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THE HIGH TEMPERATURE OF THE TWELVE MONTHS, MAY, 1911, TO APRIL, 1912.

The extraordinarily high temperature records in London which have been remarked upon in these pages during the past twelve months have been maintained through April, and for the first time in the Camden Square record there has been a run of twelve consecutive months in each of which the mean temperature has been above the average of fifty years. The longest previous successions of months with mean temperature above the average were the nine months, November, 1895, to July, 1896, and the eight months, February to September, 1868. At the opposite extreme there was a succession of fourteen months with temperature below the average for each month from September, 1887, to October, 1888, and one of fifteen months from November, 1878, to January, 1880; every month of the year 1879 having had a mean temperature below the average.

In 1911 the month of April was the only one below the average; no other year in the record has had less than three months below the average temperature.

The mean temperature for the twelve months, May, 1911, to April, 1912, is 53°·1, or 3°·1 above the average. The nearest approach to this figure for any twelve successive months in the past 54 years is 52°·8 for the period, March, 1868, to February, 1869; the warmest calendar year was 1868 with 52°·3, or 2°·3 above the average, 1911 coming next with 52°·2, or 2°·2 above the average.

Five months in the twelve between May, 1911, and April, 1912, show an excess over the average of 4° or above, and three of these stand out as the warmest months of their name in the record. In May, 1911, the mean temperature was 58°·0, or 4°·0 above the average, and the highest for May in the record excepting only 1868 and 1893. The excess in June was not remarkable, but July proved to be the warmest month ever recorded at Camden Square. This was mainly due to the uncommonly high maxima, the mean shade maximum of the month being 81°·7. In this month temperature reached 80° on 20 days and rose to 90° on 5 days. August was also exceptionally hot, the mean temperature, 68°·2, being 5°·9 above the average and the highest on record for August. In this month shade temperature readings of 80° or more were observed on 14 days, reaching 90° on 4 days and rising to the unparalleled maximum of 97°·1 on August 9th. The excess of the mean temperature over the average in September was due to the continuance of the summer conditions into the first half of the month, 8 of the first 12 days having a shade temperature of 80° or above. Temperature was only slightly in excess in October and November, but in December the excess amounted to 5°·0. December was, in fact, warmer than November, the mean temperature of which was 44°·4 as against 44°·7 in December. The mean temperature excess in January was only 1°·7, but the excess in February was remarkable. The most severe frosts of the winter occurred in the first week, but the unusual warmth of the latter part of the month raised the mean temperature 3°·6 above the average. March was also very remarkable for its warmth, both the mean temperature, 46°·5, and the mean shade minimum, 40°·5, being the highest on record for March. There were no frosts in the screen, which also constitutes a record for March. The excess of 2°·1 over the average in the mean temperature of April was chiefly due to the high shade maxima in the latter half of the month.

The following table shows the mean temperature, mean shade maxima, and mean shade minima for each of the twelve consecutive warm months, with the difference from the average. The record values are given in heavy type.

Temperature of the twelve months, May, 1911—April, 1912.

MONTHS.	MEAN TEMPERATURE.		MEAN SHADE MAX.		MEAN SHADE MIN.	
	Actual.	Diff. from Aver.	Actual.	Diff. from Aver.	Actual.	Diff. from Aver.
May, 1911	58°·0	+4°·0	69°·2	+4°·6	47°·9	+3°·3
June, ,,	61·4	+1·3	71·8	+1·0	52·2	+1·5
July, ,,	**69·0**	**+5·5**	81·7	+7·4	56·9	+2·7
August, ,,	**68·2**	**+5·9**	**80·8**	**+8·1**	**57·9**	**+4·5**
September, ,,	60·4	+2·7	73·0	+5·6	50·0	+1·3
October, ,,	50·4	+0·3	58·1	+0·4	43·9	+0·2
November, ,,	44·4	+0·9	49·9	+0·8	39·3	+1·1
December, ,,	44·7	+5·0	49·3	+5·0	39·5	+4·5
January, 1912	40·2	+1·7	44·2	+0·9	36·1	+2·3
February, ,,	43·3	+3·6	48·7	+3·2	38·0	+3·3
March, ,,	**46·5**	**+4·4**	53·3	+3·3	**40·5**	**+5·1**
April, ,,	50·2	+2·1	61·1	+3·2	40·0	+0·3
May, 1911—April, 1912	**53·1**	**+3·1**	**61·8**	**+3·7**	**45·2**	**+2·5**

TEMPERATURE OBSERVATIONS DURING THE SOLAR ECLIPSE OF APRIL 17th.

IDEAL atmospheric conditions prevailed in London for observing the solar eclipse of April 17th, and during the time of the moon's passage before the sun a series of meteorological observations at Camden Square was made by Mr. H. E. Carter, acting under the instructions of Dr. H. R. Mill.

The eclipse, which was of magnitude ·92, began at 10.51 a.m., had its greatest phase at 0.11 p.m., and ended at 1.30 p.m. The meteorological observations were taken at intervals of 10 minutes from 10.40 to 11.50, at 5-minute intervals for the succeeding 40 minutes, and again every 10 minutes until 1.30 p.m.

The observations showed that there was a depression of 4°·8 in the air temperature on a Glaisher stand due to the shutting off of the sun's rays, while a thermometer laid on the grass and unsheltered from the sun showed a depression of 23°·8, and a black-bulb thermometer in vacuo showed a drop of 39° in an hour and a quarter. The lowest temperature in each case occurred simultaneously at 0.15 p.m., but the grass thermometer and solar radiation thermometer showed a tendency to fall earlier than the shade thermometer. An interesting feature of the curves is the slight depression at 11 o'clock, which is followed by a temporary recovery. At this time cumulus clouds were observed passing before the sun, and no doubt produced the irregularity in the fall of temperature. From 11.10 onwards the sky was practically cloudless, and the eclipse could be very clearly seen through a piece of smoked glass until the final stage. At 11.40 there was an appreciable lessening of the sun's light, and it was possible to see the eclipse with the naked eye. From about noon to 0.20 p.m., during the greatest phase, the sky assumed a dull leaden appearance, such as frequently heralds the approach of thunderstorms, and in the subdued light deronicum flowers in the garden showed a tendency to close their petals. The humidity of the atmosphere throughout was practically constant at 62 per cent., the 15 observations made between 11.20 a.m. and 1 p.m. showing a variation of only 2 per cent.

The readings of a Wilson Radio-Integrator were of special interest. The amount of liquid evaporated by the sun in the first ten minutes was 0·5 unit, and thenceforward there was a marked falling off in the amount until 11.55 a.m. when evaporation appears to have ceased until 0.30 p.m., after which a gradual rise took effect. The sunshine, as recorded by a Campbell-Stokes instrument, showed a gradual thinning before and thickening after the greatest phase, and a complete break in the record from noon until 0.20 p.m.

The observations made at Camden Square were as follows :—

Time.	Shade Temperature.		Humidity.	Temp. in Sun on Grass.	Solar Radiation Temp.	Radio-Integrator.
	Dry Bulb.	Wet Bulb.				
			per cent.			units.
10.40	57°·2	52°·6	71	74°·2	94°·4	0·5
.50	57·9	52·5	69	74·2	95·2	0·5
11. 0	57·3	52·0	69	64·1	88·8	0·4
·10	57·7	52·0	67	71·5	89·3	0·4
.20	58·3	51·7	63	68·1	89·4	0·4
.30	57·2	50·2	61	69·5	85·1	0·4
.40	57·0	50·1	61	64·6	77·2	0·3
.50	55·7	48·8	61	59·5	69·5	0·2
.55	55·2	48·7	62	57·0	65·6	0·1
12. 0	54·9	48·3	61	55·0	62·2	0·0
. 5	54·3	47·9	62	52·3	58·6	0 0
.10	53·7	47·6	63	50·5	56·2	0·0
.15	53·5	47·3	63	50·4	55·8	0·0
.20	53·6	47·3	62	50·5	57·5	0·0
.25	53·6	47·4	63	53·5	60·3	0·0
.30	53·9	47·6	62	56·1	64·0	0·0
.40	54·4	48·2	63	60·5	69·7	0·1
·50	55·0	48·6	63	65·0	77·1	0·0
13. 0	55·9	49·2	61	68·4	84·4	0·1
.10	56·8	49·6	59	75·3	89·8	0·2
.20	57·6	50·2	59	77·5	94·5	0·3
.30	58·1	50·7	59	78·3	96·6	0·4

Mrs. H. R. Mill, at Mill Hill, observed the rise of temperature after the maximum of the eclipse as follows :—

Hour ...	12.10	12.20	12.30	12.40	12.50	13.0
Dry bulb ...	51°·8	51°·2	51°·4	52°·3	53°·4	53°·7
Wet bulb ...	44°·0	43°·8	44°·2	45°·0	45°·8	45°·8
Grass ...	44°·8	44°·9	46°·2	50°·1	58°·6	60°·5

Mr. J. B. Jordan, at Hythe, made observations at intervals of a quarter of an hour as given below, the temperatures in sunshine being apparently taken by a bright-bulb thermometer freely exposed to the air. It will be observed that the shade temperature dropped 8° and recovered 9°·25 by 1.30 p.m ; the sky was clear throughout.

Air Temperatures recorded at Hythe, Kent.

Hour.	In Shade.	In Sunshine.	Hour.	In Shade.	In Sunshine.
10.00	57°	67°	12.15	51°	50·5
.15	58	68	.30	51·5	52
.30	58·75	69	.45	53·5	58
.45	59	69·5	13.00	55·5	63
11.00	59	69	.15	58	69·5
.15	58·75	68·25	.30	60·25	73
.30	57	65	.45	60	72·5
.45	55·5	61	14.00	59·75	71
12.00	52·75	54	.15	59	70

Mr. W. W. Bryant has kindly furnished us with the following series of observations taken at the Royal Observatory, Greenwich, in the Magnetic Pavilion enclosure. The intervals of time are closer than in the Camden Square series, and the result differs somewhat remarkably. The fall of shade temperature was 6°·2 as compared with 4°·8 at Camden Square, but the rise to 1.30 was only 4°·1 as compared with 4°·6 at Camden Square. The black-bulb temperature at Greenwich fell 47°·2 as compared with 38°·6 at Camden Square, and the rise to 1.30 amounted to 43°·2 as compared with 40°·8 at Camden Square.

Observations in Magnetic Pavilion Enclosure, Greenwich.

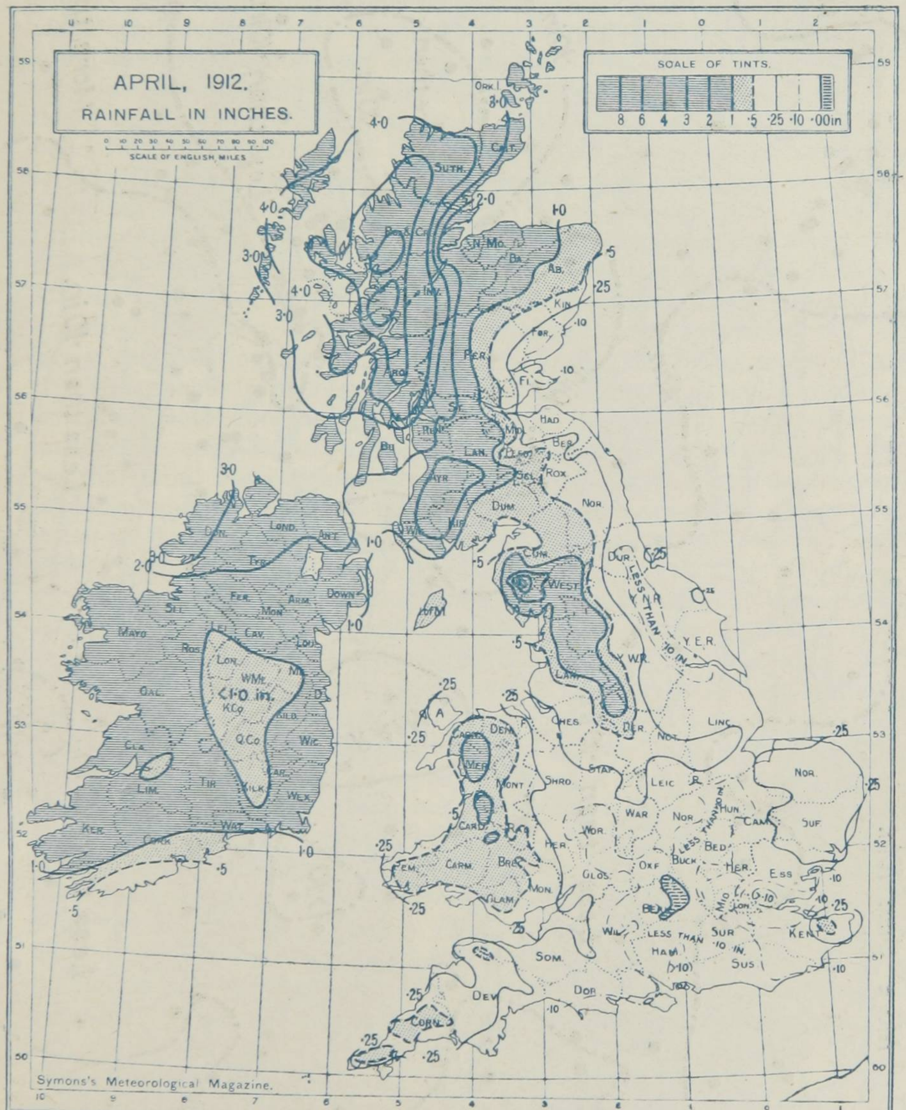
Hour.	Dry Bulb.	Wet Bulb.	Black Bulb in Vacuo.	Hour.	Dry Bulb.	Wet Bulb.	Black Bulb in Vacuo.
	°	°	°		°	°	°
10.35	57·1	49·7	75·8	12.15	52·3	42·5	57·0
.37½			80·9	.17½			56·8
.40	57·5	48·5	87·9	.20	52·0	42·7	56·8
.42½			92·8	.22½			57·5
.45	57·5	47·0	97·5	.25	52·3	42·5	58·6
.47½			98·8	.27½			59·6
.50	57·3	47·3	100·0	.30	52·4	42·7	60·8
.52½			100·3	.32½			62·1
.55	58·2	48·0	101·6	.35	52·5	42·9	63·9
.57½			102·3	.37½			65·2
11. 0	57·8	47·6	103·8	.40	53·2	43·7	67·7
. 2½			104·0	.42½			69·8
. 5	57·4	47·0	101·7 } Wind freshening.	.45	53·2	43·0	71·0
. 7½			97·8 }	.47½			73·0
.10	57·3	46·8	97·3	.50	53·6	43·5	75·2
.12½			96·9	.52½			77·1
.15	57·3	46·1	96·6	.55	54·0	43·7	79·3
.17½			96·6	.57½			81·7
.20	56·6	45·6	95·5	13. 0	54·4	43·9	82·8
.22½			95·0	. 2½			84·6
.25	56·3	45·7	93·3	. 5	54·5	44·0	86·6
.27½			91·9	. 7½			88·2
.30	56·0	45·7	88·5	.10	54·9	44·4	89·9
.32½			86·8	.12½			91·4
.35	55·5	45·3	81·9	.15	55·0	44·1	92·9
.37½			81·2	.17½			94·3
.40	55·8	46·1	79·2	.20	56·1	45·4	95·0
.42½			78·2	.22½			97·0
.45	54·9	44·9	75·8	.25	56·2	45·3	98·0
.47½			75·1	.27½			99·3
.50	54·5	44·6	73·1	.30	56·1	45·4	100·0
.52½			71·5	.32½			100·5
.55	54·1	44·3	69·7	.35	56·2	45·4	101·0
.57½			67·0	.37½			100·5
12. 0	53·5	44·0	65·9	.40	56·6	46·0	101·3
. 2½			64·0	.42½			101·9
. 5	53·1	43·0	61·9	.45	56·7	46·0	101·3
. 7½			60·5				
.10	52·4	42·8	59·0				
.12½			57·8				

THE RAINFALL OF APRIL 1912.

April was an exceptionally wet month in the west of Scotland, practically the whole of which, north of the Clyde, had more than 4 inches of rain, large areas more than 6 inches, and a few wet spots more than 10 inches. A record of 25 inches from Loan, Invernessshire, has been received, and while it is difficult to assign bounds to the possible this value seems beyond the probable and we are investigating the circumstances before accepting the figure. The east of Scotland on the contrary was very dry, having less than 1 inch for the most part, a broad margin round the coast, south of Aberdeen, with less than half an inch and a pretty large area round the Firth of Tay with less than one-tenth of an inch for the whole month, no rain at all being reported from Montrose. The distribution of rainfall thus intensified the natural contrast between east and west.

In Ireland the rainfall was little under the average for the month; very little of the country had less than 1 inch of rain, or more than 3.

In England and Wales April was extremely dry, and the drought was widespread throughout the length and breadth of the land. Indeed, so far as we can judge from a hasty comparison of former dry months, no month in the past sixty years has had less rain in England except February, 1891. We may say with confidence that no previous April since the establishment of the British Rainfall Organization has been so dry. We have accordingly supplemented our usual treatment of monthly rainfall by a map of the British Isles showing the isohyetals of ·50, ·25 and ·10 in. as well as the inch lines. The effect is seen most remarkably in our usual map of the Thames Valley, on which no higher isohyetal appears than ·25 in. and the greater part of the area lies within the ·10 in. line, while from Maidenhead to Wallingford the valley of the Thames and the section of the Chiltern Hills to the north seem to have had no rain at all throughout the month. The map of the British Isles once more brings out in extreme prominence the tendency for the north-west and south-east to deviate to opposite sides of the average. We are overwhelmed with letters from Observers in all parts of the dry area, and these have materially supplemented the ordinary monthly returns used in compiling the maps, but to our regret we are unable to deal more fully with the communications. As regards London, we have taken some trouble to ascertain whether there has ever been so dry an April since records were started. At Camden Square, since 1858, no April has had so little rain as in 1912 (·04 in.), and only one month, February, 1891, with ·01 in., had a lower figure. The record at Greenwich Observatory and other London records go farther back, and there was no year back to 1781 without one or more rainfall stations reporting in the London district. Records are also available for 1774-79 and 1729-35, and in all these there were only two Aprils (1817 and 1840) which had less than ·10 in. of rain in London, and these had each ·06. Twenty months altogether had less than ·10 in., and of these only five had less than ·04 in.


APRIL, 1912.
RAINFALL IN INCHES.
SCALE OF ENGLISH MILES
SCALE OF TINTS.
8 6 4 3 2 1 ·5 ·25 ·10 ·00in
LESS THAN ·10 IN.
Symons's Meteorological Magazine.

THAMES VALLEY RAINFALL — APRIL, 1912.

Symons's Meteorological Magazine.

Watershed of River Thames above Teddington, and River Lee above Feildes Weir.

Rainfall Stations reporting.

Isohyetals.

THE WEATHER OF APRIL.

By FRED. J. BRODIE.

At the beginning of the month a strong northerly wind blew in the rear of a rather deep barometrical depression which had passed eastwards across the United Kingdom at the close of March. The weather was, therefore, cold and changeable, with showers of hail, sleet, or snow in most districts; and on the night of the 1st a sharp frost was experienced, the sheltered thermometer falling to between 3° and 5° below the freezing point at many inland stations, and to 10° or 12° below it on the surface of the grass. With the advance of a large anticyclone from the Atlantic the weather improved, and temperature rose steadily to about its normal level for the time of year. On the 2nd the anticyclone extended over practically the whole of western Europe, but soon receded in a southerly direction, and a mild current of air from west and south-west extended over the entire kingdom. On the 5th and 6th the thermometer rose above 65° in many parts of England, a maximum reading of 68° being recorded at Greenwich and in some parts of our eastern counties, and a reading of 69° at Geldeston and Clacton-on-Sea. On the 7th the southern anticyclone spread northwards, but on the 8th (Easter Monday), the weather in all but the southern districts was affected by a depression of considerable intensity which passed swiftly eastwards along the north of Scotland. During its progress strong gales from W. and N.W. were experienced, the wind at Aberdeen reaching, in gusts, 71 miles per hour. For a time the wind remained in a north-westerly quarter with cool but improving weather, and on the nights of the 10th and 11th sharp frosts were experienced very generally, the thermometer in the screen falling to 20° at Balmoral and West Linton. On the grass a reading of 16° was recorded as far south as Kew, and a reading of 14° at Birmingham and Newton Rigg, Cumberland. After the 11th a large anticyclone extended over the country from the Atlantic with warm days, but with cold nights and sharp ground frosts on the early mornings of the 17th and 18th. On the 18th the exposed thermometer fell to 22° at Greenwich, to 21° at Wisley and Rauceby, and to 20° at Birmingham. Between the 18th and 20th the anticyclone receded to the eastward, and with a large depression over the Eastern Atlantic the wind drew into S. or S.E., with a decided rise of temperature. The highest readings of the month were recorded between the 19th and 21st, when the thermometer rose to 70°, or a trifle above it in many parts of the country (as far north even as central Scotland), and touched 73° at Camden Square. After the 21st the anticyclone remained in possession of the situation until the end of the month. The wind blew mainly from points between north and east, so that the thermometer in the daytime failed to rise to any high level, though with a clear sky the nights were cold. The lowest night temperatures occurred at the close of the month, chiefly between the 28th and 30th, when the sheltered thermometer fell to 4° or 5° below the freezing point in several parts of Great Britain. On the surface of the grass readings below 20° were registered very commonly.

The mean temperature of the month was everywhere above the average, and in London the mean of the daily maxima was the highest recorded in April since 1894. Bright sunshine was unusually prevalent. At Westminster the total duration, 215 hours, was 101 in excess of the normal, and although slightly smaller than in 1909, was larger than in any other April of the 29 years 1883—1911.

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on Wednesday evening, April 17th, at the Institution of Civil Engineers, Great George Street, Westminster, Dr. H. N. Dickson, President, in the chair.

Mr. J. E. Clark and Mr. R. H. Hooker presented the "Report on the Phenological Observations for 1911." For the past twenty years this report has been prepared by Mr. E. Mawley, but as he is no longer able to do so, the work has been taken over by Messrs. Clark and Hooker. For the present the observations are being continued on the same lines as hitherto. The outstanding features of the weather during the past year were the severe cold of early April; the summer of abnormal dryness, heat and sunshine; and the continuous rainfall when once the drought thoroughly broke about mid-October. After referring to the flowering of plants, the appearance of insects, and the song and migration of birds, the authors dealt with the yield of farm crops, and showed that potatoes and wheat were above the average, but most of the other crops were below the average, especially beans, roots and hay. Throughout Great Britain harvest began generally a fortnight to three weeks earlier than usual, and the duration was very short, the termination of the harvest being fully a month earlier than the average.

An interesting discussion followed, in which most of the speakers congratulated the authors on the way in which they had handled the facts in the report. Colonel Rawson and Mr. Southall referred to the great effect of sunshine upon plants. Mr. H. Mellish said that the season did not prove to have been so early as might have been expected. There was an exceptionally early harvest, but flowering plants were on the average only three to five days earlier than usual. This raised the question whether flowering was the stage which showed the full effect of the weather so well as some other stage, such as the ripening of the fruit, might do. Mr. Bayard, Mr. Bryant, Mr. Brodie, Mr. Gold and Mr. Tripp also spoke.

Mr. R. G. K. Lempfert and Mr. H. W. Braby contributed a joint paper on "A Method of summarising Anemograms." The tabulation of the hourly values of wind velocity and of wind direction as recorded by many anemometers in the British Isles forms part of the routine work of the Meteorological Office, but little has been done hitherto to summarise the tabulations. The authors have made a preliminary discussion of a few records, and in this paper they gave the results of the total run and the mean velocity in the form of wind-roses for four stations which had been selected as being typical of the extreme north, the extreme south, the east coast, and the west coast of Great Britain, viz., Deerness, Scilly, Yarmouth and Holyhead. The period dealt with was the twenty years, 1891–1910, and the wind-roses were for the months of January, April, July and October.

Mr. Hooker, Mr. Bayard, Colonel Rawson, Mr. Gold and Mr. Tripp took part in the discussion, and Mr. Lempfert replied.

The following gentlemen were elected Fellows of the Society:— Lieut. F. C. Cadogan, R.N., Capt. H. D. Groom, Capt. J. R. Moore, Mr. W. G. Reed, Mr. W. E. Rees, Mr. D. M. Sen and Dr. A. E. R. Weaver.

At the Meeting of the Royal Meteorological Society on February 21st, Mr. S. Skinner read a paper on "The Drosometer; an instrument for measuring the amount of Dew." This consists of a hemispherical glass vacuum-jacketed vessel, of the type designed by Sir James Dewar for holding liquid air, which is placed in a box having a circular aperture in the top, through which the cup is exposed, with its rim flush with the exterior surface of the box. When this is exposed to the sky the glass radiates and cools until dew is deposited on the interior of the hemispherical cup. The cup has a diameter of 11·2 centimetres, and therefore exposes a virtual surface aperture of 98 square centimetres to the sky. As the vacuum at the back of the cup is an exceedingly good non-conductor, it follows that the heat which is lost by radiation from the inner surface of the cup must be drawn from the air in the cup, and as soon as this is reduced to the dew point, moisture begins to form on the glass. As the dew separates, the latent heat of the water warms the inner glass surface, and the air from which the dew has been taken. This heat is removed by further radiation from the cup, and in this way the air in the cup gradually becomes colder and drier. If now fresh air is brought in, that will go through the same process, and will add to the quantity of water collected in the cup. In the morning, after an exposure during a clear night, the small drops separated on the glass have run together, and a circular pool is found at the bottom. To measure the volume of water in this circular pool, the author takes a pair of dividers and opens them until they just stretch across the diameter of the pool. With the aid of a curve which had been constructed by plotting diameters of the pool when measured quantities of water were run into the cup, it is possible to reduce the measurements to cubic centimetres. The cup is generally exposed at sunset and taken in in the morning before the rays of the rising sun have reached the place where it stands. A rain gauge is placed by the side of the drosometer, and consequently the presence of rain in any appreciable quantity can be recognised at once.

IMPRESSIONS OF THE ARGENTINE METEOROLOGICAL SERVICE.

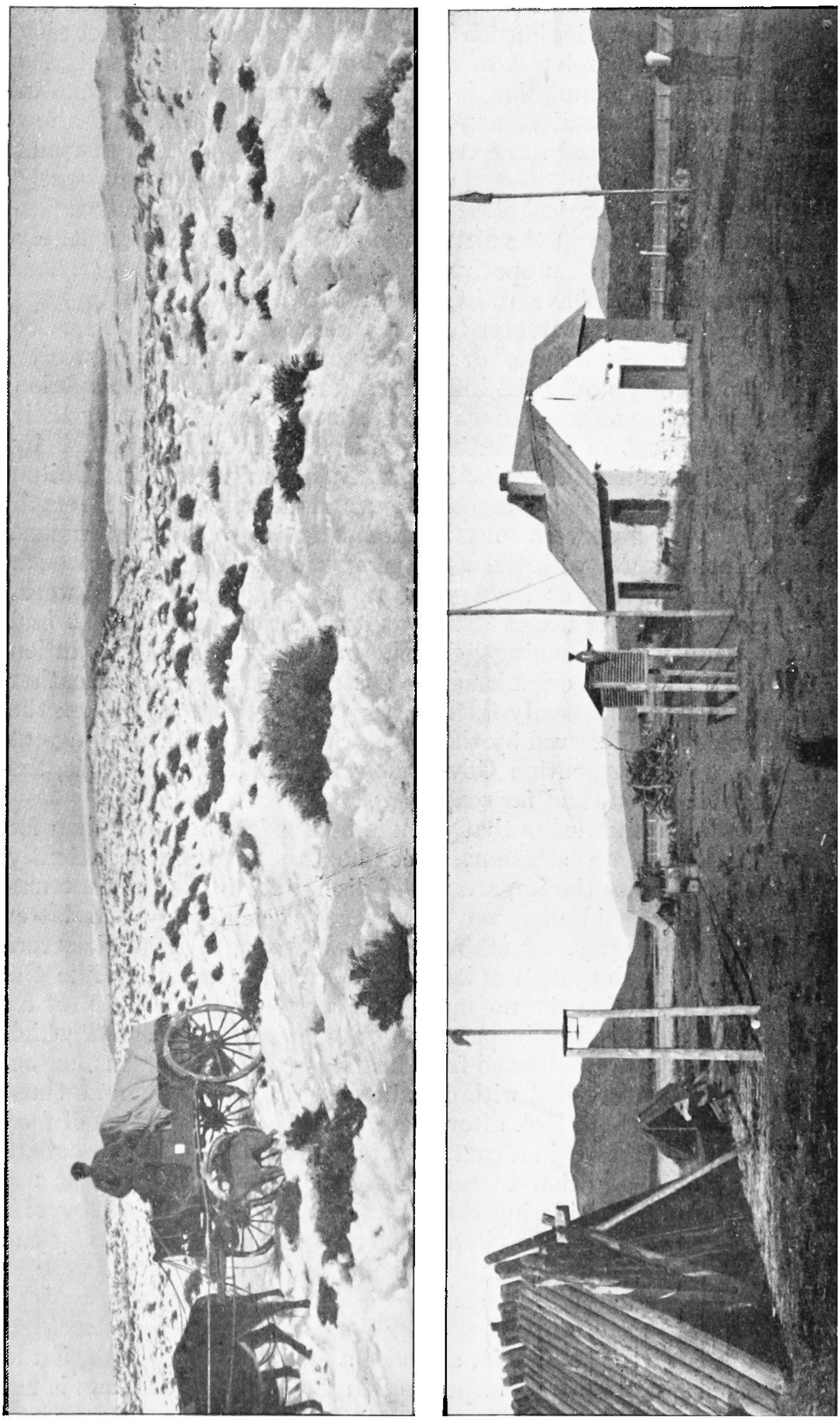
By THE EDITOR.

A RECENT visit to South America, gave us an opportunity of seeing something of the amazing development of the natural resources now going on in the southern republics and in Argentina in particular. There one learns at least how climate dominates the exploitation of a country. There is probably no part of the world in which a knowledge of the climate is of smaller practical importance than in western Europe. This arises mainly from the fact that the modes of life, the methods of agriculture, and the supply of power have all been imperceptibly moulded by the climatic environment until they have come into nearly complete adjustment with the natural conditions, generations of practical experience having dictated the "rules-of-thumb" by which the work of daily life is best carried on. Thus it is only in exceptional cases of destructive gales, sudden floods, or prolonged droughts, or when a source of water supply for a great community has to be found, that practical people are forced to recognise the necessity of detailed scientific study of the factors of climate. But for such occasions, the study of meteorology would be looked on merely as a hobby, like stamp-collecting. In a new country, where an alien and recently introduced population is engaged in developing the natural resources of a vast region in which the sharpest climatic contrasts occur and where there is no body of inherited practical experience to draw upon, the systematic study of climate becomes a matter of such urgent public importance that it has forced itself on the attention of communities who care little for pure science. In such a country there is no body of leisured and enlightened public to whose voluntary efforts recourse can be had as in the British Isles, and to a less but still an important degree, in North America, and thus what information is to be obtained must be organized by government departments.

The interesting article in which Mr. Walter G. Davis the director of the Argentine Meteorological Office described his department in our last number, stated the actual conditions of a service which in some respects is the most remarkable in the world. We have pleasure in being in a position to supplement his facts by a few comments from personal observations presenting a point of view from which his modesty excludes him.

The southern countries of South America are of insignificant breadth from east to west, but of enormous length from north to south, spanning nearly half the tropical and the whole temperate zone almost from the equator to the edge of the Antarctic regions, and the whole scale of altitude from sea-level to the summits of the Andes above 20,000 feet. Chile presents only the western slope of the Andes and the Pacific coast-line making the treatment of its climatology remarkably simple; but Argentina has to do with a vast low-lying plain between the eastern slope of the Andes and the coast-line on the Atlantic. For a complete view of the climatic conditions of temperate South America both are required; but the heavier burden falls on the Argentine. It is not easy for a European meteorologist to realize how heavy this burden is, for the distribution of population is even more unsymmetrical than in South Africa or Australia, so great is the concentration in the few large towns, so scattered the settlers upon the land. In all new and rapidly developing countries the class which contributes most largely to voluntary meteorological observations, and which alone makes possible the minute study of the distribution of rainfall, is almost entirely absent. This class in Europe and especially in the British Isles consists of people who have retired from active work, or who have sufficient means and character to live a life of unpaid public service humorously termed "leisure," or who are possessed of sufficient wealth and are sufficiently under the influence of an educated public opinion to maintain estates on which such observations are carried out by their employees as part of the routine. This class is supplemented by educational and scientific institutions, and in a country like the United Kingdom leaves little but organization and the provision of a small number of paid observers for exceptional duties to the Government Department charged with the national study of weather, or to such voluntary institutions as have grown up to supplement official work. In the new countries, where leisure and education have not yet had the opportunity of becoming general, practically the whole burden of providing as well as organizing the observations on which a weather service depends necessarily falls on the Government, and when the Government is well served by the director responsible for carrying out this work, as the Argentine Government is served by Mr. Davis, the results are enormous and far reaching.

It is common knowledge that work is better done for love than for money, and that an amateur, once he has become sufficiently instructed to realise the importance of discipline, is far more trustworthy than a paid observer, however conscientiously the latter desires to earn his pay. A staff of several thousand paid observers requires a thorough system of inspection, and, in a country like the Argentine, inspection is no mere holiday task. One trip of an Argentine meteorological inspector in Patagonia, particulars of which we heard, involved an absence from head-quarters of thirteen months, during which he travelled with a train of thirteen mules and three peons, or labourers, to look after them, carrying about 2 tons of food and camping materials in a cart, at a total expense of 4,000 dollars (about £350) in addition to salaries. The cost certainly does not appear excessive, considering the time spent and the distance covered. We are able to give two photographs (Figs. 1 and 2) taken by one of the inspectors, Mr. Mackinlay (who, despite his name, has been so completely naturalized in South America, that he speaks no English), showing the mode of travelling over the snow-covered and trackless plains of southern Patagonia, and also a typical observing station in that region. The work of inspecting in the outlying districts is not



Figures 1 and 2.—Travelling in Patagonia and A Typical Meteorological Station.

without risk, and Mr. Davis mentioned one occasion on which a mule carrying six Fortin barometers was lost by falling over a precipice while he was making his way along a difficult track in the Andes.

The central Meteorological Office in Buenos Aires, under Mr. Davis, is continually expanding the sphere of its utility. When we were there at the end of January this year, the number of rain gauge stations in the country (in addition to 240 stations with other observations) was 1,700, but it was intended to start 600 new rain gauge stations by the end of April, bringing the total up to 2,540. As the greater number of these stations report by telegraph daily when rain has fallen, the task of checking the returns as they come in is a gigantic one. We saw in preparation a new blackboard table map of the Argentine Republic on a large scale, showing all the rainfall stations, each represented by a metal socket let into the wood, with its name printed by the side. Each day's rainfall is represented on this map by a pin dropped into the socket, a distinctive colour being used for each of a selected series of ranges of amount, so that when the whole number of stations reporting has been approximately marked, a discordant colour would at once call attention to any serious discrepancy.

The unfortunate occurrence of a railway strike made it impossible for us to visit Cordoba and to see the various departments of the Meteorological Office there. Thus we missed the pleasure of meeting Professor F. H. Bigelow, who is devoting his energy to the problems of Argentine meteorology after his many years' experience in the United States Weather Bureau. We had, however, a very interesting glimpse of the meteorological observatory at Chacarita, on the outskirts of Buenos Aires, to which we were conducted by our old friend and frequent contributor, Mr. R. C. Mossman, and where we made the acquaintance of the meteorologists in charge of the observatory. The Chacarita Observatory is a small building, a view of which from the back is shown in Fig. 3. It contains the usual self-recording instruments of a first order station and a seismograph. The vanes and pressure tubes of a series of recording anemometers occupy the top of the tower, and a large enclosure, securely netted in, as shown in Fig. 4, is filled with instruments used both for routine observations and for experiment. The thermometer screen (on the right in Fig. 3) is a large louvred room similar to that at Johannesburg (see this Magazine, Vol. **40** (1905), p. 174). Special instruments are in use for experiments on solar radiation, rainfall and evaporation. The six tall cylinders shown in Fig. 5 are the special evaporimeters, on Professor Bigelow's pattern, for the measurement of the amount of evaporation from the ground in different conditions. This is an investigation of very great importance, for the agriculture of the amazingly fruitful soil of the western plains of Argentina depends entirely on irrigation from the rivers which flow from the Andes. As the irrigation channels are open streams and ditches the loss by evaporation must be great, and the determination of the amount of this loss in different

Fig. 3.

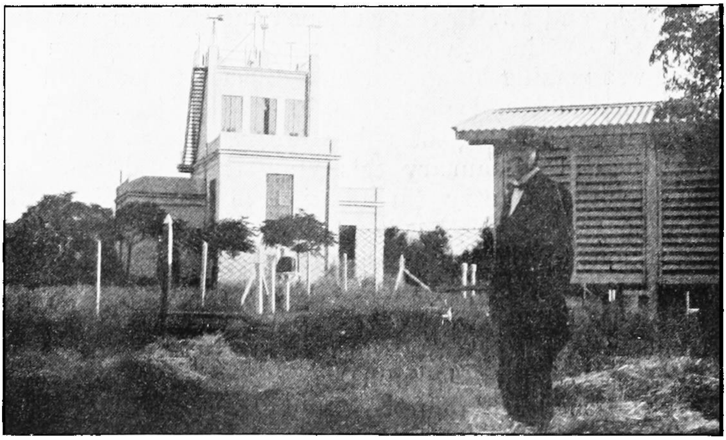


Fig. 4.

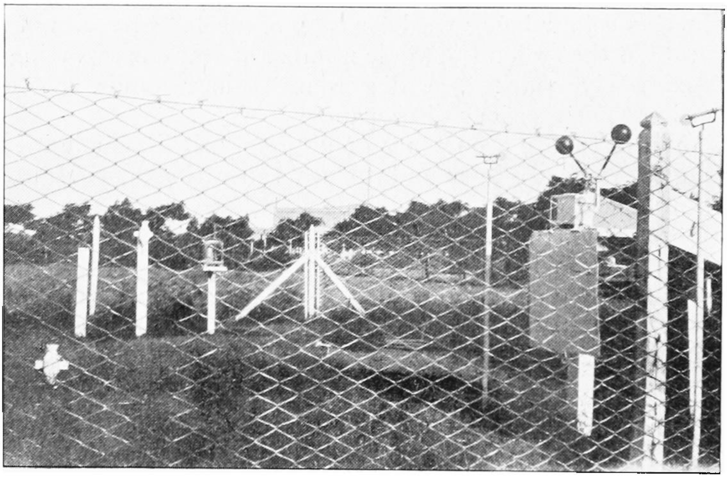
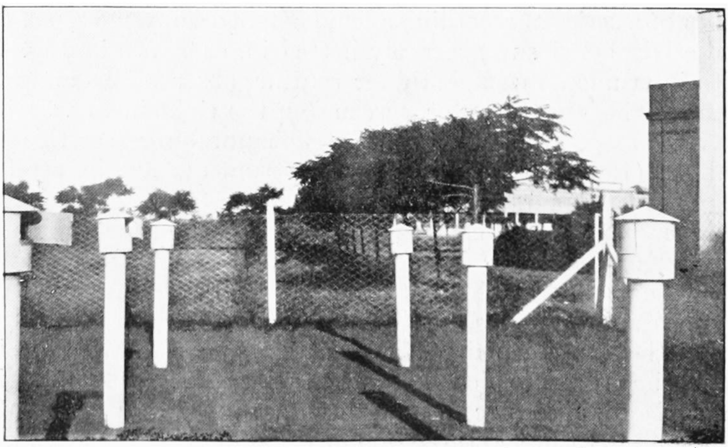


Fig. 5



Figures 3, 4 and 5.—CHACARITA OBSERVATORY AND INSTRUMENTS.

seasons and in different districts becomes an important factor in estimating the cost and the yield of new works. If, as we believe probable, the amount of evaporation is shown to be a large fraction of the season's flow, it will doubtless be found profitable to go to the expense of covering the channels or of conveying the water in pipes to the fields where it is distributed. We look forward with interest to seeing the results of the observations.

No one who sees the enthusiasm and energy with which the work of this great meteorological office is carried on, and the rapidity and certainty of the strides with which it is being extended and developed, can feel anything except the most whole-hearted admiration for all the details of plan and management. We look at it, however, not only as a whole but in its parts, and naturally we looked more closely at the part relating to rainfall measurement, and here to our regret we find a point where our criticism cannot be expressed in terms of eulogy. This point is the construction of the official pattern of rain gauge. We demur to the construction only, because although we do not like the method of exposure on a post or on the top of the thermometer screen (see Figs. 2 and 4), we allow that an exposure at 1 ft. above the ground is impracticable in a country like Argentina as it is in South Africa, but it must be borne in mind that on the average 3 or 4 per cent. must be added to the annual rainfall of Argentina or deducted from the annual rainfall of the British Isles if quantitative comparisons are to be made between the two. With regard to the construction of the rain gauge, our feeling is that the shallow rim admits of much outsplashing in heavy rain and in loss during snowfall; this is a fairly constant loss depending only on variations in the intensity of the rain or the force of the wind. But the use of a stop-cock by which to draw off the collected rain opens a door to irregular loss which must often result in discrepancies. A tap not only invites the curious passer-by to turn it and see what will happen; but even if provided with a key it is apt to work loose and drip. Large experience has shown us that the fewer pieces of metal and the fewer openings or joints the better is the gauge.

In the retrospect of our journey around and across South America the work and organization of the Meteorological Office occupies a prominent place. We owe a special debt of gratitude to Dr. Francisco P. Moreno, the eminent Argentine geographer and man of science, for guidance and hospitality which made it possible, in a very short time, to obtain a real insight into the physical and economic conditions of the country, of which the subject of this article was merely one of the incidents. The welcome extended by Mr. Davis united with Dr. Moreno's to make our visit to Buenos Aires interesting and never to be forgotten. It was something, too, to have experienced a temperature of 97° in the shade in August, 1911, and January, 1912, though the summer heat in Buenos Aires was much more trying than that in London on account of the small diurnal range leaving the night nearly as hot as the day.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

SPRING RAINFALL AND OCEAN TEMPERATURE.

YESTERDAY I saw in *The Times* a letter on the exceptional drought in April this year, signed by Dr. H. R. Mill, which suggests the following remarks. We have had about the same weather here as in England, although the effect of the drought has not been so detrimental to vegetation in our country. April is ordinarily a dry month with us, and so, unhappily, is May also. I have put forward the hypothesis that such conditions are due to the state of the Atlantic Ocean, from which our rainfall comes. As is well known, there is a change in early spring in the meteorological conditions over the Atlantic, the great depression over its northern parts then breaking up into a number of smaller depressions, which ultimately give place to higher pressure.

The character of the cyclones which pass over Sweden and Norway in May is peculiar. Our May cyclones are small systems which pass rapidly over the Scandinavian peninsula and vanish somewhere in Finland or Russia in case they have a sufficient store of energy in themselves to pass over our mountains, but this is ordinarily not the case. They seem to be formed in the lowest part of the atmosphere, and thus are liable to be intercepted by mountain chains. They bring us showers, but not the steady rain which we would wish to have at that season of the year.

Many years ago I compiled charts showing the surface temperature of the northern Atlantic in spring, and I then found that the surface temperature in May is remarkably uniform, about 8° C. (46°·4 F.) for the whole area from Iceland to the interior of the Baltic. This uniformity of temperature is a characteristic and important fact which should be noticed and studied by meteorologists and oceanographers in the interests of agriculture. If this period of uniformity of temperature extends longer than usual, or if the ocean surface assumes this temperature earlier or later in one year than in another, it may have extremely important consequences for farmers in your country as well as in ours. I may say that a "wet" spring means an increase in the value of the harvest of Sweden equal to £10,000,000 or £12,000,000. Now, if we cannot alter our atmospheric conditions, we may at least hope to forecast them. Especially for the culture of root crops, such as turnips and beets, it would be very useful to know if we can expect a dry or a wet spring.

I think that we might arrive at this knowledge if we kept account of the state of the ocean surface and followed the changes in the surface temperature from the beginning of March to the beginning of June. At this season we have most use for surface observations, which could easily be made on board the Atlantic liners. I speak with some experience of this, as I, in company with the late

Professor Cleve and Dr. G. Ekman, instituted a system of surface observations over a great part of the North Atlantic in 1898-99. Dr. Dickson did so two years before, and later the Marine Biological Association, under the able guidance of Dr. Allen and Mr. Matthews, have kept up a record for a number of years. I think one ought first to study the material already collected and collate it with the rainfall, and then organize systematic temperature observations over the area in question. In spring this would possibly suffice for forecasting the probability of a greater or less rainfall over northern Europe. In autumn, likewise, observations on the surface temperature would be important, but at that season they must be combined with deep temperature soundings to 800 and 1000 metres at certain representative stations. The object of the observations in autumn (say November), would be to ascertain the amount of heat stored up in the upper layers of the Atlantic in order to forecast the character of the winter. Even in this case extremely valuable information could be got with relatively little work or expense, and it is to be regretted that attention has not been directed to it before. Of course the International Council for the Study of the Sea has tried to get as much information as possible, but as we have no research steamers for regular use in the Atlantic our observations there have been sporadic. Now that the United States have joined in the International work, we may hope to extend it, especially if this should be recognized as useful for Meteorology.

O. PETTERSSON.

Gothenburg, 5th May, 1912.

THE ATLANTIC ICE-DRIFT OF APRIL, 1912, AND THE UNUSUAL WEATHER OF THE SUMMER OF 1911.

THE unusually heavy drifting of ice over the Grand Banks near Newfoundland, which caused the disaster to the White Star liner Titanic on April 14th, 1912, in latitude 41° 46′ N., exactly on the agreed steamer track from England to New York, seems to fill a gap in my conclusions upon the causes of the equally unusual weather of the summer of 1911. The time agrees with the arrival near Newfoundland of ice-bergs "calved" in the preceding Arctic summer. An unusually heavy drifting may have been caused as well by storms as by earthquakes in the Arctic regions. Earthquakes are sometimes effects of heavy storms, but in any case there are no grounds for supposing that a great earthquake occurred in the Arctic regions north of Davis Strait in the first weeks of last summer. The unusually heavy drifting of ice in April, 1912, near Newfoundland, therefore, supplies one more reason for supposing that there were unusually heavy storms in the American and Atlantic areas of the Arctic regions in the summer of 1911, and thus supports my explanation of the extreme dryness of that summer in western and central Europe, and of the extreme changes observed in the weather of these regions up to April, 1912. On the other hand, this consideration suggests the possibility of timely warning of exceptional ice movements, allowing precautions to be taken against such dreadful calamities as the shipwreck of the Titanic.

In your Magazine for March, 1907, I published a paper on "Qualitative analysis of curve diagrams," which showed a very important agreement (89 %) of the oscillations of water temperature at Horns Reef on the North Sea with the oscillations of Arctic ice near Newfoundland. This agreement related to the 14 years from 1887 to 1900. It is augmented to 94 % by taking account of the 19 years from 1881 to 1900. But, regarding the anomalous conditions of 1911, that probable connexion does not yet suffice for a sure forecast of a wet and cool summer in 1912 in western and central Europe, though such an effect is very likely.

WILHELM KREBS.

Schnelsen, Holstein, April 30, 1912.

THE MEASUREMENT OF DEW.

THE last issue of the *Quarterly Journal* of the Royal Meteorological Society provides an instance of a difficulty I have long felt in regard to "contributions to science." The practice differs in different learned societies in the matter of printing discussions, without which the value of many papers is largely discounted. Our Society follows the admirable plan of printing a full account of the discussion when held, and also of allowing the last word to an absent author. It does happen, however, at times, that a paper is read at the end of a meeting and there is no time for any discussion. An instance of this is Mr. Skinner's paper on the Drosometer, which has now appeared, as it was read, without comment. Surely this is a case where we need not use the stereotyped phrase "Comment is needless." To mention only two points that at once suggest themselves. Why should any reliance be placed on a comparison between a drosometer and an antiquated funnel and bottle rain gauge? A properly enclosed rain gauge *might* have given valuable data for comparison. Again, why should the fact that the drosometer collected more dew than the bottle be held, *ipso facto*, an advantage? Surely if the *real* deposition of dew be an important matter for measurement, the best measure would be the one that most nearly reproduced the conditions of nature, as exemplified, for instance, in a small grass plot, and not the one that collects most moisture, else why not use some hygroscopic surface at once?

I think that if you can see your way to opening a discussion in your columns, on the subject, it might serve a useful purpose, as there may well be others who have experimented on similar lines, who may be discouraged from communicating them to the Society under the circumstances.

WALTER W. BRYANT.

Royal Observatory, Greenwich, London, S.E., May 8th, 1912.

[We received an account of the paper on the Drosometer, read by Mr. Skinner at the meeting of the Royal Meteorological Society on February 21st, with a notice that the discussion was postponed to a later meeting. We were strongly impressed with the importance of a full discussion on a paper of the kind, and kept back our report until the discussion could be published along with it. We were, therefore, disappointed to find that the Society had allowed the paper to be issued before the discussion was taken; we publish our abstract on p. 73, and will welcome the views of our readers upon it.—Ed. *S.M.M.*]

WEATHER FOLLOWING WET SEASONS.

When a season is very wet, it is rare to find the next season very warm, and the latter seems more likely to be cold than warm, comparing with the average. This applies specially to spring and summer. Suppose, *e.g.*, we pick out the fifteen wettest springs (March—May) at Greenwich since 1841, and note how many hot days (with 80° or more) there were in each of these years, we find this: eleven summers (June—August) with less than fifteen, which is the average, three average, and one over average; but this last had only sixteen hot days.

The same tendency may be discerned, I think, in other pairs of seasons, and I add the following notes:—

Summer and Autumn (September—November).—Summers with more than 10 inches of rain, eight cases, and only two autumns warm.

Autumn and Winter (December—February).—Autumns with more than 8 inches, twenty-three cases; only eight winters warm.

Winter and Spring.—Winters with more than 7 inches, eight cases; only two springs warm.

I have not, in these three latter sections, dealt with the rarity of great warmth in the sequent season, but could furnish proof of this, if desired.

ALEX. B. MacDOWALL.

Mountview, Craigmore, Bute, 2nd May, 1912.

Note.—Although we have again added four pages to the normal size of this Magazine, we find that we have before us exactly twice as much matter as space permits us to insert. It has been difficult to decide what to postpone, and we have to apologize to many correspondents whose letters have to be held over, and to several publishers for the delay in inserting reviews which are ready and will, we hope, appear next month.—Ed. *S.M.M.*

RAINFALL TABLE FOR APRIL, 1912.

STATION.	COUNTY.	Lat. N. ° '	Long. W. [*E.] ° '	Height above Sea. ft.	RAINFALL OF MONTH. Aver. 1875—1909. in.	1912. in.
Camden Square	*London*	51 32	0 8	111	1·74	·04
Tenterden	*Kent*	51 4	*0 41	190	1·77	·14
Arundel (Patching)	*Sussex*	50 51	0 27	130	1·82	·07
Fawley (Cadland)	*Hampshire*	50 50	1 22	52	1·98	·11
Oxford (Magdalen College)	*Oxfordshire*	51 45	1 15	186	1·67	·01
Wellingborough (Croyland Abbey)	*Northampton*	52 18	0 41	174	1·78	·11
Shoeburyness	*Essex*	51 31	*0 48	13	1·25	·09
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	1·62	·39
Geldeston [Beccles]	*Norfolk*	52 27	*1 31	38	1·55	·38
Polapit Tamar [Launceston]	*Devon*	50 40	4 22	315	2·34	·33
Rousdon [Lyme Regis]	,,	50 41	3 0	516	2·39	·14
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·09	·20
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	2·20	·26
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	1·96	·17
Boston	*Lincolnshire*	52 58	0 1	25	1·57	·24
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	1·62	·14
Macclesfield	*Cheshire*	53 15	2 7	501	2·02	·64
Southport (Hesketh Park)	*Lancashire*	53 38	2 59	38	1·84	·39
Arncliffe Vicarage	*Yorkshire, W.R.*	54 8	2 6	732	3·73	1·81
Wetherby (Ribston Hall)	,, ,,	53 59	1 24	130	1·85	·23
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	1·69	·13
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	1·84	·17
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	6·91	3·66
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	2·50	·42
Haverfordwest	*Pembroke*	51 48	4 58	95	2·82	·82
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	2·48	·65
Llandudno	*Carnarvon*	53 20	3 50	72	1·79	·42
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	2·50	·65
Marchmont House	*Berwick*	55 44	2 24	498	2·28	·27
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	2·81	1·91
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	1·86	1·38
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	3·69	5·04
Mull (Quinish)	,,	56 34	6 13	35	2·98	3·36
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	1·93	·10
Braemar	*Aberdeen*	57 0	3 24	1114	2·30	·85
Aberdeen (Cranford)	,,	57 8	2 7	120	2·23	·52
Cawdor	*Nairn*	57 31	3 57	250	1·62	1·42
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	2·22	4·09
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	4·70	7·34
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·02	2·24
Wick	*Caithness*	58 26	3 6	77	1·89	2·25
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	3·46	1·86
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	2·68	1·07
Nenagh (Castle Lough)	*Tipperary*	52 54	8 24	120	2·54	1·06
Miltown Malbay	*Clare*	52 52	9 26	400	2·69	1·50
Gorey (Courtown House)	*Wexford*	52 40	6 13	80	2·37	1·80
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	2·54	·81
Dublin (FitzWilliam Square)	*Dublin*	53 21	6 14	54	2·03	1·32
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	2·37	·85
Cong (The Glebe)	*Mayo*	53 33	9 16	112	2·98	1·41
Crossmolina (Enniscoe)	*Mayo*	54 4	9 16	74	3·13	1·74
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	2·52	1·58
Seaforde	*Down*	54 19	5 50	180	2·76	1·72
Bushmills (Dundarave)	*Antrim*	55 12	6 30	162	2·08	2·17
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	2·50	2·01

RAINFALL TABLE FOR APRIL, 1912—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION.
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1875—1909. in.	1912. in.	Diff. from Aver. in.	% of Av.	in.	
—1·70	2	·02	9	3	6·93	8·67	+1·74	125	25·11	Camden Square
—1·63	8	·11	18	3	7·76	9·19	+1·43	118	27·64	Tenterden
—1·75	4	·05	9	2	8·53	11·24	+2·71	132	30·48	Patching
—1·87	6	·06	9	5	9·18	11·23	+2·05	122	31·87	Cadland
—1·66	1	·01	9	1	6·52	9·18	+2·66	141	24·58	Oxford
—1·67	6	·07	9	2	7·05	7·27	+ ·22	103	25·17	Croyland Abbey
—1·16	7	·06	9	3	4·96	5·88	+ ·92	118	19·28	Shoeburyness
—1·23	24	·16	9	7	6·62	7·22	+ ·60	109	25·40	Westley
—1·17	24	·11	9	8	6·06	6·14	+ ·08	101	23·73	Geldeston
—2·01	14	·13	2	8	11·62	14·73	+3·11	127	38·27	Polapit Tamar
—2·25	6	·12	9	2	10·13	13·45	+3·32	133	33·54	Rousdon
—1·89	10	·08	2, 8	4	8·55	11·88	+3·33	139	29·81	Stroud
—1·94	12	·23	9	3	9·07	11·01	+1·94	121	32·41	Wolstaston
—1·79	9	·09	8	2	8·08	10·55	+2·47	130	28·98	Coventry
—1·33	15	·12	9	9	6·11	5·88	— ·23	96	23·35	Boston
—1·48	9	·13	9	2	6·66	7·55	+ ·89	113	24·46	Hodsock Priory
—1·38	32	·45	9	6	9·48	8·67	— ·81	91	34·73	Macclesfield
—1·45	21	·26	9	4	8·57	10·34	+1·77	121	32·70	Southport
—1·92	49	·82	9	4	20·04	22·63	+2·59	113	61·49	Arncliffe
—1·62	12	·08	9	8	7·37	10·02	+2·65	136	26·87	Ribston Hall
—1·56	8	·10	9	4	7·01	7·12	+ ·11	101	26·42	Hull
—1·67	9	·05	7, 9	5	7·47	7·63	+ ·16	102	27·94	Newcastle
—3·25	53	2·00	4	10	41·94	44·14	+2·20	105	129·48	Seathwaite
—2·08	17	·18	9	10	12·11	16·06	+3·95	133	42·28	Cardiff
—2·00	29	·73	1	5	14·09	18·87	+4·78	134	46·81	Haverfordwest
—1·83	26	·18	12	7	12·52	15·27	+2·75	122	45·46	Gogerddan
—1·37	23	·22	9	4	8·54	7·80	— ·74	91	30·36	Llandudno
—1·85	26	·35	4	6	13·35	14·97	+1·62	112	43·47	Cargen
—2·01	12	·13	7	6	9·47	8·04	—1·43	85	33·76	Marchmont
— ·90	68	·80	3	12	15·08	18·74	+3·66	124	49·77	Girvan
— ·48	74	·94	4	9	10·70	10·36	— ·34	97	35·97	Glasgow
+1·35	136	2·45	4	16	22·15	23·80	+1·65	107	68·67	Inveraray
+ ·38	113	·84	20	16	17·26	15·58	—1·68	90	56·57	Quinish
—1·83	5	·05	7	4	7·91	7·12	— ·79	90	28·64	Dundee
—1·45	37	...	...	...	10·64	12·15	+1·51	114	34·93	Braemar
—1·71	23	·20	8	7	9·60	9·67	+ ·07	101	32·73	Aberdeen
— ·20	88	·45	7	8	8·31	5·32	—2·99	64	29·33	Cawdor
+1·87	184	1·16	7	15	15·79	13·39	—2·40	85	44·53	Fort Augustus
+2·64	156	1·84	7	16	28·94	27·20	—1·74	94	83·93	Bendamph
+ ·22	111	·82	7	9	9·99	8·96	—1·03	90	31·90	Dunrobin Castle
+ ·36	119	·75	7	12	8·84	9·21	+ ·37	104	29·88	Wick
—1·60	54	1·30	20	10	18·90	20·24	+1·34	107	54·81	Killarney
—1·61	40	·65	20	8	12·28	15·72	+3·44	128	39·57	Waterford
—1·48	42	·74	20	9	12·30	12·59	+ ·29	102	39·43	Castle Lough
—1·19	56	·50	20	13	13·02	14·94	+1·92	115	45·11	Miltown Malbay
— ·57	76	1·13	21	4	10·59	16·67	+6·08	157	34·99	Courtown Ho.
—1·73	32	·42	20	8	10·83	12·00	+1·17	111	35·92	Abbey Leix
— ·71	65	·87	21	7	8·08	10·12	+2·04	125	27·68	Dublin
—1·52	36	·27	20	13	10·78	13·78	+3·00	128	36·15	Mullingar
—1·57	47	·53	20	14	15·29	14·43	— ·86	94	48·90	Cong
—1·39	56	·49	20	15	17·04	15·78	—1·26	93	52·87	Enniscoe
— ·94	63	·79	20	11	12·92	14·44	+1·52	112	42·71	Markree
—1·04	62	·88	21	9	11·82	16·71	+4·89	141	38·91	Seaforde
+ ·09	104	·76	20	10	10·56	11·80	+1·24	112	37·56	Dundarave
— ·49	80	·52	20	12	11·62	13·50	+1·88	116	39·38	Omagh

SUPPLEMENTARY RAINFALL, APRIL, 1912.

Div.	STATION.	Rain inches	Div.	STATION.	Rain inches
II.	Warlingham, Redvers Road..	·05	XI.	Lligwy	·34
,,	Ramsgate	·38	,,	Douglas	...
,,	Hailsham	·12	XII.	Stoneykirk, Ardwell House...	·86
,,	Totland Bay, Aston House...	·12	,,	Dalry, The Old Garroch	2·59
,,	Stockbridge, Ashley	·02	,,	Langholm, Drove Road	·86
,,	Grayshott	·02	,,	Beattock, Kinnelhead	·97
,,	Reading, Caversham Lock ...	·01	XIII.	St. Mary's Loch, Cramilt Ldge	1·09
III.	Harrow Weald, Hill House...	·07	,,	North Berwick Reservoir	·16
,,	Pitsford, Sedgebrook	·14	,,	Edinburgh, Royal Observaty.	·24
,,	Woburn, Milton Bryan	·11	XIV.	Maybole, Knockdon Farm ...	1·69
,,	Chatteris, The Priory	·09	XV.	Campbeltown, Witchburn ..	1·99
IV.	Colchester, Lexden	·31	,,	Glenreasdell Mains	2·14
,,	Newport	·21	,,	Holy Loch, Ardnadam	4·64
,,	Ipswich, Copdock	·28	,,	Ballachulish House	7·97
,,	Blakeney	·23	,,	Islay, Eallabus	2·87
,,	Swaffham	·28	XVI.	Dollar Academy	·81
V.	Bishops Cannings	·06	,,	Balquhidder, Stronvar	3·26
,,	Winterbourne Steepleton	·09	,,	Coupar Angus	·18
,,	Ashburton, Druid House	·26	,,	Glenlyon, Meggernie Castle..	2·32
,,	Cullompton	·30	,,	Blair Athol	·58
,,	Lynmouth, Rock House	·13	,,	Montrose, Sunnyside Asylum.	·00
,,	Okehampton, Oaklands	·31	XVII.	Alford, Lynturk Manse	·66
,,	Hartland Abbey	·17	,,	Fyvie Castle	·87
,,	Probus, Lamellyn	·47	,,	Keith Station	1·68
,,	North Cadbury Rectory	·17	XVIII.	Skye, Dunvegan	6·05
VI.	Clifton, Pembroke Road	·32	,,	N. Uist, Lochmaddy	4·06
,,	Ross, The Graig	·17	,,	Glenquoich, Loan	25·40
,,	Shifnal, Hatton Grange	·21	,,	Alvey Manse	1·16
,,	Droitwich	·04	,,	Loch Ness, Drumnadrochit...	1·96
,,	Blockley, Upton Wold	·12	,,	Glencarron Lodge	10·95
VII.	Market Overton	·29	XIX.	Invershin	3·46
,,	Market Rasen	·19	,,	Loch Stack, Ardchullin	7·78
,,	Bawtry, Hesley Hall	·13	,,	Melvich	3·93
,,	Derby, Midland Railway	·20	XX.	Skibbereen Rectory	·41
,,	Buxton	·98	,,	Dunmanway, The Rectory ..	·45
VIII.	Nantwich, Dorfold Hall	·29	,,	Glanmire, Lota Lodge	·67
,,	Chatburn, Middlewood	1·32	,,	Mitchelstown Castle	1·18
,,	Cartmel, Flookburgh	1·15	,,	Darrynane Abbey	1·08
IX.	Langsett Moor, Up. Midhope	1·22	,,	Clonmel, Bruce Villa	1·34
,,	Scarborough, Scalby	·35	,,	Newmarket-on-Fergus, Fenloe	1·17
,,	Ingleby Greenhow	·15	XXI.	Laragh, Glendalough	1·96
,,	Mickleton	·42	,,	Ballycumber, Moorock Lodge	·64
X.	Bellingham, High Green Manor	·42	,,	Balbriggan, Ardgillan	1·12
,,	Ilderton, Lilburn Cottage ...	·19	XXII.	Woodlawn	1·20
,,	Keswick, The Bank	·85	,,	Westport, St. Helens	1·32
XI.	Llanfrechfa Grange	·39	,,	Achill Island, Dugort	1·74
,,	Treherbert, Tyn-y-waun	·78	,,	Mohill, The Rectory	·87
,,	Carmarthen, The Friary	·54	XXIII.	Enniskillen, Portora	1·52
,,	Castle Malgwyn [Llechryd]...	·25	,,	Dartrey [Cootehill]	1·41
,,	Crickhowell, Tal-y-maes	·90	,,	Warrenpoint, Manor House ..	1·57
,,	New Radnor, Ednol	·54	,,	Banbridge, Milltown	1·61
,,	Rhayader, Tyrmynydd	·63	,,	Belfast, Cave Hill Road	1·58
,,	Lake Vyrnwy	·57	,,	Glenarm Castle	2·88
,,	Llangyhanfal, Plâs Draw	·37	,,	Londonderry, Creggan Res...	2·69
,,	Dolgelly, Bryntirion	1·18	,,	Killybegs	3·39
,,	Bettws-y-Coed, Tyn-y-bryn...	1·01	,,	Horn Head	3·40

METEOROLOGICAL NOTES ON APRIL, 1912.

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.—The driest April in the 55 years' record, and with the single exception of February, 1891, the driest of all months in that time (see p. 70). There were 18 days absolute drought from 10th to 27th. Temp. remained high throughout and bright sunshine was recorded on every day, the amounts exceeding 10 hours on 8 days. The solar eclipse on 17th was observed under ideal atmospheric conditions (see p. 67). Mean temp. 50°·2 or 2°·1 above the average. Duration of sunshine 218·7* hours, and of R 1·6 hour. Evaporation 2·34 in. Shade max. 73°·1 on 21st; min. 30°·3 on 12th. F 1, f 7.

TENTERDEN.—Nearly as dry as April, 1893, but not so hot. Duration of sunshine 257·0† hours. Shade max. 70°·0 on 21st; min. 28°·0 on 12th. F 2, f 16.

TOTLAND BAY.—R less than any April since 1893, when only ·01 in. fell. Duration of sunshine 261·0* hours, and the greatest ever recorded in April. Shade max. 66°·0 on 23rd; min. 33°·7 on 12th. F 0, f 8.

PITSFORD.—R 1·70 in. below the average. Mean temp. 47°·9. Shade max. 72°·5 on 21st; min. 27°·3 on 12th. F 6.

IPSWICH, COPDOCK.—Duration of sunshine 246·6* hours. Mean temp. 47°·8. Shade max. 69°·3 on 21st; min. 29°·7 on 11th. F 4, f 22.

ASHBURTON.—The lowest R for April in 47 years. Shade max. 68°·0 on 22nd and 23rd; min. 35°·0 on 12th and 13th. F 0.

COVENTRY.—The driest April since observations began in 1867. Shade max. 72°·0 on 14th, 20th and 21st; min. 28°·0 on 11th. F 3.

HODSOCK PRIORY.—Shade max. 71°·0 on 21st; min. 26°·3 on 12th. F 7, f 23.

SOUTHPORT.—Duration of sunshine 227·7* hours or 49 hours above the average. Duration of R only 6·6 hours. Mean temp. 47°·8, or 2°·3 above the average. Shade max. 71°·0 on 22nd; min. 29°·0 on 12th F 1, f 17.

HULL.—Unsettled with squalls, S and R showers to 10th, then fine sunny days and cold clear nights to the end. Shade max. 69°·0 on 20th; min. 30°·0 on 12th and 13th. F 4, f 19.

HAVERFORDWEST.—Very dry and decidedly cold. Frost on several nights. Duration of sunshine 208·3* hours.

LLANDUDNO.—Shade max. 70°·0 on 22nd; min. 35°·0 on 1st.

CARGEN.—R only once, in 1873, lighter since observations commenced in 1860. A severe grass frost did much damage to flowering shrubs on 12th. During the solar eclipse on 17th, temp. fell 5°. Shade max. 70°·0 on 22nd; min. 25°·0 on 12th. F 6.

EDINBURGH.—Shade max. 66°·5 on 22nd; min. 28°·7 on 12th. F 2, f 10.

COUPAR ANGUS.—The driest April on record. Shade max. 63°·0 on 30th; min. 21°·0 on 12th.

FORT AUGUSTUS.—Shade max. 71°·0 on 23rd; min. 27°·0 on 12th. F 5.

LOCH STACK.—Duration of sunshine, 131·2* hours.

DUNMANWAY.—Fine and dry month. Warm as a rule, but some nights had slight frosts. The only month in the last 7 years with less R was August, 1909, which had ·32 in.

DUBLIN.—A fine, dry and bright month. Severe gale from W. to N.W. on 8th. Remarkable R with high bar. on 21st, due to a shallow depression within an anticyclone. Mean temp. 1°·9 above the average. Shade max. 62°·2 on 16th; min. 34°·1 on 9th. F 0, f 2.

MARKREE.—Shade max. 69°·0 on 24th; min. 31°·0 on 3rd and 29th. F 3, f 14.

WARRENPOINT.—A dry and mild month, with light winds and no frost. Shade max. 62°·0 on 14th; min. 39°·0 on 10th. F 0, f 0.

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* Campbell-Stokes. † Jordan.

Climatological Table for the British Empire, November, 1911.

STATIONS (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain. Depth.	Total Rain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	59·1	4	27·7	22	49·9	39·3	40·3	86	87·1	26·6	3·62	19	7·1
Malta	72·5	13*	52·0	18	69·6	60·2	56·6	79	134·7	...	10·11	14	5·7
Lagos	89·0	4†	72·0	9	87·5	74·5	74·1	73	154·0	70·0	1·54	4	...
Cape Town	85·7	1	45·0	16	74·9	55·4	55·5	72	...	...	1·19	8	4·1
Durban, Natal ...	86·9	28	60·0	22	78·1	64·6	...	...	147·1	...	3·47	21	7·6
Johannesburg	81·7	8	45·5	22	74·8	53·1	39·9	51	148·6	44·0	3·40	14	4·1
Mauritius	91·1	30	60·6	21	84·7	67·2	63·0	67	160·2	51·4	·26	4	5·0
Bloemfontein	90·3	30	48·8	7	80·6	55·7	50·9	57	...	...	2·21	9	4·2
Calcutta...	87·8	16	62·3	5	82·7	66·9	64·9	74	...	56·5	·46	3	3·8
Bombay...	92·4	1	72·5	20	87·9	75·6	72·3	75	136·4	67·3	·27	1	4·4
Madras	88·8	18	69·8	31	86·0	73·9	72·8	83	139·1	6·6	12·69	12	4·6
Kodaikanal	67·8	14	45·6	28	61·5	49·6	48·7	81	135·0	31·1	11·30	17	6·3
Colombo, Ceylon ...	88·7	14	69·2	3	86·1	73·1	72·8	81	151·6	67·5	13·63	22	6·9
Hongkong	80·5	17	55·7	24	73·0	65·7	61·4	76	130·3	...	2·72	12	6·8
Sydney	91·0	7, 15	48·9	4	77·6	60·7	54·6	58	147·9	39·1	1·92	13	4·6
Melbourne	105·2	30	36·8	4	74·4	52·0	48·4	59	158·2	31·7	1·38	6	5·1
Adelaide	102·8	30	44·5	1	84·8	59·2	50·3	46	161·0	34·3	·39	3	3·0
Perth	89·0	8	50·0	10	75·7	56·0	53·5	64	145·2	42·9	·18	5	4·1
Coolgardie	105·0	13	48·2	1	92·8	58·9	48·1	38	165·0	43·4	·06	1	2·8
Hobart, Tasmania ..	81·4	15	37·8	4	66·6	49·0	43·2	58	143·0	33·1	1·22	14	6·1
Wellington ...	67·0	28	41·2	25	61·3	50·8	44·4	65	118·0	33·0	2·13	17	6·5
Auckland	70·0	18‡	47·5	6	64·6	52·4	50·7	76	120·0	42·0	4·14	21	6·8
Jamaica, Kingston ..	92·7	7	70·5	28	89·4	72·9	71·5	80	...	...	1·78	8	4·8
Grenada	87·0	8, 9	72·0	2	84·0	75·6	...	78	140·0	...	5·86	23	4·0
Toronto	62·3	10	17·6	17	42·4	29·4	...	...	72·7	11·4	3·83	17	...
Fredericton	60·5	13	6·8	26	39·1	21·8	...	86	...	...	5·10	11	6·6
St. John, N.B. ...	58·4	13	16·0	26	42·3	28·8	...	...	...	...	4·82	10	5·9
Edmonton, Alta. ...	49·6	2	—23·0	14	26·9	9·8	...	80	105·0	—30 2	·50	11	5·0
Victoria, B.C.	56·1	3	14·2	11	47·4	38·2	...	88	...	...	7·40	21	8·0
Dawson	30·0	3	—34·0	15	1·6	—10·0	...	...	...	...	1·05	8	5·9

* and 21. † and 18, 22, 23, 26. ‡ and 19.

MALTA.—Mean temp of air 64°·0. Average bright sunshine, 6·3 hours. per day.

Johannesburg.—Bright sunshine, 260·2 hours.

Mauritius.—Mean temp. of air 0°·1 above, of dew point 1°·2 below, and R 1·48 in. below averages. Mean hourly velocity of wind 10·5 miles, or 0·8 above the average.

KODAIKANAL.—Bright sunshine, 140 hours.

COLOMBO.—Mean temp. of air 79°·5 or 0°·2 below, of dew point 0°·5 above, and R 1·82 in. above, averages. Mean hourly velocity of wind 4·5 miles. TS on 10 days.

HONGKONG.—Mean temp. of air 69°·1, R 1·27 in. above averages. Bright sunshine 155·1 hours or 34·5 hours below average.

Sydney.—Mean temp. of air 2°·2 above, and R 1·00 in. below, averages.

Melbourne.—Mean temp. of air 2°·0 above, and R ·83 in. below, averages.

Adelaide.—Mean temp. of air 72°·0, or 5°·0 above, and R ·66 in. below, averages, the highest mean max. temp. on record at this station.

Coolgardie.—Mean temp. of air 50·1 above, and R below, averages.

Wellington.—R 1·32 in. below the average. Bright sunshine 232·2 hours.