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## THE RAINFALL OF THE SIX MONTHS, September, 1904—February, 1905.

It very rarely happens that the general rainfall of the country remains below the average every month for six consecutive months; and although there is nothing unprecedented in the circumstance it is sufficiently interesting to induce us to summarise the condition of things in a special table, setting forth the monthly rainfall since September with the percentage of the average for as many stations as could be compressed into a page by the ingenuity of the printer.

For each of the 55 stations employed the average rainfall of the thirty years 1870–99 is known or has been computed. That is the average used in the following tables, and it is probably within 2 per cent. of the average of a much longer period, say 50 years.

To avoid confusion, the word average is used with regard to time only, the expression “general rainfall” being employed to convey a similar idea with regard to space. Thus the general rainfall of England and Wales for any period means the mean depth of rain which has fallen in that period over the whole surface. The fifty-five stations the records of which are employed are so uniformly distributed over the country that it is safe to generalise from them as to the general conditions.

It is obvious that a deficiency of one inch of rain in a place like London where the average annual fall is 25 inches is a much more serious matter than a deficiency of an inch at a station, say in Wales, with an average annual fall of 100 inches; in the former case the inch means 4 per cent., in the latter only 1 per cent. of the annual fall. Hence, to facilitate comparison the rainfall for each station is expressed not only in inches but also in ratios, the average for the month or period being indicated in each case by 100. Thus in the tables 50 represents 50 per cent. or one-half of the average fall, 75 represents three-quarters of the average fall, and so on; figures above 100 indicate falls above the average.



TABLE I.—Six Months' Winter Rainfall, September, 1904—February, 1905.

Stations.	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Sept. to Feb.	
	Total rain.	Per cent. of aver.	Total rain.	Per cent. of aver.										
London	1.17	51	1.56	55	1.70	69	1.79	84	1.34	71	.79	49	8.35	63
Tenterden	1.28	49	1.98	55	2.04	63	3.56	130	1.15	49	.76	41	10.77	66
Hartley Wintney	1.23	52	1.73	56	1.42	47	2.39	94	.72	30	.66	32	8.15	53
Hitchin	1.12	50	1.13	42	1.86	53	2.12	103	1.13	62	1.00	65	7.86	61
Winslow	1.41	59	.96	33	1.50	57	1.88	83	.84	41	.56	32	7.15	51
Bury St. Edmunds	1.17	47	1.14	43	1.50	60	1.80	85	1.19	70	1.37	88	8.17	63
Brundall	1.78	69	1.20	40	2.00	74	2.55	120	.93	56	1.43	96	9.89	73
Alderbury	2.00	79	1.72	51	1.07	34	3.29	117	.61	23	.72	33	9.41	56
Winterbourne Steepleton	3.13	92	2.77	64	1.80	37	4.20	102	1.42	36	.79	25	14.11	60
Torquay	1.81	59	2.05	50	1.55	42	2.74	79	1.42	45	.84	29	10.41	51
Polapit Tamar	2.52	69	2.32	47	4.52	105	3.75	85	2.44	63	1.63	57	17.18	72
Bath	1.37	47	.71	22	1.81	59	1.96	71	.61	24	.86	41	7.32	44
Stroud	2.27	83	.58	19	1.52	51	2.15	87	.68	28	.80	38	8.00	50
Woolstaston	2.12	77	.70	18	1.20	38	2.53	87	.70	25	1.35	59	8.60	48
Bromsgrove	1.96	84	.60	24	.99	44	1.75	90	.77	40	.50	31	6.57	52
Boston	3.13	136	.91	35	.57	27	1.95	109	.81	51	.54	35	7.91	66
Worksop	1.21	56	.32	12	.98	47	1.20	59	.53	30	.73	46	4.97	40
Derby	1.67	70	.55	20	1.25	55	1.39	61	.80	41	.67	40	6.33	48
Bolton	1.73	39	2.90	61	3.72	95	3.29	79	2.23	66	2.86	107	16.73	72
Wetherby	.81	32	.72	23	2.25	101	1.57	72	.99	52	1.40	86	7.74	57
Arncliffe	1.75	34	2.92	45	7.04	117	4.58	71	3.35	53	4.53	96	24.17	69
Hull	1.70	71	.50	15	1.51	62	1.43	61	.62	34	1.16	62	6.92	49
Newcastle	1.18	50	.81	28	3.14	118	1.94	73	.44	22	.91	58	8.42	60
Seathwaite	7.48	59	9.19	69	12.52	90	15.09	103	9.15	62	9.86	85	63.29	78
Cardiff	4.03	99	2.69	56	3.49	82	3.38	76	1.64	43	1.17	37	16.40	67
Haverfordwest	5.10	121	2.25	40	3.51	65	5.14	98	2.70	53	1.83	49	20.53	70
Gogerddan	3.96	94	3.23	58	3.18	68	4.77	106	3.05	79	2.74	90	20.93	81
Llandudno	1.15	39	1.29	32	1.84	54	3.01	102	2.20	86	1.87	95	11.36	64
Dumfries	2.78	75	2.28	52	3.10	69	3.47	74	2.33	51	2.71	75	16.67	66
Lilliesleaf	.96	35	.96	30	1.86	57	2.18	69	1.15	44	1.17	49	8.28	47
Colmonell	4.49	110	2.59	52	5.30	109	3.72	77	2.98	66	3.95	108	23.03	86
Glasgow	3.12	93	1.73	51	2.14	61	3.41	97	1.87	58	2.43	96	14.70	75
Tighnabraich	7.26	131	3.45	60	5.81	94	6.16	97	5.34	91	5.74	126	33.76	99
Inveraray	6.25	103	5.69	90	5.42	85	7.92	107	7.12	107	6.88	140	39.28	104
Islay	4.30	104	4.45	85	6.13	115	4.20	75	4.53	97	4.07	109	28.28	97
Mull	4.61	84	5.30	87	4.35	68	4.58	71	4.29	73	5.03	112	28.16	81
Dundee	2.35	92	.70	26	.60	22	1.80	66	.35	17	.80	38	6.60	44
Braemar	2.14	65	1.29	32	1.39	35	1.87	59	1.61	55	2.36	87	10.66	53
Aberdeen	2.33	77	1.03	32	1.41	41	2.80	83	.73	31	2.04	84	10.34	58
Cawdor	1.73	57	1.33	47	1.67	63	2.26	89	2.05	96	2.45	132	11.49	76
Invergarry	5.72	112	3.85	70	3.77	63	6.66	100	7.55	114	7.23	148	34.78	100
Bendamp	8.19	99	7.39	74	6.70	68	8.73	97	8.51	97	11.66	172	51.18	97
Dunrobin	2.40	89	1.82	55	2.20	67	2.45	72	3.38	129	3.73	157	15.98	90
Killarney	3.42	73	2.85	47	4.34	74	5.01	75	4.52	69	2.80	51	22.94	65
Waterford	4.40	143	1.74	43	2.15	55	3.76	87	2.73	67	1.14	35	15.92	70
Broadford	2.97	101	3.15	101	2.51	79	3.36	100	2.56	86	1.84	84	16.39	92
Carlow	3.35	120	1.51	43	1.68	53	2.09	60	2.40	76	1.04	40	12.07	65
Dublin	2.34	109	.45	15	1.08	42	1.50	63	1.90	88	.75	38	8.02	56
Mullingar	2.98	94	2.50	73	1.99	58	2.23	65	2.40	78	1.71	68	13.81	72
Ballinasloe	3.11	98	2.77	80	2.70	75	3.48	96	2.26	65	1.63	66	15.95	80
Clifton	5.97	89	4.92	62	6.22	75	6.21	69	6.08	77	5.08	84	34.48	75
Crossmolina	3.81	92	2.98	59	5.55	99	4.82	83	4.70	94	3.63	91	25.49	86
Seaforde	3.71	110	.85	22	2.36	60	2.46	68	1.85	51	1.70	57	12.93	61
Londonderry	2.68	71	2.80	63	4.73	113	3.06	71	3.08	87	3.78	138	20.13	87
Omagh	3.00	85	3.51	94	3.41	97	2.85	76	3.30	99	1.98	80	18.05	88

When the figures quoted in Table I. are set down on a map, the apparent irregularity of the deficiencies disappears, and the distribution is seen to be simple and easy to grasp. The rainfall for the six months reached and even slightly exceeded the average over a narrow strip in the west of Scotland from the west end of the Caledonian Canal to the Firth of Clyde. The rainfall amounted to at least 75 per cent. or three-quarters of the average over all Scotland north of Inverness and west of the meridian of 4° W., and also in the north-western half of Ireland, in the English Lake district, and in a small area on the west coast of Wales. All the rest of the British Isles had less than three-quarters of the usual fall.

In two large areas the rainfall for the six months fell short of 50 per cent. of the average. The first of these areas with less than half the usual fall is situated in the south-east of Scotland, including practically the whole of the counties of Fife, Kinross, Haddington and Berwick, as well as most of Forfar and Midlothian, and parts of Perth, Peebles, Selkirk and Roxburgh. The gathering grounds for the water supply of Edinburgh and Dundee lie in this area of great deficiency.

The second and larger district in which less than half the average amount of rain has fallen since September 1st, 1904, occupies the Midlands, extending from Hull in the north-east to beyond Hereford and Bath in the south-west. It includes the whole valley of the Trent, the Warwickshire Avon and the upper Thames. The whole of the counties of Derby, Nottingham, Leicester, Stafford and Warwick appear to lie within the dry area, which also includes a little of the south of Yorkshire and portions of Lincoln, Rutland, Northampton, Shropshire, Hereford, Worcester, Oxford, Gloucester, Wiltshire and Somerset. It is worthy of notice that both the dry areas have normally a low rainfall, so that the total amount of rain which fell there is extremely small. Hodsock Priory, near Worksop, is the most remarkable instance, the falls and percentages at that station having been as follows:—

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Six months
Inches .....	1·21	·32	·98	1·20	·53	·73	4·97
Per cent. of average..	56	12	47	59	30	46	40

It is, of course, well-known to our readers that the longer the period under consideration, the smaller is the deviation from the average which is likely to occur. Thus a week with less than 1 per cent. of the average rainfall is common, but a month with only 1 per cent. of the average rainfall is excessively rare, and for the general rainfall of the British Isles the driest year on record showed 77 per cent. of the average.

Although the number of stations the records of which have been discussed is too small to allow one to treat detached portions of the United Kingdom with the same confidence as the whole, it is possible to compare at least the three kingdoms as shown in Table II.

TABLE II.—*Monthly Rainfall, Sept., 1904—Feb., 1905.*

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Six months.
England and Wales .....	67	40	64	89	47	57	60
Scotland .....	88	56	67	82	75	106	78
Ireland .....	99	59	73	76	78	69	75
British Isles .....	80	48	67	84	62	73	68

February was a wet month in the west and north of Scotland, and it was the only month in the six during which the general rainfall of any of the larger divisions touched the average, though in Ireland September came very near it. Leaving Ireland out of account, for the contrasts in rainfall in that island are as usual slight, we may divide Great Britain from north to south into a smaller western and a larger eastern division. A convenient line to take is the meridian of  $4^{\circ}$  W., which runs through the centre of the map, Caithness and the portion of Sutherland east of that line being reckoned with the western division. The result for monthly rainfall then appears:—

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Six months.
Western Division, } 12 stations .....	101	64	81	90	85	114	88
Eastern Division, } 31 stations .....	64	38	61	85	46	59	58

This shows that in the west there were only four consecutive months with any general deficiency, and that was so small as to be scarcely noticeable in such a wet region.

The much larger eastern division, containing most of Wales and the whole of England except Cornwall, only received as much as two-thirds of the average rainfall in one month out of the six, and had far less than half the average amount in October (which has normally the heaviest fall of any month in the year) and in January; the total deficiency for the six months amounting to as much as 42 per cent. of the average fall.

The necessity of economising water-supply had already made itself felt in several large towns within the dry area before the end of February. In several cases warnings had been issued to householders to economise the supply, and in some the supply had actually been shut off for a considerable part of the day. As the gathering grounds of most of the large towns supplied by gravitation lie in the area of considerably deficient rainfall, the effect of this exceptionally small autumn and winter rainfall cannot fail to be seriously felt as the year advances, even if the Spring months bring a normal fall sufficient for the needs of agriculture. The winter rainfall also is that on which deep wells depend for their supply, and water from underground sources may be deficient in summer unless the rainfall is so distributed as to keep the ground saturated. The first fortnight of March has shown a comparatively large rainfall over the whole country, and it is already apparent that the succession of continuously deficient months has been broken.

## Correspondence.

To the Editor of Symons's Meteorological Magazine.

## THE DEFICIENCY OF RAINFALL.

THE deficiency of rainfall in this district seems so remarkable as to be worthy of note in your pages.

Since January 1st of the present year to date, the total precipitation has been but 1·46 inches, falling on 23 days, and I am given to understand that in some of the outlying country districts water is so scarce that it is being purchased in small quantities at high prices.

The weekly totals from Jan. 1st to Feb. 25th, 1905, are :—

Week ending.	Amount of Rain.	Week ending.	Amount of Rain.
Jan. 7th .....	·19 in.	Feb. 4th .....	·08 in.
„ 14th .....	·08 in.	„ 11th .....	·02 in.
„ 21st .....	·75 in.*	„ 18th .....	·08 in.
„ 28th .....	·03 in.	„ 25th .....	·22 in.
On January 29th...	·01 in.		
Total to 31st Jan...	1·06 in.	Total to Feb. 25th	·40 in.
		Total from Jan. 1st	1·46 in.

\* This amount all fell on one day, viz. :—the 16th, leaving 0·31 in. as the total for the rest of the month.

If it had not been for the considerable fall on January 16th, the total precipitation for the *nine weeks* under consideration would have been only 0·71 in. !

D. W. HORNER.

Worthing, Feb. 25th, 1905.

I SHOULD be glad to hear if the following is of interest or use to you, as it is certainly curious.

## Rainfall at Goring, 1905.

Jan. 2.....	·04 in.	Feb. 6.....	·04 in.
„ 4.....	·07 „	„ 7.....	·03 „
„ 5.....	·04 „	„ 18.....	·02 „
„ 6.....	·02 „	„ 25.....	·15 „
„ 8.....	·02 „	„ 26.....	·18 „
„ 17.....	·07 „	„ 28.....	·06 „
Total ...	·26 „	Total ...	·48 „

Average for 2 months, 3·48 ; fall, ·74 ; deficit, 2·74. Following a very dry autumn this is serious. The poor on our hills have been hauling water for a long while, and as an example of the dryness, the leaves of the beech lie in drifts knee-deep in our woods. Some one had set these alight, and the flames spread over a considerable area before a strong N.E. wind last week.

C. GAMBIER PARRY, MAJOR.

Elmcroft, Goring, Oxfordshire, 1st March, 1905.

I SEND you the rainfall at Walton for the four wet months, October, November, December, and January, in periods of 10 years with averages for each. These figures strikingly emphasise the present abnormal dryness: the first, 1876: 15·49, compared with the last, 1904: 2·91, shows the variations of our climate strongly.

	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
Oct. ....	2·28	2·54	2·07	·94	4·80	2·62	3·74	3·23	1·13	5·39
Nov. ....	3·44	1·84	2·07	1·11	1·54	2·10	2·60	2·09	·52	2·22
Dec. ....	6·03	2·24	1·38	1·32	3·28	2·44	1·65	·84	2·05	·53
Jan. ....	3·74	2·02	1·14	·56	·06	1·95	2·47	2·98	·93	3·79
	15·49	8·64	6·66	3·93	9·68	9·11	10·46	9·14	4·63	11·93
	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.
Oct. ....	4·16	2·32	·84	3·85	·61	2·83	5·42	1·54	3·86	2·95
Nov. ....	1·44	1·62	5·45	·77	2·65	1·86	·89	1·53	·76	2·15
Dec. ....	3·65	1·44	1·55	1·49	·51	3·11	·48	2·73	1·13	2·72
Jan. ....	2·24	·94	1·39	2·28	1·27	·91	1·21	1·41	3·80	·24
	11·49	6·32	9·23	8·39	5·04	8·71	8·00	7·21	9·55	8·06
	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	
Oct. ....	3·66	1·17	2·85	2·37	2·48	1·67	2·45	5·89	·30	
Nov. ....	1·19	1·67	1·59	·55	1·64	2·92	1·43	1·04	·98	
Dec. ....	1·84	1·77	2·01	2·37	2·48	3·57	1·11	·66	1·21	
Jan. ....	2·50	·38	2·27	2·00	1·11	·89	1·18	1·73	·42	
	9·19	4·99	8·72	7·29	7·71	9·05	6·17	9·32	2·91	
10 years, 1876-1885	..... Average									8·97
10 years, 1886-1895	.....									8·20
9 years, 1896-1904	.....									7·26
29 years, 1876-1904	.....									8·17

EDWARD SIMPSON.

Walton Hall, Wakefield, 23rd Feb., 1905.

### GREAT BAROMETRIC RANGE.

In the February number of the Magazine there is much about the high barometer of January, 1905, but no reference is made to the low barometer of the same month, or to the extreme range of the barometer in the British Isles.

In the *Daily Weather Report* of 17th January, 1905, it was stated that "at Blacksod Point the mercury descended in the night to 27·99 in."

In the Magazine you write, "so far as we have been able to ascertain, the highest recorded was 31·097 inches at Falmouth Observatory."

This gives the great range of 3·107 in. for the British Isles in a single month.

W. E. MILNER.

Rose Cottage, Berkhamsted, 24th Feb., 1905.

## REVIEWS.

*Observations de la direction des nuages faites en Danemark, aux Færøe, en Islande et au Grönland, 1896-97.* [Observations of cloud direction made in Denmark, the Færøes, Iceland and Greenland.] Copenhagen, 1904.

THIS report is published by the Meteorological Institute of Denmark, the work having been carried out in accordance with the programme of the International Meteorological Committee. The figures are stated without discussion.

*Bericht über die Ergebnisse der Beobachtungen für das Liv-Estländische Regenstationennetz. 15-jährige Mittelwerte . . . für den Zeitraum 1886-1900, von PROF. DR. B. SRESNEWSKY.* [Report on the results of the observations of the rainfall system of Livonia-Esthonia. 15-year means for the period 1886-1900.] Yuryeff [Dorpat], 1904. Size 10 × 7. Pp. 48. Maps.

THE rainfall statistics of the western Baltic province of Russia are set out in detail and embodied in a series of neatly constructed maps.

*Report of the Meteorological Council for the year ending 31st March, 1904, to the President and Council of the Royal Society.* London. Printed for H.M. Stationery Office. Size 9½ × 6. Pp. 204. Price 1s. 2d.

IF Mr. Mawley included the phenomena of official meteorological publications in his phenological report, he would have indicated the appearance of this annual by means of a very large negative quantity, for it has rarely, if ever in recent years, blossomed so early before. By our delay in noticing its arrival we have done it an injustice which we are anxious to repair by placing on record our high appreciation of the steady improvement in quality and arrangement, as well as date of issue of this very important Report. Amongst other subjects touched on in the report is the advisability of adopting a uniform scale and projection for the synoptic weather charts of all countries. It is gratifying to see the increased number of references to scientific researches, some of fundamental importance which are being promoted by the Meteorological Council. The fulfilment of the daily weather forecasts, however, shows no improvement, but that, we may hope, is due rather to a higher standard being applied to results than to less accurate prevision. The Council has decided to publish no sunshine observations made by recorders the results of which are not comparable with the standard Campbell-Stokes pattern.

*Hourly Readings obtained from the Self-Recording Instruments at Four Observatories under the Meteorological Council, 1901.* Thirty-third year. New Series. Vol. II. London. Printed for H.M. Stationery Office, 1904. Size 12 × 10. Pp. xiv. + 198. Price 25s.

ONE of the volumes in arrear. The preparation of the others is, we are glad to learn, well advanced.

## THE GLACIAL SNOW OF BEN NEVIS.

BY REV. R. P. DANSEY.

THE assertion that Great Britain can boast a glacier will probably seem to most people a bold one. The sceptical will, the writer trusts, be more inclined to believe it after perusing these notes. Ben Nevis, as every one knows, is the highest summit in Britain—4,406 feet above sea level, 110 feet above its rival, Ben Macdhui, of the Cairngorms. But it is somewhat surprising to find that the area of Ben Nevis above 4,000 feet is not quite so large as the corresponding area of Ben Macdhui, or indeed of Braeriach. If, moreover, the 3,000 feet contour line is taken, the contrast is still more startling, for it will be found that at least fifteen of the flat-topped Cairngorms have a larger surface above 3,000 feet than Ben Nevis possesses. The proximity of Ben Nevis to the western sea-board ensures it a very heavy precipitation, of which perhaps quite half, if not more, falls as snow. The precipitation on Ben Nevis is much greater than on the Cairngorms, hence we may expect a greater depth of snow than on the former mountains, but the nearness of Ben Nevis to the sea, and therefore its greater mildness, probably tend to counterbalance its greater snowfall.



CORRIE OF ALT-A-MHULLINN, BEN NEVIS, SHOWING SITE OF GLACIER  
AT THE END OF APRIL.

But there is one especial feature which favours the accumulation and duration of snow on Ben Nevis; this feature is not to be found in nearly such a marked degree on any other Scottish mountain. The summit plateau, which rises steeply from the S.W.—the Glen Nevis side—terminates, after forming the summit crest, in a magnificent series of precipices, nearly two miles in length, overlooking the N.E. face. At the bottom of these precipices runs the small stream of the Allt-a-Mhuilinn, whence the corrie takes its name. On the other side of this, rise again the steep scree-covered slopes of Cairn Mor Dearg, 4,012 feet, which at the head of this great corrie joins Ben Nevis on the east by an arête which never falls below 3,478 feet. It will thus be seen that the Allt-a-Mhuilinn corrie is enclosed on all sides except the north by very high ground. Indeed; under the summit of Ben Nevis the precipices are 2,000 feet in height, and into these grim recesses the summer sun never entirely penetrates. These grand cliffs however, their two miles of length seamed by buttress, ridge and gulley, not only keep off the sun but they also intercept the warm Atlantic winds which blow over the top and on to the slopes of the opposite mountain, Cairn Mor Dearg, leaving the snow-covered corrie in a cold atmosphere of its own making.

It will now be seen how favourably situated is this great corrie under the N.E. precipices of Ben Nevis for the accumulation and duration of snow.

And now as regards that accumulation. By far the greater part of the snow that falls on Ben Nevis with all winds from S. by W. to W.N.W.—which are the prevailing winds and bring the heaviest snowfalls—is swept off over the precipices, where it accumulates in the great hollows and gullies underneath, in the Allt-a-Mhuilinn Corrie. The maximum depth on the summit is generally reached about the end of April or some time in May. The snow usually disappears from the summit about the beginning of July, except drifts, but the much greater accumulation below still remains. The minimum depth of snow under the precipices is usually found at the beginning of September, but as I have never visited the mountain in summer I am indebted to the Rev. A. E. Robertson for the following information. But, first, what constitutes a glacier? Where does the distinction between a glacier and *névé* come in? The glaciers of Ben Nevis—there are two—are *not* glaciers, in so far as they are not fed permanently by high level snows as are real glaciers. But, says Mr. Robertson, “if you were to examine into it, I am sure you would find them practically ice, say after 12 or 24 inches below the surface, and I think also they would show glacial movement as well, so if that makes a glacier. then I think you have it on Ben Nevis.” They have never been quite melted away within living memory, so no one knows what is below, or how much is below. Mr. Robertson crossed the largest “glacier” between the “Observatory Ridge” and the “N.E. Buttress,” (climbers’ names for routes up the precipices,) in August last, and said the length of the “glacier” from top to

bottom was then 300 feet; that it was of an average breadth of 50 yards, hard as a board, ribbed just like *nevé* in the Alps, and that it would not melt much more, if at all, that year. In many places at its side he could look over into the *bergschrund* between the rocks and the snow and could see down a great way, in many places 50 feet; so Mr. Robertson concludes that if it was 50 feet at the sides it must have been much more in the middle. The rocks near it were heavily glaciated and rounded off. Mr. Robertson, who has a knowledge of all the mountains over 3,000 feet high in Scotland, says that it is on Ben Nevis only that you will find your semi-glacier if at all, and that the snow-beds in the Cairngorms—the next nearest thing—are much more open and therefore more liable to be practically melted away in a hot summer. The level of the Ben Nevis “glacier” would be about 3,000 feet, part of it higher, and part, perhaps, lower. The snow drifts on the Cairngorms are much more open and exposed, and therefore more liable to great variations, if the weather be very hot or very cold in summer, and the nearest approach to the snow-beds (glaciers) on Ben Nevis that Mr. Robertson has seen was a large drift on Ben Macdhuì above the Feithe Buidhe, which he once saw practically gone in September some years ago.

The corrie of the Allt-a-Mhuilinn is probably the wettest spot in Great Britain; if a rain gauge were placed, as Mr. Gethin Jones recently suggested in these pages, half-a-mile on the lee side of the summit of Ben Nevis, that is the side opposite to that on to which the prevailing rain-bearing winds blow, this corrie would be the spot. But the difficulties attending its reading would be very great, especially from October to June, when the corrie is often full of drift snow; and on the advent of warmer weather, avalanches, due chiefly to the giving way of the cornices on the cliffs above, crash right down into the centre of the corrie, so that unless daily observations could be taken, the records would be of little value, as the gauge would soon be snowed up and lost. Even with daily observations the records could only be approximate, unless the observer was always on the spot and could take the measurements hour by hour, as was done at the Summit Observatory, now unfortunately closed through lack of funds.

Having only visited the Corrie of the Allt-a-Mhuilinn at the end of April, three years in succession, when the snow is at its maximum depth, the writer has not had an opportunity for studying the “glaciers,” as they were then indistinguishable in the vast wilderness of snow. This year he hopes to photograph them in July or August. It would be interesting if photographs could be taken of them twice monthly, from the beginning of July to the end of September, till all melting had practically ceased. A series of photographs thus obtained might be published and compared, care being taken to remember the date on which each was taken. A piece of iron, too, might be driven deeply into the ice at, say the beginning

of July, and a mark made in the rocks alongside and the rate of movement—if any—of the glacier might thus be obtained by observations at certain intervals. I may mention that the head of the Allt-a-Mhuilinn Corrie, where the “glaciers” are, is about three hours' walk from Fort William.

### A QUARTER OF A CENTURY'S RAINFALL AT THROCKING, HERTS.

By REV. C. WIGAN HARVEY.

WITH the year 1904 I completed 25 years of rainfall observations at Throcking, Herts (487 ft. above sea-level), of which I place before your readers the yearly totals, and the ratio which each year bears to the 25 years' average.

	Total Fall. in.	Percent- age of Average. %	Max. Fall in 24 hrs. in.	Rainy Days.		Total Fall. in.	Percent- age of Average. %	Max. Fall in 24 hrs. in.	Rainy Days.
1880 ...	27·41	114	1·22	157	1894 ...	23·26	96	1·09	203
1881 ...	27·32	113	1·36	186	1895 ...	24·50	101	1·33	165
1882 ...	27·92	116	1·04	193	1896 ...	26·60	110	0·93	177
1883 ...	25·95	107	1·20	169	1897 ...	23·41	97	1·15	177
1884 ...	18·39	77	1·60	138	1898 ...	20·71	85	1·08	170
1885 ...	26·22	109	1·25	169	1899 ...	24·23	100	0·96	182
1886 ...	25·24	105	1·10	166	1900 ...	24·49	101	0·98	178
1887 ...	18·26	76	0·79	150	1901 ...	19·73	82	0·96	134
1888 ...	22·87	94	0·75	178	1902 ...	17·97	74	0·69	161
1889 ...	25·57	106	2·60	165	1903 ...	36·36	150	2·00	201
1890 ...	20·73	86	1·24	171	1904 ...	22·38	93	1·09	201
1891 ...	26·64	110	1·02	212					
1892 ...	25·62	106	1·41	171	Aver.	24·16	100	2·60	174
1893 ...	22·34	92	1·12	168					

It may be noted that the year of least rainfall in the period, 1902, when the fall was 26 per cent. below the average, and the year of greatest rainfall, 1903, when the fall was 50 per cent. above the average, are consecutive. The greatest monthly fall occurred in October, 1903, when 5·93 in. were registered; and the smallest monthly fall in February, 1891, when only 0·01 in. was gauged.

There were 30 occasions on which 1 in. and upwards fell in 24 hours; on two of these it reached 1½ in., and on two it reached 2 in. These 30 falls occurred—1 in April, 3 in May, 3 in June, 7 in July, 4 in August, 4 in September, 4 in October, 2 in November, and 2 in December. The heaviest fall of rain was 2·60 in. on July 12th, 1899, the result of a series of thunderstorms; and the heaviest fall of snow was on February 15th, 1900, when 0·98 in. was registered. There were 25 periods of absolute drought (14 days or more without rain), the longest being a period of 30 days from March 17th to April 15th, 1893. There was, however, a period of 34 days from February 1st to March 6th, 1891, during which only 0·01 in. was registered. Snow was registered to the amount of 17·11 in. on 194 days, representing about 3 per cent. of the 25 years' aggregate fall (604·12 in.).

## ROYAL METEOROLOGICAL SOCIETY.

THE usual monthly meeting was held on Wednesday evening, February 15th, at the Society's Rooms, 70, Victoria Street, Westminster, Mr. Richard Bentley, President, being in the chair.

Mr. Edward Mawley read his "Report on the Phenological Observations for 1904." He said that the weather of the phenological year ending with November, 1904, was chiefly remarkable for the persistent rains in January and February, the absence of keen frosts in May, the long continuance of hot and dry weather in July, and the small rainfall during the autumn. Throughout the year wild plants came into flower behind their usual dates, but at no period were the departures from the average exceptional. The accompanying table shows the mean dates for the thirteen selected plants in the different districts of England.

YEAR.	S.W.		S.		MIDLAND.		E.		N.W.	
	Day of year.	Diff. from aver.								
1891...	144	+10	144	+ 9	150	+11	147	+10	150	+ 6
1892...	139	+ 5	138	+ 3	144	+ 5	143	+ 6	147	+ 3
1893...	118	-16	122	-13	125	-14	123	-14	128	-16
1894...	126	- 8	130	- 5	135	- 4	127	-10	137	- 7
1895...	139	+ 5	138	+ 3	141	+ 2	138	+ 1	144	0
1896	125	- 9	128	- 7	132	- 7	130	- 7	134	-10
1897...	130	- 4	132	- 3	136	- 3	132	- 5	142	- 2
1898...	133	- 1	135	0	138	- 1	136	- 1	141	- 3
1899...	136	+ 2	136	+ 1	141	+ 2	138	+ 1	145	+ 1
1900...	142	+ 8	141	+ 6	144	+ 5	143	+ 6	152	+ 8
1901...	138	+ 4	139	+ 4	141	+ 2	139	+ 2	144	0
1902...	139	+ 5	140	+ 5	145	+ 6	142	+ 5	152	+ 8
1903...	134	0	134	- 1	137	- 2	134	- 3	145	+ 1
1904...	139	+ 5	139	+ 4	142	+ 3	140	+ 3	149	+ 5
Mean ...	134	...	135	...	139	...	137	...	144	...

— signifies early and + late.

Such spring migrants as the swallow, cuckoo and nightingale made their appearance in this country at as nearly as possible their usual time. The yield of wheat per acre was the smallest since 1895, while those of barley, beans and peas were also deficient. On the other hand, there were good crops of oats, potatoes and mangels. The best farm crops of the year were, however, those of hay, swedes and turnips. Both corn and hay were harvested in excellent condition. Apples were everywhere abundant, and all the small fruits yielded well, especially strawberries, but there was only a moderate supply of pears and plums.

The President said that Dr. Gatty, who had made a study of the

question of the migration of birds, had found that they always followed practically the same course, and that they were not much influenced by the character of the season, whether it was favourable or otherwise.

Dr. W. N. Shaw said that he had been engaged recently in an attempt to summarise the meteorological data of the "Weekly Weather Report" in a form which would facilitate inquiry into the meteorological conditions of observed phenological results, the yield of crops, and other similar questions. One aspect of the inquiry, the relation between autumn rainfall and the yield of wheat, had already been noticed in *The Times* (see this Magazine for February). It had found an explanation of the deficient yield of 1904, after the favourable spring and summer of that year, in the excessive rainfall of the autumn of 1903.

Mr. H. Mellish said that in his own immediate neighbourhood in Nottinghamshire the swedes and turnips were the worst products of the year.

Mr. Baldwin Latham suggested that the deficiency in the yield of the wheat crop in 1904 was due to the excessive wet period in the year 1903, when a large amount of percolation took place, which washed out the soluble manurial elements and left the soil impoverished. It was well known that the effect of drought on the growth and yield of wheat was nothing like so detrimental as excessive wet, and the effect of the diminution of percolation during last summer and autumn could not but have a beneficial effect in producing a good wheat harvest in the present year.

Captain D. Wilson-Barker, Mr. J. E. Clark, and Mr. F. Gaster also took part in the discussion, and Mr. E. Mawley replied.

The other papers read were :—

"Observations of Meteorological Elements made during a Balloon Ascent at Berlin, September 1st, 1904," by Dr. H. Elias and Mr. J. H. Field; and

"The Winds of East London, Cape Colony," by Mr. J. R. Sutton.

The following gentlemen were elected Fellows of the Society :—  
Capt. G. Caie, Mr. G. A. Fernandez, Mr. E. Holt, Mr. A. E. Mitchell, and Mr. J. M. G. Shaw.

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## METEOROLOGICAL OBSERVATIONS IN PEMBA DURING 1903 AND 1904.

By THEODORE BURTT.

THE following statistics of climatological observations at the Friends' Industrial Mission, Pemba, East Africa, summarise and supplement those published in this Magazine for April, 1901, and October, 1902.

It will be noticed that there is but little variation in temperature between one year and another, and apparently no relation between

the temperature and the rainfall. The highest temperature in the sun was 175°.

It is very noticeable how the rainfall has decreased in the five years, but 1904 shows a heavier rainfall than either of the two preceding years. Though I have no record of 1898, I remember it as an unusually dry year, the rainy season being almost a failure; 1897, on the other hand, was a much wetter year. From the accompanying table of 1903 it will be seen that the lack of rain was chiefly during the rainy season in April and May. May is distinctly the wettest month in the year, though in 1902 and 1904 there was a little more rain in April. During May, 1899, 56·16 in. of rain fell, 13½ inches falling in 48 hours.

*Meteorological Observations in Pemba.*

YEARS.	Mean Max.	Mean Min.	Absolute Max.	Absolute Min.	Rainfall.	Rainy Days.
					in.	
1899 .....	83·3	70·2	92·0	65·0	105·24	149
1900.....	83·5	71·3	95·0	66·0	90·35	160
1901.....	81·8	70·4	90·5	65·0	92·78	166
1902.....	82·8	71·4	91·0	67·0	68·72	132
1903.						
January.....	84·6	73·9	90·0	70·5	4·90	5
February .....	84·7	73·1	89·5	71·0	2·00	4
March.....	86·7	75·2	91·5	71·5	1·40	5
April .....	83·1	72·2	86·5	70·0	13·09	24
May .....	80·0	71·0	85·0	68·5	17·93	24
June .....	81·3	70·5	83·0	69·0	5·22	13
July .....	79·4	69·0	82·0	66·0	3·15	15
August .....	79·5	68·4	84·0	67·0	1·14	14
September.....	80·9	68·6	84·0	67·5	·52	6
October .....	82·8	70·0	86·0	68·0	1·91	2
November .....	80·9	71·7	86·0	70·0	2·65	11
December .....	83·2	73·3	87·0	70·0	9·33	15
Year, 1903.....	82·3	71·4	91·5	66·0	63·24	138
1904.						
January.....	83·5	72·9	90·5	71·5	2·12	10
February .....	84·5	72·3	86·0	71·0	·23	2
March.....	84·4	72·4	90·0	70·0	5·46	11
April .....	80·6	71·1	86·0	66·0	23·50	20
May .....	79·2	70·7	84·0	69·0	19·74	27
June .....	78·8	69·2	82·0	66·0	12·13	17
July .....	77·4	67·7	80·0	65·0	3·27	15
August .....	77·9	67·4	80·0	66·0	·97	8
September.....	79·6	68·2	82·0	66·0	1·11	8
October .....	81·2	69·2	86·0	68·0	1·71	8
November .....	81·7	70·9	87·0	68·0	13·34	17
December .....	82·5	72·9	85·0	72·0	2·65	13
Year, 1904.....	80·9	70·4	90·5	65·0	86·23	156

## RAINFALL AND TEMPERATURE, FEBRUARY, 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 1/10 or more fell.	TEMPERATURE.				No. of Nights below 32°.		
		Total Fall.	Diff. from average, 1870-99.	Greatest in 24 hours.		Deg.		Max.		Min.		Shade	Grass	
				Depth.	Date.			Deg.	Date.	Deg.	Date.			
I.	London (Camden Square) ...	inches	inches.	in.										
II.	Tenterden .....	·79	-- '83	·19	26	12	54·4	5	30·6	20	210			
„	Hartley Wintney .....	·76	-- 1·09	·43	26	14	56·0	5	28·5	12	613			
III.	Hitchin .....	·66	-- 1·40	·18	25	13	59·0	19	29·0	12	410			
„	Winslow (Addington) .....	1·00	-- '54	·49	26	13	52·0	5, 16	28·0	19, 20	8			
IV.	Bury St. Edmunds (Westley) .....	·56	-- 1·17	·14	26	12	55·0	5	27·0	20	920			
„	Brundall .....	1·37	-- '18	·38	26	13	53·0	5	26·0	20	10...			
V.	Alderbury .....	1·43	-- '06	·17	20	19	53·8	5	26·8	8	615			
„	Winterbourne Steepleton ...	·72	-- 1·49	·26	25	12	56·0	18	...	...	...			
„	Torquay (Cary Green) .....	·79	-- 2·32	·32	25	14	55·1	14	27·2	12	813			
„	Polapit Tamar [Launceston] .....	·84	-- 2·03	·46	25	10	56·8	14	32·0	25	1 9			
„	Bath .....	1·63	-- 1·21	·37	25	17	53·9	14	26·8	25	910			
VI.	Stroud (Upfield) .....	·86	-- 1·26	·27	25	10	54·8	14	21·5	25	519			
„	Church Stretton (Woolstaston) .....	·80	-- 1·33	·26	25	14	53·0	16	27·0	24	8...			
„	Bromsgrove (Stoke Reformatory) .....	1·35	-- '92	·33	26	18	52·5	5	26·0	22	11...			
VII.	Boston .....	·50	-- 1·13	·14	6	9	52·0	18	24·0	11	16...			
„	Worksop (Hodsock Priory) .....	·54	-- 1·01	·17	17	7	53·0	16	25·0	8	12...			
„	Derby (Midland Railway) .....	·73	-- '85	·23	25	9	58·2	18	24·5	8	920			
VIII.	Bolton (The Park) .....	·67	-- '99	·16	26	15	56·0	18	28·0	7	8...			
IX.	Wetherby (Ribston Hall) .....	2·86	+ '19	·49	13	20	53·9	18, 19	29·0	12	613			
„	Arncliffe Vicarage .....	1·40	-- '23	·35	28	12	...	...	...	...	...			
„	Hull (Pearson Park) .....	4·53	-- '21	·81	28	19	...	...	...	...	...			
X.	Newcastle (Town Moor) ...	1·16	-- '70	·42	28	11	55·0	18	28·0	8, 12	621			
„	Borrowdale (Seathwaite) .....	·91	-- '67	·15	25	15	...	...	...	...	...			
XI.	Cardiff (Ely) .....	9·86	-- 1·78	1·41	25	21	49·1	4	21·5	22	8...			
„	Haverfordwest (High St.) .....	1·17	-- 1·96	·33	26	17	...	...	...	...	...			
„	Aberystwith (Gogerddan) .....	1·83	-- 1·87	·53	25	22	52·8	18	29·2	25	316			
„	Llandudno .....	2·74	-- '29	·37	1	21	54·0	7, 14	21·0	21	8...			
XII.	Cargen [Dumfries] .....	1·87	-- '10	·40	6	17	53·0	16	31·0	25	3...			
„	Lliliesleaf (Riddell) .....	2·71	-- '91	·78	25	14	52·0	13, 18	25·0	12	10...			
XIII.	Edinburgh (Royal Observy.) .....	1·17	-- 1·24	·21	18	18	50·0	13a	22·0	11, 12	1619			
XIV.	Colmonell .....	1·34	...	·36	18	13	53·3	18	24·6	12	717			
XV.	Tighnabruaich .....	3·95	+ '28	·80	25	19	51·0	5, 8b	20·0	23	8...			
„	Mull (Quinish) .....	5·74	+ 1·17	·65	26	23	46·0	14	24·0	11	1717			
XVI.	Dundee (Eastern Necropolis) .....	5·03	+ '53	·97	25	24	...	...	...	...	...			
XVII.	Braemar .....	·80	-- 1·30	·20	1	11	52·4	14	24·9	12	13...			
„	Aberdeen (Cranford) .....	2·36	-- '34	·38	2	15	50·7	5	12·3	22	18			
„	Cawdor (Budgate) .....	2·04	-- '39	·40	27	18	56·0	5, 9	24·0	11	15...			
XVIII.	Invergarry .....	2·45	+ '59	·37	1	18	...	...	...	...	...			
„	Bendamph .....	7·23	+ 2·34	1·25	18	19	...	...	...	...	...			
XIX.	Dunrobin Castle .....	11·66	+ 4·89	1·74	12	25	...	...	...	...	...			
„	Castletown .....	3·73	+ 1·34	·50	3	19	54·0	18	24·5	12	12...			
XX.	Killarney .....	4·54	...	·63	9	24	51·0	5	23·0	11, 12	12...			
„	Waterford (Brook Lodge) ...	2·80	-- 2·64	1·25	26	20	55·5	5	23·0	23	...			
„	Broadford (Hurdlestown) ...	1·14	-- 2·16	·58	25	14	56·0	18	26·0	23, 24	7...			
XXI.	Carlow (Browne's Hill) .....	1·84	-- '35	·68	25	21	50·0	6, 8, 9	25·0	22	7...			
„	Dublin (Fitz William Square) .....	1·04	-- 1·57	·39	25	11	...	...	...	...	...			
XXII.	Ballinasloe .....	·75	-- 1·23	·22	25	12	55·8	18	32·0	20	110			
„	Clifden (Kylemore House) ..	1·63	-- '85	·32	25	22	60·0	8, 13	19·0	24	11...			
XXIII.	Seaforde .....	5·08	-- 1·00	·77	25	19	...	...	...	...	...			
„	Londonderry (Creggan Res.) ..	1·70	-- 1·27	·54	25	17	51·0	16	26·0	22	1115			
„	Omagh (Edenfel) .....	3·78	+ 1·05	·62	27	22	...	...	...	...	...			
„	...	1·98	-- '51	·30	25	21	51·0	5, 8	26·0	22	814			

+ Shows that the fall was above the average; — that it was below it. a—and 14, 18 b—and 9, 16.

## SUPPLEMENTARY RAINFALL, FEBRUARY, 1905.

Div.	STATION.	Rain. inches	Div.	STATION.	Rain. inches
II.	Dorking, Abinger Hall .....	·85	XI.	New Radnor, Ednol .....	1·91
„	Ramsgate, West Cliff.....	·89	„	Rhayader, Nantgwiltt .....	4·08
„	Hailsham .....	·74	„	Lake Vyrnwy .....	3·39
„	Crowborough .....	1·18	„	Ruthin, Plás Dráw.....	1·14
„	Osborne.....	·62	„	Criccieth, Talarvor.....	1·37
„	Emsworth, Redlands.....	·71	„	Anglesey, Lligwy .....	1·32
„	Alton, Ashdell .....	1·20	„	Douglas, Woodville .....	1·94
„	Newbury, Welford Park ..	1·01	XII.	Stoneykirk, Ardwell House	2·05
III.	Harrow Weald .....	·91	„	Dalry, Old Garroch .....	5·61
„	Oxford, Magdalen College..	·43	„	Langholm, Drove Road.....	3·08
„	Banbury, Bloxham.....	·72	„	Moniaive, Maxwelton House	3·41
„	Pitsford, Sedgebrook.....	·58	XIII.	N. Esk Reservoir [Penicuick]	2·65
„	Huntingdon, Brampton.....	·78	XIV.	Maybole, Knockdon Farm..	3·28
„	Wisbech, Bank House .....	1·09	„	Glasgow, Queen's Park .....	2·43
IV.	Southend .....	·56	„	Campbeltown, Redknowe...	3·62
„	Colchester, Lexden.....	·67	XV.	Inveraray, Newtown.....	6·88
„	Saffron Waldon, Newport...	1·36	„	Ballachulish House.....	9·15
„	Rendlesham Hall .....	·98	„	Islay, Eallabus .....	4·07
„	Swaffham .....	1·04	XVI.	Dollar .....	2·18
„	Blakeney .....	1·16	„	Loch Leven Sluices .....	1·22
V.	Bishops Cannings .....	·73	„	Balquhider, Stronvar .....	4·77
„	Ashburton, Druid House .....	1·62	„	Coupar Angus Station .....	·74
„	Okehampton, Oaklands.....	2·38	„	Blair Atholl.....	2·29
„	Hartland Abbey.....	1·49	„	Montrose, Sunnyside.....	·99
„	Lynmouth, Rock House ..	1·54	XVII.	Alford, Lynturk Manse ..	1·65
„	Probus, Lamellyn .....	1·38	„	Keith.....	2·42
„	Wellington, The Avenue ..	1·04	XVIII.	N. Uist, Lochmaddy.....	5·21
„	North Cadbury Rectory ..	·94	„	Aviemore, Alvey Manse ..	2·69
VI.	Clifton, Pembroke Road ..	·86	„	Loch Ness, Drumnadrochit.	3·94
„	Moreton-in-Marsh, Longboro'	·97	„	Glencarron Lodge .....	...
„	Ross, The Graig .....	·77	„	Fearn, Lower Pitkerrie.....	2·26
„	Shifnal, Hatton Grange.....	·69	XIX.	Invershin .....	4·53
„	Wem Rectory .....	·81	„	Altnaharra .....	6·22
„	Cheadle, The Heath House.	1·00	„	Bettyhill .....	3·89
„	Coventry, Kingswood .....	·96	„	Watten .....	3·27
VII.	Market Overton .....	·74	XX.	Cork, Wellesley Terrace ..	1·42
„	Market Rasen .....	·75	„	Darrynane Abbey .....	3·07
„	Bawtry, Hesley Hall.....	·63	„	Glenam [Clonmel] .....	2·01
VIII.	Neston, Hinderton.....	1·11	„	Ballingarry, Gurteen .....	1·75
„	Southport, Hesketh Park...	1·24	„	Miltown Malbay.....	1·71
„	Chatburn, Middlewood .....	2·53	XI.	Gorey, Courtown House ..	1·01
„	Cartmell, Flookburgh .....	2·25	„	Moynalty, Westland .....	1·76
IX.	Langsett Moor, Up. Midhope	3·06	„	Athlone, Twyford .....	1·53
„	Scalby, Silverdale .....	1·46	„	Mullingar, Belvedere.....	1·71
„	Ingleby Greenhow .....	1·43	XXII.	Woodlawn .....	2·16
„	Middleton, Mickleton .....	1·62	„	Westport, Murrisk Abbey..	2·64
X.	Beltingham .....	1·22	„	Crossmolina, Enniscoie ..	3·63
„	Font Reservoir, Fallowlees.	1·25	„	Collooney, Markree Obsy...	3·96
„	Ilderton, Lilburn Cottage..	·98	XXIII.	Enniskillen, Portora .....	2·97
„	Keswick, The Bank .....	3·83	„	Warrenpoint .....	1·33
XI.	Llanfrecfha Grange.....	·82	„	Banbridge, Miltown .....	1·34
„	Treherbert, Tyn-y-waun ..	4·20	„	Belfast, Springfield .....	2·61
„	Carmarthen, Friary .....	1·93	„	Bushmills, Dundarave .....	2·92
„	Castle Malgwyn .....	2·19	„	Stewartstown .....	2·02
„	Plynlimon.....	7·45	„	Killybegs .....	3·77
„	Tallyllyn .....	1·40	„	Horn Head .....	3·59

## METEOROLOGICAL NOTES ON FEBRUARY, 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 mild and dry month, rather showery in the latter half. Violent squalls with H on 26th. Notable absence of frost. Duration of sunshine 68·1\* hours, and of R 22·4 hours. Mean temp. 42°·2, or 2°·4 above the average.

TENTERDEN.—A pleasant month on the whole, but variable. Out of 14 rainy days 11 had only ·01 or ·02 in. S on 11th and 20th. Duration of sunshine 89·5† hours.

CROWBOROUGH.—Mild with scanty R, nearly half of which fell on 26th. Several H storms during the last 10 days. Mean temp 40°·3.

OSBORNE.—R about 70 per cent. below the average of 46 years.

HARTLEY WINTNEY.—Another dry month, with remarkably mild and fine weather. Great scarcity of water in ponds and springs. The last week was stormy with light R. Ozone on 25 days, with a mean of 4·0.

PITSFORD.—Very dry. The first part was pleasant, the latter cold and wet. R 1·41 in. below the average of 1880-89. Mean temp. 40°·6.

BURY ST. EDMUNDS.—Another dry month. Rivers and ponds very low and water supply getting short. Westerly winds on 23 days.

WINTERBOURNE STEEPLTON.—A very dry month, with mean temp. about 3° above the average, and many very beautiful days.

TORQUAY.—Mean temp. 45°·0, or 1°·9 above the average. Duration of sunshine 98·3\* hours, or 17·9 hours above the average. Mean amount of ozone 5·2. Max. 9·0 on 27th, with W. wind; min. 1·0 on 25th with N. wind.

WELLINGTON.—Another remarkably dry month, the R being more than 1·50 in. below the average. The temp. was generally high until 19th, when there followed a few cold days with some S.

NORTH CADBURY.—The cloud, wind and temp. were exactly normal, but the range of temp. was small, and frosts were few and slight. Extremely dry till 26th, when there was a rapid change to cyclonic conditions.

CLIFTON.—Very dry, though with frequent and light drizzle, till 25th, when a sudden change took place with the arrival of a deep cyclone in the N., and stormy weather. R one-third of the average. The R of January and February together was only 1·54 in., the least in 49 years except in 1896, when only 1·18 in. fell.

ROSS.—The dry period, which, with the exception of 10 days, Dec. 4th-13th, had continued from September 14th, or for 164 days, lasted till midnight on February 25th. In this time only 5·88 in. of R fell, or 8·92 in. less than the average.

WEM.—On the whole dry and fine, but with much cold wind during the last 10 days.

WORKSOP.—Mild and windy. The sixth dry month in succession, the fall of the six months, September to February, being less than in any of the last 29 years.

BOLTON.—The R was in excess for the first time since May, 1904. Mean temp. 40°·0, or 2°·5 above the average. Duration of sunshine 48·2\* hours, or 6·3 hours above the average. Mean amount of ozone 2·3, being 1·6 above the average.

SOUTHPORT.—An anomalous month. Very stormy and somewhat mild, westerly winds again greatly predominating, but unusually dry and sunny, with high pressure. Duration of sunshine 20\* hours above the average. R ·80 in. below the average, and underground water remarkably low. Ozone very abundant.

UPPER MIDHOPE.—From 1st to 24th dry and windy, with occasional slight R, sleet, H and S. From 25th it was very wintry, with heavy R, sleet, S and H.

CARMARTHEN.—Mild and dry in the early part. Cold N. and N.E. winds later, with showers of cold R, H, sleet and S.

HAVERFORDWEST.—Fine and mild generally, with small R. Sharp frost from 21st to 28th, causing a wholesome check to vegetation. Duration of sunshine 70·2\* hours. Gales on 5 days.

DOUGLAS.—R in small quantities on 21 days, but sunshine and temp. above the average except in the last week, when it was cold. Owing to the prevalence of strong gales vegetation was backward in spite of the mild weather and sunshine.

### SCOTLAND.

CARGEN [DUMFRIES].—A “dropping” month without exceptionally heavy R. The temp. was high and vegetation forward.

LANGHOLM.—R 1·27 in, below the average of 29 years. The last week was very cold, with frequent sleet and H.

INVERARAY.—Stormy and unsettled throughout, but mild.

COUPAR ANGUS.—An ideal, open month, with vegetation advanced. Morning frosts were numerous, but in no case severe. Mean temp. 39°·4. R fell in small quantities on many days.

LYNTURK.—R still considerably below the average. Till 19th there were high winds, several times reaching the force of a gale, but thereafter it was fairly quiet.

DRUMNADROCHIT.—R 1·06 in. above the average of 19 years.

ALTAHARRA.—Very severe gales were experienced in the first half. Exceptionally keen frost at times.

WATFEN.—Boisterous and very changeable, with storms of wind, and short S and R storms. Generally fresh and open and at times fine.

CASTLETOWN.—Till 20th damp, cold and cloudy. From 20th to 23rd clear, cold and dry, with remarkably high bar. The last few days were very damp.

### IRELAND.

DARRYNANE.—The first three weeks were mild and fine, the rest cold with H showers, some S and strong N.W. winds. R 74·5 per cent. of the average of 25 years.

HURDLESFOWN.—The first three weeks were mild, the last cold and severe.

MILTOWN MALBAY.—Very little R. Mild to the 19th, thence to the end inclement and stormy, with S, H, T and L.

DUBLIN.—Mild and open till the 18th, when a change to cold weather took place. The last 10 days were wintry, with R, H and sleet on 25th and following days. Mean temp. 43°·6, or 1°·1 above the average.

MARKREE OBSERVATORY.—Fair generally until the last few days, when a severe storm set in with H, sleet and S.

BANBRIDGE. R ·76 in. below the average of 40 years.

BELFAST.—A most useful month for the land till 26th, when the heavy sleet and S undid the previous good. R just under the average.

OMAGH.—A very favourable winter month, with temp. above, and R below, the average. The duration of bright sunshine was above the average, but it was accompanied by much barometric oscillation.

\* Campbell-Stokes.

† Jordan<sup>†</sup>

Climatological Table for the British Empire, September, 1904.

STATIONS.  <i>(Those in italics are South of the Equator.)</i>	Absolute.				Average.				Absolute.		Total Rain.		Aver. Cloud.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
London, Camden Square	74·9	5	39·1	26	65·7	48·2	51·3	87	121·2	31·1	1·17	11	4·0
Malta	88·5	1	62·3	30	81·8	68·1	65·0	72	138·9	57·9	2·30	6	3·9
Cape Town	84·7	17	40·6	4	65·0	49·6	50·3	75	...	...	2·48	11	5·3
Durban, Natal	101·1	3	50·6	11	76·5	58·6	...	...	142·9	...	·58	10	5·1
Johannesburg	79·5	30	26·5	10	67·8	45·0	37·5	65	...	24·8	·13	2	2·2
Mauritius	78·8	17	50·9	21	76·4	60·0	57·0	69	148·2	42·0	1·04	15	6·1
Calcutta	93·4	18	74·9	10	89·3	77·6	76·3	82	163·2	72·0	5·72	12	6·3
Bombay	88·1	27	75·4	25	85·6	77·8	74·7	80	136·7	69·4	1·81	11	5·9
Madras	100·5	18	72·6	2	95·7	77·2	70·7	67	161·2	70·7	3·51	10	5·2
Kodaikanal	67·0	26	48·5	25	62·8	51·3	54·0	83	136·6	38·2	6·51	16	6·3
Colombo, Ceylon	87·6	13	74·8	18	85·7	77·2	72·7	79	153·0	72·6	1·77	16	5·6
Hongkong	88·9	1	73·0	19	85·0	76·3	73·8	81	145·8	...	9·77	22	6·6
Melbourne	69·2	24	35·1	12	62·6	45·4	40·2	70	133·7	27·6	1·26	12	6·0
Adelaide	79·6	17	37·9	29	64·6	46·0	43·6	65	140·1	32·5	·69	10	4·2
Coolgardie	83·2	16	35·2	2	68·8	46·5	44·5	62	153·4	26·0	2·05	15	5·0
Sydney	80·9	25	42·0	30	66·1	49·0	44·3	65	119·1	32·8	1·00	16	4·3
Wellington	64·0	16a	35·7	24	56·5	42·4	47·3	75	115·0	33·0	5·22	20	7·0
Auckland	63·0	6,30	41·0	23	59·1	48·4	47·2	78	130·0	37·0	3·91	24	5·8
Jamaica, Negril Point.	89·9	4	70·1	2	86·7	72·7	74·2	80	...	...	6·31	13	...
Trinidad	...	...	...	...	...	...	...	...	...	...	...	...	...
Grenada	88·8	5	70·4	22	84·7	74·4	72·0	76	152·0	...	9·14	23	3·7
Toronto	79·2	11	33·8	21	67·2	50·2	52·5	79	107·0	27·4	3·99	12	5·4
Fredrickton	77·7	12	25·4	23	63·7	40·3	42·4	64	...	...	7·73	12	5·2
Winnipeg	78·0	27	26·0	20	62·1	40·8	...	...	...	...	1·88	11	6·5
Victoria, B.C.	73·4	13	43·0	19	65·6	49·3	...	...	...	...	·32	5	2·6
Dawson	60·6	11	7·8	19	46·5	27·6	...	...	...	...	1·01	6	4·4

a—and 28.

MALTA.—Mean temp. of air 74°·2, or 1°·9 below, and mean hourly velocity of wind 8·3 miles, or 0·5 above, averages. Mean temp. of sea 78°·0. TSS on 4 and L on 7 days.

Mauritius.—Mean temp. of air 1°·9, dew point 3°·2, and rainfall ·33 in., below averages. Mean hourly velocity of wind 10·1 miles, or 1·9 miles below average, mean computed direction E.S.E.

MADRAS.—Bright sunshine 180·2 hours. TSS on 4 days.

KODAIKANAL.—Bright sunshine 148 hours.

COLOMBO.—Mean temp. of air 81°·1, or 0°·3 above, of dew point 0°·6 below, and R 3·36 in. below, averages. Mean hourly velocity of wind 11·4 miles.

HONGKONG.—Mean temp. of air 80°·2. Bright sunshine 161·3 hours. Mean hourly velocity of wind 11·5 miles; mean direction E.

Adelaide.—Mean temp. of air 1°·9 below, and R 1·04 in. below, averages. Driest September with one exception (1896) in 66 years records.

Sydney.—Mean temp. of air 1°·3, R 1·97 in., and humidity 5·1, all below averages.

Wellington.—Mean temp. of air 0°·4 below, and R 1·00 in. above, averages.

Erratum.—Vol. 39, p. 244, Johannesburg, last col., Cloud, *should be* 0·6, *not* 6·0 as printed.