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THE RAINFALL OF NOVEMBER.

November proved a dry month in all parts of the British Isles except the extreme north of Scotland and in North Wales and part of Lancashire, where there was a very slight excess over the monthly average. In the south of England and South Wales there was less than 40 per cent. of the average rainfall, and, taking the country as a whole, it seems probable that within the last half century no November has been very much drier, though dry Novembers occurred in 1901, 1879, 1871 and 1867. The data for these earlier years have not been re-calculated in a comparable form, so we speak of them with some reserve In London, November was remarkably dry, with ·69 in., or 30 per cent. of the 50 years' average (2·30 in.), having only been surpassed, for low rainfall, on three occasions since the Camden Square record began in 1858. November, 1858, had ·53 in., or 23 per cent.; November, 1871, had ·60 in , or 26 per cent., and November, 1901, had ·59 in., or 26 per cent., of the average. The duration of sunshine bore some inverse relation to the amount of rain; there were 48·2 hours of bright sunshine, and since the sunshine recorder was established at Camden Square, in 1904, the brightest previous November had 35·0 hours. A writer in the *Saturday Review*, of December 5th, says :—" Our just expiring November has been mild enough and often sunny, but not sunny throughout; so it had even a more glorious predecessor in 1834." He bases this bold assertion on the slender foundation of a note by Bolton Corney in his "Curiosities of Literature, Illustrated." wherein that author, when he purchased D'Israeli's "Curiosities of Literature," states :—"I determind to reserve the *lively miscellany* as an antidote to the gloom of November; but the sun of summer shone throughout that month, an instance of ultra-felicity without parellel."

The statement cannot be checked because the sunshine recorder was not invented until twenty years later; but we have evidence at least that the rainfall of November, 1834, was more than twice as great as that of November, 1908.

During last month a large area round London, and in the Midlands, had less than one inch of rain, always a rare event in November, and the general rainfall of the three kingdoms, for the month and for the eleven months of 1908, was as follows, expressed as a percentage of the average fall :—

	Nov., 1908.		Jan.-Nov., 1908.
England and Wales	52	......	89
Scotland	77	......	97
Ireland	77	......	101
British Isles	63	......	93

It appears, from the last column, that an average rainfall for December will bring Scotland and Ireland nearly up to their average for the year; but, unless December proves very wet, there will be a deficiency of rainfall for England and Wales. It seems not improbable that 1908 will be remarkable for having a rainfall very near the average, and if so, coming after two average years, the run of three will be unique in the history of British rainfall.

THE WEATHER OF NOVEMBER, 1908.

By Fred. J. Brodie.

The weather of November may be described briefly as changeable, but mostly very dry and mild, though never very warm, the two former qualities being seldom found in conjunction at so late a period in the autumn.

The month opened with a continuance of the genial southerly airs which prevailed at the end of October, and between the 1st and 3rd (chiefly on the 1st over Great Britain) the thermometer rose to 60° and upwards in many parts of the United Kingdom, and as far north even as Banffshire. At Southampton on the 1st, and at St. Aubins, Jersey, on the 2nd, the shade maximum was as high as 63°, while at Guernsey on the 3rd the thermometer touched 65°. On the 4th the wind began to back to the eastward, and after the 6th, when the polar current increased in strength, the weather became much colder, a sharp frost being recorded in many districts between the nights of the 6th and 9th. The lowest temperatures of the month were recorded in most places on the night either of the 8th or 9th, when the sheltered thermometer fell slightly below 20° in several parts of Great Britain, as far south as Wiltshire, and reached a minimum of 16° at West Linton. On the surface of the grass readings below 15° were equally common, the exposed thermometer sinking to 13° at Birmingham, 12° at West Linton, 9° at Greenwich, and 7° at Llangammarch Wells. After the 10th a mild south-westerly breeze set in, the wind continuing to blow from that point or from west for more than a week. No very high temperatures were recorded, but on the 11th and 12th the thermometer reached 60° in several parts of England and Ireland, and slightly exceeded that level at a few places in the south and south-west. The extension of an anticyclone from the Atlantic on the 19th was marked by a temporary shift of wind to the northward, and in the course of the ensuing night a rather keen frost was experienced over Great Britain, grass temperatures below 20° being recorded at a few of the more northern stations. The wind, however, soon got back into a westerly or south-westerly quarter, and until very nearly the end of the month the thermometer was again above its normal level. The highest readings of this period were observed either on the 21st or 22nd, or on the 24th, the thermometer rising on each occasion to 55° and upwards in most districts. At Llandudno a temperature of 60° was recorded on the 21st and again on the 24th. Quite at the close of the month the equatorial current died away, and on the last two nights a sharp frost was again experienced in many parts of the kingdom.

With so decided a predominance of warmth, it is not surprising to find that the mean temperature of the month was above the average, the excess being large in the south of England and also on our extreme western coasts, from the Hebrides to the coast of Kerry. In Scotland the month was not so mild as in 1906 or 1902, but over the greater part of England and Ireland it was the warmest November since that of 1899.

METEOROLOGY AT THE BRITISH ASSOCIATION.

Dr. Shaw's address to Section A.

(Continued from p. 188.)

I will refer quite briefly to the interesting relations between the yield of barley and cool summers, or the yield of wheat and dry autumns, and the antecedent yield of eleven years before, which fell out of the body of statistics collected in the Weekly Weather Report since 1878. The accomplished statisticians of the Board of Agriculture have made this work the starting point for a general investigation of the relation between the weather and the crops, which cannot fail to have important practical bearings.

Let me take another example. For more than a full generation meteorological work has been hampered by the want of a definite understanding as to the real meaning in velocity, or force, of the various points of the scale of wind-estimates laid down in 1805 by Admiral Beaufort for use at sea, and still handed on as an oral tradition. The prolonged inquiry, which goes back really to the report upon the Beckley anemograph already referred to, issued quite unexpectedly in the simple result that the curve

$$p = \cdot 0105 B^3$$

(where p is the force in pounds per square foot, and B the arbitrary Beaufort number) runs practically through nine out of the eleven points on a diagram representing the empirical results of a very elaborate investigation. The empirical determinations upon which it is based are certainly not of the highest order of accuracy; they rely upon two separate investigations besides the statistical comparison, viz., the constant of an anemometer and the relation of wind velocity to wind-pressure, but no subsequent adjustment of these determinations is at all likely to be outside the limits of an error of an estimate of wind-force; and the equation can be used, quite reasonably, as a substitute for the original specification of the Beaufort scale, a specification that has vanished with the passing of ships of the type by which it was defined. This result, combined with the equation $p = {\cdot}003\,V^2$, which has been in use in the Office for many years, and has recently been confirmed as sufficiently accurate for all practical purposes by Dr. Stanton at the National Physical Laboratory and Monsieur Eiffel at the Eiffel Tower, places us upon a new plane with regard to the whole subject of wind-measurement and wind-estimation.

Results equally remarkable appear in other lines of investigation. Let me take the relation of observed wind velocity to barometric gradient. You may be aware that in actual experience the observed direction of the wind is more or less along the isobars, with the low pressure on the left of the moving air in the northern hemisphere; and that crowded isobars mean strong winds. Investigations upon this matter go back to the earliest days of the Office.

There can be no doubt that the relation, vague as it sometimes appears to be upon a weather chart, is attributable to the effect of the Earth's rotation. In order to bring the observed wind velocity into numerical relation with the pressure-gradient Guldberg and Mohn assumed a coefficient of surface 'friction,' interfering with the steady motion. The introduction of this new quantity, not otherwise determinable, left us in doubt as to how far the relation between wind and pressure distribution, deducible from the assumption of steady motion, could be regarded as a really effective hypothesis for meteorological purposes.

Recent investigation in the Office of the kinematics of the air in travelling storms, carried out with Mr. Lempfert's assistance, have shown that, so far as one can speak of the velocity of wind at all—that is to say, disregarding the transient variations of velocity of short period and dealing with the average hourly velocity, the velocity of the wind in all ordinary circumstances is effectively steady in regard to the accelerating forces to which it is subject. This view is supported by two conclusions which Mr. Gold has formulated in the course of considering the observations of wind velocity in the upper air, obtained in recent investigations with kites. The first conclusion is that the actual velocity of wind in the upper air agrees with the velocity calculated from the pressure distribution to a degree of accuracy which is remarkable, considering the uncertainties of both measurements; and the second conclusion affords a simple, and I believe practically new, explanation upon a dynamical basis of the marked difference between the observed winds in the central portions of cyclones and anti-cyclones respectively, by showing that, on the hypothesis of steady motion, the difference of sign of the effective acceleration, due to curvature of path and to the Earth's rotation respectively, leads to quite a small velocity and small gradient as the limiting values of those quantities near anti-cyclonic centres.

This conclusion is so obviously borne out by the facts that we are now practically in a position to go forward with the considerable simplification which results from regarding the steady state of motion in which pressure gradient is balanced by the effective acceleration due to the rotation of the Earth and the curvature of the path, as the normal or ordinary state of the atmosphere.

I cannot forbear to add one more instance of an argosy which has richly come to harbour so lately as this summer. You may be aware that Kelvin was of opinion that the method of harmonic analysis was likely to prove a a very powerful engine for dealing with the complexities of meteorological phenomena, as it has, in fact, dealt with those of tides. In this view Sir Richard Strachey and the Meteorological Council concurred, and an harmonic analyser was installed in the Office in 1879, but subsequently numerical calculation was used instead. A considerable amount of labour has been spent over the computation of Fourier coefficients. Not many great generalizations have flowed from this method up to the present time. I have no doubt that there is much to be done in the way of classifying temperature conditions, for climatic purposes, by the analysis of the seasonal variations. A beginning was made in a paper which was brought to the notice of the Association at Glasgow. The most striking result of the Fourier analysis we owe to Hann, who has shown that, if we confine our attention to the second Fourier coefficient of the diurnal variation of pressure —that is, to the component of twelve-hour period—we get a variation very marked in inter-tropical regions, and gradually diminishing poleward in both hemispheres, but synchronous in phase throughout the 360 degrees of a meridian. The maximum occurs along all meridians in turn about 10 A.M. and 10 P.M. local time. This semi-diurnal variation with its regular recurrence is well known to mariners, and we have recently detected it, true to its proper phase, in the observations at the winter quarters of the "Discovery"; small in amplitude indeed—about a thousandth of an inch of mercury—but certainly identifiable.

The reality of this variation of pressure, common to the whole Earth, cannot be doubted, and, so far as it goes, we may represent it (if indeed we may represent pressure differences as differences in vertical heights of atmosphere) as the deformation of a spherical atmosphere into an ellipsoid, with its longest axis in the equator pointing permanently 30° to the west of the sun. Its shortest axis would also be in the equator, and its middle axis would be along the polar axis of the Earth. Somehow or other this protuberance remains fixed in direction with regard to the sun, while the solid Earth revolves beneath it. Whatever may be the cause of this effect, obviously cosmical, and attributable to the sun, at which it indirectly points, its existence has long been recognised, and further investigation only confirms the generalisation. It is now accepted as one of the fundamental general facts of meteorology.

Professor Schuster, for whose absence from this meeting I may venture to express a regret which will be unanimous, has already contributed a paper to the Royal Society pointing out the possible relations between the diurnal variations of pressure and those of terrestrial magnetic force. Going back again to the ubiquity of the application of the relation of pressure and wind, in accordance with the dynamical explanation of Buys Ballot's Law, we should expect the effect of a pressure variation that has its counterpart in that of terrestrial magnetism to be traceable also in wind observations.

Mr. J. S. Dines has just given me particulars of the discovery of that effect in the great air-current, the variations of which I have called the pulse of the atmospheric circulation—I mean the south-east Trade Wind, the most persistent atmospheric current in the world. It is difficult as a rule to get observers to pay much attention to that current, because it is so steady; but in 1891 the Meteorological Council set up an anemometer at St. Helena, in the very heart of the current, and we have just got out the results of the hourly tabulations. When the observations for the hours 1 to 24 are grouped separately for months, so as to give the vector resultants for each hour and for each month, it appears that there is a conspicuous semi-diurnal variation in the current, which shows itself as a closed polygon of vector variations from the mean of the day.

If, instead of combining the south and east components to form a vector diagram, we plot their variations separately, the semi-diurnal variation in each is plainly marked; and the calculation of its constants shows that its amplitude is about three-quarters of a mile per hour both in the south and rather less in the east component. The easterly increment has its maxima at 10 a.m. and 10 p.m., and at these hours the phase of the variation of the southerly component is nearly opposite. Thus, to correspond with the semi-diurnal variation in the Trade Wind at St. Helena, which is equivalent to the superposition upon the resultant wind of a north-easterly component of about one mile per hour amplitude, with maxima at 10 a.m. and 10 p.m., the hours when the ellipsoidal deformation of the spherical atmosphere is passing over the locality.

I have only dealt with one month. I believe that when all the results that flow from this simple statement can be put before you, you will agree with me that the argosy which the Meteorological Council sent out in 1891 has indeed richly come to harbour.

It would be appropriate for me to add some words about the results of last year's work upon the upper air, in which we have had the valuable co-operation of the University of Manchester. These results have disclosed a number of points of unusual interest. But we are to have an opportunity of considering that subject in a discussion before the Section, and I need not deal with it here. I must, however, pause to give expression of the thanks of all meteorologists to Professor Schuster for his support of the Manchester University station at Glossop Moor. I may remind you that this generous contribution for the advancement of science on the part of Professor Schuster is in addition to the foundation of a readership in mathematical physics at Manchester, and a readership in dynamical meteorology, now held by Mr. Gold, at Cambridge.

I have said enough to show that the speculative ventures of official meteorologists are not all failures, and I will only add that if any mathematician or physicist would like to take his luck on a meteorological argosy he will be heartily welcomed. Part of the work will be drudgery; he must be prepared to face that; but the prospects of reaching port are reasonably good, so much so, indeed, that such a voyage might fairly lead to a claim for one of the higher academical degrees.

The most serious danger of waste in a busy office is that it should carry on its work without an adequate knowledge of what is being done in advancing science and improving methods elsewhere. I speak myself for the Meteorological office alone, but I believe that the responsible officials of any scientific Government department will agree with what I say.

The actual volume of original contributions on these subjects is by no means inconsiderable. You are all aware that, some years ago, the Royal Society initiated a great international enterprise for the compilation of a catalogue of scientific literature. I have been looking at the fifth annual issue of the volume on Meteorology, including Terrestrial Magnetism. I may remark that the catalogue is quite incomprehensibly eclectic as regards official literature, but let that pass. I find that, in the year that closed with July, 1907, 1042 authors (not counting offices and institutions as such) presented to the world 2131 papers on Meteorology, 229 on Atmospheric Electricity, and 180 on Terrestrial Magnetism. This will give some idea of the annual growth in these subjects, and may convince you that, after all allowance is made for duplicate titles, for papers of no importance, and for mere sheets of figures published for purposes of reference, there remains a bulk of literature too large for any single individual to cope with if he has anything else to do.

If British students, official and unofficial, are to make the most of the operation of drawing the angels down, they need help and co-operation in dealing with this mass of literature, in winnowing the important from the unimportant, and in assimilating that which makes for the real progress of the practical application of Science. This is the more necessary for these subjects because there is no organised system of academic teaching, with its attendant system of text-books.

The want of opportunity for the discussion of progress in these sciences is specially lamentable, because in its absence they lose the valuable assistance of amateur workers, who might be an effective substitute for the students of an academic study. In no subject are there more volunteers, who take an active part in observing, than in meteorology; but how few of them carry their work beyond the stage of recording observations and taking means. The reason is not lightly to be assigned to their want of capacity to carry on an investigation, but far more, I believe, to the want of knowledge of the objects of investigation and of the means of pursuing them.

Among the agencies which in the past have fostered the knowledge of these subjects, and stimulated its pursuit, there stand out prominently the annual meetings of this Association. It was the British Association which, in 1842, re-founded the Kew Observatory for the study of the physics of the atmosphere, the Earth and the sun. It was the British Association which promoted the establishment of magnetic observatories in many parts of the Earth, and in the early sixties secured the most brilliant achievements in the investigation of the atmosphere by means of balloons. I know of no other opportunity of anything like the same potentialities for the writers of papers to meet with the readers, and to confer together about the progress of the sciences in which they are interested. But its potentialities are not realised. Those of us who are most anxious for the spread of the application of mathematics and physics to the phenomena of astronomy, meteorology, and geophysics, have thought that this opportunity could not properly be utilised by crowding together all the papers that deal with such subjects into one day, or possibly two days, so that they can be polished off with the rapidity of an oriental execution. In fact, the opportunity to be polished off is precisely not the opportunity that is wanted. There are some of us who think that a British Association week is not too long for the consideration of the subjects of which a year's abstracts occupy a volume of six hundred pages, and that, if we could extend the opportunity for the consideration of these questions from one or two days to a week, and let those members who are interested form a separate committee to develop and extend these subjects, the British Association, the country, and science would all gain thereby. I venture from this place, in the name of the advancement of science, to make an appeal for the favourable consideration of this suggestion. It is not based upon the depreciation, but upon the highest appreciation of the service which mathematics and physics have rendered, and can still render, to the observational sciences, and upon the well-tried principle that close family ties are strengthened, and not weakened, by making allowance for natural development.

We regret to learn that, in spite of Dr. Shaw's strong appeal, the Committee of Section A. did not support the proposal for a special section, or sub-section, of meteorology.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

THE PRESENTATION OF RAINFALL STATISTICS.

It seems to me that the usually practised way of publishing rainfall statistics is very misleading to the general public. The year 1907 furnished a good example. The total amount was not greatly above the average, nor was the number of rain days. Yet the year was a most disastrous one for all interests depending on the weather. Here half the corn was lost and the potato crop is not yet all out of the ground, and half of the tubers are frostbitten. Why? Because in 1907 the dry weather was all packed into the four months, January, February, March and September, and the rest, viz., most of the time when crops were being saved were phenomenally wet; and not only so, but those months which had an average rainfall had an excessive number of rain days.

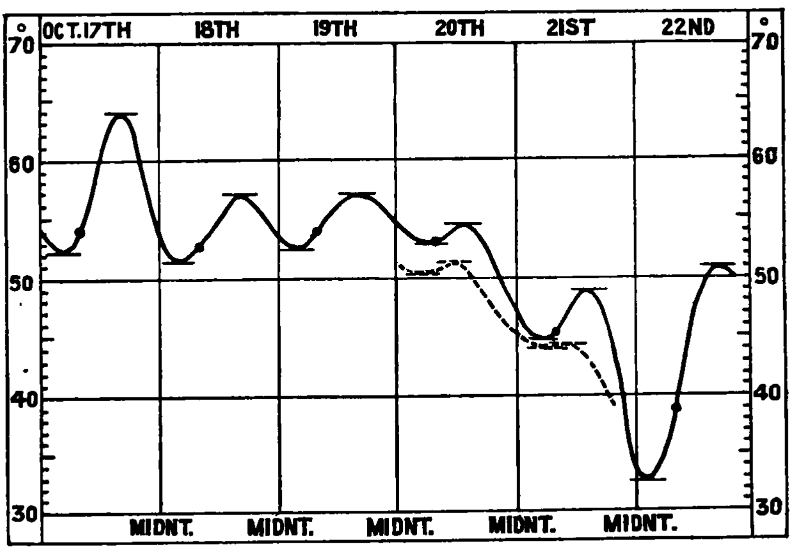
It seems to me that the *distribution* of rainfall has far more to do with the character of a season than its amount. The month of June, 1903, was an excellent example. Here the month gave a rainfall of nearly 5 in.; a very wet June. But over 4 in. of this fell on four days, and the total number of rain days was only 9, a very dry month.

WM. F. A. ELLISON.

Monart Rectory, January, 1908.

SMALL DIURNAL RANGE OF TEMPERATURE.

In the November issue of this Magazine, Mr. Hamlin calls attention to what would undoubtedly be a remarkably small diurnal range of temperature, if it were a fact that for a period of twenty-four hours the temperature did not vary by more than 1°·0 or 0°·3, the ranges quoted. That such a notable uniformity of temperature prevailed does not, however, appear to be proved by the figures given. Mr. Hamlin does not state at what hour he reads his thermometers, but it is evident he does not read them at 9 a.m., and quote the readings for the day of observation; for in that case the maximum reading for any day (*e.g.*, 21st) could not be lower than the temperature at the time of setting the thermometers on the previous day (20th), which in turn could not be lower than the minimum reading for that day, as is the case in the figures quoted by Mr. Hamlin. It thus appears that Mr. Hamlin adopts the not uncommon practice of taking the readings in the morning, and referring the maximum to the previous *civil* day. Now, in this case, nothing can be inferred from the maximum and minimum readings assigned to any day, as to the actual range of temperature on that day,* as I think will be at once evident from a consideration of the subjoined curve, which represents the general character of the temperature variation at this station for a few days at the period under discussion.



The thermometers are read at 8 a.m., and the maximum is referred to the previous day, the minimum being entered to the day of observation. In the diagram the dots represent the 8 a.m. readings of the dry bulb, and the short horizontal lines the values of the

* It is, of course, obvious that *simultaneous* readings of the max. and min. give the actual range since the previous setting.

minimum and maximum, which are assumed to occur in the early morning and afternoon respectively. This assumption may, of course, not always hold good—all that can certainly be affirmed being that the maximum and minimum entered for any day must be separated by the reading at the time of observation on that day, and that they may both occur very nearly at that time, and may not be actually the highest and lowest temperatures occurring on the *civil* day to which they are referred—in fact they may not have occurred on that *civil* day at all.

On the 20th of October at this station, the readings were :—

Min. 53°·0 (occurring at time of observation),
Max. 54°·5 (read at 8 a.m. on 21st),

giving an apparent range of only 1°·5. But a glance at the curve at once suggests that there was not a long time interval between these two readings, and that the slight rise in temperature on that day was but a brief check in the downward trend of the thermometer, which had started on the 19th and continued till the morning of the 22nd. I venture to think that this explanation will also fit Mr. Hamlin's temperatures (which I have represented by a dotted curve), and that though the fluctuations of temperature from the 18th to the 20th are seen to be small, they are not so small as would at first sight appear from the mere juxtaposition of the readings entered for each day.

J. ROWLAND, S.J.

St. Beuno's College, St. Asaph, N. Wales.

THE HIGH AUTUMN TEMPERATURES.

THE recent high temperatures are so remarkable that I venture to send my readings :—

		Maximum Temps.
1908.—Sept.	29th	73°·6
,,	30th	77°·4
Oct.	1st	79°·1
,,	2nd	76°·4
,,	3rd	78°·4

The only other October readings above 70° in my record of 30 years are :—

Oct. 5th, 1878	71°·3
Oct, 1st, 1895	71°·3

In 1895 a similar hot period occurred, but one week earlier, from September 23rd to September 29th inclusive.

1908.—Sept. 30th .... 63°·0. Minimum temp.

This has only been exceeded twice in 30 years.

CHARLES L. BROOK.

Harewood Lodge, Meltham, October 8th, 1908.

THE WARM AUTUMN AT YORK.

On line 5 of "The Warm Autumn at York," on p. 193 of the November Magazine, 71° should be 70°, as indeed the context indicates.

As expected, October, 1908, was warmer than any previous October back to 1832. The mean was 54°·3, against the previous highest, 52°·9, in 1861. The range goes down 11° to 43°·3 in 1842.

J. EDMUND CLARK.

Asgarth, Riddlesdown Road, Purley, Surrey.

PHENOLOGICAL OBSERVATIONS.

Allow me to express my entire concurrence with Mr. Bonacina's remarks on the above on pp. 175-7. Many years ago I was one of the phenological correspondents of the Meteorological Society, but gave it up from a conviction that it was practically impossible for the observations to be sufficiently accurate to have any scientific value. In addition to the difficulties mentioned by Mr. Bonacina, I would call attention to that of the height of the locality of observation, not only above sea level, but also relatively to its own immediate neighbourhood. To give an instance from my own experience: this house is situated on the slope of a hill facing south, which rises 270 ft. in about 1,300 yards. Here every spring I see cuckoo-flowers (*cardamine pratensis*), primroses and wild hyacinths beginning to flower at the foot of the hill a long time before they flower at the top. Thus, on April 15th, 1907, my notes show that hyacinths were in flower at the foot of the hill; on May 5th "beginning to open" about 200 ft. higher (vertical)—none to be seen at the top; on May 14th "almost in full flower" at the top.

ALFRED O. WALKER, F.L.S.

Ulcombe Place, Maidstone, October 28th, 1908.

ROYAL METEOROLOGICAL SOCIETY.

The first meeting of this Society for the current session was held at the Institution of Civil Engineers, Great George Street, Westminster, on Wednesday evening, November 18th, Dr. H. R. Mill, President, being in the chair.

In opening the meeting the President gave a short account of the work carried on by the Society during the recess, and alluded to the death of Prof. E. Mascart, the late head of the French Meteorological Service, who was a distinguished Honorary Member of the Society.

Mr. H. Harries read a report of the proceedings at the Twenty-fifth Anniversary of the German Meteorological Society, which was held at Hamburg, on September 28th to 30th, and which he attended as the representative of the Royal Meteorological Society.

A paper on an "Investigation of the Electrical State of the Upper Atmosphere, made at the Howard Estate Observatory, Glossop," under the joint authorship of Mr. W. Makower, Miss Margaret White and Mr. E. Marsden, of the Manchester University, was read by the Secretary. The experiments were carried out in connection with the kite observations made at the Observatory. There exists under normal atmospheric conditions a potential gradient in the atmosphere surrounding the earth.* The earth being negatively charged with respect to the air, a continuous electric current flows from the upper atmosphere to earth. It follows, therefore, that a kite attached to an earth-connected wire will tend to assume the potential of the air surrounding it, and an electric current will flow continuously down the wire to earth through the winding machine to which the wire is attached. The experiments were undertaken with a view to determining the magnitude of this current when the kite was at different heights above the ground. The authors found that in general a high wind produced at a given altitude an abnormally high value of the current flowing down the wire. Whether the action of the wind is to be accounted for by the greater volume of air which passes in a given time over the sails of the kite, so giving a greater volume of air from which electricity is collected; or whether the effect of the wind is to be attributed to electrification by friction, the authors find it difficult to say; but there is no question that the velocity of the wind does play an important part in determining the current flowing down the kite wire. In further confirmation it may be added that observations made with a captive balloon in very calm weather gave abnormally low values of the current.

Mr. W. W. Bryant, Capt. D. Wilson-Barker, Mr. W. H. Dines, the President, and Mr. C. S. Rolls took part in the discussion.

A paper, by Capt. C. H. Ley, describing the Balloon Observations which he made at Birdhill, co. Limerick, during July and August, 1908, was also read by the Secretary. These observations were carried out on behalf of the Joint Kite Committee of the Royal Meteorological Society and of the British Association. Captain Ley in his paper gave full details of the observations made on 25 pilot balloons, 7 of which carried registering instruments. The method of measuring distance employed is similar to that known by surveyors as the subtense method; that is, obtaining the range of a known vertical bar by observation of the angle subtended by it at the theodolite with an eye-piece micrometer. In this case the bar is the line joining a hydrogen balloon and a comparatively heavy air-filled balloon, the two balloons appearing as discs to be bisected simultaneously by the fixed and movable wire of the micrometer. Several balloons were observed to a horizontal distance of 24 miles. Two of

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* It is usual in these pages to distinguish, *when we can*, the name of the planet by a capital letter, a practice which prevents doubt as to the meaning of the word employed in at least three senses—Earth = the terrestrial globe, earth = soil, and earth = the technical electrical term.—Ed., *S.M.M.*

the balloons dropped in the river Shannon; these were sent up in an exceptionally calm atmosphere, and Captain Ley considers that the river produced an effect of suction upon them. The immediate neighbourhood of stratus or cirrus cloud appears to cause a reduction of vertical velocity, and, generally speaking, the highest horizontal velocity of wind appears to occur below the cirrus level. A new method developed during the course of the experiments was the observation of the balloons at night by means of naked acetylene lights. After some trouble these proved quite successful, gave long runs with less risk of being lost in small clouds, and afforded points of light which could be observed with great accuracy.

Mr. W. H. Dines, Mr. C. J. P. Cave, Mr. C. S. Rolls, Mr. F. C. Bayard, Mr. W. W. Bryant, Capt. D. Wilson-Barker, Mr. W. Marriott, and the President, took part in the discussion.

The following ladies and gentlemen were elected Fellows of the Society:—Mr. C. W. Bartholomew, Mr. W. J. E. Biker, Miss F. Rouse Boughton, Mr. E. H. Casey, Capt. F. G. Cooper, F.R.A.S., Dr. J. E. Crombie, Mrs. J. H. Foster, Capt. J. O. Hatcher, Mr. Young Hee, Dr. A. J. Herbertson, Mr. T. B. Hewetson, Mr. W. W. Larkin, Mr. A. Lockwood, Capt. D. R. W. Parsons, Capt. V. C. White Parsons, Mr. A. R. Pillai, Mr. C. E. Rivers, Assoc.M.Inst.C.E., Mr. V. I. Stephens, and Mr. W. E. Whitehouse.

SCOTTISH METEOROLOGICAL SOCIETY.

A GENERAL meeting of this Society was held on December 1st, at 5, St. Andrew Square, Edinburgh, when Lord M'Laren presided over a large attendance.

Sir Arthur Mitchell, K.C.B., in submitting a paper on "The Obedience of Scarlet Fever to Seasonal Influence in Scotland," took up a new branch of an old piece of work. Many years ago, in conjunction with the late Dr. Buchan, he had considered exhaustively the influence of weather on mortality from different diseases in the case of London. It had been shown that, for London, deaths from scarlet fever were above the average from the middle of August to the beginning of January; that deaths from this disease reached their maximum in October, and their minimum in April; and that in years of epidemic the distribution of deaths throughout the year gave a curve closely agreeing with the normal curve. Coming to Scotland a similar enquiry was confined to the eight large towns, Glasgow, Edinburgh, Dundee, Aberdeen, Greenock, Paisley, Leith and Perth, since these were the only areas for which weekly statistics were available. On grouping together the figures for these eight large towns a curve was obtained that was in essential agreement with the London curve, and this was the more remarkable since the mass of figures was much smaller than that handled in the case of London. It was further found that the separate towns agreed, more or less, closely with the general curve, and that when the cases of occurrence of scarlet fever were considered apart altogether from the resultant mortality, the seasonal progress of the disease was in all essential respects the same as that for deaths from the disease. The cases occurring included both those who lived and those who died, and a detailed examination of the statistics gave strong ground for holding that the obedience of scarlet fever to seasonal influence was even more strongly marked in the case of those who had the disease and recovered, than when dealing only with those who had the disease and died. Further, the fact that there were never such depressions below the mean as there were rises above it, seemed to indicate that the period of defect should be regarded as due rather to the absence of favouring conditions than to the presence of conditions positively and actively opposed to the occurrence of the disease.

The paper was illustrated by several striking diagrams, and it was in a way an advantage that the results were based on statistics collected some years ago when the death-rate from scarlet fever was much higher than it is to-day.

Sir Arthur was cordially thanked for his communication, and thereafter a business meeting of the Society was held. A report from the Council was adopted, and the first election of Council and Office-bearers under the new constitution of the Society took place. The following were elected for the ensuing twelve months :—

President, Sir Arthur Mitchell, M.D., K.C.B. ; *Vice-Presidents*, Professor A. Crum Brown, F.R.S., Sir A. Buchan-Hepburn, Bart. ; *Council*—The Hon. Lord M'Laren, Sir John Murray, K.C.B., F.R.S., J. Mackay Bernard, Ralph Richardson, W.S., John Aitken, LL.D., F.R.S., James Macdonald, C. G. Knott, D.Sc., David Paulin, Gilbert Thomson, C.E. ; *Hon. Secretaries*—R. T. Omond, E. M. Wedderburn, W.S. ; *Hon. Treasurer*—W. B. Wilson, W.S.

REVIEWS.

Transvaal Meteorological Department Annual Report for the Year ended 30th June, 1907. Pretoria, 1908. Size $13 \times 8\frac{1}{2}$. Pp. vi. + 126

We have before referred, with regret, to the decision of the Transvaal Meteorological Department to cut the year in the middle, as the inconvenience of having to refer to two volumes for the data of a single year, and the confusion sure to result in comparing annual data when the halves of two different years are added together, greatly affect the student consulting records. We allow, however, that it is better to have the season's rainfall in one total, as the method adopted secures.

With this exception we have nothing but praise for the volume itself and for the manner in which Mr. Innes has developed the scope and usefulness of his department. At the time of reporting there were 407 meteorological stations in the Transvaal. Although daily weather charts are not published they are prepared and forecasts issued, which are telegraphed to every telegraph office in the Transvaal, and exhibited for the information of the public.

The Kew pattern of barometer has been found unsuited for use in the Transvaal, where the variations of pressure are very small, and Fortin barometers are gradually being introduced at all stations.

An interesting map of the cloudiness of the Transvaal, based on three seasons' observations, shows that in the south-west the average amount of cloud is less than 25 per cent., and on the eastern border a little more than 35 per cent., of the whole sky.

Is Our Climate Changing. By Sir John W. Moore, M.A., M.D., D.Sc., &c. Reprinted for the Author from the *Dublin Journal of Medical Science.* October, 1908. Size $8\frac{1}{2} \times 5\frac{1}{2}$. Pp. 26. Tables.

This is the full text of the important paper read to Section A of the British Association at the Dublin meeting, in September, 1908. Sir John Moore gives a general discussion of climate changes in the British Isles, supplemented by a bibliography compiled by Mr. Lempfert, which might perhaps be profitably enlarged by the addition of more references to our earlier volumes and to those of *British Rainfall.* The observations made by Sir John Moore himself, since 1866, at FitzWilliam Square, Dublin, are discussed in a series of Tables with explanatory letterpress, and after reviewing the subject generally the conclusions are summed up thus:—

> In conclusion I venture to submit that the facts which I have put forward in this paper prove that, within the past six centuries at all events, no appreciable change has taken place in the climate of the British Isles. There is not a scintilla of evidence to show that—within historic times—any such change has taken place in the past, or is likely to take place in the future.

Royal Commission on Sewage Disposal. Fifth Report. Appendix V. Reports to the Commission, by Mr. Baldwin Latham, M.Inst.C.E and Mr. R. A. Tatton, M.Inst.C.E. *Upon the Effects of Rainfall on the Flow of Sewage.* [Cd. 4283.] London. Printed for H.M. Stationery Office, 1908. Size $13 \times 8\frac{1}{2}$. Pp. 198.

These reports deal with one of the important practical applications of the study of rainfall.

METEOROLOGICAL NEWS.

Mr. A. Watt, Secretary of the Scottish Meteorological Society, has just completed a course of twelve evening lectures on General Meteorology at the Royal Botanic Garden, Edinburgh, to Government students of horticulture, of whom a large number are employed in the Garden.

RAINFALL TABLE FOR NOVEMBER, 1908.

STATION.	COUNTY.	Lat. N. ° ′	Long. W. [*E.] ° ′	Height above Sea. ft.	RAINFALL OF MONTH. Aver. 1870-99. in.	1908. in.
Camden Square	*London*	51 32	0 8	111	2·45	·69
Tenterden	*Kent*	51 4	*0 41	190	3·22	1·09
West Dean	*Hampshire*	51 3	1 38	137	3·25	1·06
Hartley Wintney	″	51 18	0 53	222	3·03	·85
Hitchin	*Hertfordshire*	51 57	0 17	238	2·56	·86
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	2·63	·85
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	2·50	1·12
Brundall	*Norfolk*	52 37	*1 26	66	2·71	1·66
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	4·82	1·45
Torquay (Cary Green)	*Devon*	50 28	3 32	12	3·71	·75
Polapit Tamar [Launceston]	″	50 40	4 22	315	4·29	1·77
Bath	*Somerset*	51 23	2 21	67	3·06	·84
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·99	1·05
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	3·18	1·61
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	2·80	1·15
Boston	*Lincolnshire*	52 58	0 1	25	2·14	1·21
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	2·10	1·20
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	2·28	1·57
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	3·91	3·65
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	2·23	1·49
Arncliffe Vicarage	″ ″	54 8	2 6	732	6·00	6·07
Hull (Pearson Park)	″ *E.R.*	53 45	0 20	6	2·45	1·13
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	2·65	1·46
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	13·91	12·26
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	4·26	1·77
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	5·41	2·63
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	4·68	3·09
Llandudno	*Carnarvon*	53 20	3 50	72	3·38	3·48
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	4·50	2·97
Hawick (Branxholm)	*Roxburgh*	55 24	2 51	457	3·71	1·96
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	...	1·39
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	5·31	6·00
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	3·48	...
Tighnabruaich	*Argyll*	55 55	5 14	50	6·21	5·09
Mull (Quinish)	″	56 36	6 13	35	6·43	4·87
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·76	1·68
Braemar	*Aberdeen*	57 0	3 24	1114	3·94	2·78
Aberdeen (Cranford)	″	57 8	2 7	120	3·47	1·63
Cawdor	*Nairn*	57 31	3 57	250	2·65	2·00
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	4·52	4·35
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	9·79	10·08
Dunrobin Castle	*Sutherland*	57 59	3 56	14	3·26	3·57
Castletown	*Caithness*	58 35	3 23	100	...	3·91
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	5·85	3·48
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	3·91	2·46
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	3·19	3·06
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	3·21	2·69
Dublin (FitzWilliam Square)	*Dublin*	53 21	6 14	54	2·60	1·24
Ballinasloe	*Galway*	53 20	8 15	160	3·60	3·02
Clifden (Kylemore House)	″	53 32	9 52	105	8·25	...
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	5·63	4·11
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	3·93	2·99
Seaforde	*Down*	54 19	5 50	180	3·94	3·44
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	4·19	3·67
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	3·53	3·09

RAINFALL TABLE FOR NOVEMBER, 1908—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.					
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1870-99. in.	1908. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1870-1899. in.	STATION.
—1·76	28	·22	21	10	23·04	21·78	—1·26	95	25·16	Camden Square
—2·13	34	·30	21	13	25·62	20·19	—5·43	79	28·36	Tenterden
—2·19	33	·41	21	9	27·19	20·79	—6·40	76	29·93	West Dean
—2·18	28	·33	21	11	24·56	22·32	—2·23	91	27·10	Hartley Wintney
—1·70	34	·14	21, 29	15	22·61	20·47	—2·14	91	24·66	Hitchin
—1·78	32	·14	21, 29	12	24·48	21·41	—3·07	87	26·75	Addington
—1·38	45	·43	21	10	23·28	20·86	—2·42	90	25·39	Westley
—1·05	61	·40	21	12	23·27	21·99	—1·28	95	25·40	Brundall
—3·37	30	·44	21	12	34·87	30·21	—4·66	87	39·00	Winterbourne Stpltn
—2·96	20	·16	12	11	31·54	21·42	—10·12	68	35·00	Torquay
—2·52	41	·48	21	11	34·46	28·80	—5·66	84	38·85	Polapit Tamar
—2·22	27	·23	18	10	27·99	21·28	—6·71	76	30·75	Bath
—1·94	35	·23	21	14	27·37	21·25	—6·12	78	29·85	Stroud
—1·57	51	·41	12	16	30·12	28·09	—2·03	93	33·04	Wolstaston
—1·65	41	·29	18	14	26·77	21·91	—4·86	82	29·21	Coventry
— ·93	57	·49	21	12	21·51	19·73	—1·78	92	23·30	Boston
— ·90	57	·24	12	14	22·68	19·02	—3·66	84	24·70	Hodsock Priory
— ·71	69	·31	12	14	23·90	22·13	—1·77	93	26·18	Derby
— ·26	93	1·36	21	17	38·24	41·07	+2·83	107	42·43	Bolton
— ·74	67	·47	13	12	24·77	23·24	—1·53	94	26·96	Ribston Hall
+ ·07	101	1·16	25	19	54·55	60·67	+6·12	111	60·96	Arncliffe Vic.
—1·32	46	·40	21	14	24·66	18·62	—6·04	75	27·02	Hull
—1·19	55	·44	1	17	25·35	21·09	—4·26	83	27·99	Newcastle
—1·65	88	3·31	21	16	117·98	115·23	—2·75	98	132·68	Seathwaite
—2·49	42	·50	21	11	38·38	31·94	—6·44	83	42·81	Cardiff
—2·78	49	·69	28	13	42·66	37·28	—5·38	87	47·88	Haverfordwest
—1·59	66	1·09	21	11	40·92	39·35	—1·57	96	45·41	Gogerddan
+ ·10	103	·52	21	15	28·03	28·50	+ ·47	102	30·98	Llandudno
—1·53	66	·44	13	14	38·75	42·47	+3·72	110	43·43	Cargen
—1·75	53	·29	22	17	31·26	27·64	—3·62	88	34·80	Branxholm
...	...	·37	25	14	...	21·04	...	...	...	Edinburgh
+ ·69	113	·99	21	22	43·63	46·22	+2·59	106	48·87	Girvan
...	...	...	...	...	32·27	...	...	...	35·80	Glasgow
—1·12	82	1·18	21	18	51·57	58·23	+6·66	113	57·90	Tighnabruaich
—1·56	76	·82	21	18	51·05	47·78	—3·27	94	57·53	Quinish
—1·08	61	·36	24	18	26·22	23·78	—2·44	91	28·95	Dundee
—1·16	71	...	...	...	32·92	30·13	—2·79	92	36·07	Braemar
—1·84	47	·22	11, 21	18	29·62	25·61	—4·01	86	33·01	Aberdeen
— ·65	75	·50	22	12	26·84	22·27	—4·57	83	29·37	Cawdor
— ·17	96	·66	24	16	38·58	39·37	+ ·79	102	43·71	Fort Augustus
+ ·29	103	1·47	27	21	77·46	82·36	+4·90	106	86·50	Bendamph
+ ·31	110	·53	22	20	28·21	31·28	+3·07	111	31·60	Dunrobin Castle
...	...	·67	20	24	...	31·33	...	...	...	Castletown
—2·37	59	1·24	27	19	51·47	41·29	—10·18	80	58·11	Killarney
—1·45	63	·49	13	15	34·99	33·93	—1·06	97	39·30	Waterford
— ·13	96	·75	27	17	30·10	36·12	+6·02	120	33·47	Hurdlestown
— ·52	84	·60	28	18	31·71	32·62	+ ·91	103	35·19	Abbey Leix
—1·36	48	·36	13	12	25·36	22·02	—3·34	87	27·75	Dublin
— ·58	84	·65	13	23	33·41	30·09	—3·32	90	37·04	Ballinasloe
...	...	...	...	...	71·24	...	...	...	80·23	Kylemore House
—1·52	73	·80	21	17	44·69	47·38	+2·69	106	50·50	Enniscoe
— ·94	76	·61	21	17	37·64	42·28	+4·64	112	41·83	Markree Obsy.
— ·50	87	·67	18	17	34·97	38·50	+3·53	110	38·61	Seaforde
— ·52	88	·55	18	21	36·89	40·31	+3·42	109	41·20	Londonderry
...	88	·47	25	17	34·08	...	...	...	37·85	Omagh

SUPPLEMENTARY RAINFALL, NOVEMBER, 1908.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Warlingham, Redvers Road	·98	XI.	Rhayader, Tyrmynydd	4·91
,,	Ramsgate	1·20	,,	Lake Vyrnwy	...
,,	Steyning	1·64	,,	Llangyhanfal, Plâs Draw	2·57
,,	Hailsham	1·27	,,	Criccieth, Talarvor	2·79
,,	Totland Bay, Aston House	·85	,,	Snowdon, Cwm Dyli	10·58
,,	Emsworth, Redlands	1·36	,,	Lligwy	2·95
,,	Stockbridge, Ashley	1·05	,,	Douglas, Woodville	3·09
,,	Reading, Calcot Place	·85	XII.	Stoneykirk, Ardwell House	3·33
III.	Harrow Weald, Hill House	·89	,,	Dalry, The Old Garroch	5·82
,,	Oxford, Magdalen College	1·10	,,	Langholm, Drove Road	3·81
,,	Pitsford, Sedgebrook	·95	,,	Moniaive, Maxwelton House	3·43
,,	Huntingdon, Brampton	·79	XIII.	N. Esk Reservoir [Penicuick]	2·95
,,	Woburn, Milton Bryant	·86	XIV.	Maybole, Knockdon Farm	3·71
,,	Wisbech, Bank House	·91	XV.	Campbeltown, Witchburn	4·52
IV.	Southend Water Works	1·22	,,	Inveraray, Newtown	6·34
,,	Colchester, Lexden	1·03	,,	Ballachulish House	6·29
,,	Newport, The Vicarage	·96	,,	Islay, Eallabus	3·77
,,	Rendlesham	1·07	XVI.	Dollar Academy	3·35
,,	Swaffham	1·24	,,	Loch Leven Sluice	3·33
,,	Blakeney	1·18	,,	Balquhidder, Stronvar	7·37
V.	Bishops Cannings	1·68	,,	Perth, The Museum	2·40
,,	Ashburton, Druid House	2·17	,,	Coupar Angus Station	1·98
,,	Honiton, Combe Raleigh	1·50	,,	Blair Atholl	3·15
,,	Okehampton, Oaklands	2·30	,,	Montrose, Sunnyside Asylum	1·66
,,	Hartland Abbey	2·13	XVII.	Alford, Lynturk Manse	1·09
,,	Lynmouth, Rock House	2·58	,,	Keith Station	2·36
,,	Probus, Lamellyn	1·40	XVIII.	N. Uist, Lochmaddy	4·61
,,	North Cadbury Rectory	1·30	,,	Alvey Manse	3·27
VI.	Clifton, Pembroke Road	1·11	,,	Loch Ness, Drumnadrochit	3·39
,,	Ross, The Graig	1·05	,,	Glencarron Lodge	9·27
,,	Shifnal, Hatton Grange	2·11	,,	Fearn, Lower Pitkerrie	2·28
,,	Blockley, Upton Wold	1·30	XIX.	Invershin	3·75
,,	Worcester, Boughton Park	1·33	,,	Altnaharra	5·42
VII.	Market Overton	1·06	,,	Bettyhill	3·78
,,	Market Rasen	1·26	XX.	Dunmanway, The Rectory	3·45
,,	Bawtry, Hesley Hall	·83	,,	Cork	2·52
,,	Buxton	4·26	,,	Darrynane Abbey	2·70
VIII.	Neston, Hinderton Lodge	2·28	,,	Glenam [Clonmel]	2·68
,,	Southport, Hesketh Park	2·77	,,	Ballingarry, Gurteen	3·01
,,	Chatburn, Middlewood	4·15	,,	Miltown Malbay	2·78
,,	Cartmel, Flookburgh	4·56	XXI.	Gorey, Courtown House	2·39
IX.	Langsett Moor, Up. Midhope	2·77	,,	Moynalty, Westland	2·80
,,	Scarborough, Scalby	1·79	,,	Athlone, Twyford	2·82
,,	Ingleby Greenhow	1·62	,,	Mullingar, Belvedere	2·45
,,	Mickleton	1·90	XXII.	Woodlawn	3·56
X.	Bardon Mill, Beltingham	2·06	,,	Westport, St. Helens	4·00
,,	Ewesley, Fallowlees	1·41	,,	Mohill	3·31
,,	Ilderton, Lilburn Cottage	1·17	XXIII.	Enniskillen, Portora	3·41
,,	Keswick, York Bank	4·86	,,	Dartrey [Cootehill]	2·78
XI.	Llanfrechfa Grange	1·91	,,	Warrenpoint, Manor House	2·56
,,	Treherbert, Tyn-y-waun	5·67	,,	Banbridge, Milltown	2·46
,,	Carmarthen, The Friary	3·56	,,	Belfast, Springfield	3·05
,,	Castle Malgwyn [Llechryd]	3·57	,,	Bushmills, Dundarave	3·32
,,	Plynlimon	6·20	,,	Sion House	3·18
,,	Crickhowell, Ffordlas	2·50	,,	Killybegs	5·65
,,	New Radnor, Ednol	3·09	,,	Horn Head	3·99

METEOROLOGICAL NOTES ON NOVEMBER, 1908.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—Fair to fine, dry and mild weather prevailed throughout with a remarkable absence of wind, except from 20th to 25th. The R was the lowest, for November, in 51 years with three exceptions, viz., 1858, 1871 and 1901, when the amounts were ·53 in., ·60 in., ·59 in. respectively. Duration of sunshine, 48·2* hours, and of R, 19·4 hours. Mean temp. 46°·8, or 3°·8 above the average. Shade max., 58°·5 on 12th; min., 23°·1 on 10th. F 3, f 7.

TENTERDEN.—Duration of sunshine, 97·0† hours. Shade max., 60°·0 on 1st and 12th; min., 26°·0 on 10th. F 3, f 12.

TOTLAND BAY.—Duration of sunshine, 115·9* hours. Shade max., 61°·7 on 1st; min., 29°·3 on 10th. F 1, f 2.

PITSFORD.—R 1·47 in. below the average. Mean temp., 44°·9. Shade max., 57°·0 on 1st and 11th; min., 18°·0 on 10th. F 6.

TORQUAY.—Duration of sunshine, 74·8* hours, or 5·5 hours above the average. Mean temp., 50°·8, or 3°·4 above the average. Shade max., 61°·3 on 2nd; min., 39°·7 on 8th. F 0, f 0.

ASHBURTON, DRUID HOUSE.—R 3·33 in. below the average of 43 years. Shade max., 57°·2 on 11th; min., 32°·6 on 8th. F 0.

BATH.—Shade max. 60°·0 on 1st; min. 24°·8 on 10th. F 4.

ROSS.—Shade max., 58°·6 on 22nd; min., 21°·2 on 10th. F 5, f 6.

HODSOCK PRIORY.—Shade max., 58°·9 on 12th; min., 17°·7 on 10th. F 8, f 12.

SOUTHPORT.—R ·47 in. below the average. Duration of sunshine, 55·5* hours, or 9·0 hours above the average. Duration of R, 41·3 hours. Mean temp., 45°·4, or 2°·1 above the average. Shade max., 57°·8 on 12th; min., 27°·9 on 10th. F 6, f 13.

HULL.—The weather was dull and often cold with frequent fogs. Duration of sunshine, 26·4* hours. Shade max., 56°·0 on 1st; min., 26°·0 on 8th. F 4, f 12

CARMARTHEN.—Fine and mild during the first fortnight, but R during the latter part. Leaves have remained on the trees unusually late.

HAVERFORDWEST.—Unusually fine, with small R and very little frost. Agricultural operations were well advanced. Duration of sunshine 78·5* hours. Shade max. 58°·3 on 11th; min. 31°·3 on 8th and 10th. F 3, f 7.

LLANDUDNO.—Shade max. 61°·8 on 3rd; min. 31°·2 on 10th. F 1.

DOUGLAS.—Unusually mild for the most part, with many beautiful autumn days, but wet and stormy from 16th to 28th.

DUMFRIES.—Shade max. 56°·0 on 2nd, 4th and 5th; min. 24°·0 on 10th. F 6.

EDINBURGH.—Shade max. 54°·7 on 28th; min. 30°·6 on 10th. F 2, f 7.

DUNDEE.—Shade max. 52°·8 on 24th; min. 27°·6 on 10th. F 3.

FORT AUGUSTUS.—Shade max. 55°·6 on 12th; min. 27°·0 on 20th. F 4.

WATERFORD.—Very mild, with a good deal of fog. Shade max. 59°·0 on 11th; min. 27°·0 on 30th. F 4.

DUBLIN.—Mean temp. 48°·1, or 2°·8 above the average. L occurred with a fresh to strong gale on the evening of 22nd. Shade max. 59°·6 on 11th; min. 31°·1 on 30th. F 1, f 2.

MARKREE.—Shade max. 60°·4 on 2nd; min. 26°·2 on 20th. F 6, f 15.

WARRENPOINT.—Shade max. 58°·0 on 2nd; min. 29°·0 on 30th. F 2, f 3.

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* Campbell-Stokes. † Jordan.

Climatological Table for the British Empire, June, 1908.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	86·0	4	41·1	7	73·6	51·7	51·2	71	126·6	36·9	1·26	9	6·5
Malta	86·0	3	62·0	1	79·8	66·8	62·5	68	149·2	...	·12	1	1·7
Lagos	90·0	10	71·0	4, 27	84·9	73·5	74·7	82	160·0	66·0	16·05	20	8·8
Cape Town	69·5	7	38·0	22	61·5	47·7	47·6	77	...	...	5·82	11	5·2
Durban, Natal ...	77·6	4	49·2	28	73·0	55·6	...	...	127·7	...	·52	4	3·1
Johannesburg	68·2	3	34·1	6	62·6	44·9	38·4	68	123·1	30·0	·00	0	2·0
Mauritius	81·7	4	57·7	20	77·0	63·6	61·8	77	134·1	48·6	4·82	16	5·2
Calcutta...	100·9	13	74·8	18	91·7	79·8	77·7	81	156·6	73·4	26·12	10	7·0
Bombay...	94·2	10	76·5	30	89·0	80·6	77·0	79	138·3	73·8	15·19	16	6·9
Madras	107·5	1	77·2	28	102·2	82·1	71·5	62	145·7	75·2	·48	9	6·0
Kodaikanal	70·0	5, 7	50·7	16	65·0	53·7	50·0	76	136·6	36·4	2·35	16	6·9
Colombo, Ceylon ...	88·1	1	73·8	12	86·0	77·5	75·3	81	130·5	72·1	4·27	16	7·2
Hongkong	87·9	23	71·3	7	83·6	77·2	75·0	84	143·1	...	15·25	24	8·4
Melbourne	64·2	18	29·9	3	53·2	41·9	39·9	76	92·7	25·0	3·94	17	6·7
Adelaide	67·1	17	35·9	24	57·2	42·9	42·8	78	125·0	27·1	5·42	18	5·8
Coolgardie	67·0	1	31·0	18	56·4	39·8	...	72	127·9	27·6	·14	11	4·3
Perth	74·2	1	37·2	8	61·2	45·3	...	70	120·0	34·0	·68	14	5·0
Sydney	66·5	1	39·1	25	57·9	44·6	39·6	74	93·3	32·9	·94	11	3·7
Wellington ...	61·0	9	39·0	17†	54·7	46·6	44·0	79	95·0	28·0	4·84	19	7·5
Auckland	63·0	13*	41·0	17‖	57·9	48·7	47·0	79	113·0	33·0	3·79	20	5·8
Jamaica, Kingston ...	91·6	11	68·5	3	87·8	72·8	70·6	76	...	...	6·93	4	5·1
Trinidad	95·0	30	65·0	22	87·5	69·5	72·2	81	161·0	65·0	5·22	17	...
Grenada	86·2	18	72·6	2	83·6	74·8	72·9	82	141·2	...	6·04	24	4·8
Toronto	88·2	21	42·7	3	77·3	55·2	...	...	119·5	40·0	3·07	10	3·2
Fredericton	91·5	9	34·3	3	74·8	48·3	...	68	...	...	2·16	8	4·4
St. John's, N.B. ...	78·7	25	35·0	2	64·0	50·2	...	...	...	...	2·43	9	5·1
Victoria, B.C.	79·4	30	46·0	6, 12	67·9	49·5	...	69	...	...	·09	4	5·0

* and 14. † and 21. ‖ and 18, 20.

MALTA.—Mean temp. of air 73°·8.

Johannesburg.—Bright sunshine, 273·3 hours.

Mauritius.—Mean temp. of air 1°·0, dew point 0°·7, and R 2·69 in. above averages. Mean hourly velocity of wind 11·2 miles.

KODAIKANAL.—Bright sunshine 130 hours.

COLOMBO.—Mean temp. of air 79°·5 or 1°·5 below, of dew point 1°·1 above, and R 3·64 in. below, averages. Mean hourly velocity of wind, 8·4 miles.

HONGKONG.—Mean temp. of air 80°·2. bright sunshine 147·8 hours. Mean hourly velocity of wind 13·0 miles.

Melbourne.—Mean temp. of air 2°·8 below, and R 1·89 in. above, averages.

Adelaide.—Mean temp. of air 3°·5 below, and R 2·44 in. above, averages.

Sydney.—Mean temp. of air 3°·0 below, and R 4·39 in. below, averages.

Wellington.—Mean temp. of air 1°·1 above, and R ·14 in. below, averages. Bright sunshine 86 hours.

TRINIDAD.—R 3·05 in. below 43 years' average.