Symons's
Meteorological Magazine.

No. 525. OCTOBER, 1909. Vol. XLIV.

METEOROLOGICAL LUNCHEON AT WINNIPEG.

By E. Gold, M.A.

The outstanding feature of the proceedings at the British Association was the transmutation of the time-honoured "Meteorological Breakfast" into a "Luncheon." No one who experienced waiting at Winnipeg will cavil at the change. It had been desired and anticipated that the more arduous labours would have been ended, and the defeat of meteorological conundrum-makers achieved before the luncheon hour of 1.30 p.m. on Tuesday, but it was ruled otherwise. Nevertheless the luncheon was much more enjoyable than a breakfast, occupying the same time, could possibly have been. Mr. R. F. Stupart, Director of the Canadian Meteorological Service, presided over the forty distinguished scientists who honoured the occasion by their presence. Speeches were made by Mr. Stupart, Dr. Shaw and, on behalf of voluntary observers, by Sir John Moore.

The following were present at the luncheon :—

Mrs. Aikins.
Prof. Frank Allen.
Prof. H. T. Barnes.
Dr. Bauer.
Dr. R. Bell.
Prof. E. W. Brown.
Prof. A. H. R. Bullen.
Mr. E. F. Burton.
Mr. G. G. Chisholm.
Rev. W. Cooke.
Major Craigie.
Mr. Crawley.
Prof. Crew.
Mr. A. S. Eddington.
Prof. A. S. Eve.
Mr. E. Gold.
Dr. T. H. Havelock.
Prof. Humphreys.
Mrs. Humphreys.
Sir. Joseph Larmor.
Prof. Love.
Prof. MacLennan.
Dr. Martin.
Mr. Metcalfe.
Sir John Moore.
Lady Moore.
Mr. Paterson.
Prof. J. H. Poynting.
Dr. A. A. Rambaut.
Mr. Hugh Richardson.
Prof. A. L. Rotch.
The Archbishop of Ruperts Land.
Prof. Rutherford.
Dr. C. E. Saunders.
Dr. W. Saunders.
Dr. W. N. Shaw.
Mrs. Shaw.
Mr. R. F. Stupart.
Sir J. J. Thomson.
Lady Thomson.
Prof. Zeleny.

Mr. Stupart had prepared, on Tuesday morning, a weather chart showing the distribution of atmospheric elements, at that time, over

North America. The chart, with its vicious looking "low" near the Gulf of Mexico, and a milder creation of the same type farther north, created considerable interest. As it was the first map of the kind constructed in Winnipeg it was felt desirable that it should be published, and it is believed to be on the way to that end.

METEOROLOGY AT THE BRITISH ASSOCIATION, WINNIPEG, 1909.

By E. Gold, M.A.

It was, of course, inevitable that meteorology should take a less prominent position in the proceedings of Section A than at Dublin last year. But those meteorologists who were fortunate enough to be present at Winnipeg, and to foregather with the meteorologists of Canada and the United States, will look back with pleasure to the discussions, both public and private, which arose for the broadening of their ideas, meteorological and meteorologistical if such an addition to a rather overwhelming vocabulary is permissible.

On Friday three papers of meteorological interest formed the central section of a thick sandwich of cosmical physics. Mr. Stupart, Director of the Canadian Meteorological Service, read a paper on the Distribution of Atmospheric Pressure in Canada. The chief points of the paper were (1) that the world charts of pressure distribution give an inadequate and even inaccurate representation of the pressure conditions in the Dominion, (2) that relatively high pressure in the north-west at Dawson City is accompanied by relatively mild winters, and low pressure by severe winters, a fact which is directly contrary to the prevailing idea that in winter the higher the pressure the lower the temperature over continental areas.

Dr. Shaw read a paper by Mr. Craig on the Surface Motion of Air in Certain Circular Storms. The paper dealt with the kinematical conditions in travelling storms. The paths of the air for particular cases were obtained from theoretical considerations and were compared with the paths deduced from actual observations. The results appear to imply that we may take the paths obtained from theoretical considerations for circular storms as approximate standards and that we must seek the causes of departure from these paths in local conditions.

Mr. J. W. Shipley showed photographs of large hailstones observed in Western Canada shortly before the meeting. In the centre of one of the stones he examined was a small fly which had apparently been carried upwards and had formed a nucleus of condensation.

After a lengthy discussion on Earth Tides, on Tuesday morning, the Section divided, and the meteorology of the upper air was discussed in the department of Cosmical Physics, the discussion being resumed on Wednesday morning. Prof. Humphreys, of the U.S. Weather Bureau, communicated a paper on Seasonal and Storm Vertical Temperature Gradients. The paper dealt mainly with results obtained by ballons sondes in Europe, and showed that in

regions of high pressure (pressure above 770 mm., or 30·30 in.) the mean temperature was higher than in regions of low pressure (pressure < 750 mm., or 29·50 in.), both in summer and winter. This result is in agreement with that found from the manned balloon observations by von Bezold, and is corroborated by the results given by Gold and Harwood in their Report on the Present State of Our Knowledge of Upper Atmosphere. In this report the names "Advective" and "Convective" Regions are used to denote the upper and lower parts of the atmosphere, and H_c is used to denote the height at which the advective region begins.

The three sets of terms applied to the same phenomena are therefore :—

Isothermal Layer.	Adiabatic Atmosphere.
Strato-sphere.	Tropo-sphere.
Advective Region.	Convective Region.

The European observations showed remarkable minima in the value of H_c in March and September, and an attempt was made in the Report to connect these with the general circulation of the atmosphere. The interesting law discovered by Egnell, $V\rho = \text{const.}$ where V is wind velocity and ρ air-density, was shown to be only approximately true and was proved to be a consequence of the difference in temperature between regions of high and low pressure.

On Wednesday morning Prof. Rotch gave an account of the highest balloon ascent in America. He found a remarkable result which occurred in at least two ascents, that the temperature *increased* in a cumulus cloud in passing from the base upwards. Considerable discussion took place, and some doubt was expressed as to the reality of the phenomenon, but Prof. Rotch stated that the observations were unexceptionable. The fact adds further difficulties to the explanation of the formation of clouds and their connection with atmospheric motion.

Dr. Shaw showed photographs of models illustrating the temperature distribution in the free atmosphere over the British Isles in the International Week, in July, 1908. The models show the gradual production, or pushing forward, of a wedge of cold air at a height greater than 10 km. The wedge had just reached Limerick on the first day, but two days later extended well over England. These models put into a speaking form the results of observations which might otherwise remain as columns of cold, meaningless figures, and they give great encouragement to the meteorologist who may have been inclined to think that all the hopes he entertained when upper air investigation began were being buried in a useless, unwieldy mass of observations. It may be noted that the construction of the models was only made possible by the observations obtained near Limerick, in Ireland, and the important information they convey ought to stimulate a Government, interested in Ireland and in the atmosphere, to promote a further and a continuous series of ascents into the latter over the former.

Prof. Humphreys described an arrangement by which he hoped it would be possible to get a record of the ultra violet part of the solar spectrum (below 0·2 μ) at very great altitudes. He proposed to use a ground quartz plate for diffusing the incident solar beam so that a spectrum might be obtained whatever was the relative direction of the incident light.

The meeting closed with a paper by Mr. F. Denison Napier on the Connection Between Atmospheric Pressure and the Motion of the Horizontal Pendulum of the Milne Seismograph.

THE RAINFALL OF SEPTEMBER 27th—28th, 1909.

Owing to the accident that the heavy rainfall which produced great floods in Wales took place near the end instead of the beginning of the month, it is possible, within little more than ten days of the occurrence, to construct a map giving the approximate distribution of the widespread rain. Although drawn from a limited number of points of observation the features are sufficiently accurately marked to warrant a reproduction of the map did our space allow it; we are, however, obliged to confine ourselves to a description. The distribution of atmospheric pressure at the time was of a complex character, but broadly speaking it was under the influence of a shallow depression, of rather irregular shape, which advanced from the Atlantic in an easterly or north-easterly direction and spread over Ireland and the western part of England on the 28th, an anticyclonic system, then lying to the northward over Scandinavia, giving way before it. During the night of the 28th the centre of low pressure was transferred somewhat suddenly from the Irish Sea to the neighbourhood of the Scilly Islands, and it appears to have been during this southerly transition that the heavy rainfall over the whole of Wales took place. This is accordant with the observation that heavy rain frequently accompanies a sudden change in the course of an atmospheric depression. A good example of this was the great Irish rainfall of August 24th—26th, 1905, when the path of a depression was deflected from a northerly to an easterly direction when lying in the neighbourhood of Dublin, and an extraordinary rainfall took place over Ireland culminating in a fall of about six inches in the Wicklow Hills.*

In the north-west of England considerable rainfall occurred on September 27th, and although the Welsh deluge was due to the rain of the twenty-four hours ending at 9 a.m. on the 29th, a certain amount fell on the previous day, and since this was probably produced by the same atmospheric disturbance, the rain of both days was included in the map. The result is to show that whilst the north of Scotland and the extreme south-west of England escaped entirely without rain, an unbroken splash of heavy rainfall extended from the west coast of Ireland eastwards right across England,

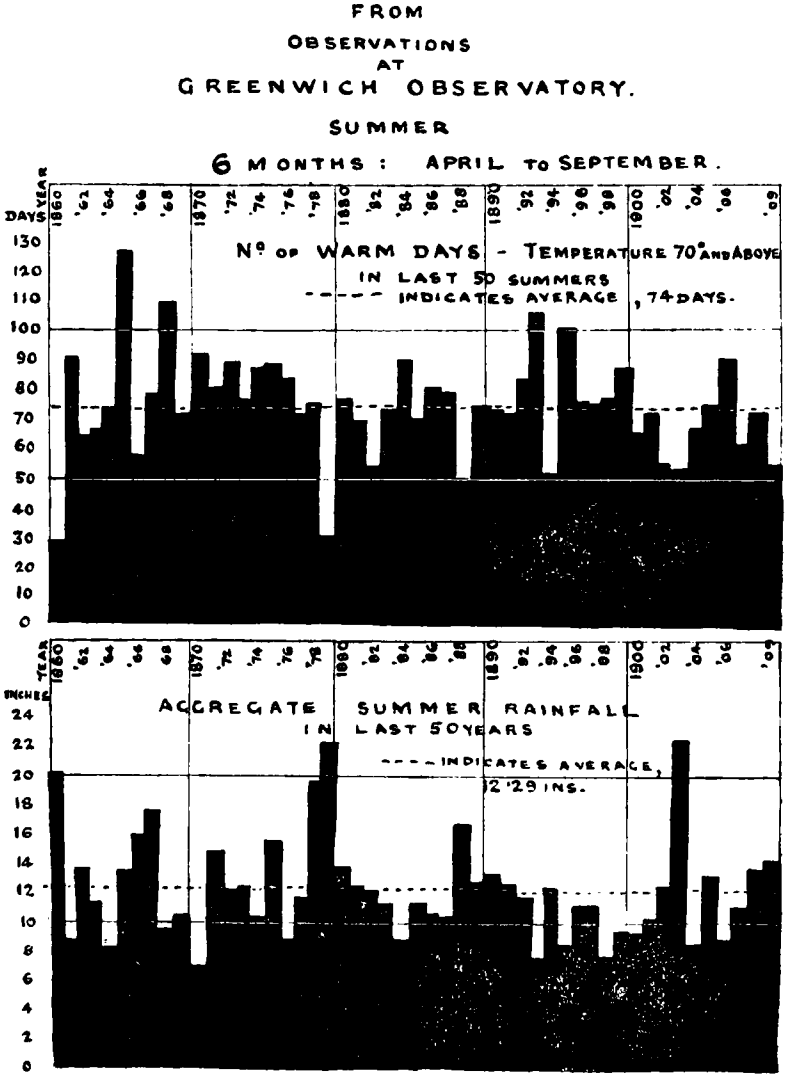
* See *British Rainfall*, 1905, p. [112].

expanding fan-wise to the southern uplands of Scotland on the north and to Exmoor and the Isle of Wight on the south. The eastern half of England, however, received less than half an inch of rain over a broad strip from Scarborough to London. The area with an inch or more stretched right across Ireland in a wide band which occupied most of the southern half of the island; it extended over the western half of England, including the whole of Wales, but excluding all but the extreme north of the Devon-Cornwall peninsula. This splash may be taken as probably embracing the Irish Sea and St. George's Channel, since all the coast stations bordering on these reported large falls on one or other of the days in question, and at least two inches fell in the Isle of Man, Anglesey, and at St. Ann's Head. The splash was thus of an unusual size, being, approximately, 400 miles in extent, from west to east, and about 250 miles from north to south, in its widest part. It is possible that when more data are available for revising the map it will be found that the main splash is broken up into a number of smaller ones, but this is by no means necessarily the case. More than two inches of rain also fell in County Clare, in Snowdonia, and a considerable part of North Wales, in the New Forest, and in a very large area covering the whole of South Wales, except, possibly, the north of Pembrokeshire and part of Cardigan. The north of Devonshire also fell within this splash. Several widely separated stations in South Wales received more than three inches, indicating that this amount probably fell over a large area. On the other side of the Bristol Channel practically three inches fell at Ilfracombe. The heaviest amount of which we have received any information was 3·95 ins. at Glyncorrwg, of which 3·16 ins. fell on the 28th. The precise outline of the three inch splash cannot be defined without the fuller information which will not be available before the end of the year, but so far as we are able to ascertain the whole of the north of Glamorgan, the Brecon Beacons, and the greater part of Carmarthen lay within it. It is, however, possible to see that the distribution of the heaviest portion of the rainfall was such as to concentrate the bulk of the run-off in mountain streams, instead of discharging it into the larger rivers which drain eastward from the main watershed of England. The consequence of this was a remarkable series of disastrous floods in the valleys fed by the mountains of South Wales, particularly in the thickly populated vales of Glamorganshire. At Glyncorrwg, where the rainfall seems to have culminated, the Corrwg stream rose seven feet in an hour, and the amount of damage done at Aberavon and Port Talbot on the low land at the mouth of that river, was enormous. At Neath and Swansea serious floods occurred, and this was also the case in the valleys draining to the eastward from the Glamorganshire plateau where the mining districts suffered severely. At Merthyr two deaths are reported owing to the floods. Extensive damage was also done by flooding in the south of Warwickshire, where the water caused much havoc among the standing crops.

FIFTY LONDON SUMMERS WEATHER RECORD.

By CHAS. HARDING, F.R.Met.Soc.

THE accompanying diagram has been prepared from the weather records made at the Greenwich Observatory during the last 50 years, and represents the weather experienced in London and the Suburbs. There were during the past summer, from April to September inclusive, only 53 days with the sheltered thermometer registering 70° or upwards, which is in exact agreement with the number of



equally warm days in 1903 which was a record wet year, and there were only 9 days with the thermometer above 80°. The hottest weather during the past summer occurred in August, when there were 20 days with the thermometer above 70°, and 6 days above 80°. There was only one day with a temperature of 70° in both April and September. It will be seen from the diagram that the greatest number of warm days during the last 50 years was 127 in 1865. The average number of warm days, temperature 70° and above, during the summer is 74. In August 1876 and 1887 the thermometer exceeded 70° every day during the month. The last ten years, with the exception of 1903, have been cool.

The rainfall for the past summer was not excessive, the aggregate measurement being only 1·80 in. more than the average of the last 50 years, which is 12·29 in. for the 6 months. There was an excess of rain in April, June, July and September, and a deficiency in both May and August. The total rainfall this summer was more than 8·00 in. less than in the summer of 1903.

THE WEATHER OF SEPTEMBER, 1909.

By Fred. J. Brodie.

The popular notion that a cool, changeable summer is usually succeeded by a fine warm September has been this year so completely discredited, that the most ardent believer in meteorological precedent must begin to look with some suspicion upon his facts and his figures. In any ordinary September one expects, at least, a few flashes of summer warmth as a reminder that one is, after all, only just entering the boundary of autumn. Last month these reminiscences of the previous season were almost entirely wanting, and among the few genial periods which were actually experienced a search through the records fails to discover one single instance in which the thermometer in any part of the United Kingdom rose much above 70°. At Greenwich the highest shade temperature recorded (on the 6th) was no higher than 71°, the reading being, as an absolute maximum, the lowest in September since 1897. At Westminster the highest reading observed was only 69°, and from the Meteorological Office record it would appear that this was the first September since 1887 in which the thermometer had failed to reach 70°. Further north the absence of warmth was even more marked. At Leith the thermometer never rose above 64°, the absolute maximum reading being lower than anything recorded in the Septembers of the previous 37 years.

The only periods of last month in which anything like genial weather was experienced occurred on the 6th, between the 17th and 19th, and between the 22nd and 25th. On the first occasion the thermometer rose to 70°, or very slightly above it at a few isolated places in the eastern and central parts of Great Britain; on the second

occasion, similar temperatures were recorded at several stations situated in the southern parts both of England and Ireland; while in the third instance a reading of 70°, or a little above, was experienced pretty generally over England, and locally in the west of Scotland, the thermometer on the 23rd reaching a maximum of 74° at Hillington. At nearly all other times in the month the maximum temperatures were considerably below the average, the coldest days occurring between the 7th and the 11th, when the thermometer over a large portion of the United Kingdom failed to reach 60°. Night frosts were experienced at various times during the month, the sharpest of all between the 14th and 16th, when the thermometer even in the shelter of the screen fell below the freezing-point in many parts of our northern and central districts, and reached 26° at Balmoral and 27° at West Linton. Ground frost was reported about the same time over a larger area, and was also experienced more or less commonly on the nights of the 1st, the 7th and 8th, the 18th to 21st, and the 27th to 29th.

In the south of Ireland, and in the Scilly and Channel Islands, the month was very dry (at Valencia the driest for at least 40 years past), but over England and Wales heavy falls of rain were frequent, the more general of such visitations occurring on the 10th, the 17th, the 23rd, the 24th, and the 27th and 28th, the storms of the last mentioned dates being sufficiently heavy to cause serious floods in Wales and some neighbouring parts of England, The heavy rains which occurred in the Thames Valley on the 17th, and over a larger portion of England on the 23rd—24th, were accompanied in many places by severe thunderstorms. The total duration of bright sunshine for the month was in excess of the average on the west coasts of Ireland and Scotland, but below the normal in nearly all other localities. In London (at Westminster) the aggregate of 93·5 hours was the smallest registered in September since the year 1896.

Correspondence.

To the Editor of Symons's Meteorological Mgaazine.

RAINING CATS AND DOGS.

WOULD you enquire through your Magazine for explanations of the following expressions that we often hear connected with rain:—Mist, Drizzle, Spitting, "Cats and Dogs," Downpour. The last is the only simple one that I can see the true meaning of.

Shenley, Herts, 10th October, 1909. G. L. DASHWOOD.

A DAYLIGHT METEOR.

I saw such a wonderful sight this morning, about 9.20, from my kitchen window, looking due north. The sky was absolutely cloudless, and the sunshine in consequence very brilliant. I suddenly looked up, to see for a second a white shining object sailing down to the N.W.—like a silver star. It left no track of light behind. I am so sorry I did not see from what point in the zenith it emanated, and it was so soon behind a group of trees I could only see it for such a moment. I send you this as I should like to hear if anyone else observed it. The sky was cloudless and of a brilliant blue.

The Mount, Witley, Surrey, 6th October, 1909. J. FOSTER.

I saw a very brilliant meteor this morning at 9.30, when I was walking in the garden, and, although the sun was shining, there was quite a flash of light for the moment. Its position was N.N.W., and its descent was apparently straight down and at the finish it was extremely brilliant. One would have liked to have seen it at night. I have never in my life seen anything like it in the day.

GEO PAYNE.

Abinger Hall Gardens, Dorking, Surrey, 6th October, 1909.

THE MAGNETIC STORM OF SEPTEMBER 25th.

In connection with the magnetic storm of Saturday, September 25th, it may interest your readers to know that an aurora was observed at Guernsey (English Channel), at 8 p.m. on that day. I am induced to inform you of this because of published statements to the effect that, contrary to the usual experience, the disturbance appeared to have been accompanied by no auroral manifestation over the United Kingdom. I believe that had there been no moonlight or clouds, a good, if possibly short, display of the Northern Lights would have been witnessed in this island. However, as I watched, the rosy glow high up in the E.N.E. sky (to which my attention had been drawn while strolling in the garden at this place) flickered and brightened decidedly, then slowly faded. At 8.10 all trace of the aurora had vanished, but whether this was owing to clouds which were then encroaching upon that part of the sky, or not, I cannot positively say.

BASIL T. ROWSWELL.

Les Blanches, Guernsey, 6th October, 1909.

The Editor, while on board the *Dunottar Castle* off the island of Majorca in the western Mediterranean, was informed by the captain that a brilliant display of aurora had been visible from about 8 to 8.15 p.m., the unusual circumstance of such an appearance so far south attracting his special attention.

SUNSPOTS AND SUNSHINE.

SUNSHINE-RECORDING is still young: the records are of no great length as yet. In the case of Kew we have data for 32 complete years (1877 to 1908). The following remarks on these are offered more by way of suggesting future observations than as proving anything.

The period covers three sunspot maxima (1883, '93 and 1905), and three minima (1878, '89 and 1901). Has it ever been noticed that, so far as these figures go, we have had considerably more sunshine about maxima than about minima?

Thus, taking the totals of three years about each maximum and minimum, we find this:—

Max.	hours.	Min.	hours.
1883 (3 years)	4,249	1878 (3 years)	3,736
1893 (,,)	4,551	1889 (,,)	3,766
1905 (,,)	4,698	1901 (,,)	4,533
	13,498		12,035

The difference, 1463 hours, is about 12 per cent. of the lower value.

We might deal with individual months in the same way, noting *i.e.* the sunshine in the three Januarys about each maximum and each minimum, the three Februarys, &c. Here is the table of totals (for nine months in each case). I indicate also the difference and the percentage (roughly), this is of the lower value.

	Max.	Min.	Diff.	p.c. of lower value.
January	383	369	+ 14	4
February	576	452	+124	29
March	1114	803	+311	39
April	1521	1181	+340	29
May	1811	1579	+232	15
June	1697	1572	+125	8
July	1819	1591	+228	14
August	1758	1594	+164	10
September	1205	1283	— 78	(7)
October	799	902	—103	(13)
November	505	431	+ 74	17
December	310	278	+ 32	11
	13,498	12,035		

It will be seen that maximum has an excess over minimum in each month except two, September and October. The most marked difference is in March and adjoining months.

It is a curious feature of March that in no case of the nine Marchs about minimum was the sunshine over average (109 hours). February again shows only one of the nine Februarys over average. Supposing the next minimum to be in 1912, it would be interesting to see if the three years, 1911-12-13, continued this feature of deficient sunshine in March.

The above figures relate to the Campbell-Stokes instrument.

ALEX. B MACDOWALL.

COLD SEPTEMBER 1st & 2nd.

You will no doubt have many notes on the low temperatures on the mornings of September 1st and 2nd. At Tunbridge Wells the thermometer on the 1st fell to 39°, and on the 2nd to 37°, at my station on the hill, and to 38° in the town itself.

At Worthing the temperature fell to 41° on the 1st and 43° on the 2nd.

These seem to me to be very low records for the beginning of September.

D. W. HORNER.

Worthing, September 9th.

LIGHTNING SEEN TO STRIKE.

The storm of September 17th here was extremely violent on the electrical side although little rain fell, and has raised a curious question in my mind. Can lightning strike a wet field and leave no noticeable mark? On the 17th thunder was practically continuous from about 1.30 to 4 p.m., and from 3.10 to 3.30 there were about two peals per minute, under a five seconds interval. There were no low clouds, for there was a fair S.E. surface wind, but the clouds appeared almost stationary. Where could the lightning go to? Also my mechanic says he saw the fields in front struck twice, and sticks to it that he saw the flash with the Watlington trees as a background. People in Watlington also say that they saw the lightning repeatedly below the crust of the hill. A cottage was struck just on top, but that is the only point where any record is left.

W. H. DINES.

Watlington, Oxon., 1st October, 1909.

UNITS OF RAINFALL MEASUREMENTS.

By A. Hampton Brown.

While looking through the rainfall figures for October, 1908, the extraordinary differences in the number of rain days at adjacent stations seemed to me so unusual and inexplicable, that I was tempted to enquire more closely into the matter, to try and find a possible reason for the apparent discrepancies.

The appended table shows clearly the differences referred to, and is rather disquieting in its suggestion of a lamentable lack of uniformity in observers in general with respect to the smaller amounts of precipitation.

Why there should be only 13 rain days at Weymouth with one amount of ·01, and 23 at Chickerell, only a few miles away, with 10 measurements of that figure; or why at Addington Hills 16 days should have a fall of ·01, and at Malden none at all, and Beddington only 2, is not apparent.

With the exception of the tremendous downpour in the Weymouth and Portland district, Oct. 18-21, the month as a whole was extremely dry all over the kingdom, the deficit being as much as 52 per cent. over England and Wales (vide *British Rainfall*, 1908, p. [144]). But, on the other hand, the atmosphere was particularly damp and humid, very heavy dews and wet fogs being almost of nightly occurrence. And here, perhaps, lies the whole difficulty; for on looking at the table, it seems to be the smaller amounts resulting from the deposition of dew and fog that caused the differences.

The question of height above sea level, it was thought might have some bearing on the subject, for with the clear skies at night following warm sunny days, radiation would be very active, and in the low lying districts much fog and dew would be the inevitable result. But here again, curiously enough, it is the higher level stations that report the largest number of measurements, although there is not much variation in the elevation of the adjacent stations, with the exception of Addington.

On referring to the instructions to rainfall observers, it will be seen that the Royal Meteorological Society, the Meteorological Office and the British Rainfall Organization are all agreed that when the measurable quantity is less than ·01 in., but more than half that amount, it should be entered as ·01; and both the Meteorological Office and the British Rainfall Organization advocate throwing the few drops away when the amount is less than half of ·01 (a rule which might very well be amended to one advising keeping the amounts in the measure until they reach ·01).

There is also another instruction to rainfall observers which is too often overlooked, and that is—that the gauge should be visited *every* day. But the observer knows it has not rained, and why should he trouble to go to the gauge? In many cases, it may be, he is not taking the observations from personal interest, and as for instructions he often does not know that there are any, and why should he trouble about the slight wetting in the receiver? Fortunately, these dewy foggy months are not of frequent occurrence, otherwise obsertions of rain days would be in a sad plight. The point of the whole matter is, that observers of rainfall, and those who possess gauges but leave the observations to others, should see that the gauge is inspected every day, and not only looked into, in a casual way, but the deposit poured into the measuring glass. It is not sufficient to assume, because the presence of water is noticed, that the amount is ·01 (it sometimes comes to more), and neither is it right to regard the precipitation as not worth pouring into the glass, but the instructions should be carefully followed. There would then be fewer stations with an excessive number of rain days, the observers of which, with perhaps pardonable zeal, having made rather too much of the kindly dews of night; and there would certainly be a still larger number whose records would be improved by additional entries to their otherwise meagre amounts.

October, 1908.

STATION.	Height above Sea Level.	Total Rainfall.	Rain Days.	Days with ·01 in.	Days with ·02 in.	Days with other amounts.
	feet.	in.				
Norwich	98	1·40	19	5	5	9
Lowestoft	82	1·17	9	3	0	6
Addington Hills	472	2·54	27	16	2	9
Malden (Worcester Park)	119	2·15	7	0	0	7
Beddington	120	2·31	11	2	0	9
Maidenhead	170	2·47	24	11	4	9
Reading	151	1·45	14	3	3	8
Swarraton	310	1·82	24	12	3	9
Midhurst	489	2·92	8	0	1	7
Grayshott	660	2·96	19	8	2	9
Ditcham Park	540	3·12	17	7	1	9
Ventnor	80	1·64	11	6	0	5
Bournemouth	145	2·25	20	9*	3	8
Weymouth	22	6·50	13	1	2	10
Chickerell	112	4·76	23	10	3	10
Newquay	100	2·28	10	3	0	7
Falmouth	167	2·71	20	10†	1	9
Shoeburyness	13	1·22	21	10	3	8
Southend	100	1·28	8	0	1	7
Lewes	58	1·53	25	9	8	8
Brighton	31	1·29	10	1	1	8

* 7 readings marked as dew. † 8 readings marked as mist or dew.

By the elimination of the days with amounts up to ·02 in. the agreement between the stations is very striking.

[We are of opinion that the graduation of the rain glass has more to do with the variation in the number of rain days recorded by conscientious observers than any other factor.—ED. *S.S.M.*]

MARSH VEGETATION AND EVAPORATION.

"ON stratification in the vegetation of a Marsh and its relations to evaporation and temperature" is the title of a paper published by Professor R. H. Yapp, in the *Annals of Botany*, Vol. **23**, No. xc., April, 1909. The field work was carried out mainly at Wicken Fen, in Cambridgeshire, during the summers of 1907 and 1908. In considering the vertical distribution of the transpiring organs of the various species of plants in the marsh, the plants are grouped into five ecological types, depending to a large extent on the relative positions on the stem of the larger leaves. From this difference of ecological habit there results a marked stratification in the vegetation, which varies in height from two to five feet; at the same time, however, the great majority of the shoots of the different species attain to very much

the same height, giving rise to a fairly uniform "general vegetation or shoot level,"—a feature which is of service to the mixed assembly of plants as a mutual protection against excessive transpiration and the mechanical effects of wind. By placing an evaporimeter of special construction at different levels in the marsh vegetation, Professor Yapp found that the air *in* the vegetation is on the whole much more humid than that *outside* it, and also that the higher and denser the vegetation the greater are the differences in atmospheric humidity between the upper and lower strata. Temperature observations were made with freely exposed thermometers, and the results showed that the highest layers of the vegetation possess a greater diurnal range of temperature than either the free air above or the lower layers of the vegetation. In considering the relative efficiency of the causes which promote transpiration from plants, the amount of water evaporated from the evaporimeter was used as an index. Temperature, relative humidity, and direct insolation, are of course intimately concerned with evaporation.

Wind causes a high rate of evaporation from the vertical evaporating surfaces of Professor Yapp's evaporimeters. Dr. Mill, however, from observations at Camden Square, has found that the curve of wind-velocity has *apparently* little relation to that of evaporation from the horizontal surface of an evaporating tank, but in this case the air currents have not such free play as in Professor Yapp's experiments.

L.C.W.B.

THE RAINFALL OF SOUTHERN RHODESIA.

An article upon the above subject appears in the "Geographical Teacher" for the Summer of 1909, No. 24, Vol. 5, Part 1. Being a very sparsely populated country the rainfall stations are few and far between, and even those that exist often furnish very incomplete records. At the Hope Fountain Mission Station in the Matoppos, ten miles south of Bulawayo, a record has been kept since July, 1888, but some of the figures are based upon estimates rather than upon daily observations, which have been destroyed in the wars. At Salisbury the records are under the Department of Agriculture, and at the Bulawayo Observatory the meteorological observations are made by the Rev. W. Goetz, S.J. The rain gauge of Messrs. C. E. and F. E. B. Fripp, the authors of the article under review, is situated 4496 ft. above sea-level, 300 miles away from the sea at Sofala, and half a mile from the crest of the Mlingwane Hills, which run to the south of it in a north and south direction, and at right angles to the Matoppo Hills.

In Matabeleland the rainy season lasts more or less from October till April, with a pronounced break somewhere about Christmas. From January, 1909, till the latter part of April, the rains in Matabeleland were abnormally heavy. At Messrs. Fripp's station

the rainfall for January was 12·47 in., 2·2 ins. falling on the 27th. "Such abnormal rains," to quote from the article, "as we have had this year not only directly increases the sickness which lies ever in wait for us—dysentery, blackwater, malaria, and pneumonia—but they cause badly flooded rivers cutting off all communication for days or even weeks; they hinder all surface work, whether transport, agricultural, or mining; and they cause flooded mines with great delays and expenses; and they do a vast amount of actual damage, not only to buildings and plant, but to life, both of stock and human beings."

L.C.W.B.

METEOROLOGICAL NEWS AND NOTES.

Snow in Johannesburg is of such rare occurrence that Mr. R. T. A. Innes, who reports a fall of twelve inches on August 17th—18th last, adds that "no such fall has taken place since Johannesburg was founded, in 1886-7." Tradition tells of a similar visitation in the early eighties when, however, there was little but bare veldt to tell the tale. It should be borne in mind that August, which corresponds to February in the Northern Hemisphere, is ordinarily without precipitation of any kind in the Transvaal.

A new British Antarctic Expedition is being organized by Captain R. Scott, R.N., C.V.O., the leader of the expedition in the *Discovery*. Captain Scott has secured the *Terra Nova* as the ship of the expedition, and he hopes to sail in the summer of 1910, the plan being to have two bases for wintering, one on Ross Island, near the winter quarters of Mr. Shackleton's expedition, and of the *Discovery* expedition; the other at the eastern end of the Great Ice Barrier on King Edward Land. Meteorological observations kept up at these positions and on the two southward expeditions which are projected towards the South Pole, cannot fail to add very substantially to our knowledge of Antarctic conditions.

Dr. H. R. Mill has arranged to lecture for the Gilchrist Trust, at Wexford on Monday, October 18th, at Kilkenny on Tuesday, 19th, Waterford on Wednesday, 20th, Limerick on Thursday, 21st, and Cork on Friday, 22nd. The subject of the lectures is Rain, and Dr. Mill hopes to be able to visit a number of the rainfall observers in the south of Ireland.

A Peeress who has been in the habit of purchasing a copy of *British Rainfall* every year has expressed her regret that, in view of the impending Budget of Mr. Lloyd George, she is compelled to retrench by giving up the luxury of subscribing for the annual volume.

RAINFALL TABLE FOR SEPTEMBER, 1909.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea.	RAINFALL OF MONTH.	
					Aver. 1870-99.	1909.
		° ′	° ′	ft.	in.	in.
Camden Square	*London*	51 32	0 8	111	2·29	2·56
Tenterden	*Kent*	51 4	*0 41	190	2·62	2·90
West Dean	*Hampshire*	51 3	1 38	137	2·58	3·97
Hartley Wintney	,,	51 18	0 53	222	2·38	3·42
Hitchin	*Hertfordshire*	51 57	0 17	238	2·26	1·94
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	2·38	2·40
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	2·49	3·11
Brundall	*Norfolk*	52 37	*1 26	66	2·57	1·49
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	3·40	2·80
Torquay (Cary Green)	*Devon*	50 28	3 32	12	3·05	1·49
Polapit Tamar [Launceston]	,,	50 40	4 22	315	3·63	1·18
Bath	*Somerset*	51 23	2 21	67	2·89	3·12
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·72	3·54
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	2·74	2·66
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	2·71	2·27
Boston	*Lincolnshire*	52 58	0 1	25	2·30	1·63
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	2·18	2·25
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	2·32	2·31
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	4·38	3·18
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	2·53	1·65
Arncliffe Vicarage	,, ,,	54 8	2 6	732	5·13	4·43
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	2·40	1·36
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	2·36	1·82
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	12·76	5·58
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	4·08	3·67
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	4·21	2·86
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	4·20	3·78
Llandudno	*Carnarvon*	53 20	3 50	72	2·92	3·21
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	3·71	2·60
Hawick (Branxholme)	*Roxburgh*	55 24	2 51	457	2·80	2·14
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	...	2·64
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	4·44	2·82
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	3·34	1·59
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	6·08	2·91
Mull (Quinish)	,,	56 36	6 13	35	5·47	2·41
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·55	1·41
Braemar	*Aberdeen*	57 0	3 24	1114	3·27	1·39
Aberdeen (Cranford)	,,	57 8	2 7	120	3·04	1·88
Cawdor	*Nairn*	57 31	3 57	250	3·01	1·71
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	3·93	1·69
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	8·28	4·10
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·71	2·04
Castletown	*Caithness*	58 35	3 23	100	...	2·47
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	4·67	2·10
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	3·08	2·84
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	2·94	3·21
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	2·86	2·68
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	2·15	1·82
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	3·18	2·12
Ballinasloe	*Galway*	53 20	8 15	160	3·17	...
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	4·12	3·65
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	3·85	3·45
Seaforde	*Down*	54 19	5 50	180	3·37	2·25
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	3·77	2·55
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	3·55	3·01

RAINFALL TABLE FOR SEPTEMBER, 1909—*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.	1909. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1870-1899. in.	STATION.
+ ·27	112	·39	28	21	17·74	19·05	+1·31	107	25·16	Camden Square
+ ·28	111	·61	28	19	18·80	20·62	+1·82	110	28·36	Tenterden
+1·39	154	2·00	28	19	20·41	21·50	+1·09	105	29·93	West Dean
+1·04	144	·77	29	18	18·44	20·78	+2·34	113	27·10	HartleyWintney
— ·32	86	·29	2	19	17·33	20·11	+2·78	116	24·66	Hitchin
+ ·02	101	·41	4	21	18·96	19·25	+ ·29	102	26·75	Addington
+ ·62	125	·62	28	20	18·12	19·18	+1·06	106	25·39	Westley
—1·08	58	·50	12	15	17·58	15·50	—2·08	88	25·40	Brundall
— ·60	82	·88	10	17	25·72	25·21	— ·51	98	39·00	Winterbourne Stpltn
—1·56	49	·69	10	14	23·74	20·15	—3·59	85	35·00	Torquay
—2·45	32	·33	4	15	25·20	20·92	—4·28	83	38·85	Polapit Tamar
+ ·23	108	·98	28	21	21·71	19·72	—1·99	91	30·75	Bath
+ ·82	130	1·12	28	18	21·28	20·53	— ·75	96	29·85	Stroud
— ·08	97	·64	27	16	22·95	21·36	—1·59	93	33·04	Wolstaston
— ·44	84	·41	27	17	20·79	18·98	—1·81	91	29·21	Coventry
— ·67	71	·35	6	21	16·75	18·95	+2·20	113	23·30	Boston
+ ·07	103	·49	23	18	17·81	19·79	+1·98	111	24·70	Hodsock Priory
— ·01	100	·40	28	17	18·85	18·35	— ·50	97	26·18	Derby
—1·20	73	·99	27	18	29·61	32·26	+2·65	109	42·43	Bolton
— ·88	65	·50	27	18	19·36	21·82	+2·46	113	26·96	Ribston Hall
— ·70	86	1·05	5	15	42·00	46·29	+4·29	110	60·96	Arncliffe Vic.
—1·04	57	·40	12	17	18·95	22·85	+3·90	121	27·02	Hull
— ·54	77	·58	27	18	19·76	22·66	+2·90	115	27·99	Newcastle
—7·18	44	1·75	5	12	90·72	79·96	—10·76	88	132·68	Seathwaite
— ·41	90	1·75	28	13	29·31	23·63	—5·68	81	42·81	Cardiff
—1·35	68	1·44	28	10	31·62	24·91	—6·71	79	47·88	Haverfordwest
— ·42	90	1·20	28	13	30·66	27·08	—3·58	88	45·41	Gogerddan
+ ·29	110	1·27	27	15	20·57	21·36	+ ·79	104	30·98	Llandudno
—1·11	70	·89	27	8	29·86	31·86	+2·00	107	43·43	Cargen
— ·66	76	·85	27	14	24·13	22·65	—1·48	94	34·80	Branxholme
...	...	·66	27	16	...	21·36	...	...	...	Edinburgh
—1·62	64	·74	28	17	32·90	34·16	+1·26	104	48·87	Girvan
—1·75	48	·27	27	10	25·43	25·92	+ ·49	102	35·80	Glasgow
—3·17	48	·71	3	13	42·68	40·53	—2·15	95	62·80	Inveraray
—3·06	44	·51	3	14	38·53	31·47	—7·06	82	57·53	Quinish
—1·14	55	·41	27	18	20·75	19·59	—1·16	94	28·95	Dundee
—1·88	42	...	...	...	24·93	20·99	—3·94	84	36·07	Braemar
—1·16	62	·35	21	18	22·97	24·35	+1·38	106	33·01	Aberdeen
—1·30	57	·70	21	6	21·34	20·85	— ·49	98	29·37	Cawdor
—2·24	43	·33	3	11	29·68	22·59	—7·09	76	43·71	Fort Augustus
—4·18	50	1·19	6	14	57·69	47·11	—10·58	82	86·50	Bendamph
— ·67	75	·43	3	15	21·63	21·47	— ·16	99	31·60	Dunrobin Castle
...	...	·50	8	20	...	21·80	...	...	...	Castletown
—2·57	45	·37	27	15	39·57	27·84	—11·73	70	58·11	Killarney
— ·24	92	·90	27	15	27·08	23·41	—3·67	86	39·30	Waterford
+ ·27	109	1·59	27	18	23·79	26·65	+2·86	112	33·47	Hurdlestown
— ·18	94	1·18	27	17	25·05	24·62	— ·43	98	35·19	Abbey Leix
— ·33	85	·64	27	15	19·68	18·49	—1·19	94	27·75	Dublin
—1·06	67	·68	23	12	26·18	23·43	—2·75	90	36·48	Mullingar.
...	...	...	...	..	26·36	...	...	...	37·04	Ballinasloe
— ·47	89	·96	27	19	34·02	31·13	—2·89	91	50·50	Enniscoe
— ·40	90	·73	5	16	29·17	26·48	—2·69	91	41·83	Markree Obsy.
—1·12	67	·98	27	13	27·21	27·32	+ ·11	100	38·61	Seaforde
—1·22	68	·45	6	19	28·25	31·52	+3·27	112	41·20	Londonderry
— ·54	85	·87	27	16	26·83	26·70	— ·13	100	37·85	Omagh

SUPPLEMENTARY RAINFALL, SEPTEMBER, 1909.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Warlingham, Redvers Road	3·87	XI.	Rhayader, Tyrmynydd	4·99
,,	Ramsgate	2·28	,,	Lake Vyrnwy	3·43
,,	Steyning	3·61	,,	Llangyhanfal, Plâs Draw	2·88
,,	Hailsham	3·07	,,	Dolgelly Bryntirion	5·71
,,	Totland Bay, Aston House	4·16	,,	Snowdon, Cwm Dyli	8·55
,,	Stockbridge, Ashley	3·45	,,	Lligwy	3·30
,,	Grayshott	2·70	,,	Douglas, Woodville	3·09
,,	Reading, Calcot Place	3·24	XII.	Stoneykirk, Ardwell House	1·99
III.	Harrow Weald, Hill House.	3·21	,,	Dalry, The Old Garroch	3·55
,,	Oxford, Magdalen College	2·86	,,	Langholm, Drove Road	2·77
,,	Pitsford, Sedgebrook	2·93	,,	Moniaive, Maxwelton House	2·68
,,	Huntingdon, Brampton	2·60	XIII.	N. Esk Reservoir [Penicuick]	3·20
,,	Woburn, Milton Bryant	2·29	XIV.	Maybole, Knockdon Farm	2·13
,,	Wisbech, Monica Road	1·09	XV.	Campbeltown, Witchburn	2·51
IV.	Southend Water Works	1·98	,,	Glenreasdell Mains	2·14
,,	Colchester, Lexden	1·87	,,	Ballachulish House	3·10
,,	Newport, The Vicarage	2·05	,,	Islay, Eallabus	2·64
,	Rendlesham	1·75	XVI.	Dollar Academy	2·27
,,	Swaffham	1·62	,,	Loch Leven Sluice	2·38
,,	Blakeney	1·84	,,	Balquhidder, Stronvar	2·55
V.	Bishops Cannings	3·05	,,	Perth, The Museum	1·49
,,	Ashburton, Druid House	2·03	,,	Coupar Angus	1·64
,,	Honiton, Combe Raleigh	2·79	,,	Blair Atholl	1·39
,,	Okehampton, Oaklands	1·63	,,	Montrose, Sunnyside Asylum	1·08
,,	Hartland Abbey	2·07	XVII.	Alford, Lynturk Manse	2·52
,,	Lynmouth, Rock House	3·11	,,	Keith Station	3·41
,,	Probus, Lamellyn	1·28	XVIII.	N. Uist, Lochmaddy	2·06
,,	North Cadbury Rectory	3·07	,,	Alvey Manse	2·13
VI.	Clifton, Pembroke Road	3·08	,,	Loch Ness, Drumnadrochit.	1·87
,,	Ross, The Graig	2·72	,,	Glencarron Lodge	3·38
,,	Shifnal, Hatton Grange	3·04	,,	Fearn, Lower Pitkerrie	1·97
,,	Blockley, Upton Wold	3·83	XIX.	Invershin	1·96
,,	Worcester, Boughton Park.	3·33	,,	Altnaharra	2·17
VII.	Market Overton	3·00	,,	Bettyhill	2·60
,,	Market Rasen	1·42	XX.	Dunmanway, The Rectory	·59
,,	Bawtry, Hesley Hall	1·93	,,	Cork	1·40
,,	Buxton	3·25	,,	Mitchelstown Castle	2·32
VIII.	Neston, Hinderton Lodge	2·38	,,	Darrynane Abbey	1·02
,,	Southport, Hesketh Park	2·47	,,	Glenam [Clonmel]	2·15
,,	Chatburn, Middlewood	2·73	,,	Nenagh, Traverstown	3·28
,,	Cartmel, Flookburgh	3·33	,,	Miltown Malbay	4·53
IX.	Langsett Moor, Up. Midhope	3·07	XXI.	Gorey, Courtown House	1·70
,,	Scarborough, Scalby	2·38	,,	Moynalty, Westland	2·07
,,	Ingleby Greenhow	2·97	,,	Athlone, Twyford	2·90
,,	Mickleton	1·72	XXII.	Woodlawn	3·31
X.	Bardon Mill, Beltingham	2·33	,,	Westport, St. Helens	3·43
,,	Ewesley, Font Reservoir	1·88	,,	Mohill	2·95
,,	Ilderton, Lilburn Cottage	2·16	XXIII.	Enniskillen, Portora	3·13
,,	Keswick, The Bank	2·97	,,	Dartrey [Cootehill]	2·39
XI.	Llanfrechfa Grange	4·59	,,	Warrenpoint, Manor House	2·81
,,	Treherbert, Tyn-y-waun	7·80	,,	Banbridge, Milltown	1·80
,,	Carmarthen, The Friary	5·30	,,	Belfast, Springfield	2·14
,,	Castle Malgwyn [Llechryd].	3·14	,,	Bushmills, Dundarave	2·64
,,	Plynlimon	7·50	,,	Sion House	2·17
,,	Crickhowell, Ffordlas	4·50	,,	Killybegs	...
,,	New Radnor, Ednol	3·76	,,	Horn Head	2·37

METEOROLOGICAL NOTES ON SEPTEMBER, 1909.

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.—Dull, rainy and cold weather prevailed almost throughout with occasional bright, sunny days. Much gloom or fog was experienced during the last week. Duration of sunshine 100·6* hours, and of R 55·4 hours. Mean temp. 55°·6 or 2°·1 below the average. Shade max. 70°·2 on 6th; min. 39°·7 on 2nd. F 0, f 0.

TENTERDEN.—Duration of sunshine, 134·3† hours. Shade max. 72°·0 on 17th; min. 39°·0 on 2nd. F 0, f 0.

TOTLAND BAY.—The wettest September since 1896. Duration of sunshine, 132·8* hours, or 23 hours below the average. Shade max. 69°·3 on 21st; shade min. 44°·5 on 3rd. F 0, f 0.

PITSFORD.—R ·33 in. above the average. Mean temp. 54°·2. Shade max. 69°·7 on 6th; min. 37°·6 on 2nd. F 0.

TORQUAY.—Duration of sunshine, 148·7* hours, or 17·6 hours below the average. Mean temp. 56°·8, or 1°·5 below the average. Shade max. 68°·3 on 5th; min. 43°·9 on 9th. F 0, f 1.

NORTH CADBURY.—The cloudiest September in 13 years and with the lowest mean day temp. The last half was warmer than the first, especially at night. The greatest R since 1899, largely owing to a heavy downpour on 28th and 29th. Shade max. 75°·0 on 3rd; min. 39°·0 on 8th. F 0, f 0.

ROSS.—Shade max. 70°8 on 19th; min. 33°7 on 9th. F 0, f 1.

BOLTON.—Duration of sunshine, 69·7* hours, or 16·2 hours below the average. Mean temp. 52°·3, or 1°·6 below the average. Shade max. 65°·9 on 24th; min. 39°·1 on 15th. F 0, f 9.

SOUTHPORT.—R ·73 in. below the average of 35 years. Duration of sunshine 108·0* hours, or 31·9 hours below the average, and the least recorded in September except in 1896. Duration of R 47·7 hours. Mean temp. 53°·4, or 1°·9 below the average. Shade max. 65°·2 on 24th; min. 37°·9 on 2nd. F 0, f 6.

HULL.—Duration of sunshine, 59·4* hours. Shade max. 69°·0 on 3rd; min. 40°·0 on 9th. F 0, f 0.

HAVERFORDWEST.—Duration of sunshine 227·6* hours. Shade max. 67°·9 on 22nd; min. 38°·0 on 10th. F 0, f 1.

LLANDUDNO.—Shade max. 65°·5 on 17th; min. 40°·2 on 14th. F 0, f 0.

DOUGLAS.—Apart from the torrential R of 27th and 28th, the month was dry, fine, calm and sunny. No R fell from 10th to 22nd when fine harvesting weather was enjoyed. Temp. was below the average almost throughout.

CARGEN.—Shade max 69°·0 on 17th and 23rd; min. 35°·0 on 2nd and 14th.

EDINBURGH.—Shade max. 62°·8 on 17th; min. 39°·6 on 15th. F 0, f 2.

COUPAR ANGUS.—Brilliant weather and heavy night dews were experienced at the opening, and ideal harvest weather prevailed until 20th. Thereafter the R was generally light but persistent. Shade max. 72°·0 on 10th; min. 29°·0 on 14th.

FORT AUGUSTUS.—Shade max. 68°·0 on 10th; min. 31°·0 on 2nd. F 2.

CORK.—Shade max. 65°·0 on 5th; min. 37°·0 on 14th. F 0, f 0.

DUBLIN.—At the beginning R was frequent but not heavy. A dry period set in on 12th lasting with one or two slight interruptions until 27th when a shallow depression brought great gloom and heavy R. Mean temp. 53°·8, or 2°·1 below the average. Shade max. 64°·5 on 19th; min. 40°·7 on 14th. F 0, f 0.

MARKREE.—Shade max. 68°·4 on 19th; min. 30°·1 on 15th. F 2, f 5.

WARRENPOINT.—Shade max. 66°·0 on 5th; min. 39°·0 on 13th and 14th. F 0, f 0.

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* Campbell-Stokes. † Jordan.

Climatological Table for the British Empire, April, 1909.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	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	70·6	11	28·5	2	60·4	39·9	41·7	75	116·6	23·6	1·90	12	4·7
Malta	72·0	28	47·7	4	64·3	55·4	55·4	81	141·1	...	1·57	3	5·2
Lagos	91·0	27*	72·0	3‡	87·8	76·4	75·3	76	161·0	70·0	5·52	12	8·0
Cape Town	88·3	11	41·9	29	73·4	56·3	55·0	73	...	...	·36	7	4·0
Durban, Natal ...	88·7	3	54·6	30	79·9	63·6	...	...	142·9	...	2·27	13	3·0
Johannesburg	74·6	20	37·1	30	68·6	51·4	50·8	75	141·7	33·8	·15	3	3·0
Mauritius	83·8	15	65·6	19	81·5	69·1	68·1	80	152·0	55·4	2·89	18	5·3
Calcutta...	100·2	8	67·2	13	92·9	73·1	71·3	73	158·1	63·3	5·95	11	5·1
Bombay...	94·0	30	73·3	3	88·9	76·8	72·8	74	135·2	65·7	·00	0	1·9
Madras	98·0	27	68·4	12	91·8	77·0	75·7	81	140·5	68·4	7·52	8	3·1
Kodaikanal	71·2	17	50·4	28	67·6	53·3	51·7	75	142·6	39·3	3·60	14	4·6
Colombo, Ceylon ...	92·8	20†	71·0	27	90·7	76·2	74·9	77	154·0	69·0	3·35	9	4·9
Hongkong	85·7	27	61·6	1	75·8	67·4	64·7	79	137·3	...	2·46	10	7·8
Melbourne	79·1	12	39·7	21§	63·7	47·8	44·2	65	134·2	33·7	1·92	15	6·0
Adelaide	88·0	3	40·0	19	68·4	50·0	45·7	64	149·9	32·3	3·27	15	6·0
Coolgardie	95·0	2	38·0	30	71·5	50·8	47·5	61	157·0	35·2	·59	4	4·3
Perth	90·9	1	46·7	28	73·6	56·3	54·6	70	140·2	40·9	1·52	6	4·8
Sydney	89·0	4	46·0	24	70·8	55·4	50·7	68	125·7	33·3	1·03	18	4·5
Wellington ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Auckland	72·0	7	44·0	26	66·5	54·3	52·4	75	130·0	36·0	1·20	11	5·1
Jamaica, Kingston ...	93·5	4	66·2	8	87·7	70·5	77·7	72	...	...	1·61	5	3·9
Trinidad	89·0	sev.	66·0	5, 8	86·3	68·7	71·2	81	155·0	59·0	1·78	7	...
Grenada	86·0	1, 6*	68·6	8	83·4	72·4	70·0	76	144·0	...	3·82	24	5·0
Toronto	61·3	6	15·6	11	48·8	33·0	...	...	79·0	13·7	5·41	17	...
Fredericton	63·0	13	11·5	12	45·7	26·8	...	72	...	...	2·38	7	5·8
St. John's, N.B. ...	53·5	21	18·5	1	44·1	30·9	...	...	...	...	5·58	16	6·1
Victoria, B.C.	60·4	21	32·0	17	55·2	39·3	...	72	...	...	·61	5	5·0
Dawson	52·8	30	-15·0	15	35·3	8·8	...	...	...	...	·64	7	4·7

* and 28. † and 21. ‡ and 7, 30. § and 24.

MALTA.—Mean temp. of air 59°·2. Average bright sunshine 8·4 hours per day.

Johannesburg.—Bright sunshine 258·5 hours.

Mauritius.—Mean temp. of air 0°·6, of dew point 0°·7, and R 2·25 in., below averages. Mean hourly velocity of wind 9·3 miles or 1·2 below average. TSS 28th and 29th.

KODAIKANAL.—Bright sunshine 223 hours. TSS on 24 days.

COLOMBO.—Mean temp. of air 83°·8 or 1°·2 above, of dew point 0°·4 above, and R 6·93 in. below averages. Mean hourly velocity of wind 4·8 miles.

HONGKONG.—Mean temp. of air 71°·1. Bright sunshine 155·4 hours, or 51 hours above average. Mean hourly velocity of wind 14·1 miles. R 3·42 in. below average.

Melbourne.—Mean temp. of air 3°·8 below, and R ·46 in. below, averages.

Adelaide.—Mean temp. of air 4·9 below, and R 1·41 in. above averages. Mean temp. the lowest on record in April.

Perth.—Rainfall ·14 in. above average.

Sydney.—Mean temp. 1°·5 below, and R 4·28 in. below, averages.

TRINIDAD.—R ·25 in. below 46 years' average.

RAINFALL OF THAMES VALLEY – OCTOBER 1909.

ALTITUDE SCALE

Below 250 feet	250 to 500 feet	500 to 1000 feet	Above 1000 feet

SCALE OF MILES
0 5 10 15 20

Isohyetals

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