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THE COLD AND THE SNOW STORM.

Since our last number appeared, we have been favoured with a very large mass of material, and our own regular March reports have been received. All confirm the impression mentioned in our last, that for all practical purposes the storm may be regarded as similar to that of January, 1881, but prevailing over a more northern district. We learn that Mr. C. Harding, F.R.Met.Soc., is preparing a report on the recent cold period, for presentation to the Royal Meteorological Society, and, therefore, acting upon our uniform practice, we have forwarded to him all the information which we have received, so that all who wish for the complete account will find it in the Society's *Quarterly Journal*.

We must, however, add two or three illustrative letters, and we must also thank the many correspondents who have supplied us with details, many of which, though not printed, have been very useful in checking the records of snow sent by our own regular correspondents.

To the Editor of the Meteorological Magazine.

SIR,—Perhaps it may interest you to know that we have been visited with, considering the season, an exceptionally severe snow-storm. It began blowing, coupled with very small snow, early on Monday morning (1st), but during the night more snow fell, and the drift began in real earnest, so that on going out yesterday (Tuesday) for a short time, I found drifts on the low ground close to the house, four to six feet deep, the top of many of them being level with the hedgetops. It was no use trying to clear the roads, as they would have blown up again as fast as they were cut. To-day it cleared and the wind dropped, and I got some men together to open out the roads, and, on going down, found the depth of the drifts in many places, where they were cut, six feet, at least, or more.

Yesterday (Tuesday), the postman arrived two hours late, he only comes from Cornhill, $4\frac{1}{2}$ miles off; no mails in that morning; he left the station at 10.45, and the 8 a.m. from Kelso, due at 8.27, had not arrived, though only 10 miles; neither had the train

from Berwick-on-Tweed (reverse way), due at 9.11, come in. He was unable to return yesterday, and went off to-day, intending to return to-morrow, so we did not get any letters or papers either Tuesday or to-day. The block is as serious a one here as that of January, 1881, was in the south, (I was in town at that time), and worse than it was here, as there was not then any wind to cause a drift. I cannot say I ever recollect such a drift so late in the season as March. I have seen no papers since it began, so cannot tell how far it may have extended.

Previous to this storm, many of the hill farmers, at the top of Bowmont Water and Upper Coquetdale had to bring down their sheep to the lower ground near here; so that these lowground farms were in many cases over-stocked. What they will do now I cannot tell; I fully expect to hear of a great loss among sheep. The drift was almost entirely from the east. I remain, yours truly,

B. P. SELBY.

Pawston, Cornhill-on-Tweed, March 3rd, 1886.

March 4th.—P.S. I find there was a drift here in March, 1881, when I was away, but nothing near so bad as this. Several persons to whom I have spoken, and who have been long resident in the district, have to go back 33 years (1853) before they can recollect anything so bad after January. I *believe* there was as bad a drift, or nearly so, in February, 1853. A railway cutting on the new Alnwick and Cornhill branch at Kilham, about two miles from here, and fifty feet or so deep, is blown up so thoroughly that no one would think that there was a cutting at all.

B. P. S.

To the Editor of the Meteorological Magazine.

SIR,—The great snowstorm of March 1st and 2nd was in some respects the most severe I ever knew. It snowed here incessantly, as far as I observed, for 50 hours, up to 9 a.m. on the 3rd—though at times very slightly, and it may have ceased at some time. The snow drifted very much, so that it was impossible to tell the exact depth, but as near as I could judge it was two inches at 2 p.m., ten inches at 10½ p.m. of the 1st; and 12½ inches deep at 8 a.m. on the 2nd; and it reached a maximum of about 14 inches on the 3rd. The amounts caught in the rain-gauges, when melted, gave approximately .86 and .80 of an inch on the 1st, in my new and old gauges respectively; and .36 and .55 on the 2nd; but owing to the drifting these amounts would be very inaccurate. The most probable amount, judged by taking the average of the snow gathered and melted from five different spots, is 1.07 in. for the 1st, and .53 for the 2nd; but, as the five quantities obtained differed widely, it is impossible to judge exactly.

To your list of snowed-up trains and impediments to traffic there should be added that on the 2nd inst. a train became imbedded in the snow between Seaham Harbour and Sunderland; two engines sent to its assistance were also snowed up, and railway communica-

tion between the two towns became wholly suspended, as well as between this town and Hartlepool. The deepest drift on road or railway in this district was probably in the railway cutting at Fulwell, a short way out of Sunderland, where the snow was said to be 18 ft. deep, probably somewhat of an exaggeration ; which, with accumulations at other points, completely stopped the train service between Sunderland and Newcastle, and Sunderland and Shields, for many hours. A train becoming fixed in this drift at night on the 2nd (Tuesday) blocked one line of rails till (Saturday) the 6th, when the last carriages were extricated. The Newcastle and Jarrow line was also blocked, and I believe others. I doubt whether such a stoppage to railway communication ever occurred before in this district.

The snowstorm most resembling the late one of any I have known was that of 1881, March 4th and 5th, on which occasion the total yield was heavier, but as it was partly sleet the depth here was much less.

The weather has continued very snowy ever since the great storm, snow or sleet falling with little interruption, though at times very slightly, from the morning of the 15th to last evening ; it mostly did not lie, and the total fall when melted was only .45 in.

T. W. BACKHOUSE.

Sunderland, March 18th, 1886.

To the Editor of the Meteorological Magazine.

SIR,—The cold of the past season having been most severe in the period which included the second half of February, and the first half of March, a better idea may be gained of its character by a discussion of observations from the middle of February to the middle of March, than by taking the months separately.

From my own observations the mean temperature of the period of 31 days from February 15th to March 17th, was $32^{\circ}6$. The maximum of the period was $45^{\circ}4$ on March 17th ; the minimum $21^{\circ}6$ on March 7th, which was also the lowest of the winter. On March 4th, the grass thermometer registered $16^{\circ}0$ on snow.

The mean temperature of February was $34^{\circ}8$. This, although much below the average, will not bear comparison with the mean of February, 1855, which was the coldest month in my records. The mean temperature of that month was $29^{\circ}3$, and the mean of 41 days from January 15th to February 24th, was as low as $28^{\circ}7$. In the frost of January, 1881, we had a period of 19 days with a mean temperature of $25^{\circ}2$.

The mean temperature of the first 17 days of the present month of March, was even lower than that of the 31 day period first referred to. It was $32^{\circ}2$. The dryness of the air during the same time was not less remarkable than the cold. On March 9th, at 5.45 p.m., the reading of the dry bulb was $36^{\circ}7$, of the wet bulb $28^{\circ}7$, the difference 8° , the humidity, by Glaisher's tables, 43. The mean temperature of evaporation for the whole period of 17 days was $29^{\circ}9$, and the mean humidity 73.

For rarity of occurrence the low mean temperature of the first 17 days of March was perhaps the most noteworthy feature of the season. I believe it has had no parallel since 1845. March, 1845, was a month of very unusual rigour. On the 14th, I recorded a minimum of 11° , and as late as the 21st, there was skating in this neighbourhood on ice from 4 in. to 5 in. thick. The Greenwich temperatures for that month confirm my own observations, the mean temperature of the first 21 days having been as low as $30^{\circ}\cdot4$.

The deepest snow here during the past winter was 3 in. on the morning of the 1st of March.

As a remarkable contrast to the foregoing particulars it may be added that the thermometer to-day has reached a maximum of $64^{\circ}\cdot6$.

GEORGE F. BURDER, M.D.

Clifton, March 24, 1886.

To the Editor of the Meteorological Magazine.

SIR,—In case you are collecting any statistics as to the recent storm the following table of min. temperatures observed here may be of interest. The shaded thermometer was in a Stevenson's screen, and the surface of the ground is 55 ft. above mean sea level :—

Date.	Min. in Shade.	Min. on Snow.
March 4	23·6	17·7
„ 5	11·2	0·4
„ 6	18·7	14·9
„ 7	8·4	—5·4
„ 8	8·5	0·3
„ 9	14·9	6·1
„ 10	10·2	—1·2
„ 11	24·2	15·0
„ 12	27·4	21·6
„ 13	30·2	24·6
„ 14	25·3	14·5

As to the fall of snow on the 1st, the depth in the open was about 7 in. yielding when melted $0\cdot63$ in. ; it was a good deal drifted, in some places as high as the hedges. The cold does not seem to have done much harm to vegetation, the wheat was well covered with snow and is now looking pretty well, certainly very much better than at this time last year. Roots have kept very well considering the number of alternations of frost and thaw. Birds suffered a good deal, especially blackbirds and thrushes, of which large numbers are dead. In March, 1883, when the weather was very similar, though the snow was not so deep, the lowest readings were $5^{\circ}\cdot3$ in the shade, and $-2^{\circ}\cdot2$ on the snow.—Yours truly,

H. MELLISH.

Hodsock Priory, Worksop, March 29, 1886.

METEOROLOGICAL AND ASTRONOMICAL RECURRING PERIODS.

To the Editor of the Meteorological Magazine.

SIR,—About 20 years ago I stated that remarkably cold winters and extremely hot summers usually recurred after intervals of about 40 years. The rule appears to be, that if a very hot summer is not repeated at the end of 39 years it is at the end of 40 years, and if a very cold winter does not return at the end of 40 years it does at the end of 41 years. Severe frosts are recorded as having occurred in 1659, 1669, 1699, 1709, 1740, 1745, 1749, 1755, 1774, 1780, 1789, 1820, 1827, 1830, and 1841, and they returned at the end of 40 years, in each case, in 1699, 1709, at the end of 1739, in 1749, 1780, 1785, 1789, 1795, 1814, 1820, 1829, 1860, 1867, 1870, and 1881. Latterly the very severe winters have returned more frequently at the end of 41 years, as 1789 in 1830, 1795 in 1836, 1797 in 1838, 1800 in 1841, 1814 in 1855, 1820 in 1861, 1830 in 1871, 1838 in 1879, and 1845 in 1886. In 1845 the long hard winter broke up just about the equinox, as it did this year.

Extremely mild winters seem more rare than extremely severe ones, but they also are generally repeated after an interval of 40 or 41 years. The remarkably mild winters of 1806, 1819, 1828, 1834, and 1843, returned after such an interval in each case, in 1846, 1859, 1869, 1874, and 1884.

With regard to summers, a great many remarkably hot ones have been repeated at the end of 39 or 40 years. Also at the end of 68 years. The cycle of 425 years, however, seems to be the best in this respect. Extremely hot or dry summers are stated to have occurred in 1022, 1276, 1277, 1289, 1345, 1354, 1393, 1394, and 1447, and they returned after an interval of 425 years in each case, in 1447, 1701, 1702, 1714, 1770, 1779, 1818, 1819, and 1872 respectively. Luke Howard thought that "periodical changes in a climate must be astronomical and not local." I have always thought so too. The weather cycle of 40 years does not appear to be so connected with lunar influence as some other cycles appear to be. There seems to be a lunar influence at work, but it does not appear sufficient to make it look like the best of all the meteorological cycles applying to winters. These two cycles of 40 and 425 years certainly seem to be the best, both astronomically and meteorologically. While searching for another explanation for the superior character of these two cycles, I discovered what I am not aware that anyone else has noticed, that there are remarkable astronomical cycles which correspond to those meteorological periods. There is a notably near commensurability between the periodic times of the Earth, Venus and Mercury, 40 of the earth's orbital revolutions being almost equal to 65 revolutions of Venus, and also nearly equal to 166 revolutions of Mercury. Then 425 of the earth's sidereal revolutions are nearly equal to 1765 such revolutions of Mercury,

691 of Venus, and almost equal to 226 such revolutions of Mars. The following tables will show this :—

	Sidereal Revolution in Days.	Number of Revolutions.	Days.
Mercury	87·9693	× 166 =	14603
Venus	224·7008	× 65 =	14605
The Earth	365·2564	× 40 =	14610
<hr/>			
Mercury	87·9693	× 1765 =	155266
Venus	224·7008	× 691 =	155268
The Earth	365·2564	× 425 =	155234
Mars	686·9797	× 226 =	155257

Those who deny that the foregoing statements possess any meteorological value, will at least admit that they reveal remarkable astronomical facts.

I am, yours, &c.,

GEORGE D. BRUMHAM.

Barnsbury, 3rd April, 1886.

HISTORY OF BAROMETERS.

THE usual monthly meeting of the Royal Meteorological Society was held on Wednesday evening, March 17th, at the Institution of Civil Engineers, Mr. W. Ellis, F.R.A.S., President, in the chair. Mr. W. E. Addison, Mr. A. W. Claydon, M.A., F.G.S., Mr. T. B. Moody, R.N., and Dr. W. Schlich were balloted for and duly elected Fellows of the Society. The President gave an historical sketch of the barometer. After remarking on the accidental nature of the discovery of the instrument in the year 1643, in its best form, in ignorance for some time of its value for purposes of meteorological inquiry, he gave a brief account of many early kinds of barometers, the first endeavour being in consequence of difficulties experienced with the ordinary mercurial form to enlarge the scale of variation, attempts which, in general, introduced other errors and inconveniences. The desire to experiment on elevated positions induced the construction of an early form of portable barometer, one such with cistern completely closed, leaving the air to communicate through the pores of wood having been made above 200 years ago. The President further described various points in the arrangement of the Ramsden, Gay Lussac, and other barometers, including also mention of some modern patterns of long range barometers, standard barometers, and such barometers as are more commonly used. The practice of driving out air from the mercury by heating or boiling appears to have been in use early in the last century. Engraved plates indicating the weather to be expected, with different heights of the mercury, have been longer used, at least as early as 1688. As regards correction for temperature, De Luc in the last century adopted a temperature corresponding to 54°·5 Fahr. as that to which to make reduction, because it corresponded nearly to the average of observations; this reduction is now made to the freezing point,

32° F. Reference was made to the employment of water (as in the well-known Royal Society barometer) and other liquids instead of mercury ; also to various kinds of floating and other barometers not at all or not entirely mercurial, and to metallic barometers. The President concluded his account with a sketch of the history of recording barometers or barographs, including a notice of the application of photography and electricity to recording purposes.

At the conclusion of the President's address, the meeting was adjourned to afford the Fellows and their friends an opportunity of inspecting the valuable and interesting exhibition of barometers.

EXHIBITION OF BAROMETERS.

A very valuable, indeed unprecedentedly fine collection of different forms of barometer was brought together, and where it was not possible to obtain a specimen of the instrument a photograph or illustration of it was shown. The Exhibition therefore practically included almost every known form of barometer.

The instruments were classified under the following headings :—
Mercurial Barometers : Adjustable Cistern, Closed Cistern, Siphons ;
Barographs ; Aneroids ; Metallic and other forms of Barometer.
There were altogether 78 barometers, 9 new instruments, and 33 drawings, photographs, &c., making 120 exhibits. The catalogue, a copy of which was presented to all visitors, occupies 12 pages.

Some very fine specimens of standard barometer on the Fortin principle were exhibited—Mr. P. Adie showing one with a glass plunger to raise the mercury in the cistern, Mr. Casella showing another with the scale figured to tenths of an inch, and Messrs. Negretti and Zambra showing a third with cistern and tubular casing square in section. By the side of these were placed a portable barometer, with ivory float, about 100 years old, and a standard barometer, by Barrow, the pattern used by the members of the British Meteorological Society about 1850—60. Messrs. Negretti and Zambra exhibited a self-compensating barometer with a double rack moved by one pinion, so that, when adjusting the vernier in one position, the second rack moves in the opposite direction, carrying along with it a plunger, which is the exact size of the internal diameter of the tube. This firm also showed a standard barometer with electrical adjustment, and a new standard barometer with overflow cistern adjustment. Some interesting specimens of mountain barometers were exhibited, including one originally used by the North American Boundary Commission in 1857, which since its return has been employed by the Kew Committee on the inter-comparison of the various standard barometers of this country.

Among the closed cistern barometers was a large cistern one made for the Meteorological Society of London in 1837 by Mr. R. C. Woods. The proportion of the calibre of the tube to that of the cistern is as 1 : 50, a proportion which was considered sufficient to obviate the necessity for applying the capacity correction ! The tube and cistern originally held 70 lbs. of mercury ! The next instrument

to this was the Kew barometer, first designed in 1853, in which the cistern is closed and the scale contracted so as to obviate the necessity of correction for capacity. Specimens were exhibited of the marine barometer, as supplied to Her Majesty's ships previous to 1854; the Kew marine barometer, as adopted by the Admiralty; the gun barometer, with the glass tube packed with india-rubber to check the vibration caused by gun firing; and the coast barometer. The Meteorological Office showed patterns of barometers as used in France, Holland, and Russia. Two specimens of long-range barometer were exhibited, viz. Morland's diagonal, by Messrs. Negretti and Zambra, in which the top part of the tube is inclined more or less from the perpendicular to give an enlarged scale-reading; and Hicks's spiral tube, which gives a range of 8 inches for 1 inch variation of atmospheric pressure.

Among the siphon barometers were two very old forms, viz. Amonton's double barometer and a Dutch barometer, by Reballio, combining siphon and long-range barometer, thermometer, and hygrometer. An interesting relic was the mounting of the travelling-barometer formerly belonging to, and used by, De Luc. The siphons included Gay Lussac's, Buntzen's, Jones's, Adie's, Dollond's, Bogen's, and Wild's forms of barometer; also a siphon designed by Capt. J. B. Basevi, R.E., and used by him in the high table-lands of Tibet, in connection with the operations of the Great Indian Trigonometrical Survey; Stanley's barometer, with "rising and falling" index; and Guthrie's sensitive barometer which has a flat horizontal spiral in which is a bubble of air for indicating the variations of atmospheric pressure, the motion of the bubble being four and a half times that of the true barometric variation.

A specimen of Milne's barograph was shown by the Meteorological Office, while Messrs. Negretti and Zambra exhibited their improved form of the same instrument in which the paper is carried on a cylinder. M. Redier, of Paris, sent two forms (large and small) of his barograph, which works so satisfactorily; and MM. Richard Frères, of Paris, in addition to sending a self-recording mercurial barometer, exhibited several specimens of their self-recording aneroid, which is becoming so popular in this country. This instrument consists of a series of eight vacuum-boxes, by which the effects of the atmospheric pressure are increased and transmitted by a system of levers to an arm carrying a pen. The pen, of a special form, contains an ink mixed with glycerine, and marks the curve of atmospheric pressure on the paper round the cylinder, which revolves once in seven days. This firm also showed a Bourdon's metallic recording barometer, in which the drum turning in eight days is supplied with a continuous band of paper, serving for six months or a year.

Various specimens of aneroids were exhibited, including skeleton aneroid, showing the various working parts; aneroid with altitude scales; pocket watch aneroid, indicating heights to 20,000 feet; Stanley's surveying aneroid; Field's engineering aneroid; aneroids as supplied to Her Majesty's ships previous to 1854, and the pattern

now adopted; and self-registering aneroid with maximum and minimum indexes. Messrs. Lund and Blockley exhibited a barometer by M. Redier of Paris, with a dial 6 feet in diameter, the hand of which is kept in its true position by a single aneroid vacuum box; it is admirably adapted for the inside or outside of public buildings.

Mr. Stanley showed his chrono-barometer, which is a clock that counts the oscillations of a pendulum formed by a suspended barometer. The upper chamber of the pendulum is a cylinder of an inch or more in diameter. By change of atmospheric pressure the mercury in the pendulum is displaced from the bottom to the top, and *vice versa*. The rate of the clock is accelerated or retarded in proportion to the displacement of the mercury.

Among the other forms of barometer were Jordan's glycerine barometer, the cistern and upper part of the tube only being shown, as the instrument, when complete, would be about 30 feet in height; Cetti's long-range mercurial and glycerine barometer; Hicks's flexible barometer; Lowne's handy weather-glass; Ronketti's thermo-barometer; Wilson's differential barometer; and several patterns of sympiesometer.

The most interesting of the new instruments was Immisch's pocket metallic thermometer. This is a watch-shaped instrument, and about the size of a small locket. The index-hand is actuated by the expansion and contraction of a very small Bourdon tube filled with a highly expansive liquid, and hermetically sealed, the motion of the tube being multiplied by an ordinary rack and pinion.

THE RAINFALL OF THE CAPE OF GOOD HOPE.

There is now being exhibited at the Commercial Exchange, a map illustrative of the annual rainfall of the colony, including the Free State. This map has been compiled in Mr. Gamble's office, and should be seen by all interested in the welfare of the colony. The colouring, showing the rainfall, was determined by Mr. Gamble from rainfall measurements collected by him, and enables one to see at a glance which districts are most favoured by rain. In illustration of the extent to which trees in the mass cause the clouds to fall in rain, it may be noted that the only place where the rainfall was over 54 in. was at Wynberg and the immediate vicinity; at Cape Town and neighbourhood—equally near the sea—the fall being 43 in. The only other place in the colony approaching this is the Zitzikama, where there is a large forest. The Gough, in the middle of the colony, had only 4 in. of rainfall during the whole year, a portion of Calvinia only 2 in., and Namaqualand and Bechuanaland from 2 in. to 5 in. The rainfall all over the Free State, and right down through the colony to the sea board, from the Kei River to the borders of Alexandria, is shown by one large patch of red, signifying that the fall has been singularly regular, varying from 18 to 30 in. Only one small patch of green appears in this vast tract of country, namely, at Cathcart and the Great Waterberg, where 31 in. of rain were registered during the year. The map shows most graphically what no amount of writing in the press has yet brought home, that our total rainfall is ample. It is only in the absolute necessity for extensive storage that we differ from what we choose to call more favoured countries.—

Cape Argus, March 15, 1886.

[It will be remembered that in a recent number (*Met. Mag.*, Jun., 1886), Mr. Tripp gave a map similar to that above described; we understand that Mr. Gamble's map will be shown at the Colonial Exhibition.—ED., *Met. Mag.*]

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, SEPT., 1885.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
°		°		°	°	°	0-100	°	°	inches			
England, London	76·5	15	33·7	27	64·8	48·4	48·4	78	116·3	27·7	4·30	19	5·5
Malta.....	95·1	27	63·1	19	84·0	69·3	62·6	63	143·9	60·0	·38	2	1·4
<i>Cape of Good Hope</i> ...	83·3	19	40·7	12	71·7	51·2	...	...	...	...	1·54	4	3·1
<i>Mauritius</i>	78·0	21	61·0	29	75·7	66·2	61·4	74	134·3	50·3	3·59	21	5·5
Calcutta.....	90·0	9	73·2	10	87·3	77·9	77·9	87	155·0	72·0	5·51	17	7·4
Bombay.....	89·3	29	73·9	17	85·6	76·4	75·4	82	149·8	69·1	12·01	21	6·2
Ceylon, Colombo	89·0	8	74·8	29	87·3	77·5	72·2	72	146·8	65·0	3·97	17	6·1
<i>Melbourne</i>	75·0	4	40·0	6	61·0	47·2	45·7	75	124·3	30·2	3·93	14	7·4
<i>Adelaide</i>	77·0	10	40·0	14	65·6	48·9	44·5	63	138·2	32·9	1·63	14	5·7
<i>Wellington</i>	62·5	17	36·5	14	56·6	43·7	45·1	84	122·0	34·0	2·42	15	3·6
<i>Auckland</i>	66·5	30	37·0	11	59·7	48·5	45·4	67	130·0	30·0	2·33	15	6·9
Jamaica, Kingston.....	91·6	9	71·6	28	88·7	74·2	73·3	78	...	...	5·11	...	6·1
Barbados	86·0	26	70·0	11	83·0	73·0	77·1	87	145·0	...	5·36	19	5·0
Toronto	82·5	26	38·1	23	66·9	46·7	49·8	76	...	33·4	3·62	6	4·1
New Brunswick, Fredericton	74·8	14	32·0	26	65·2	42·0	45·6	77	...	...	4·15	10	4·3
Manitoba, Winnipeg } British Columbia, }	81·1	28	25·3	30	66·7	39·5	44·6	74	...	...	·72	9	5·4
Victoria	71·0	3	42·0	25	64·6	47·8	...	...	...	...	4·00	18	...

REMARKS, SEPTEMBER, 1885.

MALTA.—Mean temp. 76°·0; mean hourly velocity of wind 8·0 miles, velocity 20 miles per hour from 8 a.m. to 4 p.m. on 12th; the sea maintained a temp. of 78°·0; TS on 9th. J. SCOLES.

Mauritius.—An unusually wet and cloudy month. Rainfall 1·78 in. and mean temp. 0°·5 above their averages; mean hourly velocity of wind 12·0 miles, extremes 29·0 miles on 2nd, and 2·7 miles on 30th, prevailing direction E.S.E.

Melbourne.—Rainfall 1·60 in., mean temp. of air 0°·8 and of dew point 2°·1, mean amount of cloud 1·3, pressure ·082 in., and humidity 4 above their respective averages; prevailing winds N. and W., strong on 7 days; T on 10th, L on 13th, heavy dew on 19th. C. MELDRUM, F.R.S.

Adelaide.—Mean temp. 0°·2, mean pressure ·084 in. and mean amount of cloud slightly above their averages; mean diurnal range of temp. 2°·3 and rainfall slightly below their averages. R. L. J. ELLERY, F.R.S.

Wellington.—Fine up to 4th; from 4th to 10th showery and generally cold; from 11th to 25th generally fine though showery at times, and cool; remainder of the month very stormy. Mean temp. 0°·9 and rainfall 2·16 in. below their averages; T and L on 5th, L on 4th and 8th, H on 9th. W. E. COOKE.

Auckland.—The early part of the month was squally and unsettled with strong S.W. winds, the middle very fine with moderate S. and S.W. winds. Rainfall considerably below and pressure above their averages; mean temp. about the average. R. B. GORE.

BARBADOS.—Rainfall 57 per cent. below the average; mean temp. (77°·2) exactly the average; pressure somewhat unsteady; wind N.E. on 29 days, mean hourly velocity 8·0 miles, 8 per cent above the average, extremes 15·2 miles and 3·7 miles; TSS on 6 days. T. F. CHEESEMAN.

R. BOWIE WALCOTT.

SUPPLEMENTARY TABLE OF RAINFALL, MARCH, 1886.

[For the Counties, Latitudes, and Longitudes of most of these Stations,
see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	1.72	XI.	Castle Malgwyn	4.91
„	Margate, Birchington...	.81	„	Rhayader, Nantgwillt..	6.44
„	Littlehampton	2.69	„	Carno, Tybrith	5.12
„	Hailsham	2.04	„	Corwen, Rhug	4.03
„	I. of W., St. Lawrence.	3.11	„	Port Madoc	6.10
„	Alton, Ashdell.....	2.04	„	I. of Man, Douglas	4.10
III.	Winslow, Addington ...	1.94	XII.	Stoneykirk, Ardwell Ho.	3.95
„	Oxford, Magdalen Col...	1.61	„	Melrose, Abbey Gate...	4.55
„	Northampton	1.67	XIII.	N. Esk Res. [Penicuik]	2.70
„	Cambridge, Beech Ho...	1.31	XIV.	Ballantrae, Glendrishaig	4.14
„	Wisbech, Bank House..	1.94	„	Glasgow, Queen's Park.	2.58
IV.	Southend	1.00	XV.	Islay, Gruinart School..	3.48
„	Harlow, Sheering ...	1.35	XVI.	St. Andrews, Pilmour Cot	(2.57)
„	Rendlesham Hall	1.34	„	Balquhiddel, Stronvar..	6.35
„	Diss	1.48	„	Dunkeld, Inver Braan...	3.94
„	Swaffham	1.73	„	Dalnaspidal H.R.S. ...	4.20
V.	Salisbury, Alderbury ...	2.09	XVII.	Keith H.R.S.	(1.35)
„	Warminster	2.33	„	Forres H.R.S. ....	.85
„	Calne, Compton Bassett	1.86	XVIII.	Strome Ferry H.R.S....	3.28
„	Ashburton, Holne Vic...	8.08	„	Tain, Springfield.....	1.05
„	Holsworthy, Clawton...	3.06	„	Loch Shiel, Glenaladale	6.25
„	Hatherleigh, Winsford.	2.89	„	S. Uist, Ardkenneth ...	2.49
„	Lynmouth, Glenthorne.	3.44	„	Invergarry	3.63
„	Probus, Lamellyn	3.82	XIX.	Lairg H.R.S. ....	...
„	Wincanton, Stowell Rec.	2.64	„	Forsinard H.R.S.	1.08
„	Taunton.....	2.58	„	Watten H.R.S.	1.01
„	Wells, Westbury.....	2.35	XX.	Dunmanway, Coolkelure	11.20
VI.	Bristol, Clifton	2.81	„	Fermoy, Gas Works ...	3.54
„	Ross	3.19	„	Tralee, Castlemorris ...	4.37
„	Wem, Sansaw Hall.....	2.35	„	Tipperary, Henry Street	2.34
„	Cheadle, The Heath Ho.	3.81	„	Newcastle West	2.54
„	Worcester, Diglis Lock	2.23	„	Miltown Malbay.....	3.54
„	Coventry, Coundon	2.41	„	Gorey, Courtown House	2.88
VII.	Melton, Coston	2.58	XXI.	Navan, Balrath	3.65
„	Ketton Hall [Stamford]	2.27	„	Mullingar, Belvedere ...	3.38
„	Horncastle, Bucknall ...	2.57	„	Athlone, Twyford	4.50
„	Mansfield, St. John's St	3.54	„	Galway, Queen's Col....	4.18
VIII.	Macclesfield, The Park.	2.73	XXII.	Clifden, Kylemore	8.25
„	Walton-on-the-Hill.....	2.25	„	Crossmolina, Enniscoe..	4.49
„	Lancaster, South Road.	4.11	„	Collooney, Markree Obs.	3.06
„	Broughton-in-Furness ..	8.31	„	Carrick-on-Shannon ...	4.06
IX.	Wakefield, Stanley Vic.	1.51	XXIII.	Rockcorry.....	2.76
„	Ripon, Mickley	3.24	„	Warrenpoint	5.02
„	Scarborough.....	1.94	„	Newtownards	2.52
„	East Layton [Darlington]	3.48	„	Belfast, New Barnsley..	3.01
„	Middleton, Mickleton ..	1.74	„	Cushendun	1.97
X.	Haltwhistle, Unthank..	3.15	„	Bushmills .....	...
„	Shap, Copy Hill	5.97	„	Stewartstown	2.81
XI.	Llanfrechfa Grange	4.86	„	Buncrana	3.13
„	Llandovery	7.50			

[The figures in parenthesis on this and the next page have been corrected for doubtful measurements of snow.]

MARCH, 1886.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.				Days on which -01 or more fell.	TEMPERATURE.				No. of Nights below 32°.	
		Total Fall.	Differ- ence from average 1870-9	Greatest Fall in 24 hours.			Max.		Min.		In shade.	On grass.
				Dpth.	Date.		Deg.	Date	Deg.	Date		
		inches.	inches.	in.			Deg.	Date	Deg.	Date		
I.	London (Camden Square) ...	1.38	— .23	.38	1	14	62.2	24	22.1	7	18	19
II.	Maidstone (Hunton Court)...	1.33	— .25	.20	1 _a	14	...	...	...	...	...	...
III.	Strathfield Turgiss	1.21	— .19	.22	1	12	68.4	23	18.4	7	19	21
III.	Hitchin	1.28	— .20	.28	1	15	61.0	21	20.0	6	17	...
IV.	Banbury	1.95	+ .35	.32	29	16	61.0	21	16.0	7	18	...
IV.	Bury St. Edmunds (Culford)	1.77	+ .21	.35	1	14	62.0	28	16.0	16	17	...
V.	Norwich (Cossey)	1.12	— .57	.32	1	16	61.0	21	23.0	8	19	19
V.	Weymouth (Langton Herring)	3.17	...	.47	28	17	58.0	24	22.0	7	16	...
"	Barnstaple	3.07	+ .58	.57	30	11	59.5	26	22.5	17	...	...
"	Bodmin	3.93	+ .77	.56	19	18	61.0	24	22.0	13	13	15
VI.	Stroud (Upfield)	2.45	+ .64	.60	30	16	64.0	24	20.0	6	17	...
"	Churchstretton (Woolstaston)	2.83	+ .67	1.06	30	17	60.5	24	21.5	10	19	20
"	Tenbury (Orleton)	3.19	+ 1.32	1.14	30	15	63.0	24	13.5	7	18	19
VII.	Leicester	2.36	...	.49	29	12	64.5	24	17.5	7	17	20
"	Boston	2.39	+ 1.10	.55	1	13	62.0	21	16.0	7	18	...
"	Grimsby (Killingholme)	2.41	+ .75	.71	1	20	60.0	23 _b	19.0	7	15	...
"	Hesley Hall [Tickhill]	2.58	...	.85	1	19	63.0	23	11.0	8	18	...
VIII.	Manchester (Ardwick)	2.17	— .28	.50	30	14	62.0	25	25.0	7	14	...
IX.	Wetherby (Ribston Hall) ...	2.81	+ .68	1.44	1	11	...	...	...	...	...	...
X.	Skipton (Arncliffe)	7.04	+ 2.28	1.25	1	19	60.0	24	10.0	6	20	...
X.	North Shields	2.97	+ 1.52	...	...	17	62.0	25	15.5	7	17	18
XI.	Borrowdale (Seathwaite)	9.93	+ .04	2.82	26	20	63.0	24	11.5	7	18	...
XI.	Cardiff (Ely)	4.25	+ 1.56	.73	20	15	...	...	...	...	...	...
"	Haverfordwest	5.17	+ 1.98	1.17	26	15	60.0	23	17.0	12	17	20
"	Plinlimmon (Cwmsymlog) ...	6.15	...	1.63	30	13	...	...	...	...	...	...
"	Llandudno	2.55	+ .67	.70	1	15	63.0	23 _c	22.5	14	17	...
XII.	Cargen [Dumfries]	5.13	+ 2.35	1.38	26	16	65.8	24	15.0	7	17	...
"	Jedburgh (Sunnyside)	2.95	+ 1.38	.76	27	16	63.0	24	8.0	7	18	...
XIV.	Douglas Castle (Newmains)	...	...	...	...	...	...	...	...	...	...	...
XV.	Lochgilphead (Kilmory)	3.50	— 1.11	.52	30	16	...	...	...	...	...	...
"	Oban (Craigvarren)	3.05	...	.59	26	16	61.4	23	23.1	13	13	...
"	Mull (Quinish)	3.91	...	.45	22	16	...	...	...	...	...	...
XVI.	Loch Leven Sluices	3.70	+ 1.58	.50	17 _b	14	...	...	...	...	...	...
XVII.	Arbroath	2.74	+ 1.11	.46	26	13	57.0	21 _d	23.0	7	14	...
XVII.	Braemar	3.10	+ .91	.67	16	18	58.8	29	2.0	12	16	25
XVIII.	Aberdeen	2.67	...	.66	19	23	60.0	22	19.0	11	18	...
XVIII.	Lochbroom	(2.28)	...	.61	30	10	...	...	...	...	...	...
"	Culloden .....	...	...	...	...	...	...	...	...	...	...	...
XIX.	Dunrobin	1.34	...	.35	19	10	59.0	25	24.0	7	16	...
"	Kirkwall (Swanbister)	1.52	...	.29	30	18	53.9	22 _a	24.4	6	...	...
XX.	Cork (Blackrock)	6.59	+ 3.83	.80	26	18	59.0	21	27.0	3	10	...
"	Dromore Castle	5.73	...	.60	12	22	58.0	22	25.0	2	...	...
"	Waterford (Brook Lodge) ...	4.22	...	.75	26	15	53.5	21	22.5	13	13	19
"	Killaloe	2.70	...	1.03	26	15	59.0	21	19.0	4	16	...
XXI.	Carlow (Browne's Hill)	2.31	+ .20	.55	26	16	...	...	...	...	...	...
"	Dublin (FitzWilliam Square)	2.07	+ .34	.46	26	19	60.4	21	23.0	4	12	21
XXII.	Ballinasloe	3.72	+ 1.34	.66	26	19	58.0	21 _e	19.0	4	18	...
XXIII.	Waringstown	2.87	+ .81	.64	26	18	67.0	24	19.0	4	18	22
"	Londonderry (Creggan Res.) ..	2.46	...	.39	27	18	...	...	...	...	...	...
"	Omagh (Edenfel)	2.95	+ .86	.59	26	17	56.0	21 _f	22.0	3, 12	20	...

^a And 26. ^b And 27. ^c And 24. ^d And 22. ^e And 23. ^f And 23, 25.

+ Shows that the fall was above the average; —that it was below it.

METEOROLOGICAL NOTES ON MARCH, 1886.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—Cold E. winds with fog, and frost at night, prevailed all through the first part of the month, and continued far on into the latter part, pastures being bare and spring sowing at a standstill until about 17th, when a genial and timely change in the weather, with a very rapid rise of temp., occurred. A thrush's nest, with two eggs, seen on 18th; peacock, brimstone and tortoiseshell butterflies seen on 23rd. S on 1st and 6th; TS on 31st; gale on 26th.

HITCHEN.—The mean temp. of the latter part of the month, after the frost broke up on 17th, was the highest ever recorded in March: 48° at night, and 61° in the day.

BANBURY.—Mean temp. (38°·7) 2°·0 below average; on each of the first 12 days the mean temp. was below 32°; the last week was very stormy and windy. S on six days, sleet on two, fog on five, high wind on three.

CULFORD.—Up to 15th, the weather was very cold with frequent S, after which it became more genial, although the wind at times was very high. L and T with H on 29th.

COSSEY.—Frost prevailed every night to 18th inclusive.

LANGTON HERRING.—Rainfall 1·48 in. above the average for 11 years; in temperature the first 16 days presented a most striking contrast to the last 15, the mean temp. from 1st to 16th being 10°·8 below, and that from 17th to 31st 3°·6 above, the average. The mean temp. at 9 a.m. from 1st to 16th was lower than that for any month in 14 years, except January, 1881; the mean min. for the same period being the lowest without exception; the mean temp. of the whole month was 3°·8 below the average. Dense fogs prevailed from 19th to 23rd, and fog on many other days. The second half of the month was very wet; T on 31st.

BODMIN.—A very cold ungenial month, with 15 days of blasting E. wind; mean temp. (40°·9) 3°·3 below the average.

STROUD.—The first half of the month was very cold; the last half warm, wet and windy. S.W. gales on 26th and 30th; high wind, with H, sleet and L, on 31st.

WOOLSTASTON.—The severe frost of the last two months continued till the 19th, when a rapid thaw set in; mean temp. 37°·5; severe gale with H on 30th; S on five days.

ORLETON.—S fell early on the morning of 1st, covering the ground to the depth of six inches, and remained on all the high lands till the 19th. The first 18 days were very cold, with severe frost every night, and frequent light falls of S; the mean temp. at 9 a.m. for that period being 31°·5, the lowest registered here for so many consecutive days in March; on 19th a change of wind to S. took place, with a great rise of temp., which continued to the end of the month, the mean for the last 13 days being about 18° higher than that of the first 18 days. The rainfall during the last week was very great, causing high floods in the brooks and rivers on 31st. The mean temp. of the month was 1°·6 below the average of 25 years, and the lowest in March during that period excepting 1865, 1867 and 1883. All farming operations were delayed owing to the S and severe frosts having been so soon followed by heavy rains.

LEICESTER.—The early part of the month was very cold, the latter part changeable; from February 11th to March 19th the min. on grass was always below 32°.

KILLINGHOLME.—Wintry weather prevailed to the 19th, followed by 10 days of mild spring weather; the close of the month was wet and stormy; T and H on 29th.

HESLEY HALL.—Frost prevailed on the first 18 days, after which the temp. did not once fall as low as 32°.

MANCHESTER.—A cold month, beginning with a heavy S storm ; in the early part there was considerable frost at night, but the weather towards the latter part became warmer, accompanied by R ; S on seven days.

ARNCLIFFE.—A very stormy and snowy month, especially till the 17th ; many sheep were lost, and many starved ; temp. fell below 32° in shade on each of the first twenty days, and S lay in the garden till the 25th.

NORTH SHIELDS.—Much S fell during the first three days, the depth on the level being variously estimated at from eighteen inches to two feet ; drifts from 7 ft. to 15 ft. deep were met with all about. S on 12 days, fog on 4 days.

WALES.

HAVERFORDWEST.—The month of March was ushered in with great severity, deep S covering the ground ; from the 5th to the 11th a strong E. gale prevailed with severe frost, which continued without intermission up to the 18th ; the mean temp. of the 18 days being only $29^{\circ}\cdot 2$. A sudden thaw then occurred, with S. winds, and vast quantities of R, accompanied by high temp., the soil being so saturated that oat sowing was rendered impossible. Notwithstanding the high mean temp. of the last 13 days, the mean temp. of the month was only $36^{\circ}\cdot 8$, $0^{\circ}\cdot 6$ lower than that of the severe March of 1883. It was certainly the severest March since 1845.

LLANDUDNO.—The old proverb, "When March comes in like a lion it goes out like a lamb," has not this year been fulfilled, for the month began with a S storm of unexampled severity, and ended with an unusually heavy gale from S.W. There has been nothing approaching it in severity since 1854. The S which began on 1st, fell chiefly on that and the following day, and amounted to about 9 inches. S fell also on 5th, 13th, and 15th, but to no considerable amount. S continued to lie on the ground till 17th, but on that day a thaw set in, and the S soon disappeared, except on the distant hills. There was continuous nightly frost up to 17th, with a mean daily temp. of only $33^{\circ}\cdot 2$, and the max. did not reach $42^{\circ}\cdot 0$. After the disappearance of the S, the temp. gradually rose to 63° on the 23rd ; this hot wave lasted for three days, and many people believed that summer was about to come upon us prematurely ; even the swallows were apparently taken in, for one was seen flying about the Parade on 25th, but the truth of the proverb, "one swallow does not make the summer," was soon realized, for, as already stated, the month ended with a hurricane and low temp. The mean temp. of the month ($40^{\circ}\cdot 1$) was $2^{\circ}\cdot 5$ below the average ; the mean daily range ($11^{\circ}\cdot 2$) was very slightly above the average, and the total range ($40^{\circ}\cdot 5$) was no less than $11^{\circ}\cdot 3$ above the average. There was a fair quantity of bright sunshine during the month, viz., 82 hours. Heavy H shower, with L and T, on 31st.

SCOTLAND.

CARGEN.—A very stormy month, the fluctuations in temp. and pressure having been very great. The cold for the first 17 days, accompanied by heavy S storms, was unusually severe, the mean temp. ($32^{\circ}\cdot 1$) being $8^{\circ}\cdot 6$ below the average, while the mean of the last 14 days was 4° above the average ; notwithstanding bright sunshine on several days, the max. in shade only once in the first 17 days reached 42° ; the nearest approach to this extreme cold in March was in 1867, when the mean temp. of the first 17 days was $35^{\circ}\cdot 1$. It is very rarely in this part of the country that we have such heavy S storms at any period of the year as occurred during the first half of this month, and the losses to the stock farmers, and the general inconvenience occasioned by the blocking up of roads and railways was considerable. The mean temp. of the month is $3^{\circ}\cdot 0$ below the average. The unusually high max. in shade, $65^{\circ}\cdot 8$, has been only once exceeded in 26 years, viz., on March 24th, 1871, when $68^{\circ}\cdot 4$ was registered, and the unusually low min. of $15^{\circ}\cdot 0$ has only once been equalled, viz., on March 15th, 1871. Violent gale on 30th, lasting only two or three hours. H and sleet on 30th and 31st. Duration of sunshine 34 hours below the average. Vegetation and all farm work very backward at the close of the month.

JEDBURGH.—The weather of the month was very cold and ungenial ; vegetation was at a standstill and the colour of grass fields like brown paper. Frost prevailed until 17th, after which a change set in ; work in fields and gardens was much in arrear at the close and the ground damp and raw. S on 6 days.

KILMORY.—A most backward spring ; I never remember before, the month of April coming in without my having seen a single leaf bud open on the sycamore, and the scarlet rhododendron and *Andromeda floribunda*, which often flower in January, did not do so this year till the middle of March. S on 6 days.

OBAN.—The first part of the month was intensely cold and very dry ; light rains and white cloud fog characterised the second half with a short period of very high temp. from 21st to 27th. The sharp gale of the 30th was followed by a splendid display of aurora from nightfall to 10 p.m. ; light fine S showers occurred on 3rd, 15th, 17th, 18th, and 31st, but none lay on the ground. H on 23rd.

BRAEMAR.—Very cold up to the 18th, thence to the close of the month unusually mild ; very bright aurora on 30th.

ABERDEEN.—Cold weather prevailed during the greater part of the month. Rainfall about half an inch above the average. Brilliant aurora was seen on 26th and 30th and a strong "magnetic storm" occurred on 30th, interrupting telegraphic communication. S showers were very frequent.

LOCHBROOM.—The month will be long remembered for the almost constant and intense frost of the first half ; the latter half was fine with the exception of the last two days, which were as wintry as ever ; nothing had been sown or planted at the close. Severe S storm on 2nd, S on 30th ; aurora on 30th and 31st.

SWANBISTER.—S prevailed from the 1st to the 7th, it was then cold and dry to the 13th, and from the 22nd to the 27th it was very mild ; heavy S on 5th and 30th. Gale on 8th ; brilliant aurora on 30th.

IRELAND.

BLACKROCK.—The wettest March for 21 years. With the exception of 7th it was fine and cold to 13th, after which it was more or less wet every day. H on 29th and 31st.

DROMORE.—The latter part of the month was very cold, wet, and stormy.

WATERFORD.—The first half of the month was remarkably dry with harsh E. winds ; the S that fell on the last day of February remained on the ground in places until the 17th, from which date to the close of the month R was registered each day ; total amount of R 1.27 in. above the average. T and L on 23rd and 30th ; H on 16th, 29th, and 30th ; fog on 20th and 21st. Mean temp. 39.9.

KILLALOE.—Very dry parching weather prevailed till the 18th, with very cold N. and N.E. winds and frost every night ; continuous R from the 18th to the close seriously delayed the usual spring operations on the land ; during this period the wind was mostly S. and S.E., very high, and at times very stormy, with frequent T and L.

DUBLIN.—The bitterly cold weather which had prevailed during the greater part of January and February held until the 18th of March, when a great change occurred, and from that day until the 29th the mean temp. was as much above as it had previously been below the average, and hence it happens that March, 1886, will not stand out prominently as a cold month in the record of many years. The mean temp. ($40^{\circ}5$) was $2^{\circ}2$ below the average of 20 years, having, on five occasions during that period, been lower, viz., in 1865, 1867, 1869, 1876, and 1883. At the same time, no such continuous and severe cold in March was noted in any of those 20 years as that which held until the 18th of this month, the first week being, in fact, the coldest period of the winter 1885-6, the mean temp. being only slightly above freezing point. Sleet or S fell on 9 days, H on 8 ; fog occurred on 4 days ; solar halos on 7th and 10th ; high winds on 14 days ; aurora on 30th and 31st. Mean humidity 79 ; mean amount of cloud 6.2 ; prevailing winds S.E., E., and S.W.

EDENFEL.—Not since 1867 has March been marked by weather of such abnormal severity as that which prevailed for the first 18 days of this month ; a high, dry, bitter wind, oscillating from N.E. to S.E., continued without even the S that fell elsewhere to save the early vegetation, the mean temp. of the period being $34^{\circ} \cdot 3$; the fourth week was the reverse in all respects, soft, humid and balmy, and the month ended with a S.W. gale, with R, H, sleet and S. Vegetation and farm labour extremely backward.

EARTH TEMPERATURE AND WEATHER IN SOUTH AUSTRALIA.

To the Editor of the Meteorological Magazine.

SIR,—At my Torrens Observatory, situated on the plains two miles north-east from Adelaide, I give special attention to the matter of earth temperature, and have records from depths greater than those at other observatories in Australia as far as I am aware. The following statistics will be of interest, and prove by the rise at the lower depths, the abnormal force of the heat waves recently experienced on the Adelaide plains. The earth temperatures are taken as soon as practicable after the ordinary 9 a.m. observations :—

	1885.		1886.
	FEBRUARY 1ST.		FEBRUARY 1ST.
At 1 ft.	$80^{\circ} \cdot 4$	.....	$76^{\circ} \cdot 0$
„ 2 „	$79^{\circ} \cdot 3$	.....	$78^{\circ} \cdot 1$
„ 4 „	$75^{\circ} \cdot 5$	.....	$76^{\circ} \cdot 2$
„ 6 „	$71^{\circ} \cdot 5$	.....	$73^{\circ} \cdot 5$
„ 8 „	$69^{\circ} \cdot 0$	.....	$71^{\circ} \cdot 9$
„ 10 „	$68^{\circ} \cdot 1$	.....	$71^{\circ} \cdot 2$
„ 12 „	$66^{\circ} \cdot 5$	.....	$68^{\circ} \cdot 2$

During January, 1885, the air maxima exceeded 95° , but 100° was not reached. During January, 1886, maxima of $100 \cdot 6$, $105 \cdot 2$ and $111 \cdot 6$ were registered in my enlarged Stevenson's screen ; the latter value occurring on the 4th. At 3 p.m. on that day the dry bulb read $109 \cdot 7$, wet $75 \cdot 9$, giving the enormous difference of $33 \cdot 8$, and a relative humidity by Guyot's formula of only 15. At 3 a.m. on the 3rd inst. my electric hygrometer read—dry bulb $49 \cdot 6$, wet $48 \cdot 6$, giving 93 as a per-centage of humidity. Can we have a better instance of the extraordinary vicissitudes of the South Australian climate ? I employ two Stevenson's screens—the small English pattern, and an enlarged form with double roof to suit Australian conditions. Of course I have duplicate sets of instruments. I find the two screens work admirably together, the difference between them averaging but a few tenths, and there is no case of internal heating.

CLEMENT L. WRAGGE.

Torrens Observatory, Adelaide, S. Australia, February 8th, 1886.

P.S.—The rules of the Royal Meteorological Society are strictly in force.