

Symons's Meteorological Magazine.

No. 589.

FEBRUARY, 1915.

Vol. L.

INTRODUCTORY TO OUR FIFTIETH VOLUME.

ON February 16th, 1866, the first eight-page number of this Magazine appeared, not as a new creation, but as the natural evolution of the four-page Monthly Rain Circular, which, in 1865, had developed from the two-page Rain Circular first issued by George James Symons as a one-page circular, in 1863. The essential feature of the Magazine of 1915 as of the Rain Circular of 1863, is the Table of Rainfall of the preceding month, showing the total fall with the difference from the average, at a number of stations in the British Isles. Mr. Symons originally intended the publication to be the monthly organ of the British Rainfall Organization, the annual publication of which had, by 1866 grown from his four-page quarto pamphlet; "English Rainfall, 1860," to a little octavo volume of 116 pages, which was also published, it is curious to note, on February 16. The Magazine has remained in large degree, supplementary to the annual volume of *British Rainfall*. Mr. Symons, however, intended it from the first to have a wider scope, and in particular to record the proceedings of Meteorological Societies, to notice new books on Meteorological subjects, and to form a record of meteorological progress and a channel of communication between workers. These aims have been consistently held in view, though their development has always been retarded by the pressure of financial considerations; yet this pressure which limited expansion to the surplus resources of the Rainfall Organization after the publication of *British Rainfall*, has lead this little Magazine to its present great age.

We term it a great age advisedly, for none of the several monthly meteorological magazines which have sprung up in Europe or America during the last hundred years, have even approximated to its length of life, although many of them have far exceeded our issues both in size and in scientific value, while they lasted. We can look back on a tranquil and regular life of steady, though

restricted expansion in size and circulation, and of regular appearance in spite of difficulties which more than once might have justified the quick and easy solution of cessation. If in weathering these crises the number of our pages has occasionally shrunk, and now and then the scope has been narrowed, to the recording of the small beer of meteorological observing, the crises have hitherto been tided over and progress has been accelerated after them. This, we are moderately confident, will be the case with the greatest crisis of all through which we, in common with all the world, are now passing.

If we are right in interpreting and endeavouring to carry out the views of our distinguished founder, the Magazine should help to extend the usefulness of the Rainfall Organization by presenting rainfall work in its proper subordination to general Meteorology, and should stimulate Observers who may not, to begin with, have more than a casual or curious interest in reading rain records, to take larger views and follow the great advances of the science of the atmosphere. In this task we have been aided to an extent for which we are most grateful, not only by hundreds of keen Observers, but by dozens of the most eminent men of science who have devoted themselves to abstruse and profound studies of the physics of the atmosphere, and we acknowledge very gratefully the generous recognition and encouragement they have given us. We have always given prominence to the climatology of our own country—the United Kingdom first and the British Empire next—but we have received no less kindness from the meteorologists of other countries than from those of our own. At this time, when it is as fashionable to ridicule and decry all things German as it was to ridicule and decry all things pertaining to other nations a century or sixty years ago, we feel it to be a matter of scientific duty to acknowledge our equal indebtedness in the past fifty years to all these nations. Whatever may be the opinion of some men of science as to the inferiority of Germans in their particular studies, we and our readers cannot fail to remember how much we owe to German and Austrian meteorologists. While we yield to no one in our detestation of the war which Germany and Austria-Hungary have forced upon the world, or in our determination to do all that is possible to defeat the aggressions and ambitions of these governments, we cannot be so false to our own consistency as to stigmatise as poor or contemptible those vast and noble acquisitions to knowledge made in the last half century by those Germans, whom, up to last summer, all our learned societies delighted to honour. Although for the present we carry on our work without the aid of the subjects of enemy-empires, we trust that our pages in years to come will once again rejoice in the brotherhood of the men of science of a re-made Europe and a world at peace. The air still serenely laps our planet undisturbed by the

stained and strained political map beneath it, but the study of its universal law depending on the interchange of observations and the simultaneous execution of experiments has, for the moment, stopped, and when resumed there will be a gap that can never be bridged. As regards the Observers, with whose work we are more intimately associated, it is possible to find even now that the effects of the war have not all been of a detrimental nature. Although few of the 5,500 voluntary Observers can have reached the end of 1914 without some sorrow or loss or dislocation of the affairs of life due to the war, the returns of rainfall have been sent in by an earlier date than in any recent year. This is a straw that shows how the wind of public feeling blows, and it is no contemptible little army of Observers which can steady itself thus in the discharge of a commonplace peaceful routine under the fire of such a kindling of national enthusiasm for war as has never been known before.

In the remarks on the returns received from the area within sound of the German bombardment of the north-east coast, the only reference to the occurrence was this memorandum by the Observer at Filey : " Please note that no rain fell here when German guns fired so heavily at Scarborough."

Weather conditions have never before been so important in the life of the country as during the last six months, and so far as rainfall is concerned there were some unusually interesting points. The unprecedented wetness of December in the Southern Counties attracted the more attention because of the dryness of the autumn, and in all circumstances sharply contrasted spells of weather near the end of a year have been found to stimulate interest in recording and to enlarge the number of Observers in the following year. This fact no doubt accounts in part for the alacrity we have referred to, but we are satisfied that the more potent reason was the general quickening of mental processes due to the intellectual upturning produced by the war.

It must be a matter of pride to all British meteorologists, as it may well be a thing of wonder to the rest of the world, that at the Annual Meeting of the Royal Meteorological Society, reported in these pages, the retiring President, returned on short leave from the front, where he had been in charge of a motor ambulance, handed over the Chair to the new President, who had snatched an hour from his military duties with the Royal Engineers in order to show his appreciation of the abiding value of science.



REMARKS ON SNOWFALL STUDY, (GEOGRAPHICAL DISTRIBUTION).

By L. C. W. BONACINA.

I HAVE often thought that the Observers of the British Rainfall Organization could supply the material for a neglected but most interesting study, were they to keep a record of the aggregate depth of snow which falls annually in their respective localities. In so damp a climate as ours it would not always be possible to measure the exact number of inches of undrifted snow which has fallen as snow; but extreme accuracy would not be necessary in such an investigation, provided that in course of time the data gave a general idea of the approximate average monthly and annual depths of snow in different parts of the country. I might, perhaps, stimulate interest in the subject by making a few observations on the apparent distribution of snow in this country.

It has always seemed to me that the snowfall of Great Britain as a whole, though very irregular, is great, but that the undoubted rarity of deep snow in the metropolitan area has tended to produce a different impression. To speak only of the lowlands, there appears to be a far greater difference in the average snowfall between the northern and southern counties of England than the comparatively small difference of latitude alone would account for, especially in view of the fact that there is very little difference in the mean temperature of the air—at least at the coldest time of the year. The discrepancy, I think, is only explicable by reference to the much greater extent of elevated land in the north, which itself naturally receiving a big snowfall, has the effect of increasing the fall in the adjacent lowlands, by a process mainly thermal but possibly also mechanically connected with the little understood laws of crystallization of aqueous vapour from the atmosphere. When, for example, there are large quantities of falling or fallen snow over the bleak Pennine Chain, the air in the adjacent plains of Lancashire and Yorkshire will be so chilled as to cause a precipitation to fall as snow, which in the south is falling as rain. But in addition to this purely thermal effect, it is not impossible that the pressure of a central core of falling snow with freezing temperature over the Pennines may tend mechanically to bring down snow over a peripheral lowland region where the temperature may be in the dubious zone for rain or snow. Be that as it may, however, I think the big snowfalls of Manchester, Sheffield, and Leeds have some connection with neighbouring high ground.

To turn now to the west country; many a Cornishman has assured me that there is not usually much snow his side of Plymouth, but in the same breath he has never failed to impress upon me the memorable occasion in the spring of 1891, when you might walk over the hedge-tops without knowing it (provided, I suppose, you

did not sink). The fury of this great blizzard of March 9th to 13th, 1891, has probably never been surpassed in the United Kingdom, and it ranks in the annals of the west of England as more famous even, than that of January, 1881, in the south, so often quoted by Londoners.

To come to the south-eastern corner of England, the more eastern parts of Kent seem to suffer somewhat unduly from snow, not only in winter, but often very late in the spring—about April; but certain information as to how the Dover coast compares with other districts in the south of England can only be gleaned on the co-operative lines I have suggested above. As a rule the last place ever to get snow is London, and the reason is evidently to be found in the vast artificially warm town area, since snow in this country usually occurs at the upper temperature limit, which in town is thus often exceeded. The present January has furnished the first real snowfall in London since the fine falls early in March, 1909. Notwithstanding the scarcity of snow in London of recent years, the municipal authorities generally seem to expect a big dose, to judge from the lavish display of posters advertising for able-bodied men in case of eventualities. I might add, in this connection, that one sultry day last July, as I was toiling along the dusty high-road between Putney and Kingston, longing to turn in at Robin Hood Gate to see the great trees in Richmond Park once more, I was both amazed and amused to find a refreshing souvenir of the previous winter stuck in a poster on the side of a dust-bin by the road-side, and headed "Metropolitan Borough of Wandsworth: Snowstorms."

ROYAL METEOROLOGICAL SOCIETY.

THE annual General Meeting of the Society was held on January 20th, at the Surveyors' Institution, Westminster, Mr. C. J. P. Cave, President, in the Chair.

In the report for the year 1914 the Council noted a slight increase in the number of Fellows, the total number on December 31st, being 729. Acknowledgment was made of the services of Dr. H. N. Dickson, as Acting-President during the President's absence in France with the Red Cross Society. Upper Air researches had been continued, Mr. Gold having carried out a series of observations during a voyage to Australia. At the instance of the Aeronautical Society a Joint Committee had been appointed to initiate and promote means for utilizing the special knowledge of each Society for advancing the science of both. The preparation of a Climatological Atlas of the British Isles had been continued in co-operation with the Meteorological Office, and the work

relating to barometric pressure and wind was almost complete. Provisional maps showing the amounts of cloud had been prepared and the material for maps of sunshine was being collated by the Meteorological Office. Dr. H. R. Mill had undertaken to co-operate by the preparation of rainfall maps.

Votes of thanks were accorded the Council for their work during the year, and the Institution of Civil Engineers and Surveyors' Institution, for the use of their rooms. On the motion of Dr. C. Chree, seconded by Mr. W. W. Bryant, a hearty vote of thanks was given to Mr. C. J. P. Cave, the retiring President, for the manner in which he had directed the work of the Society during two years of office. Mr. Bryant remarked on the noteworthy coincidence that both the retiring President and his successor appeared in khaki.

The following officers were elected for the ensuing session. *President*: Capt. H. G. Lyons, D.Sc., F.R.S.; *Vice-Presidents*: Mr. C. J. P. Cave, Mr. E. Gold, Mr. Baldwin Latham, C.E., Mr. Carle Salter; *Treasurer*: Mr. F. Druce; *Secretaries*: Mr. F. Campbell Bayard, Capt. W. F. Caborne, C.B.; *Foreign Secretary*: Dr. R. H. Scott, F.R.S.; *Councillors*: Mr. W. W. Bryant, Dr. C. Chree, F.R.S., Dr. H. N. Dickson, Messrs., J. S. Dines, R. H. Hooker, A. P. Jenkin, R. G. K. Lempfert, Lt.-Col. H. Mellish, Sir J. W. Moore, M.D., D.Sc., Col. H. E. Rawson, C.B., Capt. A. Simpson, Capt. D. Wilson-Barker.

Capt. Lyons, on taking the chair, said that if the present time was one of stress and difficulty, it was one in which meteorology was surely coming to its own. Aircraft and naval flotillas owed much to meteorology, and he urged the Society to endeavour to promote the science now that it was so much to the front. He added that he would do all in his power to uphold the dignity of the office to which he had succeeded, and hoped that the Society's meetings would maintain the high standard reached under Mr. Cave's presidency.

At the Ordinary Meeting, which followed, the members of the Committee engaged in the preparation of the Climatological Atlas, gave an account of the work so far accomplished. Dr. H. N. Dickson, chairman of the Committee, dealt with the difficulties in regard to publication at the present time. It had been decided to issue the Atlas in two volumes, the first comprising maps of barometric pressure, wind, sunshine, and cloud; the second, temperature, relative humidity, and rainfall. The data upon which the work was based was for the 40 years, 1871 to 1910. Lt.-Col. Mellish described the preparation of the maps of cloud amounts. He much regretted that practically all the observations were taken at 9 a.m., an hour which had been recently shown to be undesirable, owing to frequent atmospheric changes at this time of day. Mr. Gold, dealing with barometric pressure, doubted if 40 years was

a sufficiently long period from which to deduce normal values. He was led to this belief by the results of an analysis of the long records existing at Gordon Castle, Edinburgh, and London. Mr. Lempfert, dealing with the wind, said that maps of frequency had been prepared for each month, and for each quarter of the compass. The effect of orographical features was apparent in the results for many stations, and the difference between summer and winter was also made clear. Work was now being done on wind velocity and the results would be shown in the form of wind roses. The sunshine results would shortly be completed and would appear as an appendix.

Mr. J. H. Wilson was elected a Fellow of the Society. At the December meeting the following gentlemen were elected Fellows : Mr. G. A. C. de Boinville, Dr. J. Brownlee, Mr. C. E. Evans, Mr. C. M. G. Hoyte, Capt. T. Robertson.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

SEASONAL LIMITS.

WHILST quite agreeing with Mr. Brodie (Vol. 49, p. 182), that the present Meteorological Seasonal Limits lead to some misconceptions as to weather in the various quarters, may I venture to suggest a much more simple way of surmounting the difficulty than that which he proposes ? It appears to me that if Meteorologists were to adopt the Astronomical divisions of the year, the troubles stated by your correspondent would practically disappear. Autumn weather is finished with by December 21st, Winter conditions seldom if ever occur later than March 21st. Spring frosts have been known to occur as late as June 13th (1911), but never later than the 21st of that month, whilst only on one occasion has a really great "heat wave" taken place in the past 30 years, later than September 23rd. Now if Mr. Brodie's suggestion were adopted Spring would end in the middle of May. Being an amateur gardener of some little experience I know that some of the worst "May frosts" are apt to occur *after* the 15th of the month, and have frequently had my bedding-plants "blackened" by disregarding the advice of my gardener not to put anything delicate out of doors until after the 20th May. Mr. Brodie would put these late May frosts, then, down to Summer and not to Spring. Is this quite right to Summer ? If the Astronomical Seasons were followed by Meteorologists all these minor difficulties would vanish, and we should still have the year practically divisible by four.

D. W. HORNER, F.R.S.A., F.R.Met.Soc.

"The Chestnuts," Mangelsbury, Stow-on-the-Wold, Gloucester, December 5th, 1914.

RE-ARRANGEMENT OF THE SEASONS.

I do not agree with Mr. Bonacina that the length of day and steepness of ray have much to do with this matter. The chief factors are *mean* and *extreme* temperatures. Notwithstanding the duration of daylight and the approximate verticality of the solar beams in May, that month is unquestionably in Spring (except, perhaps, the last week or ten days), and the period is often chilly and sometimes very frosty in the small hours. As to February, that time of the year has provided us with two months (1855 and 1895), of almost unparalleled severity, to say nothing of others also very cold. Obviously that month is *not* in Spring, though its daylight is greater than that of November. As to bursts of very mild weather in February, it should be noted that we experience them at times in every winter month, even as far north as Wick. I have sometimes thought that these high Scotch temperatures may be due to a kind of *föhn* wind crossing the Highlands. Some of the most *lovely* sunny weather occurs in November, as I know from an experience of nearly seventy years.

August is often spoken of as an Autumn month, on the strength of the harvest; but wheat-ears, botanically, are "fruit," quite as much as cherries, raspberries, etc., which belong to the Summer. August is clearly a Summer month, though Mr. Bonacina calls it "already Autumn." All fruit months (June to September) may be regarded as Summer. The time of the golden and fast-dropping leaf is Autumn.

It will be found that length of day and approach to verticality of ray cannot be happily wedded to temperature, the ripening of crops, and much of the labour of the husbandman.

Too much importance must not be given to the appearance of flowers. The primrose, lesser periwinkle, snowdrop, hazel, elm, daffodil, crocus, dog-mercury, etc., are *hyemal* as well as vernal.

E. G. ALDRIDGE.

Bideford, 22nd January, 1915.

THE SNOWFALL, JANUARY 22nd.

Snow commenced to fall about 6 a.m., and continued more or less until nearly 7 p.m. It was 12 inches deep at 2 p.m., and every tree and shrub was deeply covered, presenting a very beautiful sight. The damage the snow did to trees, shrubs, and telephone wires was remarkable. The newspapers reported rain in the city, but none fell here, though a rapid thaw set in at night. My rain gauge yielded 1.20 in. snow water.

G. E. DACEY.

65, Clarendon Road, Lewisham, S.E.

THE FLOODING OF SALISBURY CATHEDRAL.

I SEND you, as a memento of the Salisbury floods of the 5th and 6th January, a photograph taken by me on the 6th, of the interior of the Cathedral. As you will see by the photograph, the water was very clear, the flood being caused by spring water, which came



up all over the nave, between the stones of the pavement. We had here, from October 13th to December 31st, 1914, 16·86 in. of rain, and of this 2·93 in. fell in the last seven days of December, and on the top of this came 2·06 in. for the first three days of the present month.

GEORGE KNOWLES.

Stockton, Codford St. Mary, Wilts, 24th January, 1915.

OUR ANNUAL DEW DEPOSIT, AND HORARY TEMPERATURE.

UPWARDS of seventeen months ago, to wit, 31st July, 1913, you were good enough to refer me to certain works on dew formation, as bearing on the method of investigation I was employing in examining into that matter. Since then I have been carefully and diligently pursuing the subject in the way described on p. 163 of Vol. 48, *Symons's Meteorological Magazine*, and the results for last year and the previous one are now analysed out. But they are remarkably small. One wonders how and where those who pose as authorities get their information. With the exercise of the utmost generosity I could not allow to the year 1913 a more ample deposit of dew here than the equivalent of 0·75 in. rainfall; and last year I got decidedly less, 0·316 in., in fact. In both cases about 55 per cent. of the total seems to have been precipitated from the atmosphere, and 45 per cent. exhaled by grass and soil. Now it seems reasonable to assume that dew is deposited in some parts of Great Britain much more liberally than in others; also that there is a considerable variation in the amount at any one place from year to year. Would it not be possible to organise a scheme for the systematic investigation of this matter in the British Islands? From time to time we meet with the statement of a credited authority on such subject—and that to the effect that the average value of the annual dew deposit in this country is five inches. Such seems to me a gross exaggeration; but one feels he would like to know what led to such estimate, whether correct or not.

During the last two years, also, I have been interested to note what one might term the horary value of fluctuations in temperature, by means of a thermograph. It seems to me if this sort of thing were done generally throughout Great Britain a far more striking record of annual variation would be obtained than by carefully noting the annual “mean” here and there. I append the figures so obtained for the years 1913—1914.

		1913.	1914.
Hours with temp. below 32 deg.	..	110	61
„ „ 32 to 40 deg.	..	780	986
„ „ 40 to 50 deg.	..	2,590	2,438·5
„ „ 50 to 60 deg.	..	3,086	2,921·5
„ „ 60 to 70 deg.	..	1,785	1,715·5
„ „ 70 to 80 deg.	..	351	547
„ „ 80 to 90 deg.	..	58	87
Higher than 90 deg.	.. ..	0	3·5

WILLIAM GODDEN.

Richmond Avenue, Willesden, 17th January, 1915.

RAPID RISE IN A CHALK WELL.

I THINK the records given below of the rainfall adjacent to, and the depth to the water in, a well sunk in the Chalk from a point 480 ft. above Ordnance Datum, at the head of the Wandle Gathering Ground at Chelsham, Surrey, will be of interest to your readers.

Date	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Depth to Water from Surface. ft.	Daily Rain- fall. in.	Depth to Water from Surface. ft.	Daily Rain- fall. in.	Depth to Water from Surface. ft.	Daily Rain- fall. in.	Depth to Water from Surface. ft.	Daily Rain- fall. in.
1...			183-0			·02	208-0	
2...			183-0		190-0	·19	208-0	·24
3...			189-0		195-0		208-0	
4...					195-0	·26	208-0	·30
5...			180-0		195-0	·04	208-0	
6...			181-0		196-0	·02	208-0	·20
7...			181-0		200-0		208-0	·11
8...		·04	181-0				208-0	·06
9...		·03	185-0		192-0		208-0	1·51
10...		·10	187-0		199-0	·02	208-0	·03
11...	176-0	·16			206-0	·19	199-0	·28
12...	176-0	·15	183-0	·01	206-0	·02	191-0	·52
13...		·13	187-0	·06	206-0	·09	181-0	·95
14...	176-0		187-0	·40	206-0	·06	167-0	·44
15...	176-0		187-0	·01		1-16	156-0	·04
16...	176-0	·05	187-0		190-0		148-0	
17...	177-0	·03	188-0		198-0		142-0	·15
18...	177-0				202-0		137-0	·37
19...	177-0	·01			206-0	·25	134-0	·22
20...		·03		·02	207-0			·09
21...	177-0				207-0		129-0	·05
22...	178-0			·11			127-0	
23...	178-0			·02	196-0		125-0	·03
24...	179-0			·01	200-0	·10	124-0	
25...	179-0			·33	206-0		123-0	
26...	179-0		188-0	·06	207-0	·23	122-0	·73
27...			192-0	·01	208-0	·05		·29
28...	179-0		192-0	·07	208-0	·35	121-0	·64
29...	183-0		192-0	·47	208-0	·23	121-0	
30...	183-0		193-0	·07	208-0	·57	118-0	·26
31...			193-0				118-0	·04
		0·73		1·65		3·85		7·55

It will be seen that the rainfall for the three autumn months, September, October, and November, was very low, and that the water in the well reached its maximum depth from the surface on the 27th November, and remained at that depth till December 10th. The rise was then remarkably rapid. By the next morning it had risen 9 feet, by the 17th 66 feet, and by the end of the month 90 feet. Since it began on December 10th, the rise has amounted to the date of this letter, to 126 feet. These facts presage an early breaking out of the Bourne, in the Kenley Valley, if it has not already occurred.

W. VAUX GRAHAM.

5, Queen Anne's Gate, Westminster. S.W., January 25th, 1913.

REMARKABLE SNOWFALL AT BORDEN WOOD, LIPHOOK.

On the 22nd of January snow began to fall at daybreak and continued throughout the day, and it still snowed at 11 p.m. The snow was of a very heavy, moist character, and from about 4 o'clock rain fell also. At 2 p.m. the depth of snow was 6 inches, at 11 p.m., 8 inches. On the following morning, 23rd, the surface of the snow was frozen, the grass minimum thermometer registered 31 degrees, the rain gauge recorded 1.30 in. The snow lay till 31st. Absolute calm prevailed during the snowfall, and afterwards, owing to this fact, the snow remained on everything on which it fell, evergreen trees and shrubs were borne to the ground, as also were dense twigged deciduous trees as birch, willow, etc., causing many branches to splinter and break off. Astonishing as it may seem, many stout limbs of oak gave way under the great strain and snapped off. As illustrating the calm which prevailed and the clinging nature of the snow on this occasion, it was interesting to note that on a horizontal wire stretched in the open (gauge 14) at noon, the snow stood 3 inches high, soon after 4 p.m. some 4 inches were suspended from the wire and about 1 inch remained on top.

Borden Wood, Liphook.

E. J. PLATT.

REVIEWS.

Water Supplies, Their Purification, Filtration, and Sterilisation.

A handbook for the use of Local and Municipal Authorities. By SAMUEL RIDEAL, D.Sc., and ERIC K. RIDEAL, B.A., Ph.D. With numerous illustrations and tables. London, Crosby, Lockwood and Son, 1914. Size 9 × 5½. Pp. xxii. + 274.

DR. SAMUEL RIDEAL, as the result of long experience in chemistry applied to the purification of water, speaks with a voice of high authority on all matters connected with the detection and elimination of impurities from the most necessary of all commodities. He does not deal, except in passing, with the meteorological, geological, or engineering aspects of water supply, but concentrates his attention upon sources of contamination and methods of purification. The treatment throughout is designed for the local official desirous of understanding the modern methods of chemical and bacteriological treatment of water supplies. The general reader will learn with some surprise how complicated is the process necessary to restore purity to the rain drops contaminated by their contact with air and earth, and the method by which the aid of beneficent bacteria is invoked against disease-producing organisms. Features of the book are the bibliography appended to each chapter, and the illustrations of methods of filtration, sterilisation, and other processes.

INTERNATIONAL BALLOON ASCENTS.

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

December 6th, 1911.

Starting Point.	Country.	A (Hc) miles	B (Tc) ° F.	C miles.	D ° F.	E miles.	F
Pyrton Hill.....	England ..	5·5	—60	8·6	—62	35	E.N.E.
„ 3.15 p.m.	„ ..	6·0	—63	8·8	—69	57	S.E. by E.
Brussels	Belgium ..	6·4	—74	14·3	?	70	E.N.E.
Hamburg	Germany..	6·6	—81	6·9	—69	72	N.E.
Paris.....	France....	5·8	—75	8·4	—69	75	N.E.
Strassburg	Germany..	6·6	—79	7·7	—69	41	N.E.
Munich	„ ..	7·4	—78	9·1	—69	27	N.E.
Vienna.....	Austria....	5·9	—78	7·3	—67	27	E.N.E.
Pavia	Italy	7·0	—80	13·5	?	29	N.N.E.
Pavlovsk.....	Russia	5·5	—54	11·3	—71	66	N. by W.

December 7th, 1911.

Brussels	Belgium ..	5·8	—79	8·0	—75	30	N.E.
Hamburg.....	Germany..	6·1	—76	9·9	?	80	E.
Lindenberg.....	„ ..	5·6	—71	8·6	?	43	N.E.
Paris.....	France....	6·1	—74	7·1	—78	100	N.N.E.
Strassburg.....	Germany..	6·7	—72	7·1	—71	29	E.N.E.
Zurich	Switzerland	6·8	—76	9·5	—73	..	..
Munich	Germany..	5·8	—62	5·9	—62	39	N.E.
Vienna.....	Austria ..	5·9	—78	7·2	—67	46	N.E. by E.
Pavia	Italy	7·7	—67	?	..	24	N.E.
Pavlovsk.....	Russia	6·0	—69	9·6	—65	61	E. by N.

December 8th, 1911.

Manchester	England ..	5·6	—63	11·0	—71	52	E.
Brussels	Belgium ..	8·0	—59	12·5	—58	37	E.S.E.
Lindenberg	Germany..	6·4	—83	7·9	—64	58	N.N.E.
Paris	France....	7·0	—69	11·0	?	319	S.E. by E.
Strassburg	Germany..	6·0	—58	8·5	—65	50	N.E.
Munich	„ ..	6·9	—76	7·3	—74	56	N.N.E.
Vienna.....	Austria ..	5·8	—80	7·1	—70	28	N.E.
Pavlovsk.....	Russia	6·4	—74	9·8	—65	14	N. by E.

A Height in miles of commencement of isothermal columnn.

B Temperature, F°, at bottom of column.

C Greatest height of reliable record in miles.

D Temperature, F°, at greatest height.

E Distance in miles of point where balloon fell

F Bearing of falling point from starting point

During the three days the barometer was very high over northern Russia, but very rapid and irregular changes were shown over

Central Europe. On the 6th a low pressure lay over Iceland and a high pressure over the Bay of Biscay, on the 7th the depression was approaching Scotland, and on the 8th had reached the North Sea. The maximum height given for Pavia on the 7th is 23 miles, with an air pressure of 3mm., *i.e.*, $\cdot 12$ inches of mercury pressure. This means that the balloon expanded to more than six times its diameter at starting, and there must certainly be some mistake.

THE RAINFALL IN CUBA AND IN ENGLAND, SOUTH-WEST.

By A. HAMPTON BROWN.

IN a recent enquiry dealing with the connection between the rainfall in Cuba and that recorded subsequently in England, south-west, it was pointed out that when the "rainy" season at Havana, which extends from May to October, is characterised by excessive precipitation, then the months of January to March following, in England, south-west, are more or less dry. The converse also held good. On the average of the 36 years, 1877-1912, the correlation co-efficient worked out at $-.54$ with a probable error of $\cdot 08$. The figures for 1914 have now come to hand, and the total rainfall for the wet season at Havana reaches only 71 per cent of the average fall, and indicates that in the south-west of England precipitation for the early part of the year 1915 should be abundant. In view, however, of the heavy rains of the last few weeks of 1914, one's faith in the strength of the correlation is somewhat shaken, for wet periods of from five to six months in this country, are by no means common. In 1911, the rainfall at Havana during the wet season amounted to only 66 per cent. of the average, and that recorded in England, south-west, during January to March, 1912, reached the high figure of 146 per cent. And this followed a remarkably wet October—December, the rainfall for the same district being 130 per cent. of the average. On the other hand, during the wet season at Havana in 1912, 108 per cent. of the mean rainfall was registered, which implied a deficient fall in our south-west districts in January—March, 1913, but the percentage worked out at 139 per cent. The previous three months, October—December, had also been wet (109 per cent).

Whether it is possible in this country to make any practical use of correlations, or whether it is wiser to wait until a more scientific method of long-date forecasting has been established, the reader must decide for himself. The figures given above may help him in his decision, and assist him in speculating on the probable rainfall for the coming three months. The percentages for England, south-west, mentioned above, refer to district 8 of the *Weekly Weather Report* stations of the Meteorological Office.

METEOROLOGICAL NEWS AND NOTES.

MR. JAMES S. HARDING, who died on January 11th, was one of the last links with the earliest days of the Meteorological Office. Mr. Harding was Private Secretary to Admiral FitzRoy in 1854, when the Office was a Department of the Board of Trade. He retired in 1906 after a service of more than half a century, during the greater part of which he acted as Chief Clerk to the Meteorological Council. He had been a fellow of the Royal Meteorological Society since 1866 and had made valuable contributions to the work of the Society. He was an accomplished linguist and gave much time to the study of International meteorology. Of a kindly and courteous disposition he was held in high esteem by all who knew him, and was the recipient of a handsome presentation from his colleagues in the Meteorological Office on the occasion of his retirement. Mr. Harding frequently contributed to the pages of this Magazine in earlier years.

FLOODS of a disastrous nature took place at Los Angeles, California, as a consequence of exceptional rainfall on February 18th-21st, 1914. During these four days the amount recorded varied from 2.03 in. at San Pedro on the coast, to 19.40 in. at Mount Wilson, and 19.20 in. at Mount Lowe, about 30 miles north. At Mount Lowe, at an elevation of 3420 feet, the annual average rainfall is only 26 inches, so that during the four days about three-quarters of a normal year's rain fell. Dr. Ford A. Carpenter, in an address to the American Society of Civil Engineers, has given particulars of a large number of floods during the last 37 years, only 9 years having been free from floods. The majority of these have taken place after the second of two successive heavy rains. The most serious was in 1884, and in 1889 no fewer than five floods were experienced.

ERRORS DUE TO UNUSUAL UNITS are always difficult to detect until writers grow accustomed to the unfamiliar appearances of the quantities dealt with. Similar difficulties arise in the hasty reading of statistics grouped in a new way, an interesting example of which is found in the statement, which has appeared in many newspapers, that 4.19 in. of rain fell in five minutes at Oklahoma in June, 1913. As a matter of fact the fall on this occasion was only 0.13 in., but the table containing the information gave accumulated rainfall at 5-minute intervals, hence the mistake. Professor Alexander McAdie, writing from the Blue Hill Observatory to *Nature* of October, 1914, explained how the mistake arose and expressed a hope that the correction might receive wide publicity as the error had found its way even into so critical a journal as the *Meteorologische Zeitschrift*.

RAINFALL TABLE FOR JANUARY, 1915.

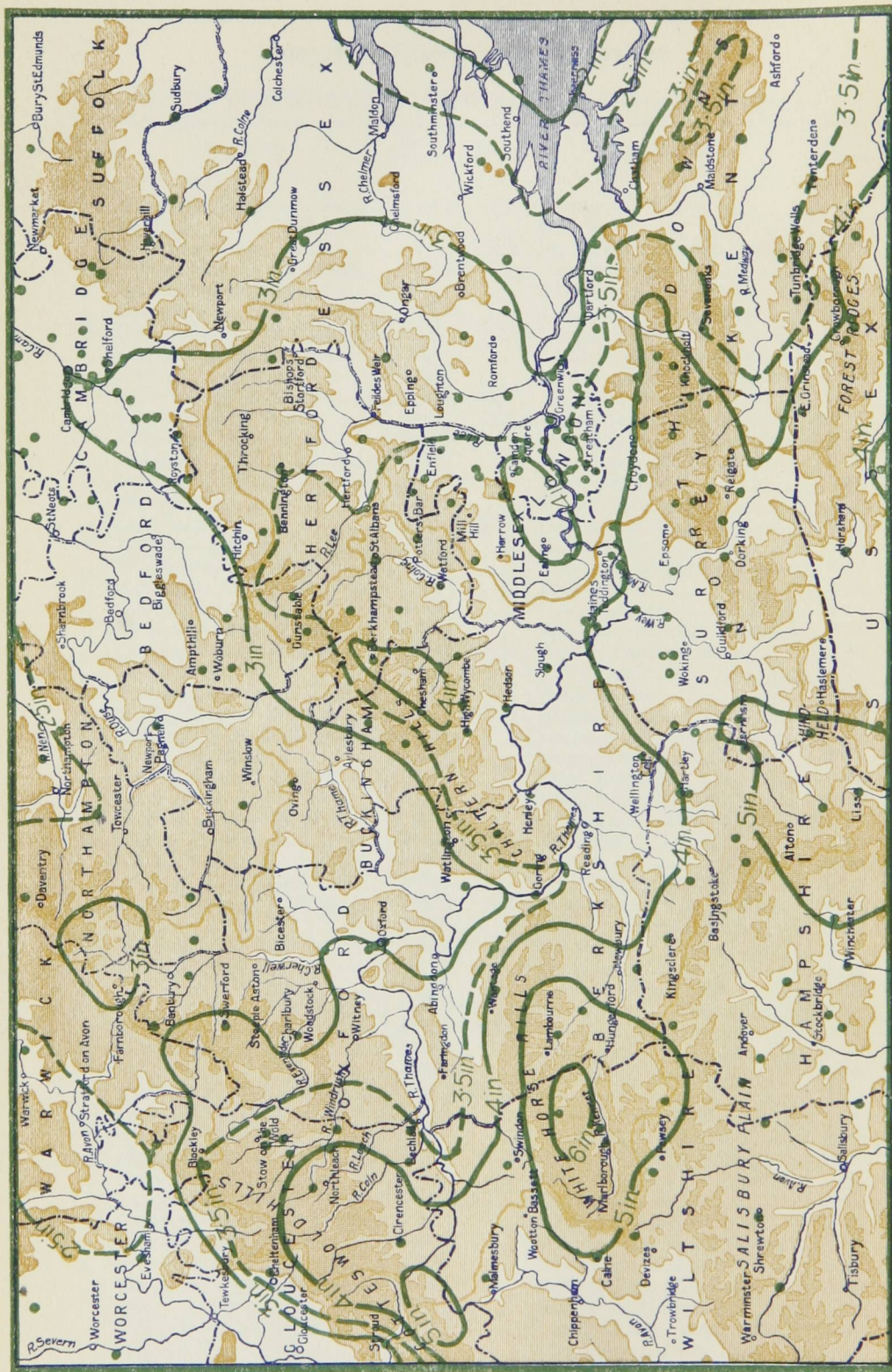
STATION.	COUNTY.	Lat. N.	Long. W. [°E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1915. in.
Camden Square.....	London.....	51 32	0 8	111	1'83	4'12
Tenterden.....	Kent.....	51 4	*0 41	190	2'14	3'22
Arundel (Patching).....	Sussex.....	50 51	0 27	130	2'59	5'05
Fawley (Cadland).....	Hampshire.....	50 50	1 22	52	2'75	4'18
Oxford (Magdalen College).....	Oxfordshire.....	51 45	1 15	186	1'78	2'84
Wellingborough(Swanspool).....	Northampton.....	52 18	0 41	155	1'90	2'51
Shoeburyness.....	Essex.....	51 31	*0 48	13	1'33	1'96
Bury St. Edmunds(Westley).....	Suffolk.....	52 15	*0 40	226	1'70	2'70
Geldeston [Beceles].....	Norfolk.....	52 27	*1 31	38	1'53	3'38
Polapit Tamar [Launceston].....	Devon.....	50 40	4 22	315	3'59	5'10
Rousdon [Lyne Regis].....	„.....	50 41	3 0	516	2'94	3'56
Stroud (Upheld).....	Gloucestershire..	51 44	2 13	226	2'33	2'98
Church Stretton (Wolstaston).....	Shropshire.....	52 35	2 48	800	2'51	5'08
Boston.....	Lincolnshire.....	52 58	0 1	11	1'54	2'55
Worksop (Hodsock Priory).....	Nottinghamshire	53 22	1 5	56	1'70	2'15
Mickleover Manor.....	Derbyshire.....	52 54	1 32	280	1'95	2'76
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'66	5'69
Southport (Hesketh Park).....	Lancashire.....	53 39	2 59	38	2'55	3'98
Arneliffe Vicarage.....	Yorkshire, W.R.	54 8	2 6	732	6'26	9'72
Wetherby (Ribston Hall).....	„.....	53 59	1 24	130	1'89	3'42
Hull (Pearson Park).....	„ E.R.	53 45	0 20	6	1'70	2'84
Newcastle (Town Moor).....	Northumberland	54 59	1 38	201	1'90	2'12
Borrowdale (Seathwaite).....	Cumberland.....	54 30	3 10	423	13'44	16'79
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	3'65	4'10
Haverfordwest.....	Pembroke.....	51 48	4 58	90	4'69	4'30
Aberystwyth (Gogerddan).....	Cardigan.....	52 26	4 1	83	3'91	6'71
Llandudno.....	Carnarvon.....	53 20	3 50	72	2'51	3'57
Cargen [Dumtries].....	Kirkcudbright...	55 2	3 37	80	4'10	3'53
Marchmont House.....	Berwick.....	55 44	2 24	498	2'40	2'28
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	4'78	6'55
Glasgow (Queen's Park).....	Renfrew.....	55 53	4 18	144	3'53	2'31
Inveraray (Newtown).....	Argyll.....	56 14	5 4	17	7'34	7'72
Mull (Quinish).....	„.....	56 34	6 13	35	5'55	8'16
Dundee (Eastern Necropolis).....	Forfar.....	56 28	2 57	199	2'01	1'94
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'92	3'48
Aberdeen (Cranford).....	„.....	57 8	2 7	120	2'36	3'42
Gordon Castle.....	Moray.....	57 37	3 5	107	1'99	2'47
Fort Augustus (S. Benedict's).....	E. Inverness.....	57 9	4 41	68	5'58	4'31
Loch Torridon (Bendamph).....	W. Ross.....	57 32	5 32	20	9'42	10'82
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'75	...
Wick.....	Caithness.....	58 26	3 6	77	2'48	2'15
Killarney (District Asylum).....	Kerry.....	52 4	9 31	178	5'94	5'41
Waterford (Brook Lodge).....	Waterford.....	52 15	7 7	104	3'78	2'29
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	3'88	5'27
Ennistymon House.....	Clare.....	52 57	9 18	37	4'30	6'93
Gorey (Courtown House).....	Wexford.....	52 40	6 13	80	3'19	2'40
Abbey Leix (Blandsfort).....	Queen's County..	52 56	7 17	532	3'15	3'65
Dublin (Fitz William Square).....	Dublin.....	53 21	6 14	54	2'14	2'10
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	367	3'10	5'27
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 16	74	5'35	6'78
Cong (The Glebe).....	„.....	53 33	9 16	112	4'79	6'32
Collooney (Markree Obsy.).....	Sligo.....	54 11	8 27	127	3'87	5'69
Seaforde.....	Down.....	54 19	5 50	180	3'41	2'60
Bushmills (Dundarave).....	Antrim.....	55 12	6 30	162	3'19	2'62
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	3'46	4'49

RAINFALL TABLE FOR JANUARY, 1915—continued.

RAINFALL OF MONTH (con.)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION.
Diff. from Av. in.	% of Av.	Max. in 24 hours.	No. of Days		Aver. 1875-1909.	1915.	Diff. from Aver. in.	% of Av.		
		in. Date.			in.	in.			in.	
+2.29	225	.93	22	19	...	...	...	...	25.11	Camden Square
+1.08	150	.60	1	21	...	...	...	...	27.64	Tenterden
+2.46	195	.96	6	23	...	...	...	...	30.48	Patching
+1.43	152	.90	3	21	...	...	...	...	31.87	Cadland
+1.06	160	.79	3	19	...	...	...	...	24.58	Oxford
+ .61	132	.48	1	18	...	...	...	...	25.20	Swanspool
+ .63	147	.27	7	23	..	...	...	...	19.28	Shoeburyness
+1.00	159	.34	10	20	...	...	...	...	25.40	Westley
+1.85	221	.52	21	28	...	...	...	...	23.73	Geldeston
+1.51	142	.77	20	26	...	...	...	...	38.27	Polapit Tamar
+ .62	121	.95	6	20	...	...	...	...	33.54	Rousdon
+ .65	128	.66	3	18	...	...	...	...	29.81	Stroud
+2.57	202	.92	3	19	...	...	...	...	32.41	Wolstaston
+1.01	166	.24	1, 3	25	...	...	...	...	23.35	Boston
+ .45	127	.52	3	20	...	...	...	...	24.46	Hodsock Priory
+ .81	142	.57	4	22	...	...	...	...	26.65	Wickleeover
+3.03	214	.72	7	21	...	...	...	...	34.73	Macclesfield
+1.43	156	.83	7	18	...	...	...	...	32.70	Southport
+3.46	156	2.13	15	19	...	...	...	...	61.49	Arncliffe
+1.53	181	.88	3	13	...	...	...	...	26.87	Ribston Hall
+1.14	167	.62	3	29	...	...	...	...	26.42	Hull
+ .22	112	.52	3	25	...	...	...	...	27.94	Newcastle
+3.35	125	2.20	15	20	...	...	...	...	129.48	Seathwaite
+ .45	112	.47	1	25	...	...	...	...	42.28	Cardiff
— .39	92	.74	20	18	...	...	...	...	46.81	Haverfordwest
+2.80	172	.85	20	21	...	...	...	...	45.46	Gogerddan
+1.06	142	.76	7	15	...	...	...	...	30.36	Llandudno
— .57	86	.75	10	16	...	...	...	...	43.47	Cargen
— .12	95	.35	3	17	...	...	...	...	33.76	Marchmont
+1.77	137	1.25	30	21	...	...	...	...	49.77	Girvan
—1.22	65	.38	14	16	...	...	...	...	35.97	Glasgow
+ .38	105	1.16	14	20	...	...	...	...	68.67	Inveraray
+2.61	147	1.02	6	24	...	...	...	...	56.57	Quinish
— .07	97	.39	4	14	...	...	...	...	28.64	Dundee
+ .56	119	1.30	1	15	...	...	...	...	34.93	Braemar
+1.06	145	.56	12	20	...	...	...	...	32.73	Aberdeen
+ .48	124	.63	12	19	...	...	...	...	30.34	Gordon Castle
—1.27	77	.70	14	19	...	...	...	...	44.53	Fort Augustus
+1.40	115	1.20	14	20	...	...	...	...	83.93	Bendamp
...	...	...	...	...	...	...	...	...	31.90	Dunrobin Castle
— .33	87	...	...	...	...	...	...	...	29.88	Wick
— .53	91	.55	4	27	...	...	...	...	54.81	Killarney
—1.49	61	.23	15	21	...	...	...	...	39.57	Waterford
+1.39	136	.86	1	22	...	...	...	...	39.43	Castle Lough
+2.63	161	.61	1	27	...	...	...	...	46.52	Ennistymon
— .79	75	.36	15	13	...	...	...	...	34.99	Courtown Ho.
+ .50	116	.53	1	20	...	...	...	...	35.92	Abbey Leix
— .04	98	.35	1	18	...	...	...	...	27.68	Dublin
+2.17	170	.85	10	26	...	...	...	...	36.15	Mullingar
+1.43	127	1.28	15	26	...	...	...	...	52.87	Ennisceoe
+1.53	132	1.01	15	25	...	...	...	...	48.90	Cong
+1.82	147	.86	15	26	...	...	...	...	42.71	Markree
— .81	76	.59	15	19	...	...	...	...	38.91	Seaforde
— .57	82	.34	10	20	...	...	...	...	37.56	Dundarave
+1.03	130	.69	15	26	...	...	...	...	39.38	Omagh

SUPPLEMENTARY RAINFALL, JANUARY, 1915.

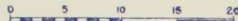
Div.	STATION.	Rain inches	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	5·00	XI.	Lligwy	4·07
„	Ramsgate	2·81	„	Douglas	3·63
„	Hailsham	4·55	XII.	Stoneykirk, Ardwell House...	2·68
„	Totland Bay, Aston House...	3·53	„	Carsphairn Shiel	7·89
„	Stockbridge, Ashley..	4·34	„	Beattock, Kinnelhead	4·71
„	Grayshott	5·26	„	Langholm, Drove Road	3·14
III.	Harrow Weald, Hill House...	3·68	XIII.	Meggat Water, Cramilt Lodge	2·96
„	Caversham, Rectory Road ...	3·63	„	North Berwick Reservoir.....	1·71
„	Pitsford, Sedgebrook.....	2·39	„	Edinburgh, Royal Observaty.	1·22
„	Woburn, Milton Bryant.....	2·93	XIV.	Maybole, Knockdon Farm ...	4·00
„	Chatteris, The Priory.....	2·42	XV.	Ballachulish House	11·11
IV.	Elsenham, Gaunts End	3·08	„	Campbeltown, Witchburn ..	4·11
„	Colchester, Hill Ho., Lexden	2·65	„	Holy Loch, Ardnadam.....	6·70
„	Ipswich, Rookwood, Copdock	2·66	„	Islay, Eallabus	4·92
„	Blakeney	3·18	„	Tiree, Cornaigmore	5·43
„	Swaffham	2·72	XVI.	Dollar Academy	2·78
V.	Bishops Cannings	4·68	„	Balquhiddie, Stronvar.....	6·19
„	Wimborne, St. John's Hill ...	3·52	„	Glenlyon, Meggernie Castle..	6·34
„	Ashburton, Druid House..	4·97	„	Blair Atholl	3·93
„	Cullompton	4·72	„	Coupar Angus	2·04
„	Lynmouth, Rock House	4·79	„	Montrose, Sunnyside Asylum.	2·63
„	Okehampton, Oaklands.	6·18	XVII.	Alford, Lynturk Manse	3·56
„	Hartland Abbey.....	2·71	„	Fyvie Castle	4·70
„	Probus, Lamellyn.....	4·51	„	Keith Station ..	4·16
„	North Cadbury Rectory.....	3·71	XVIII.	Rothiemurchus	2·65
VI.	Clifton, Pembroke Road.....	3·73	„	Loch Quoich, Loan	22·70
„	Ross, The Graig	3·05	„	Drumadrochit	2·85
„	Shifnal, Hatton Grange.....	3·20	„	Skye, Dunvegan	7·56
„	Droitwich.....	2·69	„	Lochmaddy, Bayhead	4·48
„	Blockley, Upton Wold.....	3·55	„	Glencarron Lodge	11·40
VII.	Market Overton.....	2·65	XIX.	Invershin	1·93
„	Market Rasen	2·36	„	Melvich	2·52
„	Bawtry, Hesley Hall	1·96	„	Loch Stack, Achfary	9·03
„	Derby, Midland Railway.....	2·60	XX.	Dunmanway, The Rectory ..	6·73
„	Buxton	8·47	„	Glanmire, Lota Lodge.....	2·87
VIII.	Nantwich, Dorfold Hall	3·84	„	Mitchelstown Castle.....	3·81
„	Chatburn, Middlewood	6·17	„	Darrynane Abbey.....	6·42
„	Lancaster, Strathspey	5·35	„	Clonmel, Bruce Villa	2·59
IX.	Langsett Moor, Up. Midhope	6·67	„	Newmarket-on-Fergus, Fenloe	5·22
„	Scarborough, Scalby	4·94	XXI.	Laragh, Glendalough	5·11
„	Ingleby Greenhow	3·97	„	Ballycumber, Moorock Lodge	4·21
„	Mickleton	4·60	„	Balbriggan, Ardgillan	2·00
X.	Bellingham, High Green Manor	2·36	XXII.	Woodlawn	4·75
„	Ilderton, Lilburn Cottage ...	2·21	„	Ballynahinch Castle.....	7·40
„	Keswick, The Bank.....	5·75	„	Westport, St. Helens	6·06
XI.	Llanfrechfa Grange	3·75	„	Dugort, Slievemore Hotel ...	8·28
„	Treherbert, Tyn-y-waun	8·68	„	Mohill Rectory	4·10
„	Carmarthen, The Friary	4·72	XXIII.	Enniskillen, Portora.....	5·14
„	Fishguard Goodwick Station.	3·57	„	Dartrey [Cootehill]	3·47
„	Crickhowell, Tal-y-maes.....	4·50	„	Warrenpoint, Manor House ..	2·65
„	New Radnor, Ednol	2·00	„	Banbridge, Milltown	2·37
„	Birmingham WW., Tyrmynydd	8·65	„	Belfast, Cave Hill Road	4·19
„	Lake Vyrnwy	5·02	„	Ballymena Harryville	4·39
„	Llangynhafal, Plâs Draw.....	3·39	„	Londonderry, Creggan Res...	4·43
„	Dolgelly, Bryntirion.....	8·09	„	Dunfanaghy, Horn Head ...	4·72
„	Bettws-y-Coed, Tyn-y-bryn...	8·76	„	Killybegs	7·83



ALTITUDE
SCALE

Below 250 feet	250 to 500 feet	500 to 1000 feet	Above 1000 feet
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SCALE OF MILES



THE WEATHER OF JANUARY.

Owing to the influence of a deep barometric depression in the west, rough weather prevailed generally at the beginning of the month. Southerly gales were experienced in Ireland and along the west coast of Great Britain on the 1st. At Warrenpoint, where the gale was very severe, the sea wall and roadway were carried away in several places. Heavy rain fell daily in almost all parts of the Kingdom, and on the 3rd snow or sleet fell at many stations in the south of England. On this day the fall measured 2·30 in. at Mildenhall, 2·11 in. at Wexcombe, and more than 1·00 in. over the upper Thames Valley. About 1·00 in. of rain fell at most stations in Devon and Cornwall on the 6th. The floods in the Thames Valley, the most serious since November 1894, reached their height at the beginning of the second week. Large areas were under water, in places to a depth of over two feet, and the Thames and its tributaries were swollen to an extraordinary degree. At Shrewton the chalk springs were higher than had been recorded for 140 years. The approach of an anticyclone from the south-west brought a temporary improvement in the weather over the south and south-east of England between the 10th and 12th, but over the country generally unsettled conditions continued. Temperature increased and on the 13th rose to 55°, or slightly above in nearly all parts of England and Ireland, and to 50° at many stations in Scotland. A depression which passed across the northern part of the country in an easterly direction on the 14th and 15th, occasioned strong south-westerly winds generally, with heavy rain over Scotland and the north of England. Numerous stations had more than 1·00 in. of rain on either day, and on the 15th there was 2·20 in. at Seathwaite, and 2·13 in. at Arncliffe. A large anticyclone extended over the British Isles from the Atlantic on the 17th, and for some days a more settled type of weather was experienced. A depression over the Netherlands on the morning of the 22nd passed down the English Channel, and heavy snow fell over the whole of the south-east of England. At many stations in Surrey it was about a foot deep, and caused much damage. In London traffic was much delayed and the telegraph and telephone services were interrupted. Severe frosts occurred generally on the 22nd and 23rd, and on the latter day the shade minimum temperature at Tunbridge Wells and Clacton was 18°. Slight and indefinite changes of pressure occurred during the last days of the month, and the weather was cold and the rainfall slight in all districts.

In London the weather was mild and wet throughout, the total rainfall at Camden Square, 4·12 in., being the greatest in January in the 58 years' record, with the exception of January, 1877, when 4·74 in. was measured. The mean temperature, 39°·7, was 1°·2 above the average. The duration of sunshine was 29·9 hours, and of rain 86·5 hours. Evaporation, ·11 in.

The rainfall of the month was above the average over practically the whole of the British Isles, the excess being greatest in the south of England. More than 3·00 in. fell south of a line joining Yarmouth and Bristol Channel, except on the lowland of East Anglia and in the Thames Estuary. There were many scattered areas in the south with more than 5·00 in. of rain. On the Pennines 8·00 in. or more fell generally, but the fall diminished to less than 4·00 in. on the Lancashire coast and to less than 3·00 in. over the greater part of the north-midland counties. Part of the south-east of Scotland had less than 2·00 in., but to the west of the Grampians the fall was generally above 5·00 in., and exceeded 10·00 in. in the wet regions of Argyll and Inverness-shire. In Ireland some stations in the east and south-east had about 2·00 in., while there was 4·00 in. in the north and over the greater part of the central area and as much as 12·00 in. at some wet stations in Kerry and Galway.

Over the Kingdom as a whole the general rainfall expressed as a percentage of the average, was as follows: England and Wales, 148; Scotland, 108; Ireland, 115; British Isles, 127.

Climatological Table for the British Empire, August, 1914.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
London, Camden Square	85°·5	24	47°·1	8	75°·5	54°·7	56°·9	80	128°·9	42°·8	1·24	9	5·4
Malta	86°·0	8	68°·4	3	81°·1	64°·5	...	76	138°·0	...	·07	1	0·8
Lagos	87°·0	3, 21	68°·0	12	81°·9	71°·7	69°·8	78	153°·3	61°·0	·84	12	7·3
Cape Town	73°·7	20	36°·9	12	61°·8	45°·9	47°·8	80	...	...	4·38	15	5·2
Natal, Durban ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Johannesburg	72°·2	31	25°·8	25	61°·8	40°·5	31°·5	57	...	24°·3	·85	1	1·4
Mauritius	76°·5	30	57°·8	30	74°·7	62°·6	58°·7	72	...	50°·7	1·71	21	5·2
Bloemfontein	76°·8	31	25°·8	1	64°·1	38°·0	30°·8	53	...	...	·52	2	2·3
Calcutta... ..	92°·7	22	73°·6	5	88°·6	79°·4	77°·9	85	...	72°·0	9·40	13	8·4
Bombay... ..	86°·9	30	75°·8	14	84°·5	77°·6	76°·4	86	130°·5	65°·2	12·44	30	7·8
Madras	100°·0	1	73°·8	11	93°·2	77°·1	73°·0	75	157°·6	72°·5	9·41	16	6°·5
Colombo, Ceylon	88°·0	27*	73°·2	5	85°·9	76°·1	73°·9	79	156°·2	69°·9	1·49	9	7·1
Hongkong	94°·0	31	75°·0	15	87°·9	78°·2	74°·9	79	...	...	4·21	16	6·3
Sydney	74°·0	18	44°·9	11	64°·7	50°·0	46°·4	68	121°·3	34°·0	2·13	9	4·6
Melbourne	72°·4	27†	33°·0	10*	60°·6	44°·3	41°·5	63	117°·5	24°·6	·66	10	6°·0
Adelaide	78°·8	27	40°·3	25	68°·0	48°·5	43°·9	58	131°·6	28°·1	·35	7	3·6
Perth ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie	80°·6	25	40°·8	4	69°·2	46°·2	41°·2	49	141°·2	35°·0	2·27	7	2·8
Hobart, Tasmania	71°·6	28	33°·5	30	57°·3	43°·1	38°·4	60	116°·0	24°·0	1·16	14	6°·5
Wellington	62°·8	19	31°·4	15	55°·5	41°·8	41°·5	77	117°·0	22°·4	1·16	8	5°·5
Auckland	60°·0	22	40°·5	5	56°·4	44°·5	44°·9	81	120°·0	38°·0	1·16	20	4°·7
Jamaica, Kingston	94°·0	9	72°·2	26	90°·7	74°·1	71°·8	78	...	...	·80	10	3°·8
Grenada	87°·0	sev.	72°·0	19	84°·7	75°·1	...	77	136°·0	...	6·86	22	5°·6
Toronto	92°·0	7	48°·1	26	77°·8	58°·4	59°·5	78	145°·0	46°·0	5·20	16	4°·4
Fredericton	85°·0	7, 10	39°·0	28	74°·3	51°·4	...	77	...	...	3·94	12	5°·1
St. John, N.B.	75°·2	12	46°·5	26	66°·6	54°·1	55°·0	83	...	...	2·93	16	6°·1
Alberta, Edmonton	86°·2	1	41°·5	23	72°·9	49°·5	...	66	137°·2	36°·0	2·59	13	3°·9
Victoria, B.C.	81°·8	19	45°·9	29	67°·3	51°·6	...	75	...	...	·18	4	2°·5

* and 30. † and 28.

Mauritius.—Mean temp. 0°·2 above, dew point 0°·5 below, and R ·77 in. below, averages. Mean hourly velocity of wind 14·4 miles.

COLOMBO.—Mean temp. 81°·0 or 0°·2 below, dew point 0°·5 above, and R 1·23 in. below, averages. Mean hourly velocity of wind 5·9 miles.

HONGKONG.—Mean temp. 82°·3. Mean hourly velocity of wind 8·6 miles. Bright sunshine 244·9 hours.

Adelaide.—A most abnormal month, unparalleled in the history of the Observatory. Warmest and driest on record.

	1914.		Average.	Previous highest.	Date.
Mean Max.	...	68°·0	61°·9	66°·3	1860
„ Min.	...	48°·5	45°·8	48°·3	1877
„ Temp.	...	58°·3	53°·9	56°·5	1911
Total Rain	...	·35 in.	2·50 in.	·76 in.	1911
Mean Relative Humidity	...	58 p.c.	71 p.c.	64 p.c.	1913
Sunshine	...	207·5 hrs.	159·6 hrs.	195·3 hrs.	1891 & 1899

Hobart.—Mean temp. 2°·4 above, and R ·66 in. below, averages.

Wellington.—Mean temp. 0°·3 above, and R 3·50 in. below, averages. Bright sunshine 180·7 hours. Frosts on 14 days.