

XXXII. *Experiments to investigate the Variation of Local Heat.*
 By James Six, Esq.; communicated by the Rev. Francis
 Wollaston, LL.B. F. R. S.

Read June 10, 1784.

BEING desirous of investigating the variation of local heat, I made the following experiments.

On the 4th of September, 1783, I placed thermometers in three different stations; one on the top of the high tower of Canterbury Cathedral, about 220 feet from the ground; another at the bottom of the same tower, at about 110 feet; and a third in my own garden*, not more than six feet from the ground. They were all carefully exposed to the open air in a shady northern aspect; the lowest was as little liable to be affected by the reflection of the sun's rays as the elevation would permit, the second still less, and the highest not at all. They continued unremoved in their several places, where I visited them daily for the space of three weeks, and minuted down the greatest degree of heat and cold that happened each day and night in their respective stations †.

* This garden is situate not far from the Cathedral, at the extremity of the buildings on the north side of the city.

† The thermometers here made use of were constructed to shew the greatest degree of heat and cold which happened in the observer's absence (described Phil. Transf. vol. LXXII. part I.), which rendered them particularly convenient on this occasion. They had hung together for some time, and seldom differed half a degree from each other.

By

By these observations it appears, see Table I. that, notwithstanding some irregularities, the heat of the days at the lowest station always exceeded that at the middle, and still more the heat at the upper station. As in many instances the higher regions of the atmosphere have been found to be colder than the lower, and the thermometer in the garden was more liable to be heated by the reflection of the sun's rays from the earth than the upper ones, a difference of this kind might have been expected. But I was greatly surpris'd to find the cold of the night at the lowest, not only equal to, but, very frequently, exceeding the cold at the higher stations. As I wished to know, whether these variations would continue the same in the winter, when the weather was colder; and whether a thermometer, placed at some distance from the city, having an elevation equal to that on the top of the Cathedral tower, would agree with it; on the 19th of December, 1783, I dispos'd the three thermometers in the following manner: one in my garden; one on the top of the high tower, as before; and the third on the top of St. Thomas's Hill, about a mile distant from the city, where, at fifteen feet from the ground, it was nearly level with that on the Cathedral tower. Table II. contains the observations that were then made*. The weather at this time proving cold, favoured the experiment; and I now found the several thermometers nearly agreeing with each other in the day-time: but in the night, the cold at the lower station exceeded the cold at the higher ones rather more than it did in the month of September, when the weather was warmer.

* The few omissions in this Table were occasioned by the severity of the cold preventing my attending at a proper time the thermometers, which were at a considerable distance from each other.

At the time of taking these thermometrical observations, I likewise noted the different dispositions of the atmosphere in other respects: such as the pressure, moisture, and dryness of the air; force and direction of the winds; quantity of rain; whether the appearances of the sky were clear or cloudy, &c. as I apprehended the local variation of the thermometers might, in a certain degree, correspond with some particular change in the state of the atmosphere.

The event answered my expectation in a singular manner in respect to the nocturnal variation; for it generally happened, that when the sky was dark and cloudy, whatever was the condition of the atmosphere with relation to the other particulars above enumerated, the thermometers agreed pretty nearly with each other; but, on the contrary, whenever the sky became clear, the cold of the night at the lowest station in the garden constantly exceeded the cold at the top of the Cathedral tower, where the instrument was placed 220 feet from the ground, entirely exposed to the open air, wind, dews, and rain, in a shady northern aspect.

The local variations in the day-time seemed to be regulated by the general degree of heat only, without being affected by any other particular disposition of the atmosphere, or the clearness or cloudiness of the sky, as the nocturnal variations were. In the month of September, when the glasses rose from 60° to 70° , the heat at the lower station constantly exceeded the heat at the upper station; and in some measure proportionally, as the weather was hotter*. In December and January, when

* As the heat at the lower station exceeded the heat at the upper ones, when the weather was hot; and equally so, whenever the sky was cloudy, as well as when it was clear; it appears, that the glass at the lower station was not materially affected by the reflection of the sun's rays from the earth, as at first I apprehended it would be.

from below 30° they seldom rose to 40° , the local variation in the day-time nearly ceased, or was found in very small degrees inclining sometimes one way, sometimes the other.

That the clearness of the sky should contribute to the coolness of the air in the night, is not at all surprising; but that, whenever the sky becomes clear, the cold should seem to arise from the earth, and be found in the greatest degree, as long as it continues clear, in the lowest situation, seems a little extraordinary: this, however, appeared to be the case, both in the warmer as well as in the colder weather, during the whole time these observations were taken, and remarkably so on the following days. On the first of January the weather was cold, the sky cloudy, the glasses in the night were at 20° , and in the day at 34° : the wind which had been at S.E. the day before, changed in the evening to S. and brought on a thaw. On the second of January clouds and misty rain darkened the sky all day; the wind blew briskly at S.W.; the glasses in the night were at $32^{\circ}\frac{1}{2}$, in the day at 40° . On the third of January the clouds and rain continued, the weather growing still warmer; wind at S.W. by S.; the glasses in the night were at 36° , in the day at $45^{\circ}\frac{1}{2}$. These three days the weather gradually became warmer; and, while the sky remained darkened by clouds, all the glasses in their several stations nearly agreed with each other. About noon, on the third of January, the sky becoming clear, the air grew cooler; and going into my garden, about eight o'clock in the evening, I perceived the surface of the ground, which had been wet by the rain in the forenoon, began to be frozen. Looking immediately at the thermometer, I saw the mercury at $33^{\circ}\frac{1}{2}$; and observing a piece of wet linen hanging near the glass, not five feet from the ground, I took it into my hand, and found it not in the least frozen; by which it appeared, that

that the degree of cold which had frozen the surface of the ground, had not then ascended to the glass, nor to the linen, and consequently had not been communicated to the air five or six feet above the earth. The next day I found, as I expected, a considerable local variation; the index for the cold of the night in the garden being at 32° , that on the hill being at $35^{\circ}\frac{3}{4}$, and that on the top of the tower at $37^{\circ}\frac{3}{4}$ *. Probably the weather did not continue clear the whole night; if it had, it is likely the degrees of cold would have been found proportionally greater at every station. On the morning of the 4th there fell a misty rain, which continued only till noon, when the sky became clear again, and continued so till the 7th; during which time the nocturnal heights of the thermometers differed considerably from each other; but on the sky's becoming cloudy, the local variation ceased.

Thermometrical observations, made under the same circumstances in respect to the season of the year, place, and situation †, may probably be liable to similar local varia-

* It is remarkable, that the thermometer on St. Thomas's hill did not vary so much from that in the garden, as that did which was on the Cathedral tower, although these two elevated glasses were within three feet of a perfect level with each other; the variations, however, as often as they happened, inclined the same way. The reason of this might probably be, that although the glass on the hill was at an equal altitude with that on the tower, in respect to the ground on which the Cathedral stands: yet the former was only 15 feet, while the latter was 220 feet from the ground.

† Situation in regard to hill or valley. The valley in which Canterbury stands is at that place about a mile in breadth, opening to the N.E.; the hills on either side do not rise very sudden, nor very high; the river Stour, divided into branches, passes through the city, and, about fourteen miles below, empties itself into the sea, which washes the coast from the NN.W. round by the E. to the S.; distant from the city at different places from six to sixteen miles.

tions : to those who make them, the result of these experiments may be of some use. If convenient opportunity offered, I should be glad, by the assistance of friends, to try the local difference of heat and cold in more distant, as well as more elevated, situations.

By experiments of this kind it may possibly in some measure be found, how far evaporations from the earth, at certain times, or vapours ascending, descending, or meeting, in different parts of the atmosphere, may increase or diminish the heat of the air in those places : or whether different degrees of heat and cold (subject however to change) may not be found in different strata of air, or vapour, floating in different parts of the atmosphere ; or in what degree and proportion, the cold increases at different altitudes and in different seasons of the year : whether the cold, which is known to be very intense in the summer time on the tops of high mountains, receives a proportional increase, or be not less subject to variety by the return of winter and summer, night and day, than what we experience in the plains below.

March 10, 1784.

JAMES SIX.

T A B L E I.

The greatest daily variation of heat and cold in the atmosphere, from the 4th to the 24th of 1783, taken from three different stations, and compared together. One thermometer tower in Canterbury, 220 feet from the ground; another at the bottom of the same tower, third in a garden, about six feet from the ground. N. B. The nocturnal degrees of cold be night immediately preceding the day to the date of which they are placed.

	Greatest degree of cold in the night.					Greatest degree of heat in the day.					
	Thermometer in the garden.	Thermometer at the bottom of the tower.	Thermometer on the top of the tower.	Difference of garden from bot- tom of tower.	Difference of garden from top of tower.	Thermometer in the garden.	Thermometer at the bottom of the tower.	Thermometer on the top of the tower.	Difference of garden from bot- tom of tower.	Difference of garden from top of tower.	
Sept. 4	50½	—	51	—	—0½	66	61	61	+5	+5	Morning still and foggy; w in the forenoon at S.W.; in the afternoon and night
5	48	47¼	47½	+0¾	+0½	62½	61½	61½	+1	+1	
6	48½	50	50½	-1½	-2	66	65¼	64½	+1½	+2	Morning rained a little; w S.W. most part of the day;
7	48	49½	49½	-1½	-1½	63½	62½	63	+1	+0½	Morning clear; continued day; wind very high at W
8	50	51	51	-1	-1	66	62½	62	+3½	+4	Sometimes clear, sometime very high at W.; bar. 29.5
9	55½	55½	55½	—	—	65	63	62½	+2	+½	Morning close and cloudy; wind brisk at S.W.; bar.
10	45	47	47½	2	-2½	63½	59¾	59¾	+4	+4	Morning and great part of wind high at S.W.; eve 29.6.
11	42	45	45½	-3	-3½	63½	62	60½	+1½	+3	Morning clear; cloudy a wind at S.; evening still;
12	52½	53½	54	-1	-1½	69	66½	65	+2½	+4	Morning cloudy; wind high still and clear; bar. 29.4.
13	45	48	48½	-3	-3½	65	62	62	+3	+3	Morning clear; a little rain afternoon; wind brisk at S
14	57½	57	57	+0½	+0½	68½	66½	64½	+2	+4	Morning cloudy; moist war at S.W.; misty rain; clou 29.8.
15	57	57	58	—	-1	70	68½	66	+1½	+4	Morning cloudy; wind mo the evening changed to N
16	52½	53	52½	-0½	—	65½	62½	61	+3	+4½	Morning hazy; thin clou wind at N.E.; close and w
17	51½	51½	51	—	+0½	62½	61	60½	+1½	+2	Dull and hazy most part breeze of wind at N.E.;
18	57	57	57	—	—	62½	62	61	+0½	+1½	Very dull all day; wind bri

24th of September,
 meter placed on a
 tower, 110; and a
 cold belong to the

foggy; wind began to blow
 at S.W.; clouds and rain
 and night; bar. 29.3.
 heavy rain; clear in the
 high at W.N.W.; bar.

little; wind very high at
 the day; bar. 29.5.

ntinued for most part of the
 high at W.; bar. 29.8.

fometimes cloudy; wind
 bar. 29.9.

d cloudy; clear at noon;
 7.; bar. 29.5.

it part of the day clear;
 W.; evening clear; bar.

cloudy about noon; brisk
 ing still; bar. 29.8.

wind high at S.; evening
 air; 29.4.

little rain at noon; cloudy
 brisk at S.; bar. 29.0.

moist warm air; wind brisk
 rain; cloudy evening; bar.

wind moderate S.W.; in
 ged to N.; bar. 29.5.

in clouds all day; little
 ase and warm; bar. 29.8.

ost part of the day; little
 : N.E.; bar. 30.1.

wind brisk at N.E.; bar

17	57	57	57	—	—	62½	61	60½	+1½	+2	{ breeze of wind at N.E.;
18	57	57	57	—	—	62½	62	61	+0½	+1½	{ Very dull all day; wind bri 29.9.
19	53	54½	55½	-1½	-2½	70	67½	67	+2½	+3	{ Morning clear; a little rain wind S.S.E.; bar. 29.6.
20	56	56	55½	—	+0½	64½	63	61	+1½	+3½	{ Cloudy all day, with rain clear at night; bar. 29.4.
21	44½	47½	48½	-3	-4	63½	61	60½	+2½	+3	{ Morning clear; wind at S.W. of the day; wind S.; bar.
22	56	57	57	-1	-1	59	58	58	+1	+1	{ Rain most part of the day wind S.W.; bar. 29.6.
23	50	49	50	+1	—	63	59½	59½	+3½	+3½	{ Morning still and misty; a the afternoon, clear all the wind S.W.; bar. 29.6;
24	43¾	46	46	-2¼	-2¼	63	59¾	58¾	+3¼	+4¼	{ Clear all day; wind W. and N

all part of the day; little
 N.E.; bar. 30.1.
 wind brisk at N.E.; bar
 little rain in the afternoon;
 . 29.6.
 with rain and wind S.W.;
 r. 29.4.
 d at S.W.; clear most part
 S.; bar. 29.8.
 the day; evening hazy;
 29.6.
 misty; a little shower in
 ear all the rest of the day;
 29.6.
 W. and N.W.; bar. 29.8.

T A B L E

T A B L E II.

The greatest daily variation of heat and cold in the atmosphere from the 20th of December, 8th of January, 1784, taken from three different stations, and compared together. One placed on a tower in Canterbury, 220 feet from the ground; another on a hill, a mile the same level with that on the tower; a third in a garden, about six feet from the ground. The nocturnal degrees of cold belong to the night immediately preceding the day to the they are placed.

	Greatest degree of cold in the night.					Greatest degree of heat in the day.					
	Thermometer in the garden.	Thermometer on the hill.	Thermometer on the tower.	Difference of garden from hill.	Difference of garden from tower.	Thermometer in the garden.	Thermometer on the hill.	Thermometer on the tower.	Difference of garden from hill.	Difference of garden from tower.	
Dec. 20	20°	25°	25½°	-5°	-5½°	39½°	37½°	39½°	+0°	-0½°	{ Evening preceding clear wind brisk at W.; cloud moist; barometer at 29
21	29½°	30½°	32°	-1°	-2½°	37½°	36½°	36°	-0½°	-0½°	{ Morning clear on the hill little wind at N.W.; noon; a little snow; bar
22	22°	24½°	25½°	-2½°	-3½°	34°	34½°	36°	-0½°	-2°	{ Morning slight fog in the at N.W.; air moist; little snow; bar. 29.7.
23	31½°	31½°	32°	—	-0½°	39½°	40½°	37½°	-0½°	+2½°	{ Dark and cloudy all day; air moist; evening fogg
24	31½°	33°	34½°	-1½°	-2½°	43½°	42°	41½°	+1½°	+2½°	{ Morning rainy; clear at the evening, wind at N
25	26°	27°	—	-1°	—	36°	35½°	—	+0½°	—	{ Morning cloudy; wet mist towards evening rain; night clear, bar. 29.2.
26	26½°	26½°	28°	—	-1½°	33½°	34°	36°	-0½°	-2½°	{ Morning foggy, a little evening clear in the ze N.; bar. 28.9.
27	25°	26½°	28°	-1½°	-3°	36°	34½°	35½°	+1½°	-0½°	{ Morning clear; cloudy at in the evening moderate N.E.; bar. 29.3.
28	30°	29°	29½°	+1°	+0½°	31½°	30°	33½°	+1½°	-2½°	{ Morning dark and cloudy N.E.; air dry, and felt
29	21°	21½°	22°	-0½°	-1°	24½°	24½°	—	-0½°	—	{ Morning hazy; dry mist cold and brisk at S.E. by
30	15½°	15°	16½°	+0½°	-1°	22°	21½°	21½°	+0½°	+0½°	{ Morning clear in the ze below; wind very cold bar. 29.7.
31	12½°	11½°	13°	+0½°	-0½°	21½°	—	21½°	—	—	{ Sometimes clear, somewhat brisk at S.E.; evening wind S. very high in the
Jan. 1	20°	—	20°	—	—	34°	—	33½°	—	+0½°	{ Wet mist all day; wind bar. 29.4.
2	32½°	32°	32½°	+0½°	—	40°	39½°	40°	+0½°	—	{ Morning thick fog and mist afternoon and evening with rain; bar. 29.6.
											{ Morning rainy; wind S.

ember, 1783, to the
r. One thermometer
mile distant, but on
ground. N. B. The
to the date of which

ing clear; morning clear;
V.; cloudy at noon; air very
ter at 29.9.

on the hill; fog in the city;
N.W.; air moist: cloudy at
now; bar. 29.8.

fog in the city; little wind
moist; cloudy at noon, a
r. 29.7.

all day; wind brisk at S.W.;
ing foggy; bar. 29.8.

clear at noon; cloudy late in
ind at N.; bar. 29.6.

; wet mist; wind brisk at E.;
ing rain mixed with snow;
r. 29.2.

a little snow about noon;
n the zenith; little wind at

cloudy at noon; little snow;
moderate breeze of wind at
3.

nd cloudy; wind very brisk at
and felt very cold, bar. 29.3.

dry misty air; wind very
at S.E. by E., bar. 29.7.

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very cold and brisk at S.E.

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evening rain with snow;
gh in the night; bar. 29.4.

ly; wind moderate at W.;

ing and misty rain; wind S.E.;
evening very high at S.W.
29.6.

wind S.W. by W.; clear at

2	32½	32	32½	+0½	—	40	39½	40	+0½	—	{ Morning thick fog and m afternoon and evening with rain; bar. 29.6.
3	36	35½	36	+0½	—	45½	45	45½	+0½	—	{ Morning rainy; wind S. noon; afternoon and ev still; wind S.W.; bar.
4	32	35½	37¼	-3¼	-5¼	46½	44¼	45½	+1¼	+1	{ Morning misty rain; win ing very clear and still;
5	26¼	29¼	31	-3	-4¼	36½	35½	—	+1	—	{ Morning very clear; littl ing very clear and still;
6	21½	26	27½	-4½	-6	31	30¼	—	+0½	—	{ Morning very clear; n wind at SE.; evening bar. 30.2.
7	16	19	20½	-3	-4½	29	27½	27½	+1½	+1½	{ Morning very clear; e evening dark and clo S.E.; bar. 30.0.
8	26	25½	25½	+0½	+0½	32	32	31½	—	+0½	{ Morning dark and clof wind W.N.W.; bar. 29



g and misty rain; wind S.E.;
evening very high at S.W.
. 29.6.

wind S.W. by W.; clear at
on and evening very clear and
V.; bar. 29.6.

rain; wind high at S.; even-
and still; bar. 29.8.

ear; little wind at N.E. even-
and still; bar. 30.1.

clear; moderate breeze of
evening very clear and still;

clear; cloudy about noon;
and cloudy; little wind at
.0.

and close; very dark all day;
; bar. 29.8.

T A B L E I.

The greatest daily variation of heat and cold in the atmosphere, from the 4th to the 24th of September, 1783, taken from three different stations, and compared together. One thermometer placed on a tower in Canterbury, 220 feet from the ground; another at the bottom of the same tower, 110; and a third in a garden, about six feet from the ground. N. B. The nocturnal degrees of cold belong to the night immediately preceding the day to the date of which they are placed.

Sept.	Greatest degree of cold in the night.					Greatest degree of heat in the day.					
	Thermometer in the garden.	Thermometer at the bottom of the tower.	Thermometer on the top of the tower.	Difference of garden from bottom of tower.	Difference of garden from top of tower.	Thermometer in the garden.	Thermometer at the bottom of the tower.	Thermometer on the top of the tower.	Difference of garden from bottom of tower.	Difference of garden from top of tower.	
4	50½	—	51	—	-0½	66	61	61	+5	+5	Morning still and foggy; wind began to blow in the forenoon at S.W.; clouds and rain in the afternoon and night; bar. 29.3.
5	48	47½	47½	+0½	+0½	62½	61½	61½	+1	+1	
6	48½	50	50½	-1½	-2	66	65½	64½	+1½	+2	Morning rained a little; wind very high at S.W. most part of the day; bar. 29.5.
7	48	49½	49½	-1½	-1½	63½	62½	63	+1	+0½	Morning clear; continued so most part of the day; wind very high at W.; bar. 29.8.
8	50	51	51	-1	-1	66	62½	62	+3½	+4	Sometimes clear, sometimes cloudy; wind very high at W.; bar. 29.9.
9	55½	55½	55½	—	—	65	63	62½	+2	+2½	Morning close and cloudy; clear at noon; wind brisk at S.W.; bar. 29.5.
10	45	47	47½	2	-2½	63½	59½	59½	+4	+4	Morning and great part of the day clear; wind high at S.W.; evening clear; bar. 29.6.
11	42	45	45½	-3	-3½	63½	62	60½	+1½	+3	Morning clear; cloudy about noon; brisk wind at S.; evening still; bar. 29.8.
12	52½	53½	54	-1	-1½	69	66½	65	+2½	+4	Morning cloudy; wind high at S.; evening still and clear; bar. 29.4.
13	45	48	48½	-3	-3½	65	62	62	+3	+3	Morning clear; a little rain at noon; cloudy afternoon; wind brisk at S.; bar. 29.0.
14	57½	57	57	+0½	+0½	68½	66½	64½	+2	+4	Morning cloudy; moist warm air; wind brisk at S.W.; misty rain; cloudy evening; bar. 29.8.
15	57	57	58	—	-1	70	68½	66	+1½	+4	Morning cloudy; wind moderate S.W.; in the evening changed to N.; bar. 29.5.
16	52½	53	52½	-0½	—	63½	62½	61	+3	+4½	Morning hazy; thin clouds all day; little wind at N.E.; close and warm; bar. 29.8.
17	51½	51½	51	—	+0½	62½	61	60½	+1½	+2	Dull and hazy most part of the day; little breeze of wind at N.E.; bar. 30.1.
18	57	57	57	—	—	62½	62	61	+0½	+1½	Very dull all day; wind brisk at N.E.; bar. 29.9.
19	53	54½	55½	-1½	-2½	70	67½	67	+2½	+3	Morning clear; a little rain in the afternoon; wind S.S.E.; bar. 29.6.
20	56	56	55½	—	+0½	64½	63	61	+1½	+3½	Cloudy all day, with rain and wind S.W.; clear at night; bar. 29.4.
21	44½	47½	48½	-3	-4	63½	61	60½	+2½	+3	Morning clear; wind at S.W.; clear most part of the day; wind S.; bar. 29.8.
22	56	57	57	-1	-1	59	58	58	+1	+1	Rain most part of the day; evening hazy; wind S.W.; bar. 29.6.
23	50	49	50	+1	—	63	59½	59½	+3½	+3½	Morning still and misty; a little shower in the afternoon, clear all the rest of the day; wind S.W.; bar. 29.6.
24	43½	46	46	-2½	-2½	63	59½	58½	+3½	+4½	Clear all day; wind W. and N.W.; bar. 29.8.

TABLE II.

The greatest daily variation of heat and cold in the atmosphere from the 20th of December, 1783, to the 8th of January, 1784, taken from three different stations, and compared together. One thermometer placed on a tower in Canterbury, 220 feet from the ground; another on a hill, a mile distant, but on the same level with that on the tower; a third in a garden, about six feet from the ground. N. B. The nocturnal degrees of cold belong to the night immediately preceding the day to the date of which they are placed.

	Greatest degree of cold in the night.					Greatest degree of heat in the day.					
	Thermometer in the garden.	Thermometer on the hill.	Thermometer on the tower.	Difference of garden from hill.	Difference of garden from tower.	Thermometer in the garden.	Thermometer on the hill.	Thermometer on the tower.	Difference of garden from hill.	Difference of garden from tower.	
Dec. 20	20	25	25½	-5	-5½	39½	37½	39½	+0½	-0½	{ Evening preceding clear; morning clear; wind brisk at W.; cloudy at noon; air very moist; barometer at 29.9.
21	29½	30½	32	-1	-2½	27½	36½	36	-0½	-0½	{ Morning clear on the hill; fog in the city; little wind at N.W.; air moist; cloudy at noon; a little snow; bar. 29.8.
22	22	24½	25½	-2½	-3½	34	34½	36	-0½	-2	{ Morning slight fog in the city; little wind at N.W.; air moist; cloudy at noon, a little snow; bar. 29.7.
23	31½	31½	32	—	-0½	39½	40½	37½	-0½	+2½	{ Dark and cloudy all day; wind brisk at S.W.; air moist; evening foggy; bar. 29.8.
24	31½	33	34½	-1½	-2½	43½	42	41½	+1½	+2½	{ Morning rainy; clear at noon; cloudy late in the evening. wind at N.; bar. 29.6.
25	26	27	—	-1	—	36	35½	—	+0½	—	{ Morning cloudy; wet mist; wind brisk at E.; towards evening rain mixed with snow; night clear. bar. 29.2.
26	26½	26½	28	—	-1½	33½	34	36	-0½	-2½	{ Morning foggy, a little snow about noon; evening clear in the zenith. little wind at N. bar. 28.9.
27	25	26½	28	-1½	-3	36	34½	35½	+1½	-0½	{ Morning clear; cloudy at noon; little snow in the evening. moderate breeze of wind at N.E.; bar. 29.3.
28	30	29	29½	+1	+0½	31½	30	33½	+1½	-2½	{ Morning dark and cloudy; wind very brisk at N.E.; air dry, and felt very cold, bar. 29.3.
29	21	21½	22	-0½	-1	24½	24½	—	-0½	—	{ Morning hazy; dry misty air; wind very cold and brisk at S.E. by E., bar. 29.7.
30	15½	15	16½	+0½	-1	22	21½	21½	+0½	+0½	{ Morning clear in the zenith; dry misty fog below; wind very cold and brisk at S.E. bar. 29.7.
31	12½	11½	13	+0½	-0½	21½	—	21½	—	—	{ Sometimes clear, sometimes cloudy; wind brisk at S.E.; evening rain with snow; wind S. very high in the night; bar. 29.4.
Jan. 1	20	—	20	—	—	34	—	33½	—	+0½	{ Wet mist all day; wind moderate at W.; bar. 29.4.
2	32½	32	32½	+0½	—	40	39½	40	+0½	—	{ Morning thick fog and misty rain; wind S.E.; afternoon and evening very high at S.W. with rain; bar. 29.6.
3	36	35½	36	+0½	—	45½	45	45½	+0½	—	{ Morning rainy; wind S.W. by W.; clear at noon; afternoon and evening very clear and still; wind S.W.; bar. 29.6.
4	32	35½	37½	-3½	-5½	46½	44½	45½	+1½	+1	{ Morning misty rain; wind high at S.; evening very clear and still; bar. 29.8.
5	26½	29½	31	-3	-4½	36½	35½	—	+1	—	{ Morning very clear; little wind at N.E. evening very clear and still; bar. 30.1.
6	21½	26	27½	-4½	-6	31	30½	—	+0½	—	{ Morning very clear; moderate breeze of wind at S.E.; evening very clear and still; bar. 30.2.
7	16	19	20½	-3	-4½	29	27½	27½	+1½	+1½	{ Morning very clear; cloudy about noon; evening dark and cloudy; little wind at S.E.; bar. 30.0.
8	26	25½	25½	+0½	+0½	32	32	31½	—	+0½	{ Morning dark and close; very dark all day; wind W.N.W.; bar. 29.8.

