

# Symons's Meteorological Magazine.

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## THE AUSTRALIAN ANTARCTIC EXPEDITION.

THE newspapers have published a message received from Dr. Mawson at his winter camp at Commonwealth Bay, within the Antarctic Circle, on June 23rd. This is the first message that has ever been received from the Antarctic regions at mid-winter, a period when the anxiety of friends of explorers has always been at a maximum; and it is most gratifying to learn that the health and spirits of Dr. Mawson and his companions were reported to be good in the middle of their longest night. A still more interesting and remarkable fact is that daily meteorological reports are being received in Melbourne, both from Commonwealth Bay on the Antarctic Continent, and from Macquarie Island in the Southern Ocean, by which important assistance has been given in framing the weather forecasts for Australia, as much of the bad weather originates in cyclones which travel from the Antarctic regions. We are informed that the station on Macquarie Island has been taken over by the Commonwealth Government, so that it can be expected to become a permanent outpost of weather study, bearing much the same relation to Australia that Iceland does to Europe. It will be remembered that the station set up in the South Orkneys by Mr. R. C. Mossman under the instructions of Dr. W. S. Bruce of the "Scotia" Antarctic Expedition in 1903 was taken over by the Government of the Argentine Republic, and has been at work ever since, although the records can only be transmitted to Buenos Aires once a year, and the results are thus only available for the study of past conditions. We are not aware whether a wireless installation is contemplated for the South Orkneys, though we believe that commercial interest in the whale fishery has made this a practical question, for the neighbouring sub-Antarctic Island of South Georgia, and the Falkland Islands have been for some time in wireless communication with the mainland. No more striking advance in the study of world meteorology has ever been made than this inclusion of the Antarctic regions within the system of daily meteorological weather reports; and meteorologists must pay a tribute of gratitude to Dr. Mawson for his triumphant realisation of what, a very short time ago, would have been held to be a fantastic dream.

Although the appeal by Captain Davis, to which we referred in our last month's issue, has fallen upon evil days in London, on account of the many other interests which call more loudly to the public ear, such as the raising of £90,000 by "The Times" for the purchase of the Crystal Palace, we are happy to learn that an encouraging beginning has been made. Sir Robert Lucas-Tooth has subscribed £1,000, the Royal Geographical Society, Lady Scott, Commander Evans, R.N., of the Scott Expedition, and Mr. T. Y. Buchanan, one of the two survivors of the scientific staff of the *Challenger*, have each subscribed £100, and practically all the members of Captain Scott's recent expedition have given personal donations. The Captain Scott Memorial Fund has set apart £10,000 as a fund for promoting Antarctic research, but no announcement has yet been made of any donation to the expedition at present in the field. We trust that before Captain Davis leaves for Australia this month, the funds so happily inaugurated will be augmented by Government and private donors to an amount which will convey to the Australian public an unmistakable message of congratulation on their success in carrying out scientific investigations of world-wide importance, and encouragement to them to complete the task in which they have gone so far.

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### SYNOPTIC ANTARCTIC METEOROLOGY.

*National Antarctic Expedition, 1901-1904, Meteorology, Part II., comprising Daily Synchronous Charts, 1st October, 1901, to 31st March, 1904, prepared in the Meteorological Office under the superintendence of M. W. CAMPBELL HEPWORTH, C.B., R.D., Commander R.N.R., Marine Superintendent. London: published by the Royal Society, 1913. Size 12 x 9. Pp. 26 + 262 plates.*

THIS volume completes the discussion of the Meteorology of the *Discovery* Expedition of 1901-4, but goes far beyond the work of that expedition, and furnishes for the first time a series of daily synoptic charts for the southern hemisphere south of 30° S., incorporating the Antarctic observations of the expeditions in the *Discovery*, the *Gauss*, the *Scotia* and the *Antarctic*, together with the meteorological logs of all vessels making observations in the southern ocean, as well as records from observatories in the southern portions of the southern continents. The few pages of letterpress include, first, an explanatory statement by Dr. W. N. Shaw addressed to Sir Archibald Geikie, a preface by Sir Archibald Geikie stating the conditions in which the observations were made, the arrangements arrived at by the Committee for their discussion, and a summary of Captain Scott's objections to the treatment of his meteorological data in Volume I., which was reviewed in this Magazine for October,

1908, Vol. 43, p. 165, with a postscript expressing appreciation of Captain Scott's character and achievements. Then follow four pages of remarks on the charts by Captain Campbell Hepworth, in which he points out that the total number of observations charted was 44,893, the greatest number of observations available for any one day being 52 marine for January 22nd, 1903, and 25 land for May 27th, 1909, and the smallest number being 19 marine for October 9th, 1903, and 10 land throughout October, 1901. All observations dealt with were taken at 12 noon, Greenwich mean time, and were thus strictly simultaneous. They are plotted on separate little charts for every day, the thirtieth parallel which bounds the chart being given as a circle  $3\frac{1}{2}$  inches in diameter. In addition, monthly summary charts are given. The area dealt with is greater than has ever been treated in this manner previously, although the very wide spacing of the points of observation makes it impossible to draw the isobars and isotherms as continuous curves, the length and continuity of the curves depending on the number and concentration of the points of observation. Charts are also given for purposes of comparison, showing the mean monthly distribution of temperature and pressure, as well as tables of average wind direction and gale frequency. Captain Hepworth treats of certain conclusions drawn from a study of the charts, which confirm the opinion he had formed as to the region of origin and direction of travel of the cyclones of the southern ocean, derived from the study of ships' logs, published by him in 1891; and he proceeds to deal with a few of the salient features exhibited in the charts of particular days and months. A brief discussion is given of the variation in position of the areas of permanent high pressure in the southern divisions of the three great oceans.

The immense value of this work lies in the data it presents, in a clear and comprehensible form, for the consideration of students of atmospheric circulation, who have hitherto been without means of comparing the march of atmospheric phenomena from day to day and from month to month in the southern hemisphere; and it makes us regret still more the spasmodic and unsystematic manner in which Antarctic research has been allowed to proceed since the days of the *Discovery* Expedition. Had the Committees in Europe been possessed of the enthusiasm and the courage which the explorers in the ice displayed, there seems to us to be little doubt that, with no more expenditure of public money and private munificence than has been bestowed upon Antarctic research, we might now have been in possession of a continuous series of daily charts extending, not over thirty months, but over a hundred and twenty at least. Viewed from the standpoint which we have consistently occupied with regard to Antarctic investigation, this volume, fine as it is, is only a splendid fragment of the great work that might easily have been achieved.



## SOUTHERN HEMISPHERE SEASONAL CORRELATIONS.

By R. C. MOSSMAN, F.R.S.E.

(of the Argentine Meteorological Office).

(Third Article—continued).

RAINFALL AT MALDEN ISLAND AND MEAN TEMPERATURE  
AT PUNTA ARENAS FROM MAY TO AUGUST.

A RELATION can be traced between the amount of rain that falls at Malden Island,\* South Pacific (lat. 3° 59' S., long. 155° W.) during the period May to August, and the mean temperature at Punta Arenas\* (lat. 53° 10' S., long. 70° 54' W.) during the same months. When the rainfall at Malden Island is above the average the temperature at Punta Arenas is below the normal and *vice versa*. The Malden Island data are wanting in August, 1894, May, 1897, June, 1898, and August, 1903, so that in the following totals the *mean* rainfall has been entered for the four missing months.

RAINFALL, MALDEN ISLAND, AND MEAN TEMPERATURE, PUNTA ARENAS,  
MAY TO AUGUST.

	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
Rain. Malden I. ....	2·8	3·5	6·7	4·2	(9·1)	2·0	6·4	(15·2)	(4·5)	10·7	16·0
Temp. Punta Arenas.	37·5	36·6	37·7	38·6	38·0	38·0	38·6	35·4	38·1	36·3	34·2
	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
Rain. Malden I. ....	2·2	15·3	7·1	7·8	33·3	9·4	6·8	1·6	6·7	2·5	4·2
Temp. Punta Arenas.	37·8	35·5	37·2	35·6	33·8	33·6	35·6	36·1	34·3	36·3	37·5

Referring the above values to the normals for the whole period, viz. : 8·1 inches in the case of the Malden Island rainfall, and 36°·5 for the mean temperature at Punta Arenas, we get the following departures for the years under consideration :—

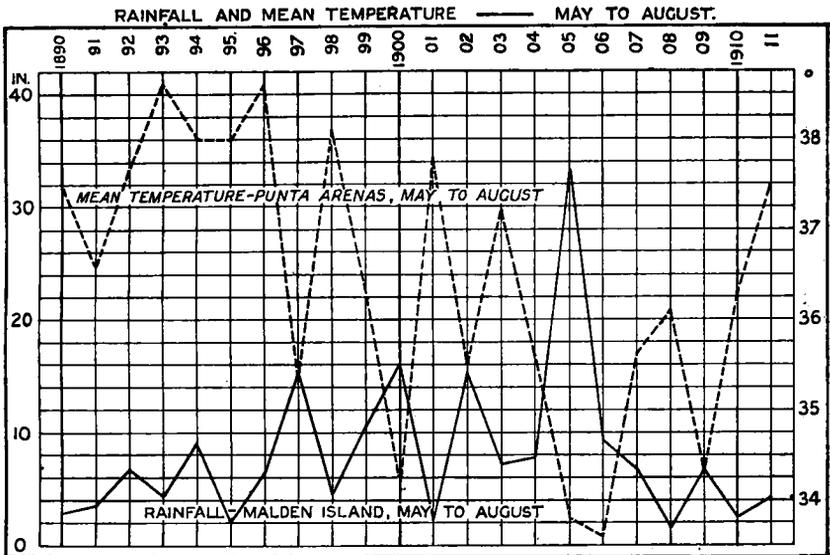
	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
Rain. Malden I. ....	-5·3	-4·6	-1·4	-3·9	+1·0	-6·1	-1·3	+7·1	-3·6	+2·6	+7·9
Temp. Punta Arenas	+1·0	+0·1	+1·2	+2·1	+1·5	+1·5	+2·1	-1·1	+1·6	-0·2	-2·3
	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
Rain. Malden I. ....	-5·9	+7·2	-1·0	-0·3	+25·2	+1·3	-1·3	-4·5	-1·3	-5·6	-3·9
Temp. Punta Arenas	+1·3	-1·0	+0·7	-0·9	-2·7	-2·9	-0·9	-0·4	-2·3	-0·2	+1·0

The correlation co-efficient deduced from the above data is 0·59, and the probable error 0·09.

During the first 17 years (1890-1906) there are only two years in which the signs are the same, viz., 1894 and 1904, but in each of the four years 1907-1910 a low mean temperature at Punta Arenas was associated with a deficient rainfall at Malden Island during the four months of the year under review. An examination of the data

\* Rain data for Malden Island kindly supplied by Dr. W. N. Shaw, temperature data for Punta Arenas until 1907 taken from Marabini's paper "*Observatorio Meteorologico del Edigio Salesiano 'S. Jose' en Punta Arenas de Magallanes.*" From 1908 to 1911 data are from this Observatory's Monthly Bulletins.

and diagrams given in Hildebrandsson's well-known papers shows occasional examples of an apparently well established correlation



breaking down for a few years, and the specific case under discussion offers yet another instance of the snapping of the chain.

An examination of the wind direction at Evangelist's Island (lat.  $52\frac{1}{2}^{\circ}$  S., long.  $75^{\circ}$  W.), at the Pacific entrance to the Straits of Magellan, and situated at no great distance from Punta Arenas, shows that in months or seasons characterised by excessive precipitation at Malden Island the winds in the south of the South Pacific blow from the south and south-west, but during dry months or seasons at Malden Island the prevailing winds at Evangelist Island are from the west and north-west. In other words, during wet months at Malden Island barometric pressure in the Antarctic regions south of Cape Horn is relatively high, and in dry years lower than usual, causing in the latter instance west and north-west winds to blow with increased frequency at Evangelist's Island. At the same time the South Pacific anti-cyclone is not only more intense but is lying further south than usual, and this, doubtless, causes some change in the position of the eastern margin of the equatorial South Pacific low pressure belt (see Isobaric Maps from May to August given in Dr. Buchan's *Challenger Report on Atmospheric Circulation*) so that rain-bearing winds at Malden Island blow with considerably diminished frequency. Hildebrandsson has shown that the variations of barometric pressure and rainfall between Tahiti and Tierra del Fuego are in opposite directions so that this opposition between the Malden Island rainfall and the temperature at Punta Arenas is probably brought about by the same physical processes induced by changes in the position of the South Pacific action centres.

## THE WEATHER OF JUNE.

THE month opened with fair or fine weather over the greater part of England, but it was generally unsettled and wet in Wales, Scotland and Ireland. Temperature was low on the 1st and 2nd, the shade minima ranging from  $34^{\circ}$  at Llangammarch Wells and  $35^{\circ}$  at West Linton to  $40^{\circ}$  in the south-east of England and west of Scotland, and  $44^{\circ}$  in the north of Scotland and at Jersey. No rain fell in London from the 9th to 19th, and at many stations in the south and south-east of England this period was also rainless. A marked rise in temperature took place on the 14th and 15th, and was maintained on the 16th and 17th, on which days the maximum temperature of the month was recorded at almost all stations. The readings ranged from  $87^{\circ}$  at Greenwich,  $85^{\circ}$  at Camden Square,  $84^{\circ}$  at Little Massingham, Cambridge and Wisley, to  $76^{\circ}$  at stations in the north and east of Scotland, and  $75^{\circ}$  in the north and south-west of Ireland. Local thunderstorms, mostly over the eastern counties of England, were frequent between the 17th and 20th. On the former date a severe storm burst over Cambridgeshire and Huntingdonshire, the rainfall exceeding 1.50 in. at many stations. At Stapleford House, where the thunder and lightning were exceptionally severe, 1.35 in. of rain fell in half-an-hour at about 3.30 p.m. At Great Paxton the fall was 2.90 in., of which 2.80 in. fell in an hour and a quarter, while at Brampton Grange 2.12 in. fell between 4.45 and 6 p.m. During the latter part of the month the rainfall was deficient, except in Ireland. Generally in the south-east of England and in the Thames Valley the rainfall was less than .10 in. during the last ten days. Temperature rose at the end of the month, and on the 29th the shade maxima reached  $80^{\circ}$  in London, Bournemouth and Brighton, and exceeded  $75^{\circ}$  at many stations in the south and east of England.

The total rainfall of the month was less than .50 in. in the estuary of the Thames and under 1.00 in. over the whole of the southern and western part of the Thames Valley except a small area round Basingstoke, where the total just exceeded an inch. The area with less than 1.00 in. of rain extended through the Midlands and along the east coast as far north as Yorkshire, excepting Cambridgeshire and the adjoining counties, where the heavy storm of the 17th raised the total to over 2.50 in. at a few stations. In Wales the fall varied from less than 2.00 in. along the eastern border to about 6.00 in. in the mountains of North Wales. Less than 2.00 in. fell along the east coast of Scotland, but more than 6.00 in. over a considerable area in Inverness and Ross. In Ireland the rain varied from about 1.50 in. in the south-east to about 3.00 in. over the interior, and about 5.00 in. in the extreme south-west. Taking the average June rainfall as 100, we find for England and Wales, 73; Scotland, 123; Ireland, 100; British Isles, 93.

Bright sunshine was abundant, many widely distant stations recording over 200 hours. In London there were no sunless days.

# THAMES VALLEY RAINFALL — JUNE, 1913.



ALTITUDE SCALE

Below 250 feet    250 to 500 feet    500 to 1000 feet    Above 1000 feet

SCALE OF MILES





## ROYAL METEOROLOGICAL SOCIETY.

AN ordinary afternoon meeting of the Society was held on June 18th, at 70, Victoria Street, S.W., Mr. C. J. P. Cave, President, in the chair.

A paper on "Pilot Balloon Observations in Barbados, 1910-1912," by Mr. J. S. Dines, was described by Mr. Marriott, and Mr. Cave gave some account of the circumstances and conditions of the observations which were carried out under considerable difficulty, and mostly by non-meteorologists. Deterioration of the rubber balloons precluded high ascents; the greatest altitude was just over 4 kilometres ( $2\frac{1}{2}$  miles). The records from 7 ascents were analysed by Mr. Dines. The few observations of vertical motion made, gave results very similar to those commonly found in England. The persistence of easterly wind suggests that the N.E. Trades are deflected in this region.

A paper by Mr. H. W. Braby on "The Harmattan Wind of the Guinea Coast" was read by the Secretary. The author examined data extending over a period of five years at Zungeru, Northern Nigeria, and brought to light many interesting facts in connection with the phenomenon. The most noteworthy feature was the small relative humidity on days of Harmattan. With regard to temperature, the period was too short for safe conclusions, but the data studied did not bear out the statement by Mr. Knox in his "Climate of Africa," that the Harmattan is a fresh wind in the morning, hot in the day, and cold at night.

Col. H. E. Rawson made some observations on the barometric conditions necessary for the Harmattan to prevail.

Dr. E. C. Snow read a paper on "The Correlation of Rainfall," written in collaboration with Mr. J. Peck. The data used, were those for the south-east of England, and were drawn from *British Rainfall*, 1908-1911. The authors correlated the monthly and seasonal falls of different periods. A significant feature of the results, was the persistence of low correlations for the summer months. An interesting discussion took place, and a critical examination by Mr. R. H. Hooker, of the method of treatment, suggested some doubt as to the accuracy of the conclusions.

Mr. C. Salter drew attention to the advisability of distinguishing between different types of rainfall in studying the figures, and suggested that some of the irregularities observed might thus be eliminated.

Col. H. E. Rawson spoke of the difference between monthly correlations in the northern and southern hemispheres. Whilst it was difficult to believe in any definite relation between the rainfall of the months in this country, the southern hemisphere provided many examples of well marked connection. He recommended the months of April and August for special investigation.

Mr. W. W. Bryant and Mr. D. W. Horner also took part in the discussion.

The following were elected fellows of the society:—Messrs. M. A. Bolton, B.A., G. F. Carter, A. S. Galbraith, W. E. Hall, Guy Harris, G. R. Swaine and W. A. Tinnock.

## Correspondence.

To the Editor of Symons's Meteorological Magazine.

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## TEMPERATURE VAGARIES IN NEW YORK.

ON June 9th of the present year the minimum temperature reached 47°, which is the lowest for that date ever recorded. On the next night 49° was the minimum, which is a fraction above the lowest for that date. In the northern part of the State much damage by frost to fruit and vegetables was reported. These low temperatures were caused by an unusual and an extensive area of high pressure, with a reading of 30·60 in., crested in the vicinity of the Great Lakes.

January of this year had a total excess of over 300° above the normal, March about 200°, April 90°. The total excess to date since January 1st is over 600°.

C. DECKER.

65, West 50th Street, New York, 10th June, 1913.

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## ORIGIN OF THE SNOWDON GAUGE.

COL. WARD is not right in supposing his friend was the "inventor" of the Snowdon gauge. Writing far away from home, I cannot refer to Volume of *Symons's Meteorological Magazine* for 1883, but on page 23 it will be found that Mr. Symons gives the credit of it to Major Mathew; perhaps the Editor will give the details.

*Crescent Wharf, Birmingham, April 24th, 1913.* J. J. GILBERT.

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## REPORTED HEAVY RAINFALL.

ACCORDING to the *Morning Post*, on one night (I think the 29th) in May Tunbridge Wells had 3¼ in. of rain in less than an hour. There seemed some additional evidence of a remarkable fall in the shape of accounts of floods, etc. There is, however, no indication of such a rainfall in your rainfall map for May. It would be interesting to know if it really happened.

Apropos of Mr. Bonacina's allusion in your Magazine to the heat of the sun and intensity of light on May 25th, I remember noticing the same thing. It was not very hot—at least as regards shade temperature—but our few brilliantly clear days do not generally appear to be also our hottest ones.

G. WESTON.

*The Vicarage, Bethersden, Ashford, Kent, 3rd July, 1913.*

[Unless authenticated by the name of the Observer and the place of observation, newspaper reports of remarkable falls of rain need not in our experience be taken too seriously. We understand that a very heavy fall of rain was recorded at Tunbridge Wells on

May 29th, but not as occurring in one hour. We are making enquiries as to the facts of the rainfall in question, but had not on previous occasions been able to induce the Observer who reports this fall to send us his readings for publication.—ED., *S.M.M.*]

### PARTIAL DROUGHT—HALO.

PARTIAL drought, since rainfall of .33 in. on May 29th, has now lasted 33 days, with a total fall of .31 in. in June on 9 days, including .11 in. on 6th, .06 in. on 9th, .04 in. on 5th. This broke to-day with .12 in. of rain.

In the City yesterday, at 3.15 p.m., there was an exceptionally perfect halo on an unusual type of high hazy cloud, which had developed between my entering the "Tube" at Shepherd's Bush and getting out at the Bank. This solar halo finally dissipated about 5.45 p.m., when the cloud material had become flocculent.

J. E. CLARK.

*Asgarth, Riddlesdown Road, Purley, Surrey, 2nd July, 1913.*

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### THE LATEST SNOW SPOT.

By J. R. GETHIN JONES.

REFERENCE has been made in this Magazine and in the newspapers for several years to the now famous snow gully known as *Y ffoes ddyfn*, *i.e.*, "the deep cut," situated about a quarter of a mile north-east of Carnedd Llewelyn, in Snowdonia, as the spot in South Britain where drifted snow remains longest into the summer.

On May 12th this spot was visited by Mr. D. H. Owen, of Birmingham, in company with the writer, with the object of ascertaining the comparative extent and form of the drift, compared with those of previous years at Whitsun-tide. The size and position of the gully are unique, not only for the accumulation of snow from all points except S.E., forming a good index of the character of a past winter, but in addition to this the lie and form of the drift tell a story of past snow storms, as fully described in the *British Rainfall*, 1909.

We started from Llanrwst at 9 a.m. with the temperature at 53°, the barometer falling, and a light S.E. wind and rain which intercepted the Berwyn and Snowdon ranges. After reaching the first divide at an altitude of 1,300 ft., above Trefriw, we could see the interesting effect of the first rise, on the Berwyn Range, of the moisture from the S.E., after crossing the English plains, in the formation of cloud, and its disappearance after crossing these ranges.

During the ascent over the Berwyn Range a new layer of cloud or mist was formed, with a darker sky, but during the descent and whilst passing over the intermediate lower ground lying about 25 miles east of the Snowdonia Range, the cloud of the lower

strata disappeared, disclosing a light and high nimbus cloud from which rain was falling. On the ascent of the second range we encountered the same cloud formation at 2,500 feet, one mile east of Carned Llewelyn, with rain falling much more heavily than at Llanrwst. This was due to the high mountain condensation and not to any change in the weather, as was shown by the relative rainfall measurements for the day, the ratio between the high and low level stations being as much as ten to one. This we often experience during a light valley rain.

The first snow drifts were met at 2,700 feet, and the object of our long walk was reached at 3,000 feet in a cold mist and rain, with a temperature of 40° and a high wind.

The gully, which lies S.E. to N.W. for a length of 450 feet, was found nearly full on the S.W. side only for a length of about 300 feet. The greatest width was about 50 feet, and the estimated depth of snow 20 feet. The deposit was formed of quite hard and clean snow. An examination of the extent, lie and shape of the drift told us the following story about the past winter.

1. That the snow storms of the winter of 1912-13, which drifted there from all points except S.E., were not sufficient to fill the gully, as in the winter of 1909-10.

2. No drifts, except perhaps small ones since melted, had occurred from the N.E. quarter.

3. No signs of any deposit of Lancashire soot which generally comes with the Easter snow from that direction, darkening the snow bed and leaving a soot deposit at the end of the melting.

4. The lie and form of the bed showed clearly that it was the effect of S.W. and W. drifting, being from the smallest drifting lines, and it was very clean. It had apparently collected simultaneously with the heavy and cold rain and sleet experienced below 2,000 feet in March. If the snow had drifted from the N.W., N., N.E., and E. points, being the longest drifting lines, I believe that the gully would have been easily filled. As the sleet and cold rain in the valleys during that month measured from six to ten inches the equivalent at Carnedd Llewelyn would be as many feet of dry snow.

5. With average weather it was estimated at the time that this drift of 1912-13 would last another month, say the middle of June, compared with the following in previous years. As a matter of fact the drift lasted till the end of the first week of June.

1908-9. Gully partly filled. The drift disappeared in the last week of June.

1909-10. Gully filled. The drift disappeared in the middle of July (see photographs in *British Rainfall*, 1909).

1910-11. Gully partly filled. The drift disappeared before the end of May.

1911-12. Gully partly filled. The drift disappeared in the last week of May.

Some 30 years ago it lasted until the middle of August during the harvest.

## INTERNATIONAL BALLOON ASCENTS.

By W. H. DINES, F.R.S.

*October 5th, 1910.*

Starting Point.	Country.	A miles.	B ° F.	C miles	D ° F.	E miles.	F
Pyrton Hill* ....	England ...	8·2	—87	9·4	—86	33	S.W.
" .....	" ..	8·2	—89	10·6	—83	27	S. by W.
Brussels .....	Belgium ...	—	—	7·1	—65	44	S.W.
Hamburg .....	Germany ..	9·2	—80	16·9	—54?	60	S.
Lindenberg ....	" ..	8·1	—80	11·7	—68	54	S.W. by S.
Paris .....	France ....	8·0	—78	9·4	—69	110	S.W. by W.
Strassburg .....	Germany ..	8·6	—78	9·3	—76	68	S.W.
Munich .....	" ..	7·6	—71	7·6	—71	94	S.W.
Vienna .....	Austria ....	— †	—	9·1	—67	122	W.S.W.
Puy de Dome ..	France ....	6·6	—81	7·6	—74	187	S.W.
Pavia .....	Italy .....	7·8	—69	11·0	—63	151	S.W.
Pavlovsk .....	Russia ....	7·4	—67	10·1	—54	71	E.S.E.
Nizhni Olchedaeff	" .....	7·7	—69	10·3	—62	32	S.W. by W.

A Height in miles of commencement of isothermal column.

B Temperature, F°, at bottom of column.

C Greatest height of reliable record in miles.

D Temperature, F°, at greatest height.

E Distance in miles of point where balloon fell.

F Bearing of falling point from starting point.

\* 4.40 p.m., October 5th.

† To indefinite to be determined.

On the 5th a shallow depression lay over the Mediterranean, a very deep one to the north-east of Iceland, while an anticyclone (30·60 in.) was found to the south-west of England. On the 6th the anticyclone was over Ireland, while both depressions had moved to the eastward.

The heights in column A are unusually large, the value 9·2 miles (14·7 km.) being especially noticeable at Hamburg.

The general drift of the balloons to the south-west is also unusual, but, so far as my experience goes, there is connection between the two anomalies.

## METEOROLOGICAL NEWS AND NOTES.

MR. R. T. OMOND, for so many years the superintendent of Ben Nevis Observatory has, we are happy to observe, received the honorary degree of LL.D. from the University of Edinburgh. No honour was ever better deserved.

BRITISH RAINFALL, 1912, is now approaching completion, and a large part of it is printed off, but there is still time to include any returns in the General Table of total rainfall which may reach us within a week of the publication of this Magazine.

*Erratum.*—In June number, p. 88, insert in Table,

1901 ... 29th 83°·8

## RAINFALL TABLE FOR JUNE, 1913.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1913. in.
Camden Square.....	London.....	51 32	0 8	111	2'28	'58
Tenterden.....	Kent.....	51 4	*0 41	190	2'03	'53
Arundel (Patching).....	Sussex.....	50 51	0 27	130	2'13	1'34
Fawley (Cadland).....	Hampshire.....	50 50	1 22	52	2'17	'84
Oxford (Magdalen College).....	Oxfordshire.....	51 45	1 15	186	2'27	'46
Wellingborough (Croyland Abbey).....	Northampton.....	52 18	0 41	174	2'10	'65
Shoeburyness.....	Essex.....	51 31	*0 48	13	1'77	'17
Bury St. Edmunds (Westley).....	Suffolk.....	52 15	*0 40	226	2'21	1'33
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	1'77	'81
Polapit Tamar [Launceston].....	Devon.....	50 40	4 22	315	2'18	1'55
Rousdon [Lyme Regis].....	„.....	50 41	3 0	516	2'18	'76
Stroud (Upfield).....	Gloucestershire.....	51 44	2 13	226	2'43	'70
Church Stretton (Wolstaston).....	Shropshire.....	52 35	2 48	800	2'59	1'41
Coventry (Kingswood).....	Warwickshire.....	52 24	1 30	340	2'52	'77
Boston.....	Lincolnshire.....	52 58	0 1	11	1'95	1'02
Worksop (Hodsock Priory).....	Nottinghamshire.....	53 22	1 5	56	2'06	'60
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'85	2'71
Southport (Hesketh Park).....	Lancashire.....	53 38	2 59	38	2'26	2'10
Arncliffe Vicarage.....	Yorkshire, W.R.....	54 8	2 6	732	3'63	2'69
Wetherby (Ribston Hall).....	„.....	53 59	1 24	130	2'17	1'41
Hull (Pearson Park).....	„ E.R.....	53 45	0 20	6	2'09	'84
Newcastle (Town Moor).....	Northumberland.....	54 59	1 38	201	2'04	1'41
Borrowdale (Seathwaite).....	Cumberland.....	54 30	3 10	423	6'94	11'83
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	2'55	2'14
Haverfordwest.....	Pembroke.....	51 48	4 58	90	2'74	2'45
Aberystwyth (Gogerddan).....	Cardigan.....	52 26	4 1	83	2'97	5'33
Llandudno.....	Carnarvon.....	53 20	3 50	72	1'97	2'63
Cargen [Dumfries].....	Kirkcudbright.....	55 2	3 37	80	2'84	3'16
Marchmont House.....	Berwick.....	55 44	2 24	498	2'38	2'80
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	3'04	2'91
Glaskow (Queen's Park).....	Renfrew.....	55 53	4 18	144	2'41	3'50
Inveraray (Newtown).....	Argyll.....	56 14	5 4	17	3'64	5'53
Mull (Quinish).....	„.....	56 34	6 13	35	3'30	2'80
Dundee (Eastern Necropolis).....	Forfar.....	56 28	2 57	199	2'06	1'27
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'18	1'61
Aberdeen (Cranford).....	„.....	57 8	2 7	120	2'02	1'35
Cawdor.....	Nairn.....	57 31	3 57	250	2'13	2'93
Fort Augustus (S. Benedict's).....	E. Inverness.....	57 9	4 41	68	2'07	3'72
Loch Torridon (Bendamph).....	W. Ross.....	57 32	5 32	20	4'07	7'47
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'10	3'20
Wick.....	Caithness.....	58 26	3 6	77	1'83	2'04
Killarney (District Asylum).....	Kerry.....	52 4	9 31	178	2'92	3'45
Waterford (Brook Lodge).....	Waterford.....	52 15	7 7	104	2'79	2'19
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	2'70	3'35
Ennistymon House.....	Clare.....	52 57	9 18	37	3'18	3'61
Gorey (Courtown House).....	Wexford.....	52 40	6 13	80	2'59	1'34
Abbey Leix (Blandsfort).....	Queen's County.....	52 56	7 17	532	2'58	3'22
Dublin (Fitz William Square).....	Dublin.....	53 21	6 14	54	2'00	1'20
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	367	2'72	3'02
Crossmolina (Enniscooe).....	Mayo.....	54 4	9 16	74	3'17	3'55
Cong (The Glebe).....	„.....	53 33	9 16	112	3'18	4'04
Collooney (Markree Obsy.).....	Sligo.....	54 11	8 27	127	3'11	3'21
Seaforde.....	Down.....	54 19	5 50	180	2'88	1'75
Bushmills (Dundarave).....	Antrim.....	55 12	6 30	162	2'56	2'02
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	2'82	3'27

## RAINFALL TABLE FOR JUNE, 1913—continued.

RAINFALL OF MONTH (con.)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION.
Diff. from Av. in.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1875-1909. in.	1913. in.	Diff. from Aver. in.	% of Av.		
		in.	Date.							
-1.70	25	.19	8	7	10.96	10.67	- .29	97	25.11	Camden Square
-1.50	26	.12	19	10	11.44	12.42	+ .98	109	27.64	Tenterden
- .79	63	.54	20	8	12.46	17.32	+4.86	139	30.48	Patching
-1.33	39	.25	17	12	13.31	16.63	+3.32	125	31.87	Cadland
-1.81	20	.11	8	9	10.60	11.39	+ .79	107	24.58	Oxford
-1.45	31	.22	6	10	11.14	11.62	+ .48	104	25.17	Croyland Abbey
-1.60	10	.05	6	7	8.00	7.96	- .04	99	19.28	Shoeburyness
- .88	60	.46	17	9	10.76	11.07	+ .31	103	25.40	Westley
- .96	46	.28	9	11	9.61	9.33	- .28	97	23.73	Geldeston
- .63	71	.61	5	13	15.88	23.98	+8.10	151	38.27	Polapit Tamar
-1.42	35	.23	19	13	14.33	17.46	+3.13	122	33.54	Rousdon
-1.73	29	.16	5	10	13.08	16.87	+3.79	129	29.81	Stroud
-1.18	54	.44	9	11	14.30	21.41	+7.11	150	32.41	Wolstaston
-1.75	30	.24	9	9	12.75	16.05	+3.30	126	28.08	Coventry
- .93	52	.39	6	11	9.86	10.78	+ .92	109	23.35	Boston
-1.46	29	.20	5	13	10.80	11.13	+ .33	103	24.46	Hodsock Priory
- .14	95	.70	9	17	14.76	18.59	+3.83	126	34.73	Macclesfield
- .16	93	.51	7	15	12.96	15.77	+2.81	122	32.70	Southport
- .94	74	1.20	9	14	27.22	36.21	+8.99	133	61.49	Arncliffe
- .76	65	.30	18	10	11.63	12.04	+ .41	104	26.87	Ribston Hall
-1.25	40	.25	24	11	11.08	11.69	+ .61	105	26.42	Hull
- .63	69	.50	24	11	11.55	14.48	+2.93	125	27.94	Newcastle
+4.89	170	4.20	9	18	56.38	75.55	+19.17	134	129.48	Seathwaite
- .41	84	.51	9	13	17.22	25.93	+8.71	150	42.28	Cardiff
- .29	89	.47	7	9	19.45	27.90	+8.45	143	46.81	Haverfordwest
+2.36	180	2.10	9	17	18.12	31.20	+13.08	172	45.46	Gogerddan
+ .66	133	.64	19	12	12.37	16.09	+3.72	130	30.36	Llandudno
+ .32	111	.76	2	15	19.06	29.04	+9.98	152	43.47	Cargen
+ .42	118	.96	19	10	14.38	15.41	+1.03	107	33.76	Marchmont
- .13	96	.68	9	20	21.10	24.45	+3.35	116	49.77	Girvan
+1.09	145	.94	19	17	15.51	19.98	+4.47	129	35.97	Glasgow
+1.89	152	1.91	9	20	29.32	37.78	+8.46	129	68.67	Inveraray
- .50	85	.61	9	19	23.55	29.08	+5.53	123	56.57	Quinish
- .79	62	.31	4	12	12.02	14.45	+2.43	120	28.64	Dundee
- .57	74	.25	4	14	15.15	20.66	+5.51	136	34.93	Braemar
- .67	67	.35	4	12	14.02	15.70	+1.68	112	32.73	Aberdeen
+ .80	138	.76	18	13	12.51	11.26	-1.25	90	29.33	Cawdor
+1.65	180	.99	9	16	20.22	24.48	+4.26	121	44.53	Fort Augustus
+3.40	183	1.37	9	22	37.55	44.47	+6.92	118	83.93	Bendamph
+1.10	152	.45	4, 18	16	14.28	11.62	-2.66	81	31.90	Dunrobin Castle
+ .21	111	.37	4	16	12.71	10.81	-1.90	85	29.88	Wick
+ .53	118	.71	9	17	24.87	32.31	+7.44	130	54.81	Killarney
- .60	79	.39	18	11	17.40	24.10	+6.70	138	39.57	Waterford
+ .65	124	.95	9	15	17.51	25.13	+7.62	144	39.43	Castle Lough
+ .43	114	.72	9	19	19.67	26.12	+6.45	133	46.52	Ennistymon
-1.25	52	.29	18	11	15.42	19.65	+4.23	127	34.99	Courtown Ho.
+ .64	125	.80	5	14	15.84	23.85	+8.01	150	35.92	Abbey Leix
- .80	60	.25	19	13	12.15	15.10	+2.95	124	27.68	Dublin
+ .30	111	.72	18	16	16.01	22.59	+6.58	141	36.15	Mullingar
+ .38	112	.63	9	18	23.38	33.07	+9.69	141	52.87	Enniscoe
+ .86	127	.88	9	18	21.41	31.13	+9.72	145	48.90	Cong
+ .10	103	.66	18	17	18.83	25.89	+7.06	137	42.71	Markree
-1.13	61	.46	12	14	17.42	20.31	+2.89	117	38.91	Seaford
- .54	79	.58	19	14	15.49	15.09	- .40	97	37.56	Dundarave
+ .45	116	.66	9	16	17.10	23.07	+5.97	135	39.38	Omagh

## SUPPLEMENTARY RAINFALL, JUNE, 1913.

Div.	STATION.	Rain inches	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	·40	XI.	Lligwy .....	2·76
„	Ramsgate .....	·89	„	Douglas .....	...
„	Hailsham .....	1·12	XII.	Stoneykirk, Ardwell House...	1·75
„	Totland Bay, Aston House...	·61	„	Dalry, The Old Garroch.....	4·41
„	Stockbridge, Ashley.. .....	·33	„	Beattock, Kinnelhead .....	3·57
„	Grayshott .....	·47	„	Langholm, Drove Road .....	2·93
„	Caversham, Rectory Road ...	·49	XIII.	Meggat Water, Cramilt Lodge	3·35
III.	Harrow Weald, Hill House...	·42	„	North Berwick Reservoir.....	1·13
„	Pitsford, Sedgebrook... ..	1·19	„	Edinburgh, Royal Observatry.	1·49
„	Woburn, Milton Bryant.....	1·16	XIV.	Maybole, Knockdon Farm ...	2·48
„	Chatteris, The Priory.....	1·19	XV.	Ballachulish House .....	6·07
IV.	Colchester, Hill Ho., Lexden	1·07	„	Campbeltown, Witchburn ..	2·77
„	Newport, Belmont House ...	1·42	„	Holy Loch, Ardnadam.....	7·29
„	Ipswich, Rookwood, Copdock	1·57	„	Islay, Eallabus .....	2·91
„	Blakeney.....	·98	„	Tiree, Cornaigmore .....	2·55
„	Swaffham .....	1·09	XVI.	Dollar Academy .....	2·47
V.	Bishops Cannings .....	·72	„	Balquhiddy, Stronvar.....	5·21
„	Winterbourne Steepleton.....	...	„	Glenlyon, Meggernie Castle..	4·86
„	Ashburton, Druid House.....	1·08	„	Blair Atholl .....	1·72
„	Cullompton .....	·89	„	Coupar Angus .....	2·24
„	Lynmouth, Rock House ...	1·75	„	Montrose, Sunnyside Asylum.	2·07
„	Okehampton, Oaklands.....	2·22	XVII.	Alford, Lynturk Manse .....	2·38
„	Hartland Abbey.....	1·62	„	Fyvie Castle .....	2·76
„	Probus, Lamellyn .....	1·31	„	Keith Station .. ..	2·11
„	North Cadbury Rectory.....	1·35	XVIII.	Alvey Manse.....	2·55
VI.	Clifton, Pembroke Road.....	1·07	„	Loch Quoich, Loan .....	13·60
„	Ross, The Graig .....	·77	„	Drumnadrochit .....	3·52
„	Shifnal, Hatton Grange.....	·96	„	Skye, Dunvegan .....	5·06
„	Droitwich .....	·82	„	N. Uist, Lochmaddy .....	...
„	Blockley, Upton Wold.....	·49	„	Glencarron Lodge .....	8·68
VII.	Market Overton.....	1·26	XIX.	Invershin .....	2·85
„	Market Rasen .....	·67	„	Melvich .....	1·89
„	Bawtry, Hesley Hall .....	·85	„	Loch Stack, Ardchullin .....	5·79
„	Derby, Midland Railway.....	1·15	XX.	Skibbereen Rectory .....	4·64
„	Buxton .....	3·24	„	Dunmanway, The Rectory ..	4·16
VIII.	Nantwich, Dorfold Hall .....	1·46	„	Glanmire, Lota Lodge, No. 1	2·23
„	Chatburn, Middlewood .....	2·91	„	Mitchelstown Castle.....	2·83
„	Cartmel, Flookburgh .....	2·52	„	Darrynane Abbey.....	4·40
IX.	Langsett Moor, Up. Midhope	1·40	„	Clonmel, Bruce Villa .....	2·19
„	Scarborough, Scalby .....	1·38	„	Newmarket-on-Fergus, Fenloe	3·96
„	Ingleby Greenhow .....	1·63	XXI.	Laragh, Glendalough .....	1·70
„	Mickleton .....	1·80	„	Ballycumber, Moorock Lodge	2·88
X.	Bellingham, High Green Manor	1·72	„	Balbriggan, Ardgillan .....	1·29
„	Ilderton, Lilburn Cottage ...	1·62	XXII.	Woodlawn .....	3·97
„	Keswick, The Bank.....	3·52	„	Westport, St. Helens .. ..	2·43
XI.	Llanfrecfa Grange .....	1·32	„	Dugort, Slievemore Hotel ...	4·52
„	Treherbert, Tyn-y-waun .....	5·16	„	Mohill Rectory .. ..	3·25
„	Carmarthen, The Friary .....	2·57	XXIII.	Enniskillen, Portora.....	3·93
„	Castle Malgwyn [Llechryd]...	2·14	„	Dartrey [Cootehill] .....	3·59
„	Crickhowell, Tal-y-maes.....	1·80	„	Warrenpoint, Manor House ..	...
„	New Radnor, Ednol .....	2·35	„	Banbridge, Milltown .....	3·08
„	Birmingham WW., Tyrmynydd	3·51	„	Belfast, Cave Hill Road .....	2·67
„	Lake Vyrnwy .....	3·69	„	Glenarm Castle.....	2·17
„	Llangyhanfal, Plás Draw.....	1·75	„	Londonderry, Creggan Res...	3·31
„	Dolgelly, Bryntirion.....	5·41	„	Dunfanaghy, Horn Head ...	3·16
„	Bettws-y-Coed, Tyn-y-bryn...	3·78	„	Killybegs .....	4·21

## METEOROLOGICAL NOTES ON JUNE, 1913.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—Only twice in the previous 55 years has June been drier, viz., in 1877 and 1895, when the total R was 42 in. and 30 in. respectively. Duration of sunshine 199·8\* hours, and no sunless days. Duration of R only 6·1 hours, and the least recorded in June in 33 years. Mean temp. 61°·1 or 1°·0 above the average. Evaporation 3·13 in. Shade max. 85°·4 on 17th; min. 43°·6 on 9th. F 0, f 0.

TENTERDEN.—Duration of sunshine 218·0† hours. Only 8 days with shade temp. over 70°. Shade max. 83°·0 on 17th; min. 42°·0 on 9th. F 0, f 0.

TOTLAND BAY.—Duration of sunshine 218·7\* hours, and 15·0 hours on 29th. Shade max. 77°·8 on 16th; min. 44°·1 on 1st. F 0, f 0.

MILTON BRYAN.—Fine and drying month with a good deal of cloud or haze, and some days of very bright sunshine. Heavy local TS on 17th, with torrential R at Loddington, Dunstable and Luton. Shade max. 87°·0 on 16th and 17th; min. 35°·0 on 3rd.

IPSWICH, COPDOCK.—A few fine warm days in the middle, otherwise inclined to be dull and disappointing. Agriculture in a very good state as a whole. Duration of sunshine 203·1\* hours. Mean temp. 58°·2. Shade max. 86°·0 on 17th; min. 41°·0 on 13th. F 0, f 1.

NORTH CADBURY.—A month of very welcome dryness. Fairly quiet with wind about normal. A good hay crop is being rapidly got in in good condition. Shade max. 84°·0 on 30th; min. 40°·5 on 9th. F 0, f 0.

WOOLSTASTON.—Fine on the whole and very dry after the 11th. The hay crop is good and is being harvested early. Shade max. 74°·0 on 16th; min. 44°·0 on 1st and 9th.

HODSOCK PRIORY.—Shade max. 80°·0 on 16th; min. 40°·1 on 1st. F 0, f 0.

SOUTHPORT.—Duration of sunshine 184·2\* hours or 34·0 hours below the average. Duration of R 40·2 hours. Mean temp. 56°·5. Evaporation 3·03 in. Shade max. 76°·0 on 16th; min. 44°·0 on 1st and 2nd. F 0, f 0.

HULL.—Very dry periods with frequent squally dry winds. Duration of sunshine 128·5\* hours. Shade max. 77°·0 on 18th; min. 42°·0 on 15th. F 0, f 0.

HAVERFORDWEST.—Fine, dry and cold, with gales on three days. Duration of sunshine 229·9\* hours. Shade max. 75°·7 on 16th; min. 37°·6 on 1st. F 0, f 0.

BETTS-Y-COED.—Fine and dry on the whole, practically all the R having fallen in the first 8 days and 2·35 in. on one day, the 8th.

MARCHMONT.—Duration of sunshine 192·9 hours on 29 days. Shade max. 72°·0 on 16th; min. 38°·0 on 12th. F 0, f 0.

EDINBURGH.—Shade max. 70°·4 on 29th; min. 41°·2 on 12th. F 0, f 0.

INVERARAY.—A great number of the fine days were chilly and sunless, and, except the 16th, none were really hot. Heavy R on 8th and 9th is believed to have done much hurt to young grouse.

ABERDEEN.—Strong gale from 6th to 10th did much damage to plants and trees.

DRUMNADROCHIT.—R 1·29 in. and rain days 2 above the average. Violent TSS occurred on 18th and 24th.

LOCH STACK.—Duration of sunshine 130·5\* hours.

DUNMANWAY.—First 11 days were unsettled and cold. In the rest of the month there was little R except on the nights of 17th, 20th and 22nd. Cold month on the whole, but 15th, 16th and last four days were very warm.

DUBLIN.—Brisk W. and N.W. winds and much cloud. The last few days were very fine, warm and brilliant. Mean temp. 57°·1 or 0°·8 below the average. Shade max. 75°·1 on 17th; min. 43°·4 on 12th. F 0, f 0.

OMAGH, EDENFEL.—A fine spell from 13th to 17th and also for last four days; the remainder was cold and wet. All vegetation backward.

\* Campbell-Stokes.

† Jordan.

Climatological Table for the British Empire, January, 1913.

STATIONS.  <i>(Those in italics are South of the Equator.)</i>	Absolute.				Average.				Absolute.		Total Rain		Aver. Cloud.	
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.		
	Temp.	Date.	Temp.	Date.										
London, Camden Square	52°3	23	27°3	13	46°0	36°3	38°8	91	0-100	73°3	23°0	2.57	17	7.5
Malta ... ..	63.1	30	48.2	20	59.7	52.8	...	86	127.0	..	..	2.55	12	5.3
Lagos ... ..	91.5	15	72.0	2.20	89.4	75.2	73.6	73*	160.2	69.0	..	.00	0	4.5
<i>Cape Town</i> ... ..	101.7	14	55.3	4	82.7	63.2	58.7	63	...	...	..	.38	3	3.2
<i>Natal, Durban</i> ... ..	84.0	19	62.6	3	78.9	68.5	69.4	81	...	...	..	6.83	12	4.3
<i>Johannesburg</i> ... ..	82.6	19	47.4	3	76.3	55.9	54.9	72	154.4	47.0	..	2.66	18	3.6
<i>Mauritius</i> ... ..	86.2	25	68.1	4	82.7	72.0	70.3	81	159.0	64.2	..	15.83	25	8.0
<i>Bloemfontein</i> .. ..	98.0	26	54.4	3	88.0	60.8	54.7	54	...	...	..	1.53	6	2.7
Calcutta... ..	84.3	22	49.2	12	78.5	55.2	53.8	64	...	41.8	..	.06	?	4.8
Bombay... ..	86.5	1	63.8	24	83.7	68.0	63.2	66	130.1	53.9	..	.00	0	0.4
Madras ... ..	86.5	30	63.1	14	84.2	67.8	65.0	73	136.4	59.4	..	.14	1	3.1
Kodaikanal ... ..	73.3	4	43.6	9, 28	66.5	47.4	41.2	60	143.3	19.3	..	.27	4	4.6
*Colombo, Ceylon ... ..	89.4	28	68.2	22	83.1	72.1	71.9	83	157.9	64.0	..	8.34	17	8.0
Hongkong ... ..	72.9	9	44.0	26	64.5	54.8	49.6	69	...	...	..	1.03	5	4.9
<i>Sydney</i> ... ..	100.6	25	59.0	22	80.2	65.8	60.4	65	155.8	48.2	..	.71	9	4.6
<i>Melbourne</i> ... ..	101.5	13	46.6	27	75.8	56.8	48.8	52	157.1	40.0	..	.37	3	4.5
<i>Adelaide</i> ... ..	109.1	27	48.8	5	84.1	58.6	50.3	44	166.0	42.7	..	.19	1	3.1
<i>Perth</i> ... ..	101.8	21	54.0	12	83.5	62.8	56.0	54	165.7	49.6	..	.13	4	2.5
<i>Coolgardie</i> ... ..	110.0	22	51.8	13	91.0	62.3	...	...	170.2	49.0	..	.15	3	3.0
<i>Hobart, Tasmania</i> ... ..	97.8	13	40.3	27	70.3	52.1	44.7	51	151.8	33.2	..	1.38	8	5.9
<i>Wellington</i> ... ..	79.8	16	47.8	28	68.7	57.4	53.7	72	146.6	36.0	..	5.03	7	6.7
<i>Auckland</i> ... ..	79.5	22	49.0	28	72.2	58.5	58.2	79	149.0	46.0	..	2.64	12	5.7
Jamaica, Kingston ... ..	90.1	6	66.1	22	86.5	68.6	67.1	74	...	...	..	.09	3	...
Grenada ... ..	87.0	2	69.0	12, 18	81.5	72.2	...	78	140.0	...	..	9.77	20	4.5
Toronto ... ..	51.6	17	3.7	9	37.8	24.8	...	...	94.0	-2.7	..	4.36	15	...
Fredericton ... ..	51.4	3	-11.0	10	31.3	12.4	18.0	85	...	...	..	4.07	15	6.0
St. John, N.B. ... ..	51.5	3	-1.0	10, 29	37.0	19.7	23.0	76	...	...	..	4.27	15	6.2
Edmonton, Alberta ... ..	46.4	28	-32.2	11	8.2	-8.2	...	80	88.2	-34.5	..	1.52	20	5.9
Victoria, B.C. ... ..	50.0	25	21.0	19	40.4	31.8	34.0	91	...	...	..	4.54	20	7.1

\* The observations are now taken at the Observatory, not at the Fort.

MALTA.—Mean temp. of air 56°·7. Bright sunshine, daily average 5·3 hours.

*Johannesburg*.—Bright sunshine 276·0 hours.

*Mauritius*.—Mean temp. of air 1°·8 below, and R 8·22 in. above, averages. Mean hourly velocity of wind 11·2 miles or 0·2 miles above averages.

KODAIKANAL.—Bright sunshine 212 hours.

COLOMBO.—Mean temp. of air 77°·6 or 1°·1 below, of dew point 2°·1 above, and R 4·25 in. above, averages. Mean velocity of wind 5·7 miles per hour. TS on 5 days.

HONGKONG.—Mean temp. of air 59°·2. Mean hourly velocity of wind 11·5 miles. Bright sunshine 198·8 hours.

*Sydney*.—Mean temp. of air 1°·4 above, and R 2·87 in. below, averages.

*Melbourne*.—Mean temp. of air 1°·2 below, and R 1·48 in. below, averages.

*Adelaide*.—Mean temp. of air 2°·8 below, and R 5·4 in. below, averages.

*Coolgardie*.—Mean temp. of air 3°·1 above average.

*Hobart*.—Mean temp. of air 0°·5 below, and R 60 in. below, averages.

*Wellington*.—R 1·7 in. above average. Bright sunshine 226·4 hours.