

Symons's Meteorological Magazine.

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THE RAINFALL AND WEATHER OF MAY, 1905.

THE month proved very dry in all parts of the country except in the western Highlands, where the deficiency was less marked. The usual tables give the actual amounts which were recorded at about 150 well-distributed stations, but about 200 additional stations have been utilized in compiling the accompanying map. We should like to be able to print all the figures which were made use of, but that is impossible, and we have to content ourselves with thanking all those who send in observations monthly, every one of whom has been helpful in drawing the map.

On the map the parts of the country where the rainfall of May exceeded one inch, are shaded with a light tint, a darker shading shows places where the falls exceeded two inches, and the lines upon that dark shading denote falls exceeding three and four inches respectively. Except in the extreme south-east and south-west, Scotland had everywhere more than an inch, and in most parts more than two inches of rainfall. The rainfall in Scotland, taking it altogether, was probably about 25 per cent. below the average. Ireland had only a small area with more than two inches, and a still smaller with less than one. It was dry, relatively, in all parts, the general deficiency from the average being something like 36 per cent.

The chief interest of the rainfall lay in England. Here the fall was everywhere far below the average, the deficiency being 57 per cent., not half the normal amount having fallen. But for a thunderstorm which arrived just too early to belong to June, the map would have been more remarkable still. As it is we see that more than an inch of rain only occurred in three districts in the west, viz.: Dartmoor, western Wales, and the Lake District, and also along a more or less irregular belt bordering the east coast, from Beachy Head to the Tees. Round Snowdon and round Seathwaite several inches of rain fell, but that took place on very small patches of country. In the relatively wet belt of the east coast, only one station reported as much as 2.00 in. The thin line running through the unshaded portion of the map includes the driest part of the country upon which less than half an inch of rain, or roughly one-quarter of the

usual amount fell. It includes the north of Cornwall, North Devon, the whole of Somerset, most of Dorset, Wiltshire, Hampshire, Gloucester, Monmouth, Glamorgan and Breconshire, the whole of Worcestershire, most of Warwickshire and Leicestershire, and considerable parts of Staffordshire, Derbyshire, Nottinghamshire and the south of Yorkshire. The dearth of rain culminated in the districts bordering on the Bristol Channel, where less than a quarter of an inch of rain fell during the month, and in some cases less than one-tenth of an inch. Several observers report that no May, and some that no month, had proved so dry in a long period over which observations extended. We quote a number of the most remarkable figures which we have received.

Stations reporting .15 in. or less of Rain in May, 1905.

		Total Rain. in.	No. of Days.	Max. Fall. in.	Date.
<i>Deron</i> ...	Braunton, Light House	·03	2	·02	11
"	" " Saunton	·06	2	·05	11
<i>Somerset</i> ...	Bath, Henrietta Park	·07	6	·02	18
<i>Devon</i>	Westward Ho!, Ferndale	·10	3	·03	1, 2, 31
"	Instow	·10	2	·06	2
<i>Somerset</i> ...	East Harptree, Harptree Court...	·11	5	·04	1
<i>Gloucester</i> ..	Clifton, Pembroke Road	·11	7	·03	31
<i>Glamorgan</i>	Penarth	·11	3	·06	1
<i>Devon</i>	Hartland Abbey	·12	4	·04	11
"	Woolacombe	·13	4	·04	11
<i>Glamorgan</i>	Cardiff, Ely	·13	3	·08	1
<i>Devon</i>	South Molton, Castle Hill School	·15	4	·06	1
"	Bideford, Horwood	·15	4	·07	2
"	Northam	·15	4	·06	2
"	Ilfracombe Hotel	·15	3	·03	1
"	Martinhoe	·15	4	·06	2
"	Lynmouth, Rock House	·15	4	·07	1

Taken as a whole England has been drier in the month of May than it was this year, and we need go no farther back than 1896 for a striking example. In that month only one station, quoted in this Magazine, from England or Wales recorded so much as one inch (and that was Seathwaite), while at most stations almost the whole of the trifling fall occurred on one day. May, 1905, can bear no comparison with so exceptional a month, but it has points of individual interest notwithstanding. In the Observers' Notes it will be seen that north-easterly and easterly winds prevailed in England to an extent unusual even in that month of east winds, and the low rainfall of the south-west of England with the steady increase of rain from Cornwall to Norfolk, may be looked upon as a direct result of the inversion of the prevailing wind, while farther north the Welsh mountains, on account of their height and the increased cooling and condensation, appear to have masked this result to some extent.

The Table of Aggregate Rainfall shows that the result of the dry month has been to throw practically the whole of England, the south-

east of Scotland, and the east of Ireland, considerably below the average for the five months to the end of May. Parts of the south-east of England, however, have come very near the average, and a remarkable deficiency is confined to the north Midlands.

The month was very free from cloud, remarkable for the large number of hours of sunshine, for high maximum temperatures, and, as is natural enough, for low minimum temperatures also. Severe night frosts did a great deal of damage in many parts of the country, and though we may hope that the first reports in the newspapers were exaggerated, there can be no doubt that the fruit crop was seriously affected.

Several letters from correspondents, on another page, deal with the nature of the month of May in different parts of the country, and we may conclude this article with a condensed quotation from the *Evesham Journal* of May 27th.

"We are sorry to have to record that the market gardeners of the town and district have sustained a most serious reverse owing to the frosts of Monday and Tuesday mornings. At the end of last week the gardens were looking exceedingly well, and there was every prospect of a successful season, and the outlook pointed to a heavy crop of plums. Now, however, the condition of things has totally changed. Monday morning's frost did a certain amount of damage, but that of the following morning was disastrous.

"The thermometer in the screen at Lansdowne registered only two degrees each night; this would be equal to about five degrees on the grass. At Beckford nearly five degrees of frost were registered in the screen, and eight degrees on the grass. In other parts the frost seems to have been more severe, particularly at Toddington. Speaking broadly, the frost has played havoc on the low lying grounds, leaving the higher land either unhurt or only slightly damaged.

"Perhaps the frost was most severely felt in the low strip of ground which runs from Hampton across the Cheltenham Road to the Mint, and along by the Red Barn between Bench Hill and Longdon Hill. Here it made a clean sweep of everything, as it has done on previous occasions. Plums, strawberries, beans and so on were destroyed in very large quantities, and strawberry beds which were a picture on Sunday presented a very dismal sight on Tuesday.

"These terrible visitations of frost lead one to wonder whether some steps cannot be taken to counteract or forestall them. It sounds somewhat far-fetched, but we do not think it at all beyond the bounds of possibility to find means for fighting the frost. It is not so very many years ago since some people objected to the investigations of the Evesham Fruit Pests Committee—on the ground of impiety for one thing! 'You can syringe 'em,' it was said, 'and you can grease-band 'em; but it's no use; you can't fight against the Almighty.' Perhaps even now some people would object to fighting the frost on the same grounds."

FIVE MONTHS' RAINFALL OF 1905.

Aggregate Rainfall for January—May, 1905.

Stations.	Total Rain.	Per cent. of Aver.	Stations.	Total Rain.	Per cent. of Aver.	Stations.	Total Rain.	Per cent. of Aver.
	in.			in.			in.	
London	8·06	94	Bolton	13·95	103	Braemar	13·10	105
Tenterden	9·10	95	Wetherby	7·82	85	Aberdeen	10·98	95
Hartley Wintney	7·73	80	Arncliffe	21·03	92	Cawdor	12·99	134
Hitchin	8·78	105	Hull	6·78	74	Invergarry	27·51	126
Winslow	7·05	76	Newcastle	6·09	65	Bendamph	37·13	119
Westley	7·90	95	Seathwaite	51·00	101	Dunrobin	14·39	127
Brundall	7·65	93	Cardiff, Ely	11·65	79	Killarney	21·05	93
Alderbury .....	...	...	Haverfordwest	16·26	95	Waterford	15·05	103
Winterbourne	11·60	83	Gogerddan	17·05	116	Broadford	13·23	114
Torquay	10·80	84	Llandudno	9·43	93	Carlow	12·06	95
Polapit Tamar	13·56	102	Cargen	16·03	100	Dublin	9·03	91
Bath	7·65	71	Lilliesleaf	8·97	78	Mullingar	12·60	99
Stroud, Upfield	9·28	88	Colmonell	14·61	91	Ballinasloe	10·67	81
Woolstaston	10·16	86	Glasgow	10·94	89	Clifden .....	...	...
Bromsgrove	6·93	81	Inveraray	29·49	129	Crossmolina	18·85	100
Boston	7·47	96	Islay, Eallabus	20·27	122	Seaforde	11·06	78
Hodsock Priory	5·39	63	Mull	23·79	117	Londonderry	15·14	107
Derby	5·74	65	Dundee	7·90	79	Omagh	15·12	117

Correspondence.

To the Editor of Symons's Meteorological Magazine.

PARTIAL DROUGHT IN MAY.

I SEND herewith a few notes of the recent dry weather.

A partial drought of 37 days with 0·35 in. of rain lasted from May 3rd to June 7th inclusive, the rain falling on 9 days, the heaviest being ·11 in. on May 14th. The only other dry period comparable with this in my register (commencing December, 1880) was in 1889, when the 35 days from June 3rd to July 8th (inclusive) had only ·19 in., of which 25 consecutive days were rainless—*i.e.*, June 11th to July 5th.

I have also a record of 25 days entirely without rain in 1887, from June 9th to July 3rd, and by going 5 days further back, 30 days with only ·01 in. of rain.

In 1899 also there were 24 consecutive days without rain; May 25th to June 17th.

In this climate both absolute and partial droughts according to your definitions are rare. I have altogether 10 absolute and 4 partial in 24½ years, their duration being—

Absolute Droughts.

3 of 15 days
 3 „ 16 „
 1 „ 17 „
 1 „ 24 „
 2 „ 25 „

Partial Droughts

1 of 29 days
 1 „ 33 „
 1 „ 35 „
 1 „ 37 „ (to date)

CHARLES L. BROOK.

Harewood Lodge, Meltham, June 9th, 1905.

RANGE OF TEMPERATURE DURING MAY, & HEAVY RAINFALL DURING THUNDERSTORM ON MAY 30th, 1905.

THE extreme range of temperature experienced here during the month of May may seem worthy of notice in your pages. On May 23rd the thermometer in the screen fell to 28° , considerable damage being caused by the sharp frost, especially to laurels and potatoes. On the 29th the shade maximum rose to $84^{\circ}\cdot 2$, thus giving the extreme range of $56^{\circ}\cdot 2$ for the month. I may add that the thermometers are Kew certified instruments.

On May 30th a sharp thunderstorm broke at 3.27 p.m., being accompanied by a perfect deluge of rain, lasting for a period of 23 minutes (to 3.50 p.m.); during this space of time the amount registered was .66 in., or a fall at the rate of nearly .03 per minute. The amount recorded previously for the month only totalled .61 in., 24 days having been absolutely rainless.

SPENCER C. RUSSELL, F. R. MET. SOC.

Ashley Road, Epsom, June 1st, 1905.

[The fall of .66 in. in 23 minutes, though interesting, is not unusual, as great an amount has frequently been recorded in half the time.—
ED. S.M.M.]

MAY FROSTS.

YOUR readers may be interested to know that two sharp frosts—for the time of year—were registered in this district during the early mornings of May 23rd and 24th :—

23rd Grass min. $28^{\circ}\cdot 2$; screen min. $30^{\circ}\cdot 9$.

24th „ „ $29^{\circ}\cdot 8$; „ „ $31^{\circ}\cdot 7$.

The instruments were verified at Kew.

W. J. CARTER.

Edenfield, New Malden, Surrey, 25th May, 1905.

THE shade temperatures registered yesterday morning were maximum 53° and minimum 32° , while this morning they were maximum 53° and minimum 31° . In May, 1898, 1900, 1901, 1903 and 1904,

there was no frost, the minimum temperature being 33° . In May, 1894, 31° was registered on 21st; in 1896, 32° on 3rd; in 1897, 30° on 13th; in 1899, 31° on 5th; and in 1902, 29° on 14th. This year furnishes a record for the end of the month at this station.

WILLIAM HALL.

Swerford, Oxfordshire, May 23rd, 1905.

PARTIAL DROUGHT, MAY, 1905.

FROM 3 p.m. on 3rd May, 1905, to 4 a.m. on 1st June, 1905, or 28 days 13 hours, the only measurable rain that fell was .05 in. on four days, three with .01 in., and one with .02 in., showing an average rainfall of only about one-fifth of the maximum named in the definition of a partial drought. Within this period was included an all but absolute drought, viz. : from 4 p.m. on May 11th to 4 a.m. on the 24th—12½ days—with no rainfall.

Either *partial* or *absolute* droughts are so rare in mid-East Cheshire—where Wilmslow lies—that I thought it worth while to report the above at once.

EDWARD PEARSON.

Parkside, Wilmslow, 2nd June, 1905.

FROST IN URUGUAY.

NOT long ago I received a copy of the *International Geography*, and in reading over the article on the Republic of Uruguay my attention was drawn to a part where the writer clearly states that frosts never occur.

I consider it is a pity that such an error should occur in what, otherwise, is a most excellent description of the country in which I have been a resident for the last fifteen years. A neighbour of mine, who has taken meteorological observations for many years back, tells me that as many as 13° F. have been registered, and there is never a winter without a succession of heavy frosts falling.

HERBERT J. WALKER, M.B. EDIN.

Estacion Molles, Uruguay, February 25th, 1905.

[It is not clear whether the statement as to 13° means a temperature of 13° F., or 13° of frost (19° F.); but the fact is plain that severe frosts do occur.—ED. S.M.M.]

GLACIAL SNOW ON BEN NEVIS.

THE Rev. R. P. Dansey referred in his interesting article in the March number on the Glacial Snow on Ben Nevis, to the difficulty of recording the rainfall in the corrie—called Allt-a-Mhuilinn—situated on the N.E. side of Ben Nevis, during the winter months.

Considering the height, geographical position of Ben Nevis, and the favourable features of this corrie to produce high rainfall, I am inclined to believe with Mr. Dansey that the wettest spot in Great Britain will be found in this corrie.

As the amount of the rainfall has been so thoroughly investigated at both the summit and the foot of Ben Nevis for so many years, and as the rainfall of probably the wettest spot in such an interesting district is still unknown, I beg to ask—could not some local people, or others, undertake to ascertain the rainfall in the corrie for only *a few months* of the coming summer.

If gauges were fixed in the corrie and on the summit, and measured, say once or twice during June, July, August and September, and *all* measured at the *same date* as those of Fort William, this would give a good idea of the amount at the supposed wettest spot for a long period, and its relation to that at the summit and at Fort William. Also by selecting these months it would enable us to record the actual precipitation, and afford a more true comparison because of the large proportion of the precipitation falling as snow during the other months, which by being blown and mixed with drift from all directions above the gauges, makes it very difficult to measure the real amount of moisture at the summit of the corrie.

I find from the one-inch Ordnance map that the corrie runs almost in a straight line towards N.W., and that the Ordnance contour lines intersect the Allt-a-Mhuilinn stream at fairly uniform distances, and in order that the records should be taken in a systematic manner, and at spots where others could see and study the different results from the map, I beg to suggest that gauges should be fixed at the points where the following contour lines crosses the stream, say 1000, 1500, 2000, 2500, and 3000 feet, and also at the summit; the distances of such spots from the main road, near the Ben Nevis Distillery, are only $1\frac{1}{2}$, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 miles, respectively, all along the same path to the end of the corrie. For a temporary purpose like this, I should think that galvanized iron, simply made into a cylindrical form, say 24 inches deep, and 5 inches diameter (for measuring a possible two weeks maximum rainfall), with a cap on the top, and the lower part of the cone turned upwards, to prevent evaporation, also a small cylinder of, say 4 inches diameter, and 4 inches deep,—which would of course hold and lift a known quantity of rain—would be suitable to do the work, and could be made by any local tinman at a small cost.

It will be seen that in order to have a good idea of the rainfall at this interesting corrie for a long period, it is *absolutely* necessary to record that of the summit and at Fort William for the *same period*, and the gauges should be fixed 10 to 20 yards from the stream, if possible on a flat piece of ground, or a slight slope, the top being 12 inches above ground, and clear of rocks, boulders and precipices.

J. R. GETHIN JONES.

Bodgethin, Deganwy, May 9th, 1905.

[We trust that Mr. Gethin Jones's suggestions will lead to some action being taken ; but the Ben Nevis Observatories have been closed, and we are not aware of a single rainfall record left in Fort William. This is the more deplorable because, unless we are mistaken, 1905 is the first year since 1875 without rainfall observations at that extremely interesting locality. Here is a definite and simple problem, one of the few in which an active observer, even without special scientific training, may furnish the data for an important piece of scientific work.—ED. *S.M.M.*].

THE PARALLEL BETWEEN 1896 and 1905.

IF I may write a third time on this subject I would begin by saying that the weather of 1905 seems to have great difficulty in getting out of the groove of 1896.

It is true that last April made an attempt to do so. Cloudy, cold and showery, it bore little resemblance to the dry and sunny April of 1896. But in one important respect the two months were not very dissimilar. The Observers' Notes in the Magazine for 1896 show that dry though that April was, there was a marked absence of easterly winds ; and it does not appear that this year the winds from between N. and E. were at all more than one expects in April. Where you have printed precise figures they seem to have ranged from 10 to 15 days.

But whatever success April may have had in departing from the 1896 pattern, May certainly fell back into the old groove. The Observers' Notes in the 1896 Magazine might be describing the May just ended. The extremely low rainfall, the decided preponderance of N. and N.E. winds, the bright sunny days with keen dry air, the cold clear nights, the injurious frosts during the first week and again just after the 20th, are features which, limited though my information is, I suspect are by no means confined to Somersetshire.

Let us hope that if England is to have repeated the hot dry July of 1896, it may also have during the next few days the welcome refreshing rains of the first ten days of that June. They are sorely needed.—Yours faithfully,

H. A. BOYS, F.R.Met.Soc.

North Cadbury Rectory, Somerset, June 2nd, 1905.

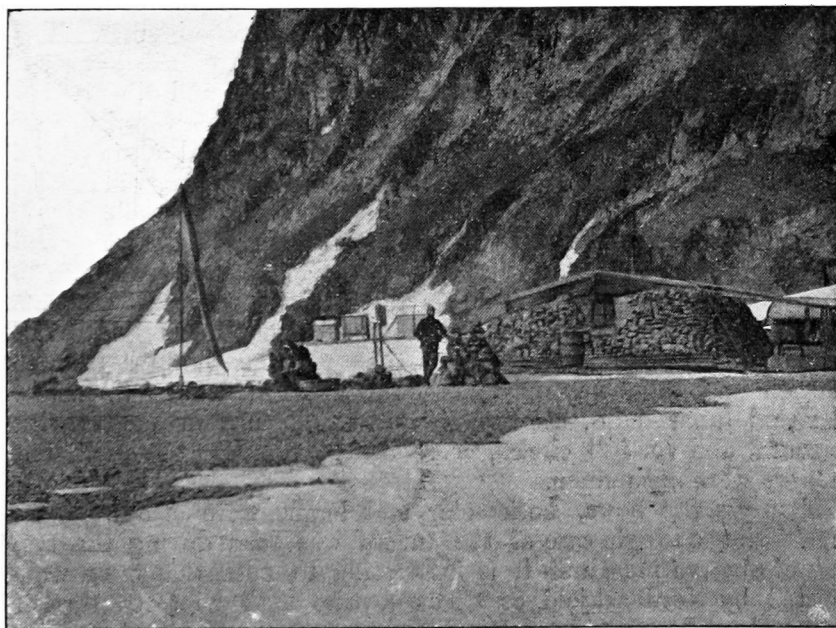
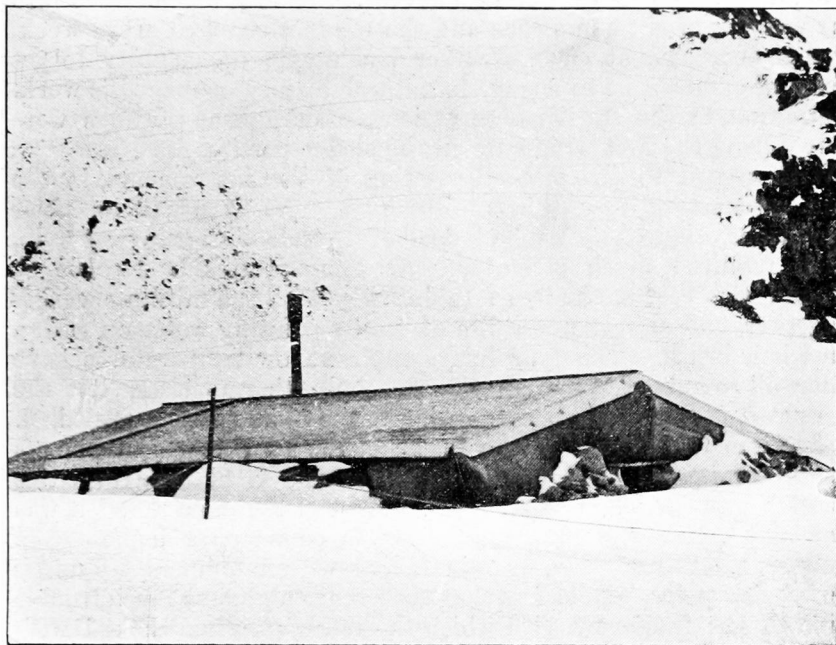
[So far as the refreshing rains of early June are concerned, Mr. Boys has proved himself once more to be a true prophet ; but it is extremely difficult to carry out such a comparison as he attempts in any but the most general terms. The heavy rains of the last days of May in the neighbourhood of London changed the character of the month at the last moment, and left the west of England, which escaped the thunderstorm, very much drier than the east, while in the north the early part of June has proved to be extremely dry, in marked contrast to the south.—ED. *S.M.M.*].

THE ANTARCTIC METEOROLOGICAL STATION IN THE SOUTH ORKNEYS.

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

THE work at this station commenced at the end of March, 1903, on the arrival of the "Scotia" in winter quarters, and terminated, so far as my connection with the station was concerned, on January 1st of the present year. In this short notice it is not intended to go with any detail into the climatic problems of the region in question; but merely to give some of the more salient features associated with our meteorological work there. From March 25th till the end of October, 1903, the observations were taken on the "Scotia," which was frozen in, in the centre of a large bay on the south side of Laurie Island. For wind observations the position occupied was remarkably good, although westerly winds were deflected somewhat owing to high land a short distance off in that direction. During the winter of 1903 the staff, officers and crew were occupied in building a house on a narrow spit that here divides the north from the south side of the island, and close to this an auxiliary meteorological station was established soon after the "Scotia" went into winter quarters. For wind directions this place was not so good as at the position where the ship wintered, as the cliffs to the west were nearer and the disturbing effect consequently greater. In this connection special attention was given to the movement of the lower clouds. On November 1st the hourly observations were transferred from the ship to the shore, where a land party had been installed to carry on the work while the "Scotia" was absent at Buenos Aires.

The instruments employed at this station were those that experience had shown to give satisfactory results under the prevailing climatic conditions. The instruments in use during 1904, when the station was under Argentine auspices, were much the same as formerly. The barometer, of the Fortin pattern, was hung in the living room of the house as far from the stove as possible. There were also two large Richard barographs, one recording in millimeters and the other in inches. The thermometer screens, five in number, were fixed on to two thick spars resting on cairns and securely anchored to the ground by stout cables. This precaution was necessary owing to the extreme violence of the squalls that occurred from time to time. In these screens were two thermographs, two hygrographs, two pairs of dry and wet bulb thermometers, and a maximum and minimum registering thermometer. Screwed to the outside of one of the screens was a stand containing a black bulb solar radiation maximum in vacuo. Close to the screens was a snow gauge, while a little further off was the Robinson anemometer, mounted on a post with the cups about seven and a half feet above the ground. There were also two sunshine recorders, one a Jordan and the other a Campbell-Stokes instrument. A terrestrial minimum thermometer was occasionally in use. Hourly observations were



METEOROLOGICAL STATION, SCOTIA BAY, LAURIE ISLAND.—WINTER AND SUMMER VIEWS.

taken, and, as there were four observers, the day was divided into four watches of six hours each and the watches changed every week. By this arrangement each observer had ample opportunity to get plenty of exercise, or to engage in natural history or magnetic work. In addition to the station observations, simultaneous readings were made during the first winter by all the sledge parties.

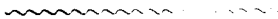
With regard to the general working of the instruments, in the main satisfactory results were obtained. As is usual on polar expeditions, there was a good deal of trouble with the wet bulb, which required much attention. At temperatures below 10° F. I found the best method was to do away with the muslin covering altogether, and merely use a film of ice by painting water on with a camel hair brush. The hair hygrographs at low temperatures gave better all-round results than the wet bulb thermometer, but the traces were frequently imperfect owing to the blizzards that prevailed. So fine was the snow that the inside of the recording instruments was full of it, and even the anemometer got filled once or twice although protected by a glass cover. Most of the snow that fell was hard and granular, and large flakes—so common at home—were rarely seen. Silver thaw, or rain falling with a temperature under the freezing point, was of frequent occurrence and gave much trouble owing to the frequency with which the screens became choked with icy incrustations. The deposition of snow crystals from fog was occasionally observed, but the crystals seldom exceeded five inches in length. On three occasions a curious phenomenon was seen at the mouth of crevasses from which smoke appeared to be issuing. The air temperature when this occurred was from 10° to 30° below zero, and the intense frost had evidently cracked the ice and liberated a quantity of relatively warm air from the interior, the water vapour of which condensed on contact with the cold external atmosphere. A smoke-like haze, known as the "Barber," was often observed issuing from open lanes or pools of water amidst the ice, the result of the great difference (often 50° to 60°) in the temperature of the water and the air in contact with it. Remarkable mirage effects were common, icebergs being observed in the air in an inverted position, at one moment lying flat like a pancake the next shooting up into tall spiral columns, while from time to time portions would appear to break off and sail away only to reunite again in a few moments. Solar and lunar halos, accompanied by mock suns or moons with horizontal and vertical circles, were also occasionally observed, but rainbows were uncommon.

Colourless fog bows, both solar and lunar, were also noted at times. Not a single case of the aurora was seen during the two years of observations, and it is interesting to note that none were reported by Nordenskjöld or Charcot, who both wintered further south and to the west of the South Orkneys, so that auroral displays must be of infrequent occurrence in this region. With regard to the clouds, the most typical form both summer and winter was stratus,

which in the former season covered the sky for days together without a break. The clouds seemed to form at a very low elevation, and even cirri were seen quite close—say, from 6,000 to 8,000 feet above the ground—but as no observations were made no definite heights can be assigned for the various cloud levels. Föhn winds were noted on several days, usually in winter, the highest temperatures recorded being $46^{\circ}\cdot8$ on May 31st, 1903, and $47^{\circ}\cdot0$ on February 11th, 1904. A peculiarity of these winds was the instability of temperature during their occurrence, which was clearly shown by the curve of a quickly moving thermograph. When these abnormally warm winds occurred they invariably blew from the W.N.W., in which direction are located some high mountains. The curious rise of temperature during blizzards, reported at the winter quarters of the "Discovery" and by Nordenskjöld, was not observed. The lowest temperature of the period occurred on August 3rd and 4th, 1904. On both these days a minimum of -40° F. was recorded, with a mean for the latter day of -33° F., and as late as October 11th, 1904, the temperature fell to -25° F., all remarkably low temperatures when one considers the low latitude ($60^{\circ} 47'$ S.) of the observatory, and the fact that it is located on an oceanic island. The mean annual temperature is, approximately, $23^{\circ}\cdot0$ F., and the mean barometric pressure $29\cdot260$ inches,* but both these values are liable to slight alterations. The highest pressure observed was $30\cdot113$ inches on October 3rd, 1903, and the lowest $27\cdot992$ inches on June 8th, 1904. There is much cloud, the mean annual amount (overcast sky or fog, 100) being 82. Summer is the cloudiest time, and winter has the least cloud. As regards the discussion of results, the values for 1904 have been worked out and prepared for publication under the direction of Mr. Walter G. Davis, the able chief of the Argentine Meteorological Office, and will appear shortly. Meanwhile good progress is being made with the reduction of the "Scotia's" observations on land and sea, but some little time must necessarily elapse before the data are published.

Mr. Mossman has kindly supplied photographs of the station as it appeared in winter and summer conditions, and these are reproduced in illustration of his description.

* The barometric readings are corrected to 32° and sea level, but not to standard gravity at 45° .



ROYAL METEOROLOGICAL SOCIETY.

THE first of the Afternoon Meetings for the present session was held on Wednesday, May 17th, in the Society's Rooms, 70, Victoria Street, Westminster, Captain D. Wilson-Barker, Vice-President, in the chair.

Mr. Richard Strachan, F.R.Met.Soc., read a paper on the "Measurement of Evaporation." He pointed out that the rainfall, evaporation and percolation are related to each other; and that rainfall is commonly considered to form the sum of evaporation and percolation. If two of these quantities are found by experiment or observation, the other is assumed to be known. This, however, does not always hold good. A month may be very dry, and still evaporation will go on at the expense of previous percolation—and otherwise. A month may be excessively wet; then there may be a fourth item in the account—viz., overflow. If evaporation, and also percolation, could be observed as readily and closely as is rainfall, then overflow could be detected and measured.

As it is unfortunately not possible to make evaporation and percolation the subject of experiment except at a very few observatories, the author thinks that it is desirable to be able to estimate, even empirically, the probable amounts of each. By using the meteorological data published for the Royal Observatory, Greenwich, he has calculated the probable evaporation for the year 1898, which agrees very closely with the observed evaporation at Camden Square and also at Croydon.

The Chairman thought it was unfortunate that a standard evaporimeter was not obtainable.

Dr. H. R. Mill said that the subject of evaporation was one of great importance and no less difficulty. He had continued Mr. Symons's observations and was not without hope of arriving at some definite conclusion from the readings.

Mr. Baldwin Latham said that all calculations of evaporation were liable to considerable errors. He did not think the taking of the temperature of the ground at Greenwich at one inch in depth at noon at all represented the true mean temperature of the water evaporated at Camden Square or Croydon. It was not possible to arrive at the true amount of evaporation by deducting the depth of water passing through a percolating gauge from the depth of rainfall, for the simple reason that during some months in a year no percolation takes place, the gauges are comparatively dry, and there is no water to evaporate.

A paper by Dr. John Ball, of Cairo, on a "Logarithmic Slide-Rule for Reducing Readings of the Barometer to Sea Level," was read by the Secretary. This slide-rule has been devised for the purpose of saving the time and labour usually occupied in calculation.

The Chairman and Mr. W. Marriott took part in the discussion.

Capt. J. J. Alsop, Mr. W. P. Gibbons, J.P., Mr. S. W. S. Morris, Mr. C. G. Trevett, and Rev. H. W. Williams, M.A., were elected Fellows of the Society.

METEOROLOGICAL NEWS AND NOTES.

THE METEOROLOGICAL OFFICE has now been placed under the charge of Dr. W. N. Shaw, F.R.S., as Director of Meteorology, instead of under the Meteorological Council with Dr. Shaw as Secretary. We have not yet been able to ascertain authoritatively what the new constitution of the Office is, or how far the Report of the Treasury Committee (see this Magazine, vol. 39, p. 101) has been acted upon, and we can only hope that the Director has a free hand and increased resources.

METEOROLOGY AT THE PUBLIC SCHOOLS is, we are glad to see, receiving increased attention. It is pleasant to quote the following paragraph from the *Standard* of June 8th :—

Harrow hitherto has been alone among the Public Schools in the non-registration and in the non-publication of an annual series of weather observations. The principal cause of this—the lack of the necessary apparatus—no longer exists, as Mr. F. Druce has now presented the school with a full equipment for the registration of temperature, moisture, and rainfall. The donor has completed his gift by a collection of books on meteorology, which have been placed in the Vaughan Library. The means thus provided of recording and describing the atmospheric variations as to climate and weather will be much appreciated by the Harrovian residents, who have experienced, in 1879, in 1897, and on May 30th last, three local storms of exceptional severity.

THE ARGENTINE GOVERNMENT have purchased the Antarctic research ship, *Le Français*, which recently arrived at Buenos Aires with Dr. Charcot's Expedition on board. Mr. Davis, director of the Oficina Meteorologica Argentina, hopes next summer to be able to establish meteorological and magnetical stations on one of the South Sandwich group, and possibly on Wandel Island, where Dr. Charcot's expedition wintered. Records from the sub-Antarctic station of South Georgia are being maintained during the present year, while the First Order station on Laurie Island, South Orkneys, established by the Scottish Antarctic Expedition, is being continued for a second year under Argentine auspices.

DR. J. HANN'S "LEHRBUCH DER METEOROLOGIE," recently reviewed in these pages, is, we are happy to see, already coming out in a new edition, which, like the first, is appearing in periodical parts. There is no other storehouse of the facts and theories of meteorology so well stocked as this, and it is simply indispensable to all students with whom the language is no bar. The translation of this work would confer an immense boon on the not-inconsiderable number of English-speaking meteorologists who do not read German.

AMAZING VALUES FOR THE RAINFALL appeared in a return recently received, and the figures could not be explained until they were referred to the observer, who solved the problem by explaining that an assistant in copying out the figures had strayed, now and again, into the adjoining column of wet bulb temperature readings !

RAINFALL AND TEMPERATURE, MAY, 1905.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables in <i>British Rainfall</i> to which each station belongs.]	RAINFALL.				Days on which -01 or more fell.	TEMPERATURE.				No. of Nights below 32°.		
		Total Fall.	Diff. from average, 1870-99.	Greatest in 24 hours.			Max.		Min.				
				Depth	Date.		Deg.	Date.	Deg.	Date.			
inches	inches.	in.								Shade	Grass		
I.	London (Camden Square) ...	1·18	—	·54	·41	30	9	83·2	29	35·1	23	0	2
II.	Tenterden	1·24	—	·48	·51	1	8	79·2	29	32·5	23	0	6
	Hartley Wintney	·75	—	1·04	·48	31	3	76·0	29, 30	33·0	22	0	3
III.	Hitchin	2·00	+	·13	1·57	30	9	...	...	...	...	...	...
	Winslow (Addington)	·76	—	1·30	·43	30	8	79·0	29	28·0	23	3	11
IV.	Bury St. Edmunds (Westley)	1·26	—	·59	·63	30	7	81·5	29	29·0	23	...	...
	Brundall	1·41	—	·33	·69	1	12	80·2	29	33·6	23	0	4
V.	Alderbury .....	...	...	...	...	...	...	...	...	...	...	...	...
	Winterbourne Steepleton ...	·53	—	1·49	·26	1	8	69·7	17	29·0	23	1	11
	Torquay (Cary Green)	·56	—	1·40	·43	1	5	68·8	17	37·9	4	0	0
	Polapit Tamar [Launceston]	·48	—	1·50	·26	1	5	69·4	20	28·1	23	4	6
	Bath	·07	—	2·02	·02	18	6	71·5	28	32·0	23	1	17
VI.	Stroud (Upfield)	·74	—	1·36	·27	3	6	73·0	31	36·0	3	0	...
	Church Stretton (Woolstaston)	·67	—	1·95	·20	1	7	68·5	28	32·0	22	1	...
	Bromsgrove (Stoke Reformatory)	·40	—	1·54	·14	1	6	72·0	28	26·0	22	6	...
VII.	Boston	1·35	—	·38	·62	30	6	83·0	28	30·0	23	1	...
	Worksop (Hodsock Priory)	·42	—	1·59	·32	1	4	75·6	28	27·6	23	3	16
	Derby (Midland Railway)	·39	—	1·57	·27	1	5	76·0	28	30·0	5	2	...
VIII.	Bolton (The Park)	·81	—	1·65	·34	1	8	71·0	28	33·9	22	0	6
IX.	Wetherby (Ribston Hall) ...	·61	—	1·29	·29	1	8	...	...	...	...	...	...
	Arncliffe Vicarage	·98	—	2·38	·41	1	11	...	...	...	...	...	...
	Hull (Pearson Park)	·51	—	1·44	·36	1	9	79·0	28	31·0	23	2	10
X.	Newcastle (Town Moor) ...	·51	—	1·38	·11	3	14	...	...	...	...	...	...
	Borrowdale (Seathwaite) ...	8·18	+	·92	2·21	28	13	72·2	18	32·6	22	0	...
XI.	Cardiff (Ely)	·13	—	2·42	·08	1	3	...	...	...	...	...	...
	Haverfordwest (High St.) ...	1·31	—	1·22	·43	1	7	71·0	18	33·2	23	0	11
	Aberystwyth (Gogerddan) ...	1·62	—	·82	·46	10	5	76·0	17	27·0	8	6	...
	Llandudno	·43	—	1·42	·16	31	7	68·0	28	39·5	23	0	...
XII.	Cargen [Dumfries]	2·17	—	·43	1·44	28	8	73·0	17, 18	31·0	23	1	...
	Lilliesleaf (Riddell)	·87	—	1·20	·23	1	14	69·0	31	30·0	4	2	11
XIII.	Edinburgh (Royal Observatory)	·55	...	...	·22	28	9	64·8	28	34·8	22	0	1
XIV.	Colmonell	·89	—	1·61	·20	26	7	75·0	18	28·0	25	2	...
XV.	Tighnabruaich	2·95	—	·26	·66	28	13	65·0	18	32·0	3	1	4
	Mull (Quinish)	3·40	+	·49	·61	24	19	...	...	...	...	...	...
XVI.	Dundee (Eastern Necropolis)	1·40	—	·48	·40	26	12	67·7	31	33·0	23	0	...
XVII.	Braemar	1·65	—	·64	·54	25	15	70·0	17	30·0	4	2	...
	Aberdeen (Cranford)	1·22	—	·98	·24	26	14	68·0	30	30·0	22	2	...
	Cawdor (Budgate)	2·08	+	·05	·28	28	18	...	...	...	...	...	...
XVIII.	Invergarry	2·73	—	·11	·60	10	10	...	...	...	...	...	...
	Bendampy	4·00	—	1·05	·90	9	18	...	...	...	...	...	...
XIX.	Dunrobin Castle	1·14	—	·88	·20	23	15	63·5	29	35·0	24	0	...
	Castletown .....	...	...	...	...	...	...	...	...	...	...	...	...
XX.	Killarney	1·47	—	1·48	·35	26	13	75·0	16	34·0	4	0	...
	Waterford (Brook Lodge) ...	1·59	—	·52	·36	28	10	69·5	18	30·0	23	1	...
	Broadford (Hurdlestown) ...	1·32	—	·77	·21	25	14	70·0	18	34·0	3	0	...
XXI.	Carlow (Browne's Hill)	1·65	—	·70	·79	1	10	...	...	...	...	...	...
	Dublin (Fitz William Square)	1·18	—	·76	·71	1	10	70·9	28	36·9	4	0	2
XXII.	Ballinasloe	1·19	—	1·30	·27	28	14	76·5	18	28·0	4	2	...
	Clifden (Kylemore House) ..	...	...	...	...	...	...	...	...	...	...	...	...
XXIII.	Seaforde	·98	—	1·47	·33	31	8	73·0	29	35·0	4	0	5
	Londonderry (Creggan Res.) ..	1·99	—	·49	·44	27	16	...	...	...	...	...	...
	Omagh (Edenfel)	2·09	—	·34	·60	28	13	76·0	18	30·0	22	3	3

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

SUPPLEMENTARY RAINFALL, MAY, 1905.

Div.	STATION.	Rain. inches	Div.	STATION.	Rain. inches
II.	Dorking, Abinger Hall	·67	XI.	New Radnor, Ednol	·58
„	Ramsgate, West Cliff	1·15	„	Rhayader, Nantgwillt	·69
„	Hailsham	1·63	„	Lake Vyrnwy	1·19
„	Crowborough	1·23	„	Ruthin, Plás Draw	·73
„	Osborne	·37	„	Criccieth, Talarvor	1·12
„	Emsworth, Redlands	·39	„	Anglesey, Lligwy	·92
„	Alton, Ashdell	·86	„	Douglas, Woodville	1·89
„	Newbury, Welford Park	·66	XII.	Stoneykirk, Ardwell House	·84
III.	Harrow Weald	1·00	„	Dalry, Old Garroch	2·36
„	Oxford, Magdalen College	·88	„	Langholm, Drove Road	3·37
„	Banbury, Bloxham Grove	·41	„	Moniaive, Maxwellton House	2·23
„	Pitsford, Sedgebrook	1·63	XIII.	N. Esk Reservoir [Penicuik]	1·50
„	Huntingdon, Brampton	1·26	XIV.	Maybole, Knockdon Farm	1·44
„	Wisbech, Bank House	1·02	„	Glasgow, Queen's Park	1·55
IV.	Southend	·80	„	Campbeltown, Redknowe	1·51
„	Colchester, Lexden	1·20	XV.	Inveraray, Newtown	3·70
„	Safron Waldon, Newport	1·09	„	Ballachulish House	4·25
„	Rendlesham Hall	1·41	„	Islay, Eallabus	3·02
„	Swaffham	1·42	XVI.	Dollar	2·57
„	Blakeney	1·02	„	Loch Leven Sluices	1·88
V.	Bishops Cannings	·33	„	Balquhiddy, Stronvar	3·12
„	Ashburton, Druid House	·86	„	Coupar Angus Station	1·83
„	Okehampton, Oaklands	·43	„	Blair Atholl	1·55
„	Hartland Abbey	·12	„	Montrose, Sunnyside	1·37
„	Lynmouth, Rock House	·15	XVII.	Alford, Lynturk Manse	1·69
„	Probus, Lamellyn	·71	„	Keith	1·30
„	Wellington, The Avenue	·33	XVIII.	N. Uist, Lochmaddy	1·25
„	North Cadbury Rectory	·32	„	Aviemore, Alvey Manse	2·01
VI.	Clifton, Pembroke Road	·11	„	Loch Ness, Drumnadrochit	1·99
„	Moreton-in-Marsh, Longboro'	·42	„	Glencarron Lodge	4·85
„	Ross, The Graig	·36	„	Fearn, Lower Pitkerrie	1·82
„	Shifnal, Hatton Grange	·48	XIX.	Invershin	1·32
„	Wem Rectory	·83	„	Altnaharra	1·32
„	Cheadle, The Heath House	·51	„	Bettyhill	·98
„	Coventry, Kingswood	·28	„	Watten	1·13
VII.	Market Overton	·48	XX.	Cork, Wellesley Terrace	·90
„	Market Rasen	·92	„	Darrynane Abbey	1·46
„	Bawtry, Hesley Hall	·43	„	Glenam [Clonmel]	1·19
VIII.	Neston, Hinderton	·72	„	Ballingarry, Gurteen	·84
„	Southport, Hesketh Park	·31	„	Miltown Malbay	1·29
„	Chatburn, Middlewood	·55	XXI.	Gorey, Courtown House	1·09
„	Cartmel, Flookburgh	1·47	„	Moynalty, Westland	1·11
IX.	Langsett Moor, Up. Midhope	·51	„	Athlone, Twyford	1·53
„	Scalby, Silverdale	1·42	„	Mullingar, Belvedere	1·19
„	Ingleby Greenhow	1·00	XXII.	Woodlawn	1·38
„	Middleton, Mickleton	·28	„	Westport, Murrisk Abbey	1·15
X.	Beltingham	·75	„	Crossmolina, Enniscoie	1·56
„	Font Reservoir, Fallowlees	1·25	„	Collooney, Markree Obsy	1·53
„	Ilderton, Lilburn Cottage	·64	XXIII.	Enniskillen, Portora	1·72
„	Keswick, The Bank	2·14	„	Warrenpoint	·99
XI.	Llanfrechfa Grange	·28	„	Banbridge, Milltown	1·31
„	Treherbert, Tyn-y-waun	·66	„	Belfast, Springfield	2·44
„	Carmarthen, Friary	1·06	„	Bushmills, Dundarave	1·79
„	Castle Malgwyn	1·32	„	Stewartstown	1·96
„	Plynlimon	2·10	„	Killybegs	1·22
„	Tallyllyn	·20	„	Horn Head	1·08

METEOROLOGICAL NOTES ON MAY, 1905.

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.

ENGLAND AND WALES.

LONDON, CAMDEN SQUARE.—A particularly fine and pleasant month. R fell on the first three and last two days, leaving the remainder of the month practically rainless. TS of moderate severity on the afternoon of 30th. Duration of sunshine 222·2* hours and of R 10·0 hours. Mean temp. 51°·1, or 1°·1 above the average.

ABINGER HALL.—A very dry month, with N.E. winds practically the whole time and much damage by frost, particularly on 25th. Rain was greatly needed and grass crops were very light.

TENTERDEN.—Wet at first, then three very dry weeks. Cold, with N. wind on 22 days. Damage by frost on 23rd, serious on low ground. Mean temp. 52°·5. Duration of sunshine 259·5† hours.

CROWBOROUGH.—Very cold nights with persistent N. and N.E. winds up to 23rd, then exceedingly warm. R 95 in. below the average of 34 years, raising the deficiency since January 1st to 1·84 in. The dry weather, cold nights and E. winds retarded all vegetation, and hay prospects were not good. Mean temp. 52°·5.

HARTLEY WINTNEY.—Stormy and rough on 1st, but afterwards exceedingly harsh and dry. TS on 31st. Ozone on 23 days; mean 3·0.

ADDINGTON MANOR.—Much damage was done by frost on 23rd, when the grass thermometer fell to 22°.

PITSFORD.—From 5th to 25th there was a continuance of cold N. wind. R was very much needed. R 42 in. below the average. Mean temp. 51°·6.

COLCHESTER.—Almost continuous N. to E. wind from 4th to 23rd, yielding cold, bright and very dry weather. Hot and close from 28th to 30th.

RENDLESHAM HALL.—Heavy R and gale on the first two days, then dry with N. to N.E. winds, ending on 22nd with S, H and R storms and frost. The last days were mild and showery.

BURY ST. EDMUNDS.—Very dry and cold, with northerly wind on 23 days. Between 3rd and 29th only 0·8 in. of R fell. Gardens and fruit were much injured by frost on 23rd.

BRUNDALL.—Mean temp. about the average, the warm days in the last week compensating for the extremely cold ones immediately preceding. The 29th was the warmest day in May since 1895.

TORQUAY.—Duration of sunshine 288·3* hours. Mean temp. 53°·0, or 0°·1 below the average. Mean amount of ozone 5·6: max. 9·0 on 1st and 2nd; min. 4·0 on several days.

POLAPIT TAMAR.—Exceptionally dry, with very low temp. at night.

LYNMOUTH.—Except the first two days and the last four, it was dry and very sunny, with cool winds keeping the temp. low. R 2·86 in. below the average of 9 years.

WELLINGTON.—Abnormally dry and fine, but the nights were generally cold. R only about one-fifth of the average.

NORTH CADBURY.—The driest month since the record commenced in September, 1896. Humidity and cloud much below the normal, and a pleasant sunny month, though bad for gardens and grass. Disastrous frost on 23rd.

CLIFTON.—Practically rainless and the driest May in 50 years, the nearest approach being in 1876, with 23 in. Cold from 21st to 23rd, with N.E. wind and frost. Last week warm.

ROSS.—The driest May since 1896. Generally very fine, but the severe frost of 22nd did considerable injury to fruit and vegetables. Temp. about the average, and R about one-sixth of average.

BOSTON.—Frost on 23rd did an immense amount of harm to early potatoes, vegetables and strawberries. Very high temp. from 28th to 30th.

WORKSOP.—The driest May for at least 30 years, practically nothing falling after the 3rd. Frost on 23rd did much damage, especially to ash plantations. Min. on grass $16^{\circ}5$.

BOLTON.—Very dry, warm and sunny, and vegetation in exposed places suffering from want of R. Mean temp. $50^{\circ}8$, or $1^{\circ}1$ above the average. Duration of sunshine $162\cdot1^*$ hours, or $6\cdot3$ hours above the average.

SOUTHPORT.—The driest May in 34 years. Mean temp. $0^{\circ}3$ above the average. Duration of sunshine 6 hours above the average. R $1\cdot81$ in. below the average.

UPPER MIDHOPE.—R $1\cdot77$ in. below the average of 10 years and the lowest in any month in that period.

LILBURN.—Remarkably dry. Cold in the early part and hot in the latter.

LLANFRECHEA GRANGE.—Very dry and R much wanted. Frost on 21st and 22nd did much harm to fruit blossom. Very warm on the last three days.

HAVERFORDWEST.—Fine but cold. Considerable damage was done by frost and vegetation was backward. Duration of sunshine $254\cdot5^*$ hours. One sunless day.

GOGERDDAN.—Very dry and cold, with keen E. and N.E. winds.

DOUGLAS.—Very fine with excessive sunshine, but strong, cold polar winds, the only genial period being from 14th to 18th. Absolute drought from 7th to 24th, with hot sun, parching wind and cold nights.

SCOTLAND.

LANGHOLM.—R $\cdot38$ in. above the average of 28 years.

LILLIESLEAF.—Cold E. winds. Quite fine for the first three weeks, then R. Cold nights. Beautiful weather for garden and farm and no damage from frost.

COLMONELL.—R the least in May with three exceptions since observations commenced. Frost on 25th did little damage near the shore.

COUPAR ANGUS.—Dry with bright sun to 23rd, then after three days with night frosts mild weather with daily R and high night temp. R $\cdot09$ in. below the average.

DRUMNADROCHIT.—R $\cdot07$ in., and rainy days 3, below the average of 19 years. Bitterly cold N. and E. winds.

DUNROBIN CASTLE.—Cold easterly winds in the early part. After 22nd milder, with occasional genial R to the end.

IRELAND.

CORK.—R only about one-third of the average. Mean temp. slightly above the average. Prevailing wind N.E. and N.W.

DARRYNANE ABBEY.—A dry month, the R being 59 per cent. of the average of 25 years. The first part was very dry and hot.

DUBLIN.—After opening with a downpour, the month proved to be one of drought. Polar winds largely predominated.

BELFAST.—A glorious month and the finest spell since May, 1901. Heavy falls in the latter days almost brought the R up to the average.

OMAGH.—All the R fell in the first and last weeks, the intermediate period being dry, mostly cloudless and warm, sometimes hot. Severe frost on 22nd, occasioning injury to all tender vegetation and fruit blossom, which the R of the last week did much to restore.

* Campbell-Stokes.

† Jordan

Climatological Table for the British Empire, December, 1904.

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.										
°		°		°	°	°	0-100	°	°	inches.				
London, Camden Square	56·3	29	27·6	9	45·2	36·6	38·9	92	68·3	19·9	1·79	18	7·7	
Malta	67·2	3	41·2	31	60·4	49·2	46·5	76	107·8	35·8	2·30	12	5·1	
Lagos	91·5	30	70·0	25	87·4	74·1	74·1	76	138·0	65·0	·75	1	3·7	
Cape Town	92·9	30	49·1	26	75·0	57·4	54·6	67	...	...	1·51	5	3·6
Durban, Natal	85·5	8, 18	56·0	14	78·9	63·9	...	...	149·0	...	6·44	19	6·0
Johannesburg	81·8	29	40·0	15	72·0	52·6	49·9	68	145·5	39·5	3·27	5	4·6	
Mauritius	88·2	26	65·4	6	85·5	70·8	67·2	71	153·2	57·7	4·66	16	6·3	
Calcutta	81·4	11	50·9	27c	78·0	57·8	57·6	71	136·9	44·9	·00	0	2·0	
Bombay	87·7	23	65·9	30	84·6	69·9	64·6	67	137·9	56·5	·00	0	2·0	
Madras	87·7	1	62·7	27	83·7	69·6	65·4	72	141·2	59·7	·85	9	5·5	
Kodaikanal	71·4	1	43·1	15	61·2	47·4	49·6	74	124·6	30·7	2·90	9	4·2	
Colombo, Ceylon	90·2	8	70·0	24	86·1	72·8	73·6	78	153·2	66·0	2·12	9	5·0	
Hongkong	75·7	8	44·8	24	66·1	55·7	48·1	62	125·5	...	·23	4	4·5	
Melbourne	102·0	24	44·7	22	78·1	53·4	48·7	55	160·2	33·2	·11	3	4·7	
Adelaide	114·0	31	47·1	19	85·6	59·0	49·7	46	161·0	42·4	·00	0	3·4	
Coolgardie	108·6	27	53·2	24	93·0	62·2	51·8	42	174·6	49·4	·81	5	3·2	
Sydney	107·5	31	57·5	2	79·9	64·5	59·8	63	138·1	47·0	·88	9	5·5	
Wellington	69·8	2	43·0	16	61·5	50·2	47·4	72	128·0	38·0	5·38	17	7·3	
Auckland	73·0	20a	48·0	14d	64·8	52·9	50·4	74	141·0	41·0	3·56	12	5·0	
Jamaica, Negril Point.	87·6	2	65·9	31	85·1	70·3	70·6	79	...	...	4·64	4	...
Grenada	83·8	9b	71·0	11	82·2	73·2	69·8	71	150·0	...	7·59	21	3·6	
Toronto	48·5	23	1·3	14	29·4	15·1	18·8	80	65·8	-5·2	1·45	13	8·0	
Fredericton	38·9	20	-20·8	25	20·6	0·2	-2·0	56	...	...	1·80	...	4·6
Winnipeg	40·2	30	-29·6	24	16·5	-4·2	...	...	...	...	1·65	...	6·8
Victoria, B.C.	55·6	29	28·2	25	47·2	40·5	40·0	86	...	...	4·71	24	8·5
Dawson	21·5	3	-36·4	26	5·1	-4·5	...	...	...	...	1·45	5	5·1

a—and 21. b—and 10, 31. c—and 28. d—and 15.

MALTA.—Mean temp. of air 54°·4, or 1°·8 below average, mean hourly velocity of wind 10·4 miles, or 0·7 below average. Mean temp. of sea 59°·4. TSS on 5th.

MAURITIUS.—Mean temp. of air 0°·5, dew point 0°·4, and R ·73 in., below averages. Mean hourly velocity of wind 8·9 miles, or 1·9 below averages; mean computed direction of wind E. by N.

MADRAS.—Bright sunshine 173·2 hours.

KODAIKANAL.—Bright sunshine 173 hours.

HONGKONG.—Mean temp. of air 60°·7. Bright sunshine 201·7 hours. Mean hourly velocity of wind 10·6 miles; mean direction E. 20° N.

ADELAIDE.—Mean temp. 0·9 above average. No rain; the driest December on record.

SYDNEY.—Mean temp. of air 2°·2 above, R 1·62 in. below, and humidity 6·0 below, averages.

WELLINGTON.—Mean temp. of air 4°·1 below, R 2·12 in. above, averages.

AUCKLAND.—Mean temp. of air 6°·0 below the average of the previous 36 years, and R 1·00 in. above average.