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SOUTHERN HEMISPHERE WEATHER IN 1914.

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

THE year 1914 presented many abnormal meteorological features in the Southern Hemisphere. We have taken as a basis for discussion the monthly values of mean temperature, rainfall, and in some cases barometric pressure, given in the *Climatological Table of the British Empire*, which appears monthly in this Magazine. These data have been supplemented by other material, supplied through the kindness of the Directors of the Meteorological Services of Great Britain, Argentina, Brazil, and Chile stations with incomplete data, except in one instance, have not been used.

I am also indebted to the Superintendent of the Observatory of Johannesburg and to Dr. Sutton of Kimberley, as well as to the Secretary of the Scottish Meteorological Society, for further data. Some additional information has also been derived from Monthly Bulletins in the library of the Royal Meteorological Society. As the result of this co-operation we are able to give monthly rainfall data for 24 stations, temperature for 21 stations, and barometric pressure for 8 stations. The somewhat scanty material from Argentina has been strengthened by values obtained from the Monthly Weather Maps of that country. Among the less known stations quoted Evangelists Island is at the Pacific entrance to the Straits of Magellan, in $52\frac{1}{2}^{\circ}$ S. lat., Point Galera, Valdivia, and Concepcion are on the coast of Chile, between latitudes 40° and 37° S., and Christmas Island lies in the Indian Ocean, in lat $10\frac{1}{2}^{\circ}$ S., long. 106° E. Ajo is close to the littoral in the province of Buenos Aires, in lat. $36\frac{1}{2}^{\circ}$ S., long. 57° W., while South Georgia and the South Orkneys are in the far South Atlantic, the former being in 54° S., $36\frac{1}{2}^{\circ}$ W., and the latter in 61° S., and 45° W. Two stations in the West Indies have been included in the rain table, as the data from this region are of interest in relation to the conditions in Argentina. All the other stations are south of the Tropic of Capricorn, except Rio de Janeiro, St. Helena, and Christmas Island. The averages where available, refer to long terms of years, but in most cases a slightly shorter period than that covered by the whole series of observations has been taken. The New Zealand and Cape Town data

refer to the 40 years 1871-1910, and in the case of the Chilean rain data, the monthly and annual means have been referred to a short average, for the years 1901 to 1910, as well as to longer normals where these were available. As the rainfall in Chile is subject to wide variations from year to year, it was necessary in order that the discussion should proceed on a uniform basis, to use a normal for the same term of years. It may be pointed out that the average temperature is in nearly every case, the mean of the daily maximum and minimum, the exceptions being Rio de Janeiro, Santiago de Chile, the South Orkneys and South Georgia, where the data

TABLE I.—*Barometric Pressure in 1914. Departure from Normal. Hundredths of an inch.*

NOTE.—Record Values are shown in heavy type.

	Jan	Feb.	Mar.	April.	May.	June.
Perth	+ 5	+ 5	— 2	+ 4	+ 9	+12
Melbourne	+ 2	+ 5	— 2	— 1	+ 7	+20
Wellington	+ 7	— 4	+ 6	—15	+ 4	— 1
S. Orkneys	+ 5	— 2	+ 6	— 1	—15	—11
Punta Arenas	+ 5	+ 1	+15	+12	— 3	—17
Santiago	— 1	0	— 1	— 1	0	— 2
Rio de Janeiro	+ 2	+ 6	+ 4	+ 5	+ 8	— 2
Johannesburg	+ 2	+ 3	+ 2	0	+ 4	0

	July.	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR.
Perth	+ 2	+ 9	+13	+ 1	— 2	— 6	+ 4
Melbourne	+ 4	+23	+25	+27	+10	(—6)	(+10)
Wellington	+ 8	+ 8	+22	+19	— 1	— 5	+ 4
S. Orkneys	+11	— 2	+ 8	—31	— 8	— 3	— 4
Punta Arenas	+ 1	+ 3	+ 1	+11	— 4	+17	+ 3
Santiago	— 2	— 3	— 2	— 2	— 5	0	— 2
Rio de Janeiro	— 6	— 1	—11	+ 2	— 3	— 5	0
Johannesburg	+ 2	+ 1	+ 2	+ 4	+ 2	+ 1	+ 2

are either derived from hourly observations or corrected to the true mean of the day. Not having temperature data from Argentina, the mean temperature from seven stations north of lat. 40° S., and for four stations south of this latitude, was measured off the monthly isothermal charts issued by the *Oficina Meteorológica*, and the values referred to normals for the respective stations, given in the *Climate of the Argentine Republic* by W. G. Davis, Buenos Aires, 1910. The normals there given refer to the ten years 1898-1907. In the four tables appended are given the departure of the mean monthly and annual barometric pressure from the normal (Table I.); the departure of mean temperature from the normal (Table II.); the actual rainfall (Table III.); and the

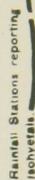
TABLE II.—Monthly and Annual Departure of the Mean Temperature during 1914
from the Normal $0^{\circ}F$.

NOTE.—Record Values are shown in heavy type.

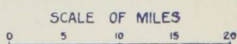
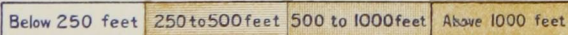
	Years of Obsns.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR.
AUSTRALIA.														
Perth	17	+1.6	-2.4	+1.0	-4.5	-1.9	+0.6	-0.8	+2.1	+3.0	+5.0	-1.6	-1.1	+0.4
Adelaide	58	-2.6	+2.9	+2.9	+0.3	+1.3	+1.4	+0.9	+4.5	+0.8	+7.7	+4.9	+1.9	+2.2
Melbourne	59	-0.5	+3.7	+3.1	+0.5	+0.7	+1.2	-0.4	+1.4	-0.8	+4.3	+3.9	+1.7	+1.6
Sydney	56	+1.4	+1.1	+1.5	+3.6	+1.9	+1.5	+0.5	+2.5	+0.9	+1.9	+4.5	+2.7	+2.0
TASMANIA.														
Hobart	44	-0.6	+0.4	+1.7	-0.6	+1.2	+1.8	-0.1	+2.5	+0.5	+2.9	-0.5	-2.3	+0.6
NEW ZEALAND.														
Auckland	47	+1.0	-0.6	-0.3	-0.4	-2.8	-2.3	-1.6	-1.5	-1.2	-1.4	-1.9	-3.4	-1.4
Wellington	47	+2.7	+1.1	+0.4	+1.0	-2.4	-0.9	+0.5	+0.2	+1.0	+1.5	-0.6	-2.9	+0.1
Hokitika	30	-1.7	-1.2	0.0	-1.2	-3.3	-3.3	+0.9	-1.3	-1.9	-2.4	-3.5	-7.4	-2.2
Dunedin	47	+2.9	+0.3	+1.7	+0.8	-1.7	+0.7	+2.0	+2.2	+2.2	+2.0	-1.2	-3.9	+0.7
SUB-ANTARCTIC.														
South Orkneys	12	-0.4	+0.4	+1.6	+5.0	+6.5	+1.4	-3.4	+3.1	+0.2	-3.2	-1.5	+1.4	+0.9
South Georgia	10	-1.1	+0.7	+0.5	+2.1	+2.5	+1.5	-0.9	-1.1	-0.9	—	—	—	—
S. AMERICA.														
Punta Arenas	27	-1.9	-1.4	+1.2	-0.7	-1.0	-2.9	-3.7	-0.4	-2.0	+0.1	-3.6	-0.1	-1.4
Santiago de Chile	54	+3.8	+3.0	+0.3	-0.9	+0.5	+1.2	+3.9	+1.8	-0.9	-0.4	-2.1	-0.7	+0.8
Argentina S. (4 stations)	10	-1.1	+2.7	+3.2	+1.1	+2.4	+1.4	+1.6	-2.9	-3.6	+0.1	-4.0	+0.7	+0.1
Argentina N. (7 stations)	10	+2.8	+1.4	-0.9	+0.5	+1.4	+4.8	+3.6	+0.9	-0.7	-0.5	-2.1	-2.0	+0.8
Rio de Janeiro	64	-0.5	-1.3	+0.2	-1.8	-2.5	+3.1	+3.2	+1.3	+2.7	+0.4	+2.3	-1.6	+0.4
S. AFRICA.														
Cape Town	73	-1.1	+0.3	+0.5	-0.6	+1.5	-0.6	+1.8	-1.4	-0.1	+2.9	+1.7	-1.6	+0.2
Johannesburg	11	+3.0	+1.7	+2.1	+2.5	+1.6	-0.5	+1.4	-3.4	+4.9	+1.9	-1.7	+0.8	+1.1
MEAN	37	+0.4	+0.7	+1.1	+0.4	+0.3	+0.6	+0.5	+0.6	+0.2	+1.1	-0.5	-0.9	+0.3
St. Helena	23	+3.2	+1.7	+0.9	0.0	+0.2	+0.6	+1.2	+1.1	+1.3	+1.8	+1.4	+1.8	+1.3
Christmas Island	12	+1.7	+1.7	+2.2	-0.2	-0.8	-0.7	-0.9	+0.2	-0.1	+1.9	+2.1	+1.5	+0.7

TABLE III.—*Showing the Monthly and Annual Rainfall during 1914.*

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
AUSTRALIA.													
Perth .....	.04	.83	.03	.75	1.82	5.66	4.44	2.36	.62	1.46	1.73	.47	20.21
Adelaide	1.07	.34	1.09	1.77	1.35	.65	1.39	.35	.60	.17	2.05	.58	11.41
Melbourne	1.45	.15	1.69	1.72	2.54	1.56	1.84	.66	1.09	.29	2.37	3.21	18.57
Sydney .....	.66	1.69	11.00	1.53	3.17	5.01	8.76	2.13	5.21	7.53	2.57	7.15	56.41
TASMANIA.													
Hobart .....	.24	.11	1.25	3.05	.97	.33	2.57	1.16	1.00	.39	1.66	2.69	15.42
NEW ZEALAND.													
Auckland	1.32	1.66	2.22	4.21	4.71	3.32	4.08	1.16	1.37	.97	1.41	1.77	28.20
Wellington ..	2.60	1.93	2.32	2.56	7.97	3.84	2.49	1.16	1.52	1.54	1.99	1.99	31.91
Hokitika	13.74	5.97	3.30	11.65	9.81	5.75	7.98	6.00	7.64	6.59	19.16	14.73	112.32
Dunedin	3.68	3.20	1.79	3.46	2.63	2.78	2.13	.74	1.69	1.81	3.48	3.92	31.31
SUB-ANTARCTIC.													
South Orkneys ..	1.65	2.05	2.09	2.40	1.38	1.57	1.30	.83	.71	1.30	1.03	1.49	17.80
South Georgia ..	3.41	2.51	2.14	5.81	3.35	4.51	6.45	4.41	1.38	—	—	—	—
SOUTH AMERICA.													
Punta Arenas	1.31	.99	.97	1.74	2.47	.88	(.48)	.35	.94	.52	.75	2.35	(13.75)
Evangelists Island ..	9.26	16.54	14.09	19.73	11.38	5.59	3.70	6.57	7.29	6.07	6.77	10.83	117.82
Point Galera	5.04	1.18	1.73	2.80	13.94	18.15	14.21	6.22	12.28	2.76	6.89	2.56	87.56
Valdivia	6.38	.39	2.48	2.52	20.16	25.16	21.46	10.24	15.91	2.96	7.95	2.76	118.37
Concepción	2.13	.00	1.69	2.40	5.99	15.55	16.66	5.75	8.07	3.07	3.35	.75	65.41
Santiago de Chile ..	.00	.00	.00	.24	2.30	8.09	4.92	2.92	4.02	2.83	2.26	.00	27.58
Ajo (Argentina)	5.85	3.77	6.80	14.87	4.91	5.36	4.53	6.93	3.91	4.49	6.58	3.15	71.15
Rio de Janeiro	2.59	6.69	1.79	8.38	1.25	.03	.09	.17	1.49	4.29	2.74	6.32	35.83
WEST INDIES.													
Trinidad .....	.50	.61	1.28	1.01	2.05	7.34	5.05	9.15	7.80	6.14	7.61	5.58	54.12
Grenada	1.80	2.09	2.61	2.59	3.95	6.85	6.72	6.86	6.63	8.44	7.77	5.56	61.87
S. ATLANTIC.													
St. Helena	3.54	4.33	6.07	5.44	5.16	3.71	3.39	5.57	3.68	1.48	3.67	3.17	49.21
SOUTH AFRICA.													
Cape Town	2.42	.33	.33	1.62	2.48	3.97	4.30	4.38	3.05	.55	1.09	.51	25.03
Johannesburg	2.71	3.09	2.93	.51	.40	.19	.00	.80	.11	2.25	6.86	7.69	27.54
Kimberley98	1.91	1.87	1.79	1.60	.56	.00	.36	.95	2.01	2.33	4.47	18.83
Christmas Island91	3.93	11.63	13.10	17.41	11.44	.94	.77	.19	.03	5.15	9.76	75.26



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This is a detailed historical map of the London Underground system, showing the extensive network of lines and stations across the city. The map includes labels for various districts such as Westminster, Covent Garden, and the City of London, as well as specific station names like Victoria, Piccadilly, and Fenchurch Street. A scale bar at the bottom left indicates distances in English miles.

The rainfall is given to the nearest tenth of an inch. A cross indicates that the fall was from .01 to .05 in. Where the position of the lines is not clearly established they are broken.

rainfall expressed as a percentage of the normal (Table IV.) Except in Table III. values which constitute an extreme record for the month and place in question are shown in heavy type. In Table II. a general mean temperature departure for the Southern Hemisphere between latitudes 23° and 61° S. is given, based on the returns from 16 stations and the two Argentine district values.

(To be continued.)



THE LONDON THUNDERSTORM OF MAY 6th.

THE severe thunderstorm of May 6th, described by Mr. Bonacina on p. 63 of our last number, was accompanied by a very heavy rainfall in a small district in the centre of London. Unfortunately the small number of rainfall records kept in the Metropolitan area makes it impossible to map out such a fall with the minuteness necessary to determine the exact area affected. We were rung up at Camden Square between 10 and 11 p.m., on the evening of May 6th, by two newspapers asking for particulars of the storm, and the enquiring journalists were both greatly impressed by the terrific downpour of rain which had occurred for more than an hour in the neighbourhood of Fleet Street. On consulting the recording rain gauge at Camden Square we found that only $\cdot 72$ in. had fallen, a small amount considering the intensity of the electrical display.

Now that full returns are available it has been possible to plot a map, which is published herewith, showing very clearly the southern limit of the rain area, no rain having been observed south of a line drawn from Richmond, through Wandsworth and Poplar to Ilford. On the north and west the rainfall faded away gradually, less than a quarter of an inch having been reported from stations north of Hornsey and Hendon. The area with more than half an inch extended roughly from Ealing to Clapton, from west to east, and from Waterloo station to Finsbury Park, from south to north. The one-inch area was probably broken into two portions, the smaller in the neighbourhood of Kew Bridge, the larger extending for about six miles from Kensington to Hackney, and for about $2\frac{1}{2}$ miles from the Thames on the south to Islington on the north. These lines are all well supported, but as the most interesting area is approached we enter the region where rain gauges become extremely rare. The line of 1.50 in. has been drawn with a very fair degree of approximation. It runs on the whole about half a mile inside the one-inch line. Only four rainfall records have been received from the six square miles which lie within it. These are 1.70 in. at Messrs. Negretti and Zambra's premises at Holborn Viaduct; 1.76 in. at Mr. Steward's, in the Strand; 3.00 in. at the Holborn Borough Stone Yard; and 3.12 in

at New River Head, the office of the Northern District of the Metropolitan Water Board. From these figures it is not very easy to draw exact isohyets of 2 and 3 inches, but following the only guide, parallelism with the outer isohyets, we have delineated the areas shown on the map. It is probable that more than 2 inches fell within the oval bounded on the west by Piccadilly Circus, on the east by Shoreditch, on the south by the Strand, and on the north by Euston Road. More than 3 inches of rain possibly fell on an area, perhaps half a mile wide and a mile and a half long, between the City and King's Cross. We cannot say with certainty that more than 3 inches fell in every part of this area, but we are fairly satisfied that more than 3 inches did not have a wider incidence, and we are of course unable to say whether at some place within the 3-inch line, the rain may not have been considerably heavier than at either of the two stations quoted.

Such very heavy falls of rain as 3 inches in less than $1\frac{1}{2}$ hours have always to be viewed with a severely critical eye, as mistakes are most frequent in the measurement of the rarest falls, and the higher the reading, the less possible is it to obtain support from neighbouring observations. We are exceedingly fortunate in this case to have two official records, which are checked monthly by comparison with the other London stations, and there can be no doubt whatever as to their accuracy. The Observers were fully alive to the remarkable nature of the fall and the following communication from Mr. J. M. Wood, C.E., Engineer for the Northern District of the Metropolitan Water Board, shows how carefully he went into the matter.

"On Thursday evening the 6th instant, I recorded 3.12 in. of rain between 8.30 p.m. and 10 p.m., due to the thunderstorm. There can be no doubt about the time and quantity, as I had the rain gauge checked by tanks and trucks which stood close by. I thought perhaps you might like to record this."

We have not had time to examine all the London rain records in order to make a complete list of falls exceeding 3 inches in a rainfall day, but, so far as our memory serves, the only instances of rainfalls appreciably exceeding those recorded on May 6th, were the falls of (i.) 3.28 in. in an hour and a half, at Camden Square, on June 23rd, 1878 (the period during which rain fell was only 58 minutes); (ii.) 3.42 in. at Blackheath, on July 23rd, 1903, a long-continued rain; and (iii.) 3.90 in. at Haverstock Hill, on April 10th, 1878, also a long-continued fall. The rainfall, therefore, cannot be said to be unprecedented, either in amount or in intensity for the London area.

As an argument for the closer planting of rain gauges in great centres of population, we may point out how easily this great fall might have been missed, indeed if the two rain gauges recording it had been displaced by half a mile we might not have known that even so much as 2 inches of rain had fallen in London on May 6th.

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on May 19th, at the Surveyors' Institution, Westminster, Major H. G. Lyons, F.R.S., President, in the Chair.

A paper was read on "The Wet English Winter of 1914-15" by Dr. H. R. Mill, and Mr. H. E. Carter. The area dealt with was restricted to England and Wales. The rainfall for each of the four months, November, 1914, to February, 1915, was plotted on large scale maps and isohyetal lines were drawn in the usual way. The data for November and December were very full and comprised about 1700 points. The maps for January and February were rather less complete, being drawn from about 750 points. In the case of December, the wettest month of the winter, a detailed comparison was made with the wettest Decembers of the last half century and the general rainfall calculated by measurement on the maps. In the other three months the general rainfall was obtained by the rougher statistical method of taking the mean of 27 stations uniformly distributed over the country. The results compared with the averages, were as follows :—

		1914-15. in.		Average in.		1914-15 as per cent. of Average.
November	...	4·65	...	3·46	...	134
December	...	7·37	...	3·49	...	211
January	...	4·35	...	2·94	...	148
February	...	4·93	...	2·49	...	198

The general rainfall of the four wettest Decembers was :—

		1868.		1876.		1911.		1914.
December	...	7·39	...	7·24	...	7·03	...	7·37

The close similarity in these results is remarkable and seems to suggest a limiting value. The rainfall of the whole period, November, 1914, to February, 1915, was compared with the average by the cartometric method, an average rainfall map for the four months being specially prepared for this purpose. The period was further compared with the two previous wettest four-monthly periods in the past 55 years, viz., November, 1876—February, 1877, and October, 1911—January, 1912, the results being :—

		General Rainfall over England and Wales.		General Rainfall as a Percentage of the Average.
Nov. 1876 to Feb. 1877	...	19·50	...	161
Oct. 1911 to Jan. 1912	...	18·67	...	131
Nov. 1914 to Feb. 1915	...	20·21	...	167

Thus the rainfall of the four months, November, 1914, to February, 1915, over England and Wales as a whole, was ·71 in. greater than the next wettest four months in any winter since the late Mr. G. J. Symons commenced the systematic collection of rainfall data. An interesting feature of the map showing the relation of the rainfall to the average in the past winter was that the Lake District and South Wales, the districts of highest rainfall, were

relatively the driest for the four months, while the south-east of England was relatively the wettest part of the country. A large area with more than twice the average fall extended from Hertford to the south coast covering most of the south-eastern counties and a smaller area with twice the average lay over Shropshire.

Dr. W. N. Shaw, Mr. R. C. Mossman, Mr. C. Harding, Mr. W. W. Bryant, Mr. R. H. Hooker, Mr. C. Salter, and Mr. E. Gold took part in the discussion on the paper.

Mr. J. E. Clark presented the "Report of the Phenological Observations from December, 1913, to November, 1914." The Report was based on the observations made at 133 stations, an increase of 6 on the previous year. All the 13 standard plants were in flower earlier than usual. The dominating factors were the abnormally mild autumn of 1913, the mild winter and the remarkably genial April weather. Fruits and crops were prejudiced by the serious May frosts and the droughty conditions from April to October. On the other hand the sunny warmth of the autumn largely countervailed to make the year successful for the farmer and partially so to fruit growers. A new feature in the Report was the introduction of a migrant table.

Mr. R. H. Hooker, who had previously collaborated with Mr. Clark in the preparation of the Report, presented some results of the agricultural returns. Generally speaking, crops were rather bad in the extreme south-east of the country and good in the extreme north-west, but differed little from the average.

Lt.-Col. Mellish spoke as to the disastrous frosts of May.

The following gentlemen were elected Fellows of the Society : Mr. Andrew Cheung, and Mr. James A. Yates.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

WET MAY IN KENT.

THAT two such excessive falls of rain as 1.55 in. on the 13th and 1.48 in. on the 17th should occur in May is quite unprecedented at this station. During 50 years only three dates show falls over an inch, 1.30 in. on May 7th, 1878 ; 1.61 in. on May 28th, 1879 ; and 1.34 in. on May 12th, 1886. There have only been eight Mays during 52 years with over three inches.

1865	.....	3.24 in.	1886	.....	3.34 in.
1869	.....	4.04 "	1891	.....	3.12 "
1878	..	4.22 "	1898	.....	3.44 "
1879	.....	3.61 "	1915	.....	3.65 "

Curiously the wet May of 1898 came in the driest year of the fifty. The fifty years' average for May is 1.76 in., but for the ten years ending 1913, only 1.46 in. ; my first twenty years, 1864-83, had an average of 2.10 in.

J. E. MACE.

View Tower, Tenterden, June 1st, 1915.

THUNDERY WEATHER ON MAY 21st.

I SHALL be interested to know whether any readers can report the occurrence of heavy thunderstorms on Friday, May 21st, along the Thames between Reading and London. The general conditions that day were very thundery, as the following notes made on a journey from London to Devonshire show.

At noon, on leaving Paddington, atmosphere warm and close ; sky cloudy, with tendency towards cumulus development ; West Drayton, heavy thunder clouds developing ; between Slough and Maidenhead the express passed through what to all appearances was a thunderstorm, but I did not see any lightning, and thunder is of course, difficult to hear in a train, unless very severe ; 0.36 p.m., Reading, rain had ceased, but the heavy black and purple shades were still throwing the elms into exquisitely beautiful relief ; 1.30, Lavington, Wiltshire, half-way to Exeter, atmosphere fresher and brighter, with fiercely hot sunshine, but a gigantic most imposing pile of cumulus lay over the Marlborough Downs ; 2.15, Athelney, Sedgmoor district of mid-Somerset, fine and sunny, small innocent-looking clouds ; 3.0 p.m., first stop, Exeter, sky again looking thundery ; Dawlish and Teignmouth, thick fog rolling in from the sea, very depressing after the rich warm thunder hues of the Thames valley ; 4.0 p.m., Torbay district, fog gone, but conditions close and thundery, rather heavy rain for two or three hours in the evening.

L. C. W. BONACINA.

May 26th, 1915.

THE SEASONS—THIRD REJOINDER.

BEFORE withdrawing from this protracted controversy, I wish to re-assert that, whatever meanings may be variously attached for certain special purposes to the expression "summer" and "winter," the outstanding fact remains that the solstitial trios May, June, July, and November, December, January, form—as regards the preponderance of atmospheric effects depending upon the interaction of the several meteorological and astronomical factors—unmistakeable *family* groups. Concerning that particular element, the mean temperature of the air, whose seasonal maximum and minimum lag behind the solstices so as to be displaced towards the succeeding equinoctial periods, this may be analysed as the combined effect of direct incoming radiation and of the store of heat already present in the soil and air. If the relative power of the sun in the twelve months of the year be represented on the scale of units from 1 to 12, then that of June will be 12, July 11, May 10, and August 9. The income of heat and light in August is, therefore, smaller than in any of the three previous months of higher sun and longer days ; yet in consequence of the large

capital of heat which the earth has accumulated during May, June, and July, the mean air temperature of August is second only to July's, simply because the weaker sun has the advantage of shining upon an already heated surface. But there are ever so many atmospheric or meteorological influences apparent to acute observation which harmonize with the different physical origin of equinoctial warmth. The same applies inversely in relation to the cold of the winter solstice and vernal equinox.

To conclude with a concrete illustration. I was travelling up from the west of England on the glorious summer evening of May 24th, and at that magic hour between 8 and 9, when the shaggy elms were looming black and huge in the still, warm air, and the whole northern sky was a sheen of golden twilight, I could not help contrasting the magnificent summer scene with the darkness and associated dampness and chilliness of the same hour on the 24th August, and deploring the extraordinary lack of perception which would, on the mere ground of a higher average temperature, have August instead of May share the illustrious summer company of June and July. There is room for August in a summer *quartette*, but not in a summer *trio*.

Finally, I think our rich heritage of English literature suggests that the man of letters, perceiving the general effects of nature, can drop a hint to the meteorologist concerning the most philosophical arrangement of the seasons.

L. C. W. BONACINA.

June 3rd, 1915.

REMARKABLE MID-MAY SNOWSTORM.

WE had a remarkable mid-May snowstorm in this district on the 13th, after two dry months, March and April, with a combined rainfall of only 1.82 in. Rain set in from the north-east about 3 p.m. on May 12. The temperature which had been 60° in the morning, fell to 45° by 5 p.m. The rain was not heavy till after daylight on the 13th, .88 in. being measured at 9 a.m. on that date. The maximum temperature on the 13th barely reached 43°, the lowest May maximum I have any record of and the rain, which was continuous, about 8.30 p.m. turned to snow; at 9 p.m. the ground was white and the temperature 32°. The snow ceased between 11 and midnight, and the ground remained white till about 4 a.m. on the 14th, *i.e.*, seven hours. As the sky remained overcast the temperature did not decline below 32°. Ganway Hill, 1,200 feet, was covered with snow till after mid-day on the 14th, and parts of the Black Mountains were white all through the 14th, in spite of abundant sunshine. The gauge showed 1.10 in. at 9 a.m. on the 14th, so that the total fall was 1.98 in. Practically all the fall was snow above 1,500 feet on the Black Mountains, and above 2,000 feet this snow

lay a foot or more in average depth on the morning of the 14th, after 24 hours continuous snowfall. On May 15th I was on the part of the range which forms the highest ground in Herefordshire, viz., 2,300 feet. At this height it was all patchy with snow (two days after the storm) and the deepest drift I encountered was five feet, though as the drift was some hundreds of yards long it may have been deeper in places. I have known the ground to be white from hail and snow showers in the last week in May, and have seen the Cleve hills white on May 30th, in 1894, from this cause, but continuous snow, from a cyclonic depression in mid-May (as distinguished from hail and snow showers of the north-west type), is a very different matter, and entirely uncommon at such a late date. The snowfall of the 13th seemed to fall off to the west rapidly, and I could see no snow on Plinlimmon or even the Brecon Beacons, though it was too hazy to speak with certainty; anyhow, the River Wye never rose, which confirms this supposition. Radnor Forest had a few drifts; drifts could also be seen from the Black Mountains on the 15th on the top of the Cleve and Malvern Hills, more on the latter, although lower, than on the more northerly Cleve group. The fall for the two days at 1,200 ft., on the Black Mountains, was 1.17 in., compared with 1.98 in. here about 12 miles further east. Early on the 15th the exposed thermometer four feet above ground, fell to 23°, and much damage was done.

R. P. DANSEY.

Kentchurch Rectory, Hereford, May 17th, 1915

METEOROLOGICAL NEWS AND NOTES.

THE LIST OF KING'S BIRTHDAY HONOURS includes the gratifying announcement that a knighthood has been conferred on Dr. W. N. Shaw, F.R.S., Director of the Meteorological Office. This is, we believe, the first instance in which a similar honour has been conferred on the head of the national weather service.

THE DEATH OF MR. AKSEL S. STEEN, Director of the Norwegian Meteorological Institution, took place in Christiania on May 10th. Mr. Steen only recently succeeded the veteran meteorologist, Professor Mohn, in the position he held so long.

THE SEARCH FOR AN EARTHLY PARADISE seems still to have some votaries; the most remarkable feature in the following advertisement which recently appeared in *The Times* is the suggestion that it is to be looked for so near London:—

“Advertiser, suffering from heart trouble, wishes to reside in a district where thunder is practically unknown, within three or four hours of London, and where some rough shooting and fishing can be obtained. . . .”

RAINFALL TABLE FOR MAY, 1915.

STATION.	COUNTY.	Lat. N.	Long. W. [°E.]	Height above Sea, ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1915. in.
Camden Square.....	London.....	51 32	0 8	111	1'75	3'72
Tenterden.....	Kent.....	51 4	*0 41	190	1'65	3'65
Arundel (Patching).....	Sussex.....	50 51	0 27	130	1'80	4'34
Fawley (Cadland).....	Hampshire.....	50 50	1 22	52	1'96	3'68
Oxford (Magdalen College).....	Oxfordshire.....	51 45	1 15	186	1'81	3'27
Wellingborough(Swanspool).....	Northampton.....	52 18	0 41	155	1'98	1'78
Shoeburyness.....	Essex.....	51 31	*0 48	13	1'27	2'58
Bury St. Edmunds(Westley).....	Suffolk.....	52 15	*0 40	226	1'93	1'61
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	1'78	2'08
Polapit Tamar [Launceston].....	Devon.....	50 40	4 22	315	2'08	2'68
Rousdon [Lyme Regis].....	„.....	50 41	3 0	516	2'02	2'24
Stroud (Upfield).....	Gloucestershire.....	51 44	2 13	226	2'10	2'42
Church Stretton (Wolstaston).....	Shropshire.....	52 35	2 48	800	2'64	3'42
Boston.....	Lincolnshire.....	52 58	0 1	11	1'80	1'59
Worksop (Hodsock Priory).....	Nottinghamshire.....	53 22	1 5	56	2'08	1'39
Mickleover Manor.....	Derbyshire.....	52 54	1 32	280	2'10	1'76
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'43	1'33
Southport (Hesketh Park).....	Lancashire.....	53 39	2 59	38	2'13	1'31
Arnelliffe Vicarage.....	Yorkshire, W.R.....	54 8	2 6	732	3'55	1'51
Wetherby (Ribston Hall).....	„.....	53 59	1 24	130	2'09	1'57
Hull (Pearson Park).....	„ E.R.....	53 45	0 20	6	1'98	1'47
Newcastle (Town Moor).....	Northumberland.....	54 59	1 38	201	2'04	2'01
Borrowdale (Seathwaite).....	Cumberland.....	54 30	3 10	423	7'50	1'18
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	2'56	2'62
Haverfordwest.....	Pembroke.....	51 48	4 58	90	2'62	2'56
Aberystwyth (Gogerddan).....	Cardigan.....	52 26	4 1	83	2'63	2'92
Llandudno.....	Carnarvon.....	53 20	3 50	72	1'86	2'02
Cargen [Dumtries].....	Kirkcudbright.....	55 2	3 37	80	2'87	1'59
Marchmont House.....	Berwick.....	55 44	2 24	498	2'53	1'67
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	2'98	1'70
Glasgow (Queen's Park).....	Renfrew.....	55 53	4 18	144	2'40	1'40
Inveraray (Newtown).....	Argyll.....	56 14	5 4	17	3'53	1'06
Mull (Quinish).....	„.....	56 34	6 13	35	2'99	'82
Dundee (Eastern Necropolis).....	Forfar.....	56 28	2 57	199	2'05	'96
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'33	'82
Aberdeen (Cranford).....	„.....	57 8	2 7	120	2'40	'88
Gordon Castle.....	Moray.....	57 37	3 5	107	2'10	1'26
Fort Augustus(S. Benedict's).....	E. Inverness.....	57 9	4 41	68	2'36	'81
Loch Torridon (Bendamph).....	W. Ross.....	57 32	5 32	20	4'54	1'41
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'19	1'08
Wick.....	Caithness.....	58 26	3 6	77	2'04	'52
Killarney (District Asylum).....	Kerry.....	52 4	9 31	178	3'05	2'24
Waterford (Brook Lodge).....	Waterford.....	52 15	7 7	104	2'33	2'81
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	2'51	1'34
Ennistymon House.....	Clare.....	52 57	9 18	37	2'70	'89
Gorey (Courtown House).....	Wexford.....	52 40	6 13	80	2'24	2'56
Abbey Leix (Blandsfort).....	Queen's County.....	52 56	7 17	532	2'43	'92
Dublin(FitzWilliamSquare).....	Dublin.....	53 21	6 14	54	2'07	1'60
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	367	2'51	1'20
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 16	74	3'17	1'96
Cong (The Glebe).....	„.....	53 33	9 16	112	2'94	1'38
Collooney (Markree Obsy.).....	Sligo.....	54 11	8 27	127	2'80	1'48
Seaforde.....	Down.....	54 19	5 50	180	2'72	2'60
Bushmills (Dundarave).....	Antrim.....	55 12	6 30	162	2'37	'72
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	2'66	'90

RAINFALL TABLE FOR MAY, 1915—*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.	1915.	Diff. from Aver. in.	% of Av.		
		in.	Date.		in.	in.			in.	
+1.97	213	1.37	13	8	8.68	13.25	+4.57	153	25.11	Camden Square
+2.00	221	1.55	13	9	9.41	13.46	+4.05	143	27.64	Tenterden
+2.54	241	2.20	13	9	10.33	16.48	+6.15	159	30.48	Patching
+1.72	188	1.40	13	10	11.14	15.47	+4.33	139	31.87	Cadland
+1.46	181	1.01	13	10	8.33	11.17	+2.84	134	24.58	Oxford
— .20	90	.91	13	8	9.08	8.40	— .68	93	25.20	Swanspool
+1.31	203	1.00	13	7	6.23	7.95	+1.72	128	19.28	Shoeburyness
— .32	83	1.02	13	9	8.55	9.67	+1.12	113	25.40	Westley
+ .30	117	1.31	13	13	7.84	11.08	+3.24	141	23.73	Geldeston
+ .60	129	.56	13	12	13.70	18.59	+4.89	136	38.27	Polapit Tamar
+ .22	111	.61	12	11	12.15	13.09	+ .94	108	33.54	Rousdon
+ .32	115	.75	13	9	10.65	12.58	+1.93	118	29.81	Strond
+ .78	130	.77	17	10	11.71	16.03	+4.32	137	32.41	Wolstaston
— .21	88	.51	13	9	7.91	8.02	+ .11	101	23.35	Boston
— .69	67	.44	11	9	8.74	7.96	— .78	91	24.46	Hodsock Priory
— .34	84	.44	1, 13	9	9.22	8.66	— .56	94	26.65	Mickleover
—1.10	55	.54	1	7	11.91	13.91	+2.00	117	34.73	Macclesfield
— .82	61	.41	11	12	10.70	12.38	+1.68	116	32.70	Southport
—2.04	43	.65	11	11	23.59	26.23	+2.64	111	61.49	Arncliffe
— .52	75	.86	11	5	9.46	10.76	+1.30	114	26.87	Ribston Hall
— .51	74	.37	1	9	8.99	9.70	+ .71	108	26.42	Hull
— .03	99	.67	11	11	9.51	9.60	+ .09	101	27.94	Newcastle
—6.32	16	.59	11	7	49.44	53.44	+4.00	108	129.48	Seathwaite
+ .06	102	.62	13	17	14.67	15.43	+ .76	105	42.28	Cardiff
— .06	98	.65	19	12	16.71	18.55	+1.84	111	46.81	Haverfordwest
+ .29	111	1.31	1	14	15.15	20.76	+5.61	137	45.46	Gogerddan
+ .16	109	.53	17	10	10.40	12.10	+1.70	116	30.36	Llandudno
—1.28	55	.55	11	8	16.22	21.52	+5.30	133	43.47	Cargen
— .86	66	.60	11	8	12.00	9.58	—2.42	80	33.76	Marchmont
—1.28	57	.90	12	8	18.06	22.97	+4.91	127	49.77	Girvan
—1.00	58	.59	28	7	13.10	11.60	—1.50	89	35.97	Glasgow
—2.47	30	.43	11	7	25.68	29.62	+3.94	115	68.67	Inveraray
—2.17	27	.22	51	10	20.25	23.47	+3.22	116	56.57	Quinish
—1.09	47	.22	11	12	9.96	9.65	— .31	97	28.64	Dundee
—1.51	35	.35	11	9	12.97	16.15	+3.18	124	34.93	Braemar
—1.52	37	.21	11	11	12.00	11.81	— .19	98	32.73	Aberdeen
— .84	60	.25	11	14	10.14	12.37	+2.23	122	30.34	Gordon Castle
—1.55	34	.20	11	9	18.15	14.58	—3.57	80	44.53	Fort Augustus
—3.13	31	.35	31	8	33.48	34.63	+1.15	103	83.93	Bendamph
—1.11	49	.36	10	9	12.18	...	...	...	31.90	Dunrobin Castle
—1.52	26	...	...	...	10.88	9.32	—1.56	86	29.88	Wick
— .81	73	.50	15	13	21.95	21.67	— .28	99	54.81	Killarney
+ .48	121	.85	16	10	14.61	13.54	—1.07	93	39.57	Waterford
—1.17	53	.76	15	8	14.81	14.68	— .13	99	39.43	Castle Lough
—1.81	33	.28	15	8	16.49	18.13	+1.64	110	46.52	Ennistymon
+ .32	114	.50	15	9	12.83	12.00	— .83	94	34.99	Courtown Ho.
—1.51	38	.30	15	8	13.26	12.00	—1.26	90	35.92	Abbey Leix
— .47	77	.61	17	12	10.15	9.50	— .65	94	27.68	Dublin
—1.31	48	.40	16	9	13.29	14.88	+1.59	112	36.15	Mullingar
—1.21	62	.39	16	13	20.21	20.76	+ .55	103	52.87	Ennisceoe
—1.56	47	.35	18	13	18.23	18.12	— .11	99	48.90	Cong
—1.32	53	.67	21	9	15.72	17.89	+2.17	114	42.71	Markree
— .12	96	.94	19	10	14.54	14.76	+ .22	102	38.91	Seaforde
—1.65	30	.56	11	3	12.93	10.53	—2.40	81	37.56	Dundarave
—1.76	34	.33	11	9	14.28	14.23	— .05	100	39.38	Omagh

SUPPLEMENTARY RAINFALL, MAY, 1915.

Div.	STATION.	Rain inches	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	3·17	XI.	Lligwy	1·85
„	Ramsgate	2·91	„	Douglas	1·83
„	Hailsham	3·94	XII.	Stoneykirk, Ardwell House...	1·45
„	Totland Bay, Aston House...	3·14	„	Carsphairn Shiel	1·55
„	Stockbridge, Ashley..	4·22	„	Beattock, Kinnelhead	1·56
„	Grayshott	4·00	„	Langholm, Drove Road	2·15
III.	Harrow Weald, Hill House...	2·51	XIII.	Meggat Water, Cramilt Lodge	1·45
„	Caversham, Rectory Road ...	3·10	„	North Berwick Reservoir.....	1·36
„	Pitsford, Sedgebrook.....	1·02	„	Edinburgh, Royal Observaty.	1·34
„	Woburn, Milton Bryant.....	1·91	XIV.	Maybole, Knockdon Farm ...	1·00
„	Chatteris, The Priory.....	1·36	XV.	Ballachulish House	1·08
IV.	Elsenham, Gaunts End	2·09	„	Campbeltown, Witchburn ..	1·89
„	Colchester, Hill Ho., Lexden	2·09	„	Holy Loch, Ardnadam	2·01
„	Ipswich, Rookwood, Copdock	2·24	„	Islay, Eallabus	1·35
„	Blakeney	1·49	„	Tiree, Cornaigmore	·67
„	Swaffham	1·34	XVI.	Dollar Academy	1·71
V.	Bishops Cannings	3·29	„	Balquhidder, Stronvar.....	1·85
„	Wimborne, St. John's Hill ...	2·80	„	Glenlyon, Meggernie Castle..	1·70
„	Ashburton, Druid House..	4·22	„	Blair Atholl	1·07
„	Cullompton	2·01	„	Coupar Angus	·99
„	Lynmouth, Rock House	1·92	„	Montrose, Sunnyside Asylum.	·89
„	Okehampton, Oaklands.....	2·72	XVII.	Alford, Lynturk Manse	1·17
„	Hartland Abbey.....	2·57	„	Fyvie Castle	·75
„	Probus, Lamellyn.....	2·15	„	Keith Station ..	2·15
„	North Cadbury Rectory.....	2·51	XVIII.	Rothiemurchus	1·36
VI.	Clifton, Pembroke Road.....	3·07	„	Loch Quoich, Loan	3·50
„	Ross, The Graig	3·36	„	Drumnadrochit	1·30
„	Shifnal, Hatton Grange.....	2·36	„	Skye, Dunvegan	·98
„	Droitwich	2·42	„	Lochmaddy, Bayhead	·86
„	Blockley, Upton Wold.....	2·72	„	Glencarron Lodge	1·31
VII.	Market Overton.....	2·33	XIX.	Invershin	1·04
„	Market Rasen	1·66	„	Melvich	1·25
„	Bawtry, Hesley Hall	1·38	„	Loch Stack, Achfary	2·12
„	Derby, Midland Railway.....	1·73	XX.	Dunmanway, The Rectory ..	2·91
„	Buxton	1·62	„	Glanmire, Lota Lodge.....	2·76
VIII.	Nantwich, Dorfold Hall	2·30	„	Mitchelstown Castle.....	1·62
„	Chatburn, Middlewood	1·71	„	Darrynane Abbey.....	3·49
„	Lancaster, Strathspey	1·23	„	Clonmel, Bruce Villa	1·96
IX.	Langsett Moor, Up. Midhope	1·78	„	Newmarket-on-Fergus, Fenloe	1·04
„	Scarborough, Scalby	1·77	XXI.	Laragh, Glendalough	1·49
„	Ingleby Greenhow	1·76	„	Ballycumber, Moorock Lodge	·57
„	Mickleton	1·70	„	Balbriggan, Ardgillan	1·44
X.	Bellingham, High Green Manor	2·83	XXII.	Ballynahinch Castle.....	1·61
„	Ilderton, Lilburn Cottage ...	1·45	„	Woodlawn	1·07
„	Keswick, The Bank	·91	„	Westport, St. Helens ...	1·06
XI.	Llanfrechfa Grange	3·65	„	Dugort, Slievemore Hotel ...	·66
„	Treherbert, Tyn-y-waun	4·68	„	Mohill Rectory	·92
„	Carmarthen, The Friary	1·74	XXIII.	Enniskillen, Portora.....	1·07
„	Fishguard Goodwick Station.	1·64	„	Dartrey [Cootehill]	·63
„	Crickhowell, Tal-y-maes.....	4·20	„	Warrenpoint, Manor House ..	1·47
„	New Radnor, Ednol	5·35	„	Banbridge, Milltown	1·22
„	Birmingham WW., Tyrmynydd	5·05	„	Belfast, Cave Hill Road	1·19
„	Lake Vyrnwy .....	...	„	Ballymena Harryville	1·03
„	Llangynhafal, Plas Draw.....	1·99	„	Londonderry, Creggan Res...	1·27
„	Dolgelly, Bryatirion.....	2·77	„	Dunfanaghy, Horn Head ...	1·83
„	Bettws-y-Coed, Tyn-y-bryn...	...	„	Killybegs	1·56

THE WEATHER OF MAY.

THE weather was generally fine and dry at the beginning of the month with occasional local thunderstorms in nearly all parts of Great Britain. On the evening of the 6th a severe storm passed across London from west to east, following a brilliantly sunny and warm day. More than 3·00 in. of rain fell in Clerkenwell, where the storm was most severe, while in the south of London there was practically none. The City streets were flooded and at West Kensington Station, on the District Railway, the water was several feet deep and traffic was suspended for some time. During a violent local thunderstorm at Leek on the following day, hail and rain amounting to 1·75 in. fell in an hour, from 5.30 to 6.30. p.m. A cold, northerly type of conditions set in over Scotland on the 11th and spread over the whole country by the 13th or 14th. On the 13th the shade maximum temperature at Oxford was only 44°, the lowest ever recorded in May, and shade minima below 30° were reported from nearly all parts of the British Isles between the 13th and 15th, and fruit trees were much damaged by the frost. At Balmoral the value was 21°, and at Eskdalemuir 22°. The 13th was also characterized by very widespread rain, with some snow in the Midland Counties of England and over Scotland. The falls were heaviest in the south-east of England, where the rain was practically continuous for 24 hours, and exceeded 2·00 in. at many stations in Sussex. At Upton Wold the snow fell to a depth of 6 inches. A depression off the south of Ireland on the 17th extended slowly eastward, and occasioned heavy rain over the southern counties of England. Many widely distributed stations had more than 1·50 in., and in Hampshire the fall was only just below 2·00 in. at several places and exactly this amount at Facombe Manor. Anticyclonic conditions set in generally about the 20th and the weather was fine and dry to the end of the month. Practically no rain fell over the south of England and the greater part of Ireland. Temperature rose considerably and was above 75° in nearly all parts of the British Isles and reached 80° at Fort William and Gordon Castle on the 24th, and at Salisbury on the 25th and 26th. A sudden drop in temperature occurred on the 27th, and on the following four days frosts occurred in many parts of England, causing injury to fruit and vegetable crops.

The rainfall of the month was very unevenly distributed. In England it was heaviest in the south and south-east, there being many areas with more than 4 in. south of the Thames. Less than 2 in. fell along the whole of the east coast north of the Wash and a remarkable feature was that the fall only just exceeded this amount in what is normally the wettest part of the Lake District. Over Wales the fall was about the average. In Scotland the rainfall was very light, being less than 2 in. over practically the whole country, and less than an inch in the north-east. In Ireland less than an inch fell over a great part of the central area and less than 2 in. everywhere, except in the exposed districts of the west and in the south and east. Over the Kingdom as a whole, the general rainfall expressed as a percentage of the average, was as follows: England and Wales, 101; Scotland, 43; Ireland, 62; British Isles, 74.

The duration of sunshine was everywhere considerable. The following amounts are reported: London (Camden Square), 201·0 hours; Margate, 217·0 hours; Worthing, 233·3 hours; Totland Bay, 242·0 hours; Copdock, 236·0 hours; Sidmouth, 205·3 hours; Ashbourne, 226·7 hours; Matlock Bath, 204·5 hours; Southport, 258·9 hours; Hull, 151·4 hours; Haverford-west, 255·6 hours; Paisley Observatory, 209·0 hours; Loch Stack, 225·8 hours.

In London there were several dull days in the first half of the month, but on the whole the weather was fine, sunny and warm. No rain fell after the 18th. Mean temperature at Camden Square 55°·6, or 1°·6 above the average. Duration of rain, 52·7 hours. Evaporation, 2·90 in.

Climatological Table for the British Empire, December, 1914.

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.		Cloud.
	Temp.	Date.	Temp.	Date.										
London, Camden Square	55°6	2	28°	23	47°0	37°6	39°3	89	75°8	24°7	6·34	24	8·2	
Malta	66·2	16	49·8	28	58·2	54·3	...	89	140·0	...	1·07	11	2·2	
Lagos	91·0	4	69·0	29	88·0	75·2	72·6	73	157·0	64·0	·67	5	5·3	
Cape Town	85·4	31	46·5	21	75·3	56·9	54·8	66	...	...	·51	6	3·9
Natal, Durban ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Johannesburg	81·4	31	54·1	30	74·8	57·2	58·6	86	...	52·0	7·69	17	6·6	
Mauritius	88·7	25	64·5	18*	83·9	69·8	65·5	69	...	58·7	1·98	16	5·5	
Bloemfontein	90·7	31	53·2	25	82·5	60·4	56·1	59	...	...	7·00	7	4·3
Calcutta... ..	82·7	11	51·3	24	78·3	57·6	55·6	67	...	45·9	1·20	1	1·8	
Bombay... ..	89·9	2	65·6	26	85·1	70·2	64·7	66	136·2	52·9	...	...	2·0
Madras	89·7	21	60·6	24	85·2	70·8	68·1	76	154·5	56·9	·77	4	4·2	
Colombo, Ceylon	90·5	3	70·0	25	86·0	73·1	73·4	82	163·1	64·7	2·92	16	7·2	
Hongkong	75·6	5	52·3	13	67·7	60·5	55·9	73	...	...	·72	5	7·5
Sydney	101·4	12	58·8	9	79·7	65·8	62·0	74	157·1	50·0	7·15	16	6·5	
Melbourne	88·8	25	52·2	20	74·3	58·1	54·9	67	147·6	45·6	3·21	15	6·2	
Adelaide	102·8	24	51·9	8	84·5	61·5	53·2	49	155·2	43·0	·58	5	4·8	
Perth	96·6	16	51·3	23	81·7	61·4	56·3	65	165·6	42·3	·47	5	3·3	
Coolgardie	104·8	11	50·0	24	88·8	63·2	55·5	49	180·0	46·0	·65	5	4·6	
Hobart, Tasmania	78·8	10	42·9	7	64·5	51·4	46·5	64	147·0	32·3	2·69	14	6·8	
Wellington	72·0	19	42·0	2	63·4	51·6	48·3	72	144·8	29·2	1·99	11	6·1	
Auckland	74·0	7	48·5	20	67·2	53·9	51·9	73	147·0	43·0	1·77	12	6·0	
Jamaica, Kingston	91·9	24	70·2	26	89·1	71·8	68·9	77	...	...	·23	5	3·3
Grenada	86·0	10	68·0	30	83·5	74·1	...	79	136·0	...	5·56	23	4·0	
Toronto	53·8	2	-7·2	26	31·5	20·0	19·5	84	93·8	-20·0	1·76	13	6·7	
Fredericton	47·0	1, 14	-22·5	25	27·6	8·6	...	81	...	...	1·96	7	3·9
St. John, N.B.	49·5	2	-10·3	26	30·9	15·8	17·4	72	...	...	2·59	8	4·0
Alberta, Edmonton	·7	31	-21·0	26	16·2	1·5	...	93	82·8	-30·0	1·10	17	6·8	
Victoria, B.C.	49·1	7	29·9	12†	43·0	36·2	...	87	...	...	·59	10	6·4

* and 19.

† and 13.

Johannesburg.—Bright sunshine 238·0 hours.

Mauritius.—Mean temp. 1°·2, dew point 2°·4, and R 2·88 in. below averages. Mean hourly velocity of wind 12·3 miles, or 1·5 miles above average.

Bloemfontein.—Rainfall highest for December ever recorded.

COLOMBO, CEYLON.—Mean temp. 79°·6 or 0°·4 above, dew point 1°·6 above, and R 2·08 in. below, averages. Mean hourly velocity of wind 5·9 miles.

HONGKONG.—Mean temp. 64°·0. Mean hourly velocity of wind 10·7 miles. Bright sunshine 111·4 hours.

Melbourne.—Mean temp. 1°·6 above average. Mean temp. for the year 59°·9.

Adelaide.—Mean temp. 1°·9 above, and R ·39 in. below, averages.

Coolgardie.—Temp. of air 0°·2 below, and R about normal.

Hobart.—Temp. of air 2°·5 below, and R ·77 in. above, averages.

Wellington.—Mean temp. 2°·8 below, and R 1·34 in. below, averages. Bright sunshine 273·5 hours.

Auckland.—Cool, cloudy, windy and dry. Rainfall, mean temp. and sunshine under average.

ALBERTA, EDMONTON.—Cold, damp, snowy and cloudy. Frosts every day except the last.