The warm year of 1806 was preceded by a warm winter. The very cold year of 1814 (the last very cold year we have had) was preceded by a cold summer, autumn and winter. The hot year of 1818 was preceded by a moderate winter, and was followed by a warm one. The hot year of 1822 was preceded by a warm winter and was followed by a moderately cold one. The hot year of 1834 followed a very mild winter and was followed by another. The hot



year of 1846 was preceded by a warm winter and was followed by a moderate one. The warm year 1848 was both preceded and followed by warm periods.

The mean temperatures of the years 1771, 1782, 1784, 1786, 1799 and 1814, were all below 46°; the coldest was 1784, and its value was 45°·1.

The mean temperatures of the years 1779, 1818, 1822, 1834 and 1846, were all above 50°·5; the year of highest temperature was 1846, and its value was 51°·3.

Thus seventy-nine years, from 1771 to 1849 inclusive, gives a mean temperature of 48°·3, with a variation, between one year and another, from 45°·1 in 1784 to 51°·3 in 1846; the difference is 6°·2.

TABLE XXIII.—Showing the mean temperature of the Air in Spring, Summer, Autumn, Winter, and for the year from March, and the same for successive groups of years.

Year.	Spring.		Summer.		Autumn.		Winter.		The year from March.	
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.	Whole year.	Group of years.
1771.	42·6	46·4	57·3	60·5	46·7	49·0	35·9	36·9	45·6	48·2
1772.	43·1		59·7		50·3		37·1		47·5	
1773.	44·2		58·3		47·1		35·9		46·4	
1774.	46·9		60·7		47·6		39·8		48·7	
1775.	48·5		62·1		48·9		35·4		48·8	
1776.	47·2		60·7		49·6		36·6		48·5	
1777.	47·0		59·7		51·0		35·4		48·3	
1778.	47·3		63·9		48·0		41·0		50·0	
1779.	50·8		62·3		51·5		34·7		49·8	
1780.	49·6	45·5	62·7	60·0	49·6	47·5	37·7	36·3	49·9	47·3
1781.	47·3		63·6		49·0		38·1		49·5	
1782.	42·5		57·9		45·1		37·4		45·7	
1783.	44·6		61·6		48·7		32·0		46·7	
1784.	45·0		57·3		47·3		32·5		45·5	
1785.	44·2		59·8		48·0		35·8		46·9	
1786.	43·7		59·2		44·2		37·4		46·1	
1787.	46·2		60·1		47·5		38·6		48·1	
1788.	48·1		59·7		48·5		34·1		47·6	
1789.	43·9		57·9		46·7		40·5		47·3	
1790.	45·6	45·8	58·6	59·1	48·5	48·8	39·2	37·0	48·0	47·7
1791.	46·8		59·5		48·2		35·7		47·6	
1792.	46·9		58·4		49·1		38·3		48·2	
1793.	44·1		59·8		49·2		39·7		48·2	
1794.	48·2		60·8		48·4		31·6		47·2	
1795.	45·2		57·8		51·6		43·2		49·5	
1796.	45·8		58·2		48·6		33·8		46·6	
1797.	44·6		59·0		47·7		39·0		47·6	
1798.	47·8		61·3		48·8		34·5		48·1	
1799.	42·7		57·6		48·2		34·6		45·8	
1800.	46·6	46·5	60·7	60·3	49·3	49·2	38·7	38·3	48·8	48·6
1801.	47·7		60·5		49·9		36·0		48·5	
1802.	46·6		59·6		49·0		35·8		47·7	
1803.	46·7		60·5		47·7		41·1		49·0	
1804.	47·1		60·5		51·6		36·3		48·9	
1805.	45·6		58·4		48·9		40·5		48·4	
1806.	46·2		60·8		51·9		41·2		50·0	
1807.	45·8		61·6		48·3		36·6		48·1	
1808.	45·6		62·1		48·4		38·5		48·7	
1809.	46·5		58·7		48·4		38·0		47·9	

TABLE XXIII. (Continued.)

Year.	Spring.		Summer.		Autumn.		Winter.		The year from March.	
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.	Whole year.	Group of years.
1810.	46.1	46.1	60.0	58.6	51.3	50.0	37.2	37.2	48.6	48.0
1811.	49.4		59.0		52.9		38.6		50.0	
1812.	43.7		56.1		48.4		37.0		46.3	
1813.	46.4		57.5		47.3		32.5		45.9	
1814.	43.9		57.7		47.6		38.1		46.8	
1815.	48.8		59.4		50.9		36.8		49.0	
1816.	43.8		55.2		49.7		39.9		47.1	
1817.	44.5		57.4		49.1		37.4		47.1	
1818.	46.3		64.2		54.5		39.6		51.2	
1819.	48.8		60.6		48.8		35.2		48.4	
1820.	47.5	47.1	58.0	60.0	47.6	50.0	37.8	38.0	47.7	48.8
1821.	47.5		57.8		52.6		42.5		50.1	
1822.	49.9		62.1		52.1		35.4		49.9	
1823.	45.7		58.0		48.7		37.8		47.6	
1824.	44.3		59.2		51.2		39.4		48.5	
1825.	46.9		62.0		50.6		38.3		49.5	
1826.	47.4		63.9		49.5		35.6		49.1	
1827.	47.5		60.0		50.1		41.4		49.8	
1828.	48.1		60.3		50.6		38.2		49.3	
1829.	45.7		58.9		46.7		33.3		46.2	
1830.	49.6	46.3	58.8	60.5	49.6	49.5	36.8	38.5	48.7	48.7
1831.	48.3		62.3		51.9		38.7		50.3	
1832.	46.4		60.5		50.5		39.8		49.3	
1833.	47.4		59.5		48.4		43.1		49.6	
1834.	48.6		62.5		51.0		40.1		50.5	
1835.	46.8		62.6		49.4		36.3		48.8	
1836.	46.6		60.3		47.4		39.0		48.3	
1837.	40.9		59.8		48.9		34.3		46.0	
1838.	44.6		59.1		48.4		38.3		47.6	
1839.	43.3		59.3		49.7		38.9		47.8	
1840.	46.3	47.7	59.9	60.7	48.1	50.1	34.1	38.5	47.1	49.3
1841.	50.1		58.2		49.9		38.1		49.1	
1842.	47.8		62.8		48.2		40.3		49.8	
1843.	47.4		59.8		50.4		39.4		49.3	
1844.	48.7		59.9		50.1		34.7		48.4	
1845.	43.6		59.3		49.9		43.1		49.0	
1846.	48.3		64.3		52.2		34.5		49.8	
1847.	47.6		61.8		51.4		40.3		50.2	
1848.	50.3		59.5		50.4		42.4		50.7	
1849.	46.6		61.0		51.3		39.2		49.5	

The mean temperature from all the results for Spring is . . . . . 46.4

The mean temperature from all the results for Summer is . . . . . 60.0

The mean temperature from all the results for Autumn is . . . . . 49.3

The mean temperature from all the results for Winter is . . . . . 37.6

The mean temperature from all the results for the Year is . . . . . 48.3

The mean temperature of spring, from all the observations, is 46.4.

The years distinguished by cold springs were 1771, 1772, 1782, 1786, 1789, 1799,

1812, 1814, 1816, 1837, 1839 and 1845, and the mean of their temperatures was  $43^{\circ}1$ .

The coldest spring, during the whole period, was in the year 1837, and its mean temperature was  $40^{\circ}9$ .

The years distinguished by hot springs were 1779, 1780, 1811, 1822, 1830, 1841 and 1848, and the mean of their temperatures was  $50^{\circ}0$ .

The hottest spring, during the whole period, was 1779, and its mean temperature was  $50^{\circ}8$ .

The mean temperature of summer, from all the observations, is  $60^{\circ}0$ . The years distinguished by cold summers were 1771, 1784, 1799, 1812, 1813, 1814, 1816, 1817, and the mean of their temperatures was  $56^{\circ}9$ .

The years distinguished by hot summers were 1778, 1779, 1780, 1781, 1818, 1826, 1831, 1834, 1835, 1842 and 1846, and the mean of their temperatures was  $63^{\circ}2$ . The coldest summer within the period was that in the year 1816, and its mean temperature was  $55^{\circ}2$ . The hottest summer within the period was that in the year 1846, and its mean temperature was  $64^{\circ}3$ .

The mean temperature of autumn, from all the observations, is  $49^{\circ}3$ . The years distinguished by cold autumns were 1771, 1782, 1786, 1789 and 1829, and the mean of their temperatures was  $45^{\circ}9$ .

The years distinguished by hot autumns were 1779, 1795, 1804, 1806, 1811, 1818, 1821, 1822, 1831 and 1846, and the mean of their temperatures was  $52^{\circ}3$ . The coldest autumn within the period was that in the year 1786, and its mean temperature was  $44^{\circ}2$ . The hottest autumn within the period was that in the year 1718, and its mean temperature was  $54^{\circ}5$ .

The mean temperature of winter, from all the observations, was  $37^{\circ}6$ . The years distinguished by cold winters were 1783, 1784, 1794, 1796, 1813 and 1829; the mean of their temperatures was  $32^{\circ}6$ .

The years distinguished by warm winters were 1778, 1795, 1803, 1806, 1821, 1827, 1833, 1845 and 1848, and the mean of their temperatures was  $42^{\circ}1$ .

The coldest winter within the period was that in the year 1794, and its mean temperature was  $31^{\circ}6$ .

The warmest winter within the period was that in the year 1795, and its mean value was  $43^{\circ}2$ . The winters of the years 1833 and 1845 were remarkably warm, being both of the value of  $43^{\circ}1$ .

By taking the difference between the mean temperature of each period from all the observations, and the mean temperature for the same period, in every year, the next Table is formed.

TABLE XXIV.—Showing the excess of the mean temperature, in every year, in Spring, Summer, Autumn, Winter, and the Year, above the mean temperature for each period from all the years, and the same for groups of years.

Year.	Spring.		Summer.		Autumn.		Winter.		The year from March.	
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.	Whole year.	Group of years.
1771.	-3.8	0.0	-2.7	+0.5	-2.6	-0.3	-1.7	-0.7	-2.7	-0.1
1772.	-3.3		-0.3		+1.0		-0.5		-0.8	
1773.	-2.2		-1.7		-2.1		-1.7		-1.9	
1774.	+0.5		+0.7		-1.7		+2.2		+0.4	
1775.	+2.1		+2.1		-0.3		-2.2		+0.5	
1776.	+0.8		+0.7		+0.3		-1.0		+0.2	
1777.	+0.6		-0.3		+1.8		-2.2		0.0	
1778.	+0.9		+3.9		-1.3		+3.4		+1.7	
1779.	+4.4		+2.3		+2.3		-2.9		+1.5	
1780.	+3.2	-0.9	+2.7	0.0	+0.3	-1.8	+0.1	-1.3	+1.6	-1.0
1781.	+0.9		+3.6		-0.2		+0.5		+1.2	
1782.	-3.9		-2.1		-4.2		-0.2		-2.6	
1783.	-1.8		+1.6		-0.5		-5.6		-1.6	
1784.	-1.4		-2.7		-2.0		-5.1		-2.8	
1785.	-2.2		-0.2		-1.2		-1.8		-1.4	
1786.	-2.7		-0.8		-5.1		-0.2		-2.2	
1787.	-0.2		+0.1		-1.7		+1.0		-0.2	
1788.	+1.7		-0.3		-0.8		-3.5		-0.7	
1789.	-2.5		-2.1		-2.5		+2.9		-1.0	
1790.	-0.8	-0.6	-1.4	-0.9	-0.8	-0.4	+1.6	-0.6	-0.3	-0.6
1791.	+0.4		-0.5		-1.0		-1.9		-0.7	
1792.	+0.5		-1.6		-0.2		+0.7		-0.1	
1793.	-2.3		-0.2		0.0		+2.1		-0.1	
1794.	+1.8		+0.8		-0.9		-6.0		-1.1	
1795.	-1.2		-2.2		+2.4		+5.6		+1.2	
1796.	-0.6		-1.8		-0.7		-3.8		-1.7	
1797.	-1.8		-1.0		-1.5		+1.4		-0.7	
1798.	+1.4		+1.3		-0.5		-3.1		-0.2	
1799.	-3.7		-2.4		-1.0		-3.0		-2.5	
1800.	+0.2	+0.1	+0.7	+0.3	+0.1	-0.1	+1.1	+0.5	+0.5	+0.3
1801.	+1.3		+0.5		+0.6		-1.6		+0.2	
1802.	+0.2		-0.4		-0.3		-1.8		-0.6	
1803.	+0.3		+0.5		-1.6		+3.5		+0.7	
1804.	+0.7		+0.5		+2.4		-1.3		+0.6	
1805.	-0.8		-1.6		-0.3		+2.9		+0.1	
1806.	-0.2		+0.8		+2.6		+3.6		+1.7	
1807.	-0.6		+1.6		-0.9		-1.0		-0.2	
1808.	-0.8		+2.1		-0.9		+0.9		+0.4	
1809.	+0.1		-1.3		-0.8		+0.4		-0.4	
1810.	-0.3	-0.3	0.0	-1.4	+2.1	+0.8	-0.4	-0.4	+0.3	-0.3
1811.	+3.0		-1.0		+3.6		+1.0		+1.7	
1812.	-2.7		-3.9		-0.8		-0.6		-2.0	
1813.	0.0		-2.5		-2.0		-5.1		-2.4	
1814.	-2.5		-2.3		-1.6		+0.5		-1.5	
1815.	+2.4		-0.6		+1.6		-0.8		+0.7	
1816.	-2.6		-4.8		+0.5		+2.3		-1.2	
1817.	-1.9		-2.6		-0.2		-0.2		-1.2	
1818.	-0.1		+4.2		+5.3		+2.0		+2.9	
1819.	+2.4		+0.6		-0.5		-2.4		+0.1	

TABLE XXIV. (Continued.)

Year.	Spring.		Summer.		Autumn.		Winter.		The year from March.				
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.	Whole year.	Group of years.			
1820.	+1.1	} +0.7	0	} 0.0	0	} -0.7	0	} +0.4	0	} +0.5			
1821.	+1.1		0		0		0		0		0	0	0
1822.	+3.5		0		0		0		0		0	0	0
1823.	-0.7		0		0		0		0		0	0	0
1824.	-2.1		0		0		0		0		0	0	0
1825.	+0.5		0		0		0		0		0	0	0
1826.	+1.0		0		0		0		0		0	0	0
1827.	+1.1		0		0		0		0		0	0	0
1828.	+1.7		0		0		0		0		0	0	0
1829.	-0.7		0		0		0		0		0	0	0
1830.	+3.2	} +0.1	-1.2	} +0.5	+0.4	} -0.2	-0.8	} +0.9	+0.4	} +0.4			
1831.	+1.9		0		0		0		0		0	0	0
1832.	0.0		0		0		0		0		0	0	0
1833.	+1.0		0		0		0		0		0	0	0
1834.	+2.2		0		0		0		0		0	0	0
1835.	+0.4		0		0		0		0		0	0	0
1836.	+0.2		0		0		0		0		0	0	0
1837.	-5.5		0		0		0		0		0	0	0
1838.	-1.8		0		0		0		0		0	0	0
1839.	-3.1		0		0		0		0		0	0	0
1840.	-0.1	} +1.3	-0.1	} +0.7	-1.1	} +0.8	-3.5	} +0.9	-1.2	} +1.0			
1841.	+3.7		0		0		0		0		0	0	0
1842.	+1.4		0		0		0		0		0	0	0
1843.	+1.0		0		0		0		0		0	0	0
1844.	+2.3		0		0		0		0		0	0	0
1845.	-2.8		0		0		0		0		0	0	0
1846.	+1.9		0		0		0		0		0	0	0
1847.	+1.2		0		0		0		0		0	0	0
1848.	+3.9		0		0		0		0		0	0	0
1849.	+0.2		0		0		0		0		0	0	0

The sign - denotes that the temperature of that period was below the average, and the sign + denotes that it was above the average.

By taking the mean of the numbers for each period, without regard to gauge,

- The mean variability in Spring is . . . 1.6
- The mean variability in Summer is . . . 1.5
- The mean variability in Autumn is . . . 1.4
- The mean variability in Winter is . . . 2.2
- The mean variability in the Year is . . . 1.1

All the following Tables are based upon the readings of self-registering thermometers, and exhibit the extreme readings at the Apartments of the Royal Society, and at the Royal Observatory, Greenwich. The first process in their formation was the copying from the Philosophical Transactions every reading of these thermometers, arranging all the minimum readings one under the other, and all the maximum readings similarly under each other, and then taking their monthly mean readings, or otherwise as was necessary to the construction of the Tables.

TABLE XXV.—Showing the monthly mean reading of the minimum temperature, and during the whole time that the maximum and minimum self-registering thermometer, at the Royal Observatory, Greenwich.

Year.	January.		February.		March.		April.		May.		June.	
	Mean of all the		Mean of all the		Mean of all the		Mean of all the		Mean of all the		Mean of all the	
	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.
1794.	32.0	38.5	43.6	49.5	40.6	51.4	45.8	58.9	46.5	60.1	52.3	67.7
1795.	23.0	29.7	32.8	39.0	35.6	45.3	42.4	53.3	46.3	62.1	50.9	63.3
1796.	43.8	50.8	37.9	45.9	35.3	46.6	43.1	57.9	45.5	59.7	51.2	66.7
1797.	34.7	40.0	38.9	42.9	34.3	45.7	41.0	53.7	45.7	62.0	49.2	65.9
1798.	36.1	43.2	35.2	44.8	37.5	48.1	44.1	59.5	49.0	63.7	55.2	72.8
1799.	32.1	38.5	33.8	42.9	35.0	44.0	39.1	49.1	45.5	59.0	50.5	65.7
1800.	35.7	41.7	33.1	40.7	34.7	44.1	45.6	56.0	50.9	64.3	51.1	64.7
1801.	37.1	45.0	36.8	43.9	41.1	50.7	39.8	55.8	47.2	63.3	52.7	68.9
1802.	31.2	37.4	37.0	44.7	36.7	49.6	43.3	58.6	54.0	61.8	51.6	67.6
1803.	33.1	37.5	34.6	42.0	38.8	50.3	43.9	57.3	46.7	59.4	52.3	65.5
1804.	41.8	47.8	35.8	43.1	38.4	47.8	45.3	51.7	52.4	66.8	55.1	71.8
1805.	33.6	38.9	36.5	44.9	38.4	49.4	41.4	54.6	45.0	59.6	50.2	65.3
1806.	38.8	46.0	39.3	47.5	39.0	46.5	40.3	50.8	49.9	65.1	54.2	70.9
1807.	35.5	42.8	37.4	46.2	34.0	44.6	44.7	55.8	51.1	64.2	52.5	68.2
1808.	35.2	42.5	34.1	42.5	35.2	43.3	39.1	51.4	52.2	67.8	53.8	68.3
1809.	33.8	40.3	41.8	50.0	39.6	49.9	38.0	49.7	50.2	65.2	52.3	68.2
1810.	33.6	39.0	37.2	43.7	39.2	49.1	42.2	54.9	45.2	59.7	52.7	70.0
1820.	30.5	37.9	35.3	43.0	37.2	50.3	44.9	59.5	48.3	62.7	52.5	66.2
1821.	35.6	43.7	33.5	43.4	39.6	50.6	45.4	58.7	44.9	60.5	50.2	63.6
1822.	35.8	46.0	40.5	50.7	44.0	55.5	43.9	55.3	52.6	65.0	58.3	73.6
1823.	.....	.....	.....	.....	.....	.....	.....	.....	49.7	64.2	49.9	66.4
1824.	36.6	41.7	37.7	43.8	37.3	45.7	40.7	51.6	46.5	58.5	51.1	64.6
1825.	37.3	43.3	36.7	44.2	36.4	45.2	44.1	58.6	48.5	63.1	51.9	69.7
1826.	29.8	37.3	40.4	47.9	.....	.....	44.6	58.8	46.3	60.8	56.4	74.6
1827.	31.2	39.2	29.3	37.5	40.1	49.7	43.3	55.3	49.1	61.6	52.8	67.5
1828.	37.5	45.0	38.4	45.2	40.0	51.0	43.1	55.0	50.0	64.2	55.9	70.2
1829.	30.1	36.3	36.4	43.7	35.9	45.7	40.6	52.4	48.4	64.9	54.1	69.6
1830.	29.3	35.0	30.9	40.5	41.5	53.9	44.1	57.9	50.0	64.8	52.0	65.2
1831.	32.5	38.9	38.5	47.2	40.9	50.8	45.1	57.2	47.1	63.0	54.7	69.0
1832.	34.5	40.8	34.7	42.6	36.9	47.7	42.0	56.4	46.3	61.6	55.2	69.5
1833.	32.8	39.0	39.6	48.1	34.6	44.3	41.7	54.7	52.9	70.4	54.5	70.6
1834.	42.5	49.0	36.7	46.6	40.4	51.3	40.3	54.4	50.5	67.7	55.0	72.5
1835.	35.3	43.1	37.1	47.7	37.1	48.3	42.4	55.8	48.0	62.5	54.6	70.7
1836.	34.5	43.8	34.0	42.3	40.2	50.5	40.5	51.3	44.7	60.6	55.2	69.1
1837.	35.3	42.7	38.0	46.5	33.9	42.6	37.3	47.0	44.4	57.6	53.8	68.5
1838.	27.1	34.4	31.2	38.4	38.1	49.2	39.2	50.9	45.8	61.3	53.6	68.6
1839.	34.7	43.3	37.1	47.7	37.4	44.2	39.7	46.0	45.0	60.5	54.9	70.2
1840.	36.9	43.5	36.5	42.4	35.9	41.7	43.3	53.5	49.6	.....	55.5	71.2
1841.	32.7	40.3	34.9	40.8	42.7	55.4	43.2	56.4	52.4	68.0	52.2	69.7
1842.	32.0	38.1	38.4	46.4	41.6	51.5	41.1	53.8	48.8	64.9	58.3	76.6
1843.	37.7	45.7	34.9	41.6	39.6	50.0	44.0	57.9	48.2	64.3	51.9	67.6
At the Royal Observatory, Greenwich.												
1840.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1841.	28.4	39.5	31.6	40.7	38.7	56.2	39.9	56.4	48.4	69.7	48.2	67.0
1842.	29.3	36.6	36.0	46.6	39.2	51.8	37.3	54.7	45.0	64.5	52.2	75.2
1843.	35.4	44.7	31.9	40.2	37.5	50.5	40.7	57.9	45.5	63.3	49.0	67.0
1844.	34.1	43.9	30.9	41.6	35.7	48.9	41.8	63.6	45.1	65.9	51.6	74.1
1845.	34.3	43.3	27.9	38.4	30.8	42.4	39.3	57.5	42.7	59.6	52.2	72.5
1846.	39.4	48.1	39.3	49.0	38.1	51.6	41.8	56.4	47.4	66.7	55.1	80.4
1847.	31.5	40.1	30.5	41.5	34.3	50.1	36.8	55.4	47.5	68.0	49.7	69.4
1848.	29.8	38.1	38.0	48.7	36.4	50.7	39.0	57.2	43.4	75.4	38.7	78.4
1849.	35.7	45.2	36.5	49.4	36.3	50.1	36.5	52.5	46.7	63.8	48.5	69.1

the monthly mean reading of the maximum temperature of Air as observed daily, meters were in use at the Apartments of the Royal Society, and from 1840, No-

Year.	July.		August.		September.		October.		November.		December.	
	Mean of all the		Mean of all the		Mean of all the		Mean of all the		Mean of all the		Mean of all the	
	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.	Minimum readings.	Maximum readings.
1794.	59.9	76.4	55.3	70.2	50.8	61.3	45.9	55.0	41.6	49.1	35.3	40.1
1795.	53.0	66.1	56.6	71.7	55.6	70.4	51.0	60.3	38.2	46.9	43.2	48.9
1796.	53.7	68.7	54.4	70.9	54.6	67.4	44.3	52.9	38.9	45.1	28.4	35.7
1797.	56.5	75.8	53.8	70.0	50.4	63.5	44.3	53.3	38.8	48.0	38.7	46.3
1798.	55.8	71.7	57.8	73.6	52.5	65.1	47.0	57.0	37.8	45.3	32.2	38.0
1799.	55.6	69.1	53.4	67.7	49.9	63.0	45.0	54.7	41.1	48.0	32.3	36.3
1800.	57.1	74.7	57.6	75.2	54.1	66.1	44.8	55.4	39.9	48.1	37.1	42.0
1801.	55.1	70.9	57.4	73.4	55.3	67.0	47.7	57.7	38.5	45.8	34.3	41.5
1802.	51.3	66.9	58.5	76.3	52.0	68.5	46.3	58.7	39.1	45.7	35.8	43.0
1803.	58.4	70.7	56.5	72.6	46.9	63.8	46.3	56.2	39.7	47.7	40.2	45.4
1804.	57.9	69.7	56.3	70.0	55.3	68.5	48.4	58.9	42.7	48.8	34.8	39.7
1805.	55.1	69.1	58.0	72.0	54.9	68.6	45.0	53.9	37.6	45.6	37.5	44.3
1806.	57.1	70.9	57.2	71.9	53.0	66.1	48.4	58.0	45.5	53.1	44.8	50.7
1807.	59.0	74.3	60.0	73.7	48.7	61.4	50.2	60.2	36.9	45.0	34.7	41.4
1808.	59.8	76.9	58.4	72.5	52.1	63.8	43.2	53.8	42.3	49.1	35.2	40.6
1809.	55.6	69.4	59.5	69.4	53.0	64.6	47.2	56.3	37.5	45.1	38.8	45.3
1810.	55.8	70.7	55.9	70.8	55.2	68.0	47.7	58.8				
1820.	56.3	68.8	55.7	69.8	49.7	64.1	44.2	55.5	39.8	48.1	38.5	45.3
1821.	54.0	67.3	58.2	71.3	56.4	67.7	47.0	58.8	44.3	54.0	41.0	50.6
1822.	59.3	70.6	58.7	69.9	53.2	64.1	50.3	58.6	47.1	54.1	34.5	41.3
1823.	55.4	67.7	56.9	68.6	51.2	64.1	45.0	53.9	42.0	46.8	38.9	44.0
1824.	57.4	72.1	56.9	69.1	54.9	65.1	47.5	56.3	43.2	51.4	39.6	46.3
1825.	59.9	74.5	57.5	71.0	57.7	68.0	48.7	56.9	38.3	46.4	39.2	43.9
1826.	.....	.....	61.2	73.6	54.3	65.3	50.3	59.4	38.3	45.5	40.8	45.7
1827.	58.1	73.4	55.2	68.8	54.2	65.0	49.2	58.5	39.5	48.0	41.0	49.1
1828.	58.3	71.5	55.9	68.6	54.2	66.4	46.2	57.0	41.8	49.9	42.6	49.2
1829.	56.2	69.8	55.2	66.6	50.3	61.6	45.8	53.9	36.7	44.9	31.4	36.6
1830.	58.1	73.0	53.9	68.5	50.1	62.0	47.0	58.4	41.9	49.7	32.2	39.4
1831.	58.3	76.6	59.9	73.2	52.9	65.2	53.1	61.6	39.3	49.1	40.6	46.0
1832.	56.1	71.2	56.8	71.3	51.8	66.2	48.4	57.9	41.9	49.0	39.0	47.0
1833.	56.1	71.5	53.0	68.4	49.4	62.5	46.9	58.1	40.4	49.1	40.8	50.3
1834.	59.3	74.7	57.9	72.8	54.1	67.3	46.2	58.2	41.4	49.4	38.1	45.6
1835.	57.3	74.8	58.4	73.8	52.8	65.8	45.4	54.5	41.5	47.5	33.6	39.6
1836.	57.1	71.9	54.5	68.9	50.3	61.2	45.3	53.5	38.7	47.6	38.0	44.4
1837.	56.7	71.7	56.6	70.0	51.7	63.2	46.1	58.8	37.2	49.0	39.8	46.0
1838.	56.0	70.8	56.4	69.0	51.5	62.6	47.0	57.4	38.9	46.8	37.5	43.5
1839.	56.7	69.9	55.4	68.6	53.0	63.5	47.3	54.3	43.8	48.0	38.0	41.8
1840.	54.9	69.8	57.9	72.7	50.0	63.3	43.2	54.8	40.8	50.7	31.5	38.8
1841.	54.8	68.8	57.2	70.0	51.7	67.3	47.0	56.9	40.8	49.8	38.8	47.1
1842.	55.5	73.5	60.8	76.0	53.5	65.6	42.9	53.4	41.5	49.0	41.9	50.5
At the Royal Observatory, Greenwich.												
1840.	.....	.....	.....	.....	.....	.....	.....	.....	35.7	46.7	27.1	36.1
1841.	51.5	67.1	54.3	70.6	51.2	67.2	43.9	55.6	38.0	48.7	35.4	44.8
1842.	52.1	71.2	56.3	78.1	49.8	64.3	39.3	53.4	39.0	48.1	40.2	49.4
1843.	53.5	71.8	55.2	72.5	52.3	70.4	42.0	55.5	38.5	50.0	40.3	48.2
1844.	54.1	72.8	50.3	67.9	50.2	67.5	44.4	56.7	39.6	48.1	30.4	36.8
1845.	53.5	71.2	50.5	67.7	46.9	63.9	44.0	59.0	40.3	51.8	35.8	47.6
1846.	56.5	77.9	56.6	74.4	51.4	71.9	44.5	58.7	40.0	50.3	27.9	37.2
1847.	54.8	78.1	52.8	74.4	46.1	64.9	46.4	61.5	40.8	52.7	37.2	46.7
1848.	51.2	73.7	50.4	68.9	45.9	66.8	43.8	59.2	36.1	50.5	37.3	48.9
1849.	51.6	74.2	54.0	74.2	51.2	68.7	44.1	59.2	38.1	49.8	34.1	43.3

TABLE XXVI.—Showing the highest and lowest readings by the self-registering were in use at the Apartments of the Royal Society, and at the Royal Observatory,

Year.	January.		February.		March.		April.		May.		June.	
	Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.	
	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
1794.	22 <sup>5</sup>	51	35	56	34	56	38	73	40	71	46	79
1795.	7	46	24	51	24	54.5	36	61	36	81.5	41	77.5
1796.	36	56	30	56	26.5	60	36	70	39	65	45	80
1797.	25	49	24.5	50	27.5	54	34	65	34	79	40	73
1798.	28	53	24	54	30	58	30	69	43	76	47	86
1799.	20	50	18	56	28	56	27	59	36	70	43	77
1800.	18	51	25	53	23	57	38	62	40	75	43	75
1801.	24	54	25	57	31	59	30	67	39	71	43	80
1802.	15	48	29	56	27	65	33	68	31	76	40	78
1803.	19	48	19	53	25	66	36	72	38	69	49	74
1804.	27	55	25	51	28	62	34	71	44	73	47	87
1805.	25	48	23	54	29	62	35	64	37	72	41	75
1806.	28	55	30	56	26	56	31	64	43	75	46	83
1807.	23	51	25	57	25	55	31	77	44	84	48	77
1808.	18	53	18	53	26	54	27	64	42	82	48	76
1809.	20	55	34	57	33	62	29	57	36	78	45	78
1810.	14	51	18	54	28	59	31	69	34	67	45	78
1820.	20	53	26	52	28	66	36	67	39	70	45	85
1821.	25	52	25	61	31	58	36	72	37	70	43	73
1822.	31	51	34	54	35	66	35	64	45	75	50	84
1823.	24	.....	.....	.....	.....	.....	.....	.....	40	75	43	74
1824.	25	52.5	28	52	28	56	28	66.5	42	73	43	74
1825.	30	54	26	51	28	53	34	66	40	71.5	42	81
1826.	16	47	32	54	.....	.....	.....	.....	36.5	72.5	49.8	87.5
1827.	16	48.8	19	52.5	31.2	57.6	32.8	73.5	37.8	69.8	46.3	74.5
1828.	28	54.5	29	55.2	29.1	61.3	32.8	70.7	42.7	72.1	49.3	78.4
1829.	19.5	45.7	23.2	50.8	26.8	58.6	30.7	59.3	44.3	70.6	41.1	77.8
1830.	17.2	42.7	17.7	56.3	32.7	65.7	29.7	72.0	42.6	77.3	46.6	76.7
1831.	24.3	48.5	26.7	59.5	31.7	59.4	35.3	65.2	33.8	72.6	48.6	75.7
1832.	27.8	48.7	28.3	49.6	30.7	55.3	36.7	67.0	38.4	74.7	46.8	76.7
1833.	27.3	46.6	32.4	55.2	27.8	54.2	34.0	62.4	43.4	81.4	46.6	80.8
1834.	32.5	55.2	29.3	54.7	30.7	57.8	33.2	64.3	43.0	75.0	47.3	86.7
1835.	25.0	49.7	27.9	53.2	32.7	54.2	30.0	66.2	41.7	72.8	44.6	83.6
1836.	17.5	53.4	25.3	50.6	31.8	64.4	32.2	61.3	35.3	69.5	47.7	82.6
1837.	24.0	50.7	30.0	54.0	26.7	49.0	28.0	59.2	35.5	68.6	43.2	75.8
1838.	11.4	50.2	24.8	48.7	31.0	58.3	29.8	64.2	36.2	73.3	44.2	79.7
1839.	23.7	51.8	26.8	51.3	26.0	53.2	30.5	58.7	33.7	72.2	45.6	85.0
1840.	22.3	54.2	27.8	50.8	30.7	53.7	34.4	72.2	41.3	.....	48.3	83.0
1841.	14.9	52.8	21.6	52.2	35.0	64.2	36.7	72.4	45.3	79.4	45.3	87.0
1842.	27.3	44.6	32.0	53.0	33.6	58.5	34.2	69.3	41.8	78.3	52.7	83.6
1843.	29.8	57.7	23.8	53.0	30.5	61.0	33.0	66.0	40.3	73.4	47.3	79.7

  

At the Royal Observatory, Greenwich.												
Year.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
1840.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1841.	4.0	53.0	12.4	54.6	29.5	66.9	31.8	76.5	41.2	82.8	40.3	78.5
1842.	23.2	46.8	26.4	53.2	29.9	60.5	28.0	73.7	36.4	74.7	44.7	87.4
1843.	24.0	57.0	20.3	51.9	26.5	63.7	27.2	70.8	37.3	69.5	42.9	77.3
1844.	18.8	53.7	20.0	50.4	24.1	60.2	33.4	74.9	33.9	77.4	43.4	87.6
1845.	24.4	51.3	7.7	48.5	13.1	59.4	29.5	70.3	34.4	68.2	43.8	86.0
1846.	29.4	55.3	26.9	62.3	26.5	58.0	33.3	63.0	38.3	84.3	49.4	91.1
1847.	23.0	52.7	10.2	55.0	16.9	64.2	27.0	63.8	36.0	86.2	41.0	80.4
1848.	15.8	50.4	29.2	55.0	27.3	71.5	29.7	75.0	33.5	83.0	38.7	78.4
1849.	20.0	56.4	26.8	58.0	27.7	60.7	28.6	64.3	36.8	75.0	38.6	80.7

By comparing the readings of the two places for the years 1841, 1842 and 1843, it grees below those at the Apartments of the Royal Society. In January 1841 the the difference is wholly attributable to the effect of the comparative heated water of places at some distance from and those near the river. The maximum temperatures 1841 at Somerset House I think must be erroneous.



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maximum and minimum thermometers in each month during the whole time they Greenwich, from the year 1841 to 1849.

Year.	July.		August.		September.		October.		November.		December.	
	Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.		Reading of the thermometers in the month.	
	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
1794.	54	84	48	78	37	68	35	63	30.5	57	25.5	54
1795.	46	76	51	79	45	78	42	68	28	56	34	56
1796.	44.5	77.5	48	80	45	79	30	59	29	57	4	51
1797.	48	85	48	76	42	71	35	63	27	57	29	56
1798.	51	78	52	83	44	76	32	64	25	60	11	50
1799.	48	77	47	73	42	72	35	63	32	58	17	50
1800.	50	81	49	89	41	77	35	66	30	59	29	51
1801.	47	79	51	79	46	73	34	66	26	60	23	52
1802.	45	71	50	82	40	75	33	75	30	53	29	50
1803.	51	86	47	81	38	75	38	67	31	57	21	55
1804.	49	80	49	81	45	81.5	38	68	34	59	19	51
1805.	50	79	51	79	43	79	35	63	31	55	25	54
1806.	52	81	51	80	44	73	35	65	36	60	39	57
1807.	48	85	52	80	38	72	39	68	28	56	23	51
1808.	50	93.5	51	80	39	71	35	63	31	56	19	53
1809.	50	78	49	79	40	72	35	65	29	54	32	54
1810.	51	78	50	80	48	83	30	68				
1820.	50	80	46	77	38	73	39	65	31	56	25	57
1821.	46	74	50	77	46	75	41	68	34	63	36	58
1822.	53	76	50	80	45	70	41	66	38	61	23	54
1823.	49	74	49	78	40	73	37	62	29	55	29	53
1824.	51	81	50.5	77	37	81	31	65	29	60	31	54
1825.	51	89	53	84	47	77	33	68	29	58	28	53.5
1826.	.....	.....	55	81.2	43.8	72.3	37.6	67.8	26.8	52.3	32.2	53
1827.	51.8	81.1	48.3	80.2	47.7	70.0	36.4	67.7	23.8	55.8	30.8	54.8
1828.	46.8	78.7	49.8	72.7	44.9	72.8	36.5	63.3	25.7	58.4	33.8	55.3
1829.	48.7	74.7	46.7	76.5	42.4	66.7	33.3	61.4	26.8	52.7	18.2	46.0
1830.	48.8	85.8	46.0	77.7	43.8	69.8	35.2	66.5	33.0	58.5	15.8	47.2
1831.	52.3	80.8	54.4	79.7	46.5	72.2	40.3	68.2	28.7	57.2	29.8	55.6
1832.	49.6	81.2	47.0	81.8	41.6	72.9	39.4	68.2	36.3	59.3	32.3	55.8
1833.	47.3	80.5	48.2	75.3	41.0	67.2	38.3	62.3	31.6	59.7	32.9	55.6
1834.	51.4	86.7	46.2	85.3	46.8	74.0	34.4	70.2	33.2	61.5	29.2	54.5
1835.	50.6	84.2	51.8	80.6	46.4	76.3	35.4	62.6	34.9	55.5	21.0	51.6
1836.	46.2	85.2	48.4	73.4	40.7	69.6	30.0	61.2	31.3	56.7	27.4	55.7
1837.	47.5	79.6	48.5	78.8	44.4	69.7	35.4	68.5	28.0	56.4	31.7	55.3
1838.	49.6	79.0	46.5	76.0	42.8	69.5	32.8	63.5	30.0	57.7	29.8	55.0
1839.	48.6	80.3	45.4	78.6	45.0	70.0	37.3	63.5	33.8	55.3	32.0	54.6
1840.	49.4	77.2	52.4	80.0	41.7	75.7	35.3	60.7	30.3	60.6	21.2	55.5
1841.	49.8	80.3	50.0	77.5	42.8	74.6	37.2	64.3	28.2	58.6	29.9	55.8
1842.	50.4	82.7	50.0	87.0	44.4	76.0	34.0	60.7	35.6	55.5	34.7	57.5
At the Royal Observatory, Greenwich.												
1840.	.....	.....	.....	.....	.....	.....	.....	.....	23.8	61.2	16.4	55.2
1841.	44.3	76.0	45.5	79.6	36.6	79.6	32.2	64.6	22.2	58.3	24.3	53.9
1842.	45.5	78.8	47.5	90.5	41.1	75.8	28.3	60.9	31.1	55.9	30.8	58.2
1843.	44.6	89.8	47.2	82.8	34.0	79.9	28.5	70.4	27.4	57.5	25.6	54.7
1844.	47.1	87.4	42.8	75.4	34.8	78.0	30.8	67.4	27.4	58.1	21.1	49.3
1845.	44.6	83.3	43.2	77.8	33.4	73.5	31.4	67.6	29.1	59.6	28.0	55.5
1846.	49.1	93.3	47.5	92.0	39.2	86.4	35.0	67.7	23.4	61.5	18.8	49.9
1847.	45.4	89.0	42.0	87.3	32.0	72.5	33.0	73.2	24.5	66.3	25.0	59.5
1848.	42.2	85.3	42.5	75.5	32.8	78.8	32.4	74.0	25.2	57.8	21.8	62.8
1849.	47.0	84.1	42.4	82.5	42.7	79.0	31.5	69.7	23.5	61.7	18.8	56.3

will be seen that the minimum temperatures at the Observatory are usually some de-reading at the Observatory was as low as 4°, whilst that at Somerset House was 14°·9; the Thames, and this difference is always shown at those low temperatures between at the Observatory are usually the higher, but not always so; the maximum in June

TABLE XXVII.—Showing the extreme readings of the thermometer in every year that self-registering thermometers were used at the Royal Society's Apartments, and from the year 1840 to 1849 at the Royal Observatory, Greenwich.

Year.	At the Apartments of the Royal Society.					
	Highest reading of the thermometer.	Lowest reading of the thermometer.	Difference or range of reading in the year.	Month and day of		
				Highest readings.	Lowest readings.	
1794.	84·0	22·0	62·0	On July 13.	On January 10.	
1795.	81·5	7·0	74·5	On May 23.	On January 25.	
1796.	80·0	4·0	76·4	On June 26 and August 22.	On December 25.	
1797.	85·0	24·5	60·5	On July 14.	On February 28.	
1798.	86·0	11·0	75·0	On June 28.	On December 29.	
1799.	77·0	17·0	60·0	On June 10, 30, July 6 and 8.	On December 31.	
1800.	89·0	18·0	71·0	On August 2.	On January 1.	
1801.	80·0	23·0	57·0	On June 29.	On December 20.	
1802.	82·0	15·0	67·0	On August 30.	On January 16.	
1803.	86·0	19·0	67·0	On July 2.	On January 26 and February 11.	
1804.	87·0	19·0	68·0	On June 25.	On December 24.	
1805.	79·0	23·0	56·0	On July 4, August 12 and Sept. 18.	On February 2.	
1806.	83·0	26·0	57·0	On June 10.	On March 13.	
1807.	85·0	23·0	62·0	On July 22.	On January 15 and December 8.	
1808.	93·5	18·0	75·5	On July 13.	On January 22 and February 15.	
1809.	79·0	20·0	59·0	On August 17.	On January 18 and 19.	
1810.	83·0	14·0	69·0	On September 2.	On January 17.	
1820.	85·0	20·0	65·0	On June 27.	On January 5.	
1821.	77·0	25·0	52·0	On August 5, 6, 22, 24 and 25.	On January 2, 3 and February 27.	
1822.	84·0	23·0	61·0	On June 10.	On December 30.	
1823.	78·0	24·0	49·0	On August 13.	On January 15.	
1824.	81·0	25·0	56·0	On July 13, 14 and September 1.	On January 14.	
1825.	89·0	26·0	63·0	On July 19.	On February 5.	
1826.	87·5	16·0	71·5	On June 27.	On January 16.	
1827.	81·1	16·0	65·1	On July 29.	On January 3.	
1828.	78·7	25·7	53·0	On July 3.	On November 12.	
1829.	77·8	18·2	59·6	On June 3.	On December 28.	
1830.	85·8	15·8	70·0	On July 30.	On December 25.	
1831.	80·8	24·3	56·5	On July 29.	On January 8.	
1832.	81·8	27·8	54·0	On August 10.	On January 5.	
1833.	81·4	27·3	54·1	On May 15.	On January 23.	
1834.	86·7	29·2	57·5	On June 21 and July 17.	On December 24.	
1835.	84·2	21·0	63·2	On July 28.	On December 25.	
1836.	85·2	17·5	67·7	On July 4.	On January 2.	
1837.	79·6	24·0	55·6	On July 28.	On January 2.	
1838.	79·7	11·4	68·3	On June 24.	On January 16.	
1839.	85·0	23·7	61·3	On June 20.	On January 30.	
1840.	83·0	21·2	61·8	On June 1.	On December 18.	
1841.	87·0	14·9	72·1	On June 20.	On January 9.	
1842.	87·0	27·3	59·7	On August 11.	On January 24.	
At the Royal Observatory, Greenwich.						
1841.	82·8	4·0	78·8	On May 27.	On January 9.	
1842.	90·5	23·2	67·3	On August 10.	On January 23.	
1843.	89·8	20·3	69·5	On July 6.	On February 15.	
1844.	87·6	18·8	68·6	On June 25.	On January 3.	
1845.	86·0	7·7	78·3	On June 13.	On February 11.	
1846.	93·3	18·8	74·5	On July 5.	On December 14 and 30.	
1847.	89·0	10·2	78·8	On July 12.	On February 11.	
1848.	85·3	15·8	69·5	On July 14.	On January 28.	
1849.	84·1	18·8	65·3	On July 8.	On December 29.	

From the particulars in this Table, it seems that the highest reading of the thermometer within the year has occurred three times in May, seventeen times in June, twenty-four times in July, ten times in August, and three times in September.

The lowest reading of the thermometer in the year has occurred twenty-eight times in January, nine times in February, once in March, once in November, and fourteen times in December.

TABLE XXVIII.—Showing the highest and lowest temperature during the period in each month.

Month.	At the Apartments of the Royal Society.					At the Royal Observatory, Greenwich.				
	The lowest reading of the thermometer.	The highest reading of the thermometer.	Difference of readings.	Mean of all the		The lowest reading of the thermometer.	The highest reading of the thermometer.	Difference of readings.	Mean of all the	
				Lowest readings.	Highest readings.				Lowest readings.	Highest readings.
January ...	7.0	57.7	50.7	22.6	51.0	4.0	57.0	53.0	20.2	52.9
February...	17.7	61.0	43.3	26.1	53.7	7.7	62.3	54.6	19.9	54.3
March.....	23.0	66.0	43.0	29.2	58.5	13.1	71.5	58.4	24.6	62.7
April .....	27.0	77.0	50.0	32.8	66.5	27.0	76.5	49.5	29.8	70.3
May .....	31.0	84.0	53.0	39.3	73.8	33.5	86.2	52.7	36.4	77.9
June .....	40.0	87.5	47.5	45.5	79.5	38.6	87.6	49.0	42.5	83.0
July.....	44.5	93.5	49.0	49.3	80.5	42.2	93.3	51.1	45.5	85.2
August ...	45.4	89.0	43.6	49.4	79.3	42.0	92.0	50.0	44.5	82.6
September	37.0	83.0	46.0	42.9	73.6	32.0	86.4	54.4	36.3	78.2
October ...	30.0	75.0	45.0	35.5	65.2	28.3	74.0	45.7	31.4	68.4
November	23.8	63.0	39.2	30.4	57.4	22.2	66.3	44.1	26.0	59.6
December	4.0	58.0	54.0	25.9	53.6	16.4	62.8	46.4	23.5	55.5

The lowest reading, as observed at the Apartments of the Royal Society, was 4°; it occurred in the night of December 24, 1796 (at this time the reading in the environs of London was—6°). The highest reading was 89°; the difference of these readings is 85°.

The lowest reading, as observed at the Royal Observatory within the years 1841 to 1849, was 4°, and the highest was 93°·3; the difference of these readings is 89°·3.

TABLE XXIX.—Showing the extreme range of the thermometer in every month during the time self-registering instruments were in use at the Apartments of the Royal Society, and at the Royal Observatory, Greenwich, from 1840.

Year.	At the Apartments of the Royal Society.											
	Extreme range of readings of the thermometer in each month.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1794.	29°	21°	22°	35°	31°	33°	30°	30°	31°	28°	26·5	28·5
1795.	39	27	30·5	25	45·5	36·5	30	28	33	26	28	22
1796.	20	26	33·5	34	26	35	33	32	34	29	28	47
1797.	24	25·5	26·5	31	45	33	37	28	29	28	30	27
1798.	25	30	28	39	33	39	27	31	32	32	35	39
1799.	30	38	28	32	34	34	29	26	30	28	26	33
1800.	33	28	34	24	35	32	31	40	36	31	29	22
1801.	30	32	28	37	32	37	32	28	27	32	34	29
1802.	33	27	38	35	45	38	26	32	35	42	23	21
1803.	29	34	41	36	31	25	35	34	37	29	26	34
1804.	28	26	34	37	29	40	31	32	36·5	30	25	32
1805.	23	31	33	29	35	34	29	28	36	28	24	29
1806.	27	26	30	33	32	37	29	29	29	30	24	18
1807.	28	32	30	46	40	29	37	28	34	29	28	28
1808.	35	35	28	37	40	28	43·5	29	32	28	25	34
1809.	35	23	29	28	42	33	28	30	32	30	25	22
1810.	37	36	31	38	33	33	27	30	35	38		
1820.	33	26	38	31	31	40	30	31	35	26	25	32
1821.	27	36	27	36	33	30	28	27	29	27	29	22
1822.	20	20	31	29	30	34	23	30	25	25	23	31
1823.	.....	.....	.....	.....	35	31	25	29·0	33	25	26	24
1824.	27·5	24	28	38·5	31	31	30	26·5	44	34	31	23
1825.	24	25	25	32	31·5	39	38	31·0	30	35	29	25·5
1826.	31	22	.....	.....	36	37·7	.....	26·2	28·5	30·2	25·5	20·8
1827.	32·8	33·5	26·4	40·7	32	28·2	29·3	31·9	22·3	31·3	32·0	24·0
1828.	26·5	26·2	32·2	37·9	29·4	29·1	31·9	22·9	27·9	26·8	32·7	21·5
1829.	26·2	27·6	31·8	28·6	26·3	36·7	26·0	29·8	24·3	28·1	25·9	27·8
1830.	25·5	38·6	33·0	42·3	34·7	30·1	37·0	31·7	26·0	31·3	25·5	31·4
1831.	24·2	32·8	27·7	29·9	38·8	27·1	28·5	25·3	25·7	27·9	28·5	25·8
1832.	20·9	21·3	24·6	30·3	36·3	29·9	31·6	34·8	31·3	28·8	23·0	23·5
1833.	19·3	22·8	26·4	28·4	38·0	34·2	33·2	27·1	26·2	24·0	28·1	22·7
1834.	22·7	25·4	27·1	31·1	32·0	39·4	35·3	39·1	27·2	35·8	28·3	25·3
1835.	24·7	25·3	21·5	36·2	31·1	39·0	33·6	28·8	29·9	27·2	20·6	30·6
1836.	35·9	25·3	32·6	29·1	34·2	34·9	39·0	25·0	28·9	31·2	25·4	28·3
1837.	26·7	24·0	22·3	31·2	33·1	32·6	32·1	30·3	25·3	33·1	28·4	23·6
1838.	38·8	23·9	27·3	34·4	37·1	35·5	29·4	29·5	26·7	30·7	27·7	25·2
1839.	28·1	24·5	27·2	28·2	38·5	39·4	31·7	33·2	25·0	26·2	21·5	22·6
1840.	31·9	23·0	23·0	37·8	.....	34·7	27·8	27·6	34·0	25·4	30·3	34·3
1841.	37·9	30·6	29·2	35·7	34·1	41·7	30·5	27·5	31·8	27·1	30·4	25·9
1842.	17·3	21·0	24·9	35·1	36·5	30·9	32·3	37·0	31·6	26·7	19·9	22·8
1843.	27·9	29·2	30·5	33·0	33·1	32·4						
	At the Royal Observatory, Greenwich.											
1840.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37·4	38·8
1841.	49·0	42·2	37·4	44·7	41·6	38·2	31·7	34·1	43·0	32·4	36·1	29·6
1842.	23·6	26·8	30·6	45·7	38·3	42·7	33·3	43·0	34·7	32·6	24·8	27·4
1843.	33·0	31·6	37·2	43·6	32·2	34·4	45·2	35·6	45·9	41·9	30·1	29·1
1844.	34·9	30·4	36·1	41·5	43·5	44·2	40·3	32·6	43·2	36·6	30·7	28·2
1845.	26·9	40·8	46·3	40·8	33·8	42·2	38·7	34·6	40·1	36·2	30·5	27·5
1846.	25·9	35·4	31·5	29·7	46·0	41·7	44·2	44·5	47·2	32·7	38·1	31·1
1847.	29·7	44·8	47·3	36·8	50·2	39·4	43·6	45·3	40·5	40·2	41·8	34·5
1848.	34·6	25·8	44·2	45·3	49·5	39·7	43·1	33·0	46·0	41·6	32·6	41·0
1849.	36·4	31·2	33·0	35·7	38·2	42·1	37·1	40·1	36·3	38·2	38·2	35·9

TABLE XXX.—Showing the mean daily range of temperature in each month.

Year.	At the Apartments of the Royal Society.											
	The average daily range of temperature.											
	January.	February.	March.	April.	May.	June.	Jr'y.	August.	September.	October.	November.	December.
1794.	6·5	5·9	10·8	13·1	13·6	15·4	16·5	14·9	10·5	9·1	7·5	4·8
1795.	6·7	6·2	9·7	10·9	15·8	12·4	13·1	15·1	14·8	9·3	8·7	5·7
1796.	7·0	8·0	11·3	14·8	14·2	15·5	15·0	16·5	12·8	8·6	6·2	7·3
1797.	5·3	4·0	11·4	12·7	16·3	16·7	19·3	16·2	13·1	9·0	9·2	7·6
1798.	7·1	9·6	10·6	15·4	14·7	17·6	15·9	15·8	12·6	10·0	7·5	5·8
1799.	6·4	9·1	9·0	10·0	13·5	15·2	13·5	14·3	13·1	9·7	6·9	4·0
1800.	6·0	7·6	9·4	10·4	13·4	13·6	17·6	17·6	12·0	10·6	8·2	4·9
1801.	7·9	7·1	9·6	16·0	16·1	16·2	15·8	16·0	11·7	10·0	7·3	7·2
1802.	6·2	7·7	12·9	15·3	7·8	16·0	15·6	17·8	16·5	12·4	6·6	7·2
1803.	4·4	7·4	11·5	13·4	12·7	13·2	12·3	16·1	16·9	9·9	8·0	5·2
1804.	6·0	7·3	9·4	6·4	14·4	16·7	11·8	13·7	13·2	10·5	6·1	4·9
1805.	5·3	8·4	11·0	13·2	14·6	15·1	14·0	14·0	13·7	8·9	8·0	6·8
1806.	7·2	8·2	7·5	10·5	15·2	16·7	13·8	14·7	13·1	9·6	7·6	5·9
1807.	7·3	8·8	10·6	11·1	13·1	15·7	15·3	13·7	12·7	10·0	8·1	6·7
1808.	7·3	8·4	8·1	12·3	15·5	14·5	17·1	14·1	11·7	10·6	6·8	5·4
1809.	6·5	8·2	10·3	11·7	15·0	15·9	13·8	9·9	11·6	9·1	7·6	6·5
1810.	5·4	6·5	9·9	12·7	14·5	17·3	14·9	14·9	12·8	11·1	.....	.....
1820.	7·4	7·7	13·1	14·6	14·4	13·7	12·5	14·1	14·4	11·3	8·3	6·8
1821.	8·1	9·9	11·0	13·3	15·6	13·4	13·3	13·1	11·3	11·8	9·7	9·6
1822.	10·2	10·2	11·5	11·4	12·4	15·3	11·3	11·2	10·9	8·3	7·0	6·8
1823.	.....	.....	.....	.....	14·5	16·5	12·3	11·7	12·9	8·9	4·8	5·1
1824.	5·1	6·1	8·4	10·9	12·0	13·5	14·7	12·2	10·2	8·8	8·2	6·7
1825.	6·0	7·5	8·8	14·5	14·6	17·8	14·6	13·5	10·3	8·2	8·1	4·7
1826.	7·5	7·5	.....	14·2	14·5	18·2	.....	12·4	11·0	9·1	7·2	4·9
1827.	8·0	8·2	9·6	12·0	12·5	14·7	15·3	13·6	10·8	9·3	8·5	8·1
1828.	7·5	6·8	11·0	11·9	14·2	14·3	13·2	12·7	12·2	10·8	8·1	6·6
1829.	6·2	7·3	9·8	11·8	16·5	15·5	13·6	11·4	11·3	8·1	8·2	5·2
1830.	5·7	9·6	12·4	13·8	14·8	13·2	14·9	14·6	11·9	11·4	7·8	7·2
1831.	6·4	8·7	9·9	12·1	15·9	14·3	18·3	13·3	12·3	8·5	9·8	5·4
1832.	6·3	7·9	10·8	14·4	15·3	14·3	15·1	14·5	14·4	9·5	7·1	8·0
1833.	6·2	8·5	9·7	13·0	17·5	16·1	15·4	15·4	13·1	11·2	8·7	9·5
1834.	6·5	9·9	10·9	14·1	17·2	17·5	15·4	14·9	13·2	12·0	8·0	7·5
1835.	7·8	10·6	11·1	13·4	14·5	16·1	17·5	15·4	13·0	9·1	6·0	6·0
1836.	9·3	8·3	10·3	10·8	15·9	13·7	14·8	14·4	10·9	8·2	8·9	6·4
1837.	7·4	8·5	8·7	9·7	13·2	14·7	15·0	13·4	11·5	12·7	11·8	6·8
1838.	7·3	7·2	11·1	11·7	15·5	15·0	14·8	12·6	11·1	10·4	7·9	6·0
1839.	8·6	10·6	6·8	6·3	15·5	15·3	13·2	13·2	10·5	7·0	4·2	3·8
1840.	6·6	5·9	5·8	10·2	.....	15·7	14·9	14·8	13·3	11·6	9·9	7·3
1841.	7·6	5·9	12·7	13·2	15·6	17·5	14·0	12·8	15·6	9·9	9·0	8·3
1842.	6·1	8·0	9·9	12·7	16·1	18·3	18·0	15·2	12·1	10·5	7·5	8·6
1843.	8·0	6·7	10·4	13·9	16·1	15·7	.....	.....	.....	.....	.....	.....
At the Royal Observatory, Greenwich.												
1840.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11·0	9·0
1841.	11·1	9·1	17·5	16·5	21·3	18·8	15·6	16·3	16·0	11·7	10·7	9·4
1842.	6·4	10·4	10·9	16·1	16·7	22·2	17·7	20·3	12·8	13·2	7·9	8·2
1843.	7·9	7·5	12·4	15·4	14·7	15·2	15·6	16·4	17·4	12·8	10·2	6·6
1844.	8·7	10·5	12·1	21·0	18·6	19·9	16·2	15·4	15·3	12·4	7·4	5·4
1845.	6·4	8·7	11·1	16·8	14·2	18·2	14·9	14·8	15·6	13·3	10·9	9·9
1846.	7·7	8·3	12·7	13·1	16·6	22·5	17·5	15·5	18·0	10·4	8·0	10·3
1847.	8·8	11·6	16·0	18·3	21·2	19·4	23·3	21·0	18·7	14·0	11·4	9·7
1848.	8·3	10·7	14·3	16·7	30·5	17·7	22·5	18·5	20·9	16·5	15·7	12·7
1849.	10·8	12·9	13·8	16·0	16·3	20·6	22·6	20·2	17·5	15·1	11·7	9·1

TABLE XXXI.—Showing the mean monthly minimum temperature by night, the mean monthly maximum temperature by day, the mean daily and monthly range of temperature, at the Apartments of the Royal Society, and at the Royal Observatory, Greenwich, together with the increase of temperature month by month, by night and by day.

Month.	Mean of all the minimum readings, or of the lowest temperature by night at the		Higher mean minimum reading at the		Mean of all the maximum readings, or of the highest temperature by day at the		Lower mean maximum reading at the		The mean daily range of temperature at the		Less daily range at the		The mean monthly range of temperature at the		Less monthly range at the		Monthly increase in the mean				
	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	Royal Society.	Royal Observatory.	At the Royal Society.	At the Royal Observatory.	Of the lowest temperature by night	Of the highest temperature by day	At the Royal Society.	At the Royal Observatory.	
December ...	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
January .....	34.4	33.1	1.3	46.2	42.2	8.5	6.8	1.7	28.4	32.7	4.3	28.4	32.7	-3.1	-1.5	-2.7	-1.8	-3.1	-1.5	-2.7	-1.8
February .....	36.4	33.6	2.8	44.3	44.0	9.9	7.9	2.0	27.6	34.3	6.7	27.6	34.3	+2.0	+0.5	+3.1	+1.8	+2.0	+0.5	+3.1	+1.8
March .....	37.8	36.3	1.5	48.2	50.3	13.4	10.2	3.2	29.3	38.2	8.9	29.3	38.2	+1.4	+2.7	+3.6	+6.3	+1.4	+2.7	+3.6	+6.3
April .....	42.5	39.2	3.3	54.7	56.8	16.7	12.3	4.4	33.7	40.5	6.8	33.7	40.5	+4.7	+2.9	+7.0	+6.5	+4.7	+2.9	+7.0	+6.5
May .....	48.3	45.7	2.6	63.1	66.3	18.9	14.8	4.1	34.8	41.5	6.7	34.8	41.5	+5.8	+6.5	+8.2	+8.4	+5.8	+6.5	+8.2	+8.4
June .....	53.1	49.5	3.6	68.6	72.6	19.4	15.5	3.9	34.0	40.5	6.5	34.0	40.5	+4.8	+3.8	+5.5	+7.4	+4.8	+3.8	+5.5	+7.4
July .....	56.6	53.2	3.4	71.4	73.1	18.4	14.9	3.5	31.2	39.7	8.5	31.2	39.7	+3.5	+3.7	+2.8	+0.5	+3.5	+3.7	+2.8	+0.5
August .....	56.9	53.4	3.5	70.8	72.1	17.6	14.1	3.5	29.9	38.1	8.2	29.9	38.1	0.0	+0.2	-0.6	-1.0	0.0	+0.2	-0.6	-1.0
September ...	52.6	49.4	3.2	65.1	67.3	17.0	12.5	4.5	30.7	41.8	11.1	30.7	41.8	-4.0	-4.0	-5.7	-4.8	-4.0	-4.0	-5.7	-4.8
October .....	46.8	43.6	3.2	56.7	57.6	13.3	9.9	3.4	29.5	36.9	7.4	29.5	36.9	-5.8	-5.8	-8.4	-9.7	-5.8	-5.8	-8.4	-9.7
November ...	40.4	38.6	1.8	48.2	49.7	10.5	8.0	2.5	27.0	34.0	7.0	27.0	34.0	-6.4	-6.4	-8.5	-7.9	-6.4	-6.4	-8.5	-7.9
December ...	37.5	34.6	2.9	43.9	44.0	9.0	6.4	2.6	27.1	32.3	5.2	27.1	32.3	-2.9	-4.1	-4.3	-5.7	-2.9	-4.1	-4.3	-5.7

The successive differences shown here between the results at the Apartments of the Royal Society and at the Royal Observatory, are harmonious with the differences exhibited in Table XIII. and following remarks, between the temperatures of the water of the Thames and those of the air at Greenwich, but of less amount, and they indicate the great influence the presence of a tidal river has upon the meteorological elements of the district through which it passes.

The subjects of this paper are the determination of mean numerical values, and the establishment of the laws of periodic variation from the long series of observations which were taken under the direction of this Society, combined with that still being made at Greenwich. I have not attempted to deduce any rules for non-periodic variations.

It is most fortunate that through all reports this series of observations continued unbroken for so many years, and that it did not cease till that at Greenwich had been in operation for two or three years.

The number of observations treated of in this paper exceeds 200,000, spread nearly equally over seventy-nine years, and the results generally are important additions to science. I consider the determination of the mean temperature at Greenwich as a real addition; it is probably the best determination of this element of any spot on the globe, and it will help to an accurate knowledge of the mean temperature of its surface.

I may however here remark, that none of the mean results in this paper could have been calculated if observations at equal intervals had not been taken throughout the twenty-four hours and continued for a few years. The observations at Greenwich have supplied this want. It was upon them, taken for five years, I based my determinations of curve of hourly mean temperature, and by this means have made all the observations available.

As it is difficult to have instruments read more frequently than twice or thrice in a day, yet, to make these available, it is necessary that the laws of diurnal changes of temperature be known; and where such is not the case, an effort should be made in all countries to have a series of hourly or bi-hourly observations made for a few years, so as to be able to deduce useful results. Such series of frequent observations need not be made near each other, as it is found that the observations made over a considerable extent of country are subject to the same general laws.