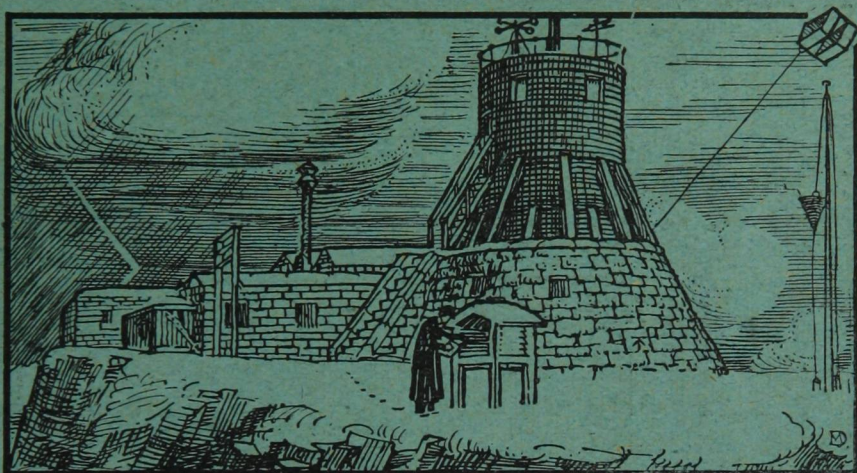


NO. 549 SYMONS'S VOL. 46
 METEOROLOGICAL
 ❄️ • MAGAZINE • ❄️
 EDITED BY HUGH ROBERT MILL



OCTOBER, 1911.

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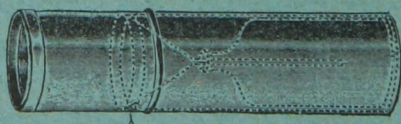
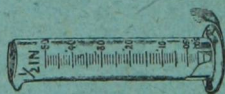
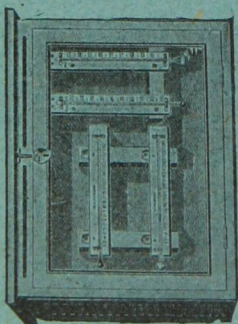
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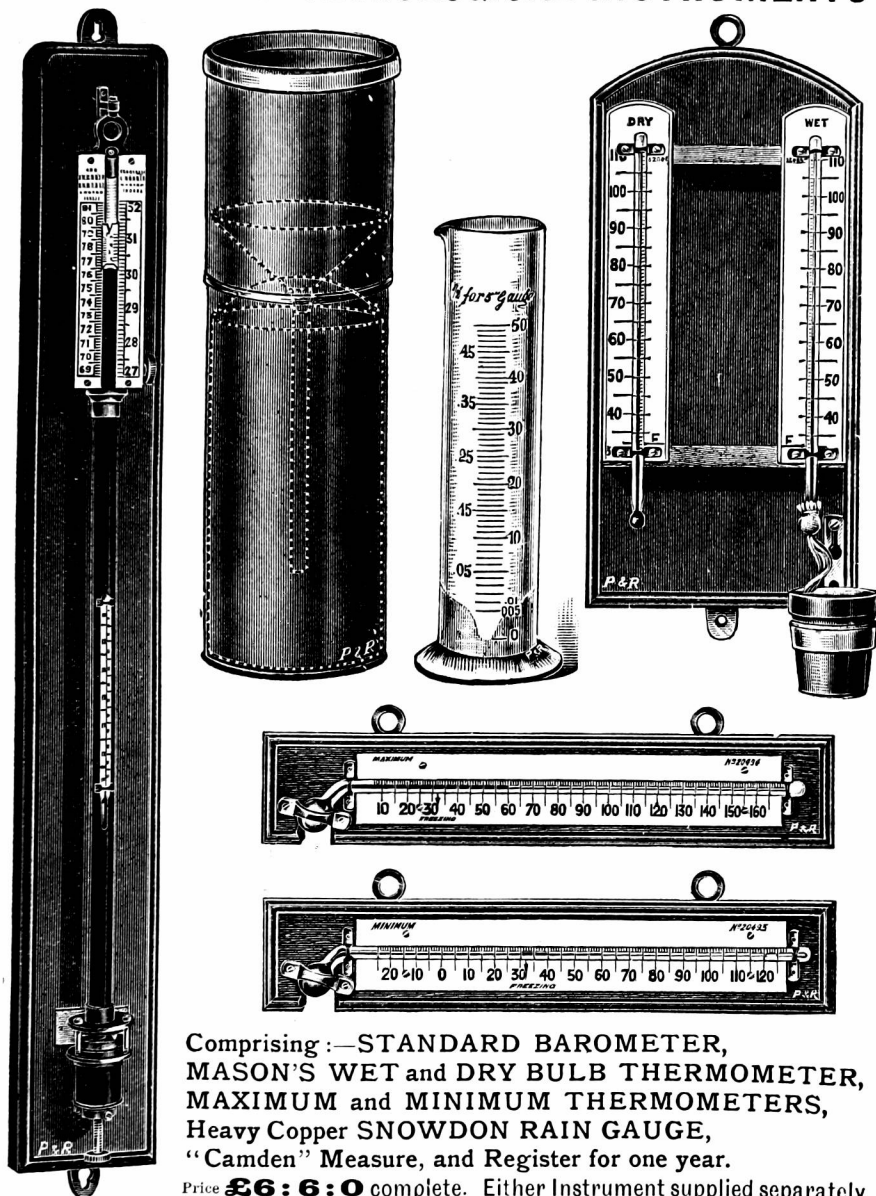
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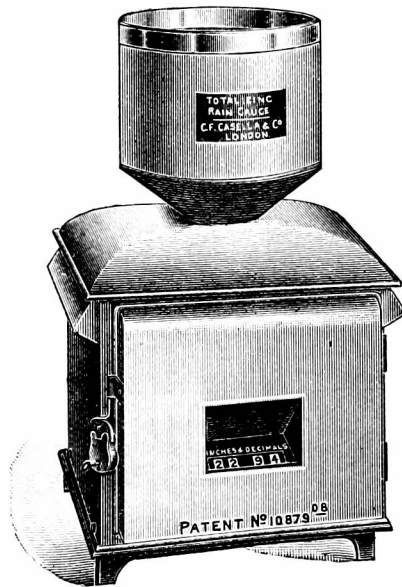
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VOL. XLVI.

WEATHER IN THE SEVENTEENTH CENTURY.

By WALTER SEDGWICK, M.A.

PART III.—AUTUMN.

OF the four seasons of the year, so far, at any rate, as the neighbourhood of London is concerned, Autumn is the least liable to be distinguished by climatic conditions of a noticeable or memorable character. At this period of the year there can be no occurrence of such phenomena as extreme heat waves, severe frosts or prolonged droughts, which are likely to be long remembered because of their effect upon the health, comfort and prosperity of mankind, and of the injury which they cause to crops, gardens and plant life. Usually the more noticeable features of autumn weather are strong winds and heavy rainfalls, and even these are liable to escape the pen of the chronicler, because the gales of September, October and November are on the average exceeded in frequency and strength by the gales of December and January, and the rainfalls of autumn seldom cause floods as extensive as those of winter. Hence it is not surprising to find that Evelyn and Pepys, when chronicling the noticeable events of their time, have made fewer comments on the weather occurring during the autumn months than in the case of the other seasons of the year.

It is also unusual to hear statements implying that there has been a change in the character of autumn weather even by those who believe firmly in a permanent change in the climate of England, and although the intended meaning of the familiar phrases, "an old-fashioned winter" and "an old-fashioned summer," is well understood, the expression, "an old-fashioned autumn," is unfamiliar, and conveys no clear meaning. Accordingly, when considering the witness of the two diarists relating to the weather of the autumn months, we do not know what alleged alteration in the English climate we are to establish or refute.

Taking September first, we find in the diaries eleven years in which the weather of this month is mentioned. Of these, four are noted for spells of fine weather, viz. :—1666, 1678, 1696 and 1697, and one for thoroughly bad weather, viz. :—1661. The two Septembers of

1684 and 1689 are referred to for great warmth, and that of 1663 for great cold. On the whole September seems to have been a fine month in the Seventeenth Century, but the information given is too scanty to justify any certain conclusion.

The month of October presents special interest, owing to the comparatively high temperatures experienced in recent years, and the popular belief which has consequently arisen that summer-like weather tends to remain until later in the year than was formerly the case. Mr. Marriott has recently shewn that in England the temperature of October has been above the average for the last fourteen years, 1897-1910, except only in 1905 (*vide* "Variations in the English Climate, 1881-1910," *Quarterly Journal Royal Met. Soc.*, Vol. 38, July, 1911), and if this represented a steady and continuous change, and not merely a periodic change, the weather of October in the time of Evelyn should be noticeably colder than at the present time. This, however, so far as can be judged from the diaries is not the case. In 1692 Evelyn refers to October as "this usually pleasant month"; also he writes of "a most pleasant autumn" in 1691, "very mild weather the whole of October," in 1695, and "a warm and pleasant season," in 1699. It is true that he describes the warm weather of October, 1699, as unusual, but, on the other hand, he only refers to one October, viz., 1692, as a cold month. Even the recent warm October of 1908 seems to have a counterpart in the October of 1668, when Pepys writes of "the most summer weather that ever was seen." There is one extract which at first sight does suggest a difference of climate in the nature of an earlier winter than now, viz., Evelyn's entry of the 9th October, 1695, "weather very sharp, winter approaching apace," but it will be seen that only a few weeks later he writes of "very mild weather the whole of October"; and on the succeeding 4th January he says, "hitherto mild, dark, misty weather." In fact, it seems that in October, 1695, Evelyn fell into the error, which is so common at the present day, of mistaking a very brief spell of cold weather in the early autumn for the beginning of a severe winter.

November is mainly referred to by Evelyn for its unsettled and stormy weather, this being sometimes accompanied by cold and snow, as in 1643 and 1684, but more usually by mild temperatures and rain. The cold referred to on the 12th November, 1684, was followed by a severe winter, but in several other years the cold of November was only temporary, and the year 1691 is noted for its fine warm weather at the end of the month. The general character of the weather of this month, as described by Evelyn, is very similar to its general character at the present time.

It is interesting to read the account of a London fog on the 25th November, 1699, which, except for its brief duration, must have been similar to the London fogs of a few years ago.

Note.—In the following extracts the dates have been corrected to New Style, except where (O.S.) occurs.

Extracts from Pepys's diary are distinguished thus—(P.); all other extracts are from Evelyn's diary.

1631. There happened now an extraordinary dearth in England, corn bearing an excessive price.
1643. 21 November.—Between Dover and Calais—Weather snowy.
 22 „ —Between Calais and Boulogne—A great fall of snow accompanied with hail, rain and sudden darkness.
1661. 28 September.—An exceeding sickly, wet autumn.
1663. 7 „ —Cold all night and this morning, and a very great frost they say abroad, which is much, having had no summer at all almost. (P.)
 29 October.—Waked with a very high wind, and said to my wife “I pray God I hear not of the death of any great person, this wind is so high,” fearing that the Queen might be dead. (P.)
1666. (a) 12 September.—The wind mighty high and driving the fire into the City, and everything after so long a drought proving combustible. (P.)
 At night—it being brave, dry and moonshine, and warm weather. (P.)
- (a) 13 „ —A fierce eastern wind in a very dry season
 The heat with a long set of fair and warm weather had even ignited the air and prepared the materials to conceive the fire.
- (a) 14 „ —The eastern wind still more impetuously driving the flames forward.
- 19 „ —Rainy: which it had not done a good while before. (P.)
- 6, 7 October.—Weather very bad a very furious blowing night. (P.)
- 31 „ —This season, after so long and extraordinary a drought in August and September (O.S.), as if preparatory for the dreadful fire, was so very wet and rainy as many feared an ensuing famine.
1668. 7 October.—It being most summer weather that ever was seen. (P.)
 8 „ —A most summerlike day and a fine warm evening. (P.)
1671. 23 September.—A dreadful tempest.
1675. 25 October.—An exceedingly dry . . . autumn.
1676. 10 November—A prodigious and dangerous mist (in the evening).
1678. 18 September.—Excessive hot autumn.
1679. 16 October.—A very wet and sickly season.
1684. 3 September.—Excessive hot. We had not had above one or two considerable showers, and those storms, these eight or nine months. Many trees died for the want of refreshment.
 12 November.—A sudden change from temperate warm weather to an excessive cold rain, frost, snow and storm, such as had seldom been known. This winter began as early and fierce as the past did late; till about Christmas there then had been hardly any winter.
1685. 15 November.—An extraordinary wet morning.

1688. 24 October.—The wind, which had been hitherto west, was east all this day.
28 November.—It was now a very hard frost.
1689. 4 September.—Hitherto it has been a most seasonable summer.
20 November.—After a very wet season the winter came on severely.
27 „ —Much wet without frost, yet the wind north and easterly.
1690. 22 October.—Very great storms of wind.
26 November.—Exceeding great storms, yet a warm season.
1691. 23 September.—Great storm at sea.
24 October.—A most pleasing autumn.
18 November to 10 December.—An extraordinary dry and warm season, without frost, and like a new spring; such as had not been known for many years.
1692. October (O.S.)—This season was so exceedingly cold by reason of a long and tempestuous north-east wind that this usually pleasant month was very uncomfortable. No fruit ripened kindly.
1693. 10 November.—A very wet and uncomfortable season.
22 „ —The season continued very wet as it had nearly all the summer, if one might call it summer, in which there was no fruit, but corn was very plentiful.
1695. 5 October.—The season wet, great storms, unseasonable harvest weather.
9 „ —Very cold weather Weather very sharp, winter approaching apace.
4 November.—Very mild weather the whole of October (O.S.)
1696. September (O.S.)—Fine seasonable weather, and a great harvest after a cold wet summer.
3 November.—Unseasonable stormy weather and an ill seed time.
18 „ —The first frost began fiercely, but lasted not long.
25 „ to 3 December.—Very stormy weather, rain and inundations.
1697. September (O.S.)—Very bright weather, but with sharp east wind.
13 October.—Great storms all the week.
1699. 31 October.—After an unusual warm and pleasant season we were surprised with a very sharp frost.
25 November.—There happened this week so thick a mist and fog that people lost their way in the streets, it being so intense that no light of candles or torches yielded any (or but very little) direction. It began about four in the afternoon and was quite gone by eight, without any wind to disperse it. At the Thames they beat drums to direct the waterman to make the shore.
- 1704.(b) 18 September.—The day before was wet and stormy, but this was one of the most serene and calm days that had been all the year.
October (O.S.)—This year has been very plentiful.

NOTES.—(a). The days of the Fire of London began 2nd Sept., 1666 (O.S.)

(b). The day of the thanksgiving service for the battle of Blenheim.

THE HOT WEATHER OF JULY-SEPTEMBER, 1911, IN LONDON.

THE great warmth which dominated July and August extended well into September, and an examination of the records for the three months at Camden Square shows some interesting results. Last month attention was directed in these pages to the fact that July and August were the two warmest months in the long record, taking the mean temperature as indicative of the whole month. Though September was in no way so remarkable as the two earlier months, it was, nevertheless, a month of high temperature, especially in the first half, and considerable interest attaches to the three months when compared with previous records.

The mean temperature of September, 1911, was $60^{\circ}\cdot4$, or $2^{\circ}\cdot7$ above the average, and this has been exceeded in five previous Septembers. The mean shade maximum was $73^{\circ}\cdot0$, or $5^{\circ}\cdot6$ above the average, and this has only been exceeded in September three times, in 1865, 1895 and 1898. The highest shade temperature of the month was $92^{\circ}\cdot3$ on the 8th, which, with the exception of $94^{\circ}\cdot0$ in 1906, was the highest temperature ever recorded in September.

The mean temperature for the three months, July to September, was $65^{\circ}\cdot9$, or $4^{\circ}\cdot7$ above the average. This is $1^{\circ}\cdot5$ higher than for any July to September period in the preceding 53 years, the nearest approach being in 1868 and 1899, which both gave $64^{\circ}\cdot4$, or $3^{\circ}\cdot2$ above the average. Temperature reached 80° on 8 days in September, making a total of 42 days with temperature 80° or above in the three months. In 1868 and 1899 there were only 30 and 29 days respectively on which 80° was reached. There was a remarkable absence of cloud, the mean amount at 9 a.m. for the three months in the scale 0—10 being 3·1, 4·5 and 3·0. In this fact, probably, lies the reason for the close proximity to the normal of the minimum temperatures, while the maxima were much in excess. The duration of sunshine for the three months was unusually great, and amounted to 688·7 hours, or 229·6 hours a month.

The following table shows a comparison of July to September, 1911, with 1868 and 1899, the years in which the conditions most nearly approached those of the present year, and with the average of the 50 years 1860–1909:—

	JULY.			AUGUST.			SEPTEMBER.		
	Mean Temp.	Mean Max.	Absolute Max.	Mean Temp.	Mean Max.	Absolute Max.	Mean Temp.	Mean Max.	Absolute Max.
Average	$63^{\circ}\cdot5$	$74^{\circ}\cdot3$	...	$62^{\circ}\cdot3$	$72^{\circ}\cdot7$	...	$57^{\circ}\cdot7$	$67^{\circ}\cdot4$	...
1868...	68·8	82·4	93·3	64·0	73·9	88·2	60·4	71·8	91·0
1899...	67·6	79·2	89·2	67·0	79·4	91·2	58·6	68·4	79·7
1911...	69·0	81·7	92·6	68·2	80·8	97·1	60·4	73·0	92·3

The values in heavy type are the highest for the months to which they refer in the Camden Square record.

METEOROLOGY AT THE BRITISH ASSOCIATION.

THE METEOROLOGICAL LUNCHEON.

By E. GOLD, M.A.

THE third annual Meteorological Luncheon was held on Tuesday, September 4th, at the Esplanade Hotel, Portsmouth.

The following is believed to be a complete list of those present at the luncheon :—

Mr. C. O. Bartrum
Mrs. Bartrum
Dr. H. Basset
Mr. H. Bateman
Mr. F. A. Bellamy
Dr. Borns
Mr. C. W. Campbell
Mr. C. J. P. Cave
Mrs. Cave
Rev. A. L. Cortie
Mr. J. I. Craig
Mrs. Craig
Dr. H. N. Dickson
Mr. J. S. Dines
Dr. F. W. Dyson, F.R.S.
Mr. A. S. Eddington
Dr. Mearns Fraser
Mr. Wilson Fox
Mr. E. Gold
Mrs. Gold

Mr. H. R. Hassé
Prof. W. M. Hicks, F.R.S.
Dr. W. G. Humphreys
Mrs. Humphreys
Mr. E. Kitto
Mrs. Kitto
Lady Lockyer
Dr. H. R. Mill
Mrs. H. R. Mill
Prof. J. Milne, F.R.S.
Dr. J. W. Nicholson
Prof. Pettersson
Mr. W. E. Rolston
Dr. W. N. Shaw, F.R.S.
Mrs. Shaw
Mr. F. T. M. Stratton
Miss Stratton
Prof. Trouton, F.R.S.
Prof. H. H. Turner, F.R.S.

Dr. Shaw, who presided, explained that the function of the luncheon was not to provide opportunities for making and hearing speeches, it was rather to enable observers and workers to realise how much each was dependent on the other, and how much each suffered through the other's delinquencies. There was a certain simplicity, more apparent than real, in the requirements of meteorological observations: they ought all to be exactly the same as each other, and as their predecessors, neither better nor worse. He referred to the exceptional character of the year's weather, and said he could offer a very simple explanation. In May he lost his umbrella one night after a dinner at the Trocadero. At the time he thought he had taken in exchange the umbrella of the Director of the British Rainfall Organization. He had discovered his mistake only during the previous week; and now if he had to issue a forecast, all he could say was, "Look out, squalls ahead," because last night he lost his umbrella again.

Dr. Mill rose to welcome the foreign guests, or, as he more truthfully and gracefully called them, "our guests from other lands." Meteorology was a world-science and recognised no political boundaries or divisions. Mr. J. I. Craig represented one of the youngest but at the same time one of the most enterprising of the official services, the Survey Department of Egypt. He could hardly be called "foreign" in his official capacity, and he might be pardoned

if he said that in his private capacity Mr. Craig represented the choicest part of these islands. Professor Pettersson was no stranger to those present, since this was his fourth visit to the meetings of the British Association. He was not only a representative of the world-wide science of oceanography, but of many sciences, since he had originally achieved distinction as a chemist. Professor Pettersson was, however, the most modest of men, as modest indeed as his University of Stockholm, which contented itself with the name of High School. Dr. Humphreys represented the greatest meteorological service of the world, that of the United States, and the occasions on which that service was not represented at these banquets were very rare. He had great pleasure in seeing so excellent a custom kept up, and renewed the old welcome to the new representative. He asked those present to drink in the good old British way to the health of the guests from other lands.

Mr. Craig acknowledged briefly the kindness extended to him. He came from a hot place to this country to enjoy its cool breezes, but the past summer had resembled so closely the weather from which he had fled that it had produced desecration of an old nursery classic, which now ran—— (The speaker then lapsed into poetry.)

Professor Pettersson confessed that he did not belong to the pure strain of meteorologists, although his oceanographical work led him to results which might interest such meteorologists, while their work interested him. He always gained pleasure and instruction from the meetings of the British Association, and his pleasure was never alloyed even by the loss of his umbrella. Dr. Shaw's misfortune brought to his mind a story told of the Primate of his country. On a certain very wet day he was to be received in audience by the King, and on alighting from his carriage was proceeding straight to the presence chamber when an attendant remonstrated: "Your grace has forgotten to leave your umbrella and goloshes." "Ah!" returned the Archbishop, "I have already lost four umbrellas in this house, and do not intend to lose another," and without more ado marched into the King's presence wearing his goloshes and firmly holding his umbrella.

Dr. Humphreys said how he wished his chief, Professor Willis Moore, had been there to listen to the kind things which Dr. Mill had said, and to reply on behalf of the service which he represented. They in America had a large area to deal with, and the practical problems presented to them were varied as the climates of the different regions. In California at this period of the year a man might forecast fine weather every day and have 90 per cent. of accurate forecasts; but woe betide the man who forecasted fine weather when it rained, or who forecasted rain when it continued fine. The people there were engaged in fruit-drying, and so long as the weather was fine the fruit lay out in the trays; when rain was expected the trays were piled in stacks, and were easily kept dry, and the fruit was not damaged; but if the rain did not come, the

labour of piling was wasted, and the drying had been retarded unnecessarily. Accuracy in the forecasts was therefore of vital importance. The case was similar in connection with frosts in spring, the baneful effect of which on the fruit trees was minimised by "smudging." The difficulty in the cranberry marshes was even greater, because frost sometimes occurred there when there was no other frost anywhere around. In the marshes frost could be prevented by flooding with water; but the supply was limited, and if it was used on the strength of an inaccurate forecast, none might be available when frost actually came.

Dr. Dickson proposed the toast of Cosmical Physics. He did not feel quite sure that he understood exactly what the term meant, and he thought that he might be in better condition if he could drop the "s" out of cosmical. He had on one occasion prepared a recondite address to an estimable temperance society on the "Ethics of Port," before he realized that he had been the victim of a mistake, and the title "Ethics of Sport" had to be substituted, with a fresh address. In Professor Turner, whose name he wished to couple with the toast, they had one of the most ardent supporters and able exponents of Cosmical Physics.

Professor Turner said that although one might not be able to say much about "Cosmical Physics" until one knew more about the Cosmos, he might be able to tell them something about it, because he was there at its birth. At the Dover meeting of the Association in 1899, Section A divided, and the Department of Meteorology met separately on certain days. The next year, at Bradford, the Department of Astronomy, with a separate chairman and address, met on two days. In 1901, at Glasgow, this plan was continued, with himself as chairman; but the difficulty of obtaining an audience made it clear that the plan needed alteration, and the next year, at Belfast, the department of "Astronomy and Cosmical Physics" met for the first time, with Professor Schuster as chairman. Since then Cosmical Physics has grown and extended its bounds, which were in the nature of things never very rigid, until it seemed to some of us that it deserved to rank as a separate section. That idea did not, however, meet with general approval, and we are now concerned with making the best of things as they are.

Dr. Shaw proposed the toast of "Local Meteorology," and associated with it the name of Dr. Mearns Fraser, who was responsible for the observations made at Portsmouth. In one sense all meteorology was local, and it was only through the fidelity with which the observations in each place were continued, that the greater part of our knowledge of climate had been obtained.

Dr. Mearns Fraser replied very briefly, and asked the company, in view of the weather which had been provided at Portsmouth during the meeting, to remember that "actions speak louder than words." He had been gratified by the kind way in which reference had been made to the station under his charge.

THAMES VALLEY RAINFALL SEPTEMBER, 1911.



ALTITUDE SCALE

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

SCALE OF MILES

0 5 10 15 20

THE WEATHER OF SEPTEMBER.

By FRED. J. BRODIE.

It was not until very nearly the middle of September that the marvellous summer of 1911 could be regarded as at an end.

At the opening of the month, showery weather was produced in Ireland and Scotland by a depression which moved eastwards across Iceland. The greater part of England lay under the influence of a large Continental anticyclone, and on the 2nd the thermometer over our eastern, midland and south-eastern counties rose above 85° , a shade maximum as high as 90° being recorded at Camden Square and at Cromer and Hillington. After this the Continental high-pressure area was joined by a new system, which came in from the Atlantic, and from the 3rd to the 11th anticyclonic conditions ruled supreme. Bright sunny weather was, therefore, experienced very generally, with a continued high temperature, especially over England. The heat appears to have culminated on the 8th, when the thermometer, for the seventh time this year, rose above 90° in many English districts, and touched 93° at Hampstead, Bath and Cambridge, and 94° at Greenwich and at Raunds (Northamptonshire). On the following day when a northerly wind sprang up in the rear of a shallow depression which moved eastwards across the south of England, the thermometer fell rapidly, the maximum readings being mostly below 70° .

After the 11th the anticyclone withdrew bodily to the Continent, and on the following day the passage of a deep cyclonic system from Iceland to Norway was accompanied by the development of secondary disturbances over various parts of Western Europe. In the front of these secondaries a warm wind set in from the southward, the thermometer on the 12th rising to 85° and upwards in many parts of our eastern and south-eastern counties, to 88° at Greenwich and to 89° at Camden Square. This burst of heat proved to be the last of the season, no shade readings appreciably above 70° being afterwards recorded in any part of the United Kingdom. Between the 14th and 18th of the month an anticyclone again spread in temporarily from the Atlantic, but the conditions had then become autumnal, and although the days were fairly warm and sunny, the nights were cold, with sharp ground frosts on the 15th and 16th. It was only in the central parts of Scotland and Wales that the sheltered thermometer fell below the freezing point, but on the surface of the grass the minima were as low as 14° at Llangammarch Wells, 22° at Hereford and 27° at Colmonell (Ayrshire). Between the 19th and 21st a large barometrical depression, which had extended southward from Iceland, moved eastward directly across the United Kingdom, and with the northerly winds which set in in its rear another ground frost was experienced, the exposed thermometer falling on the early morning of the 21st or 22nd to 18° at Llangammarch Wells, and to 22° at Balmoral, Hereford and Marlborough. From the 22nd to the 27th a showery south-westerly type of weather prevailed, the most

important feature occurring on the 25th, when an extremely heavy downpour of rain was experienced in the south-east of Ireland. At the close of the month the weather fell into a very tempestuous state. On the night of the 29th a cyclonic disturbance, which had originally been developed over the upper part of the Atlantic, moved rapidly in an east-south-easterly direction across North Britain and afterwards passed on to Holland, North Germany and the Baltic. In the front of the system the southerly and south-westerly breeze was of no great strength, but in its rear the barometer rose very suddenly and the wind increased considerably from north and north-west and blew with the force of a whole gale over the entire southern portion of the North Sea, including our own south and south-east coasts. The storm resulted in numerous maritime casualties.

Owing to the excessive warmth of the earlier days the mean temperature of the month was considerably above the average in the south and east of England, and especially in the Channel Islands, where the week ended September 9th was unusually hot. In the north of England the excess was small and in many parts of Scotland and Ireland there was a slight deficiency of warmth. The north of Scotland experienced about the normal quantity of bright sunshine, but in most other districts there was a large excess. In London (at Westminster) the total duration, 215 hours, was no fewer than 98 hours in excess of the normal, and was greater than in any September since the recording instrument was permanently installed in 1883. The nearest approach was in 1895, when 194 hours were registered.

INTERNATIONAL BALLOON ASCENTS.

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

April 1st, 1909.

Starting Point.	Country.	A miles.	B ° F.	C miles.	D ° F.	E miles.	F
Manchester.....	England ..	6·2	—64	8·8	—63	75	S.E. by S.
Pyrton Hill.....	„ ..	5·6	—69	8·8	—63	40	S.E.
Lindenberg.....	Germany..	6·6	—83	8·4	—71	36	N.E. by E.
Paris	France....	7·4	—78	10·5	—74	81	E.S.E.
Strassburg	Germany..	6·8	—74	7·8	—62	45	E. by S.
Nizhni Olchadaeff	Russia	6·5	—69	8·9	—58	4	N.N.E.

A=Height in miles of commencement of isothermal column.

B=Temperature, F°, at bottom of column.

C=Greatest height of reliable record in miles.

D=Temperature, F°, at greatest height.

E=Distance in miles of point where balloon fell.

F=Bearing of falling point from starting point.

In the morning the south-western part of an extensive trough of low pressure lay over Holland and North Germany; alterations in the distribution of pressure were occurring very rapidly, so that by 6 p.m. the barometer over Scotland had risen from 30·10 in. to 30·40 in., and the evening chart showed quite a different system.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

PLANETARY RAINFALL.

THE values of rainfall percentages for Cape Town and Buenos Aires supplied by Dr. Sutton are interesting, but they do not suffice to show that there is any real connection between the two places. The correlation co-efficient between the quantities has only the low value of $\cdot 16$, with a probable error of $\cdot 11$, and the apparent connection may well be a chance one and be reversed in the next thirty years. (See a paper by Mr. R. H. Hooker in the *Quarterly Journal* of the R. Met. Soc. for October, 1908. Vol. **34**. No. 141. p. 277.)

For comparison I append the values of some correlation co-efficients.

Rainfall in the 13—20th weeks of the year and the depth of water in a deep well at the end of August, '63.

Spring rainfall and the crop of hay '80.

Mean temperature and death rate of the summer quarter, '72.

Barometric pressure at the surface and the height of the isothermal zone, '68 (in England). Barometric pressure and the temperature of the isothermal, —'60 (in England).

W. H. DINES.

METEOROLOGY AT THE BRITISH ASSOCIATION.

I THINK the account, published in your September issue, of Meteorology at the British Association's Portsmouth meeting performs an excellent service in bringing more directly before meteorologists the stimulus and encouragement which are contained in Professor Turner's address; but in its earlier paragraphs it conveys a wrong impression, and one which may be harmful to the progress of our science in this country. It seizes on two incidents in the details of organisation, and leaves the reader to assume that these represent the position of Meteorology, and the share it had in the meeting at Portsmouth. In order to show how far such an assumption would depart from fact, I need only point out that Dr. Humphreys, of the U.S. Weather Bureau, read a paper in full section immediately after Professor Turner's Presidential address, that Dr. Shaw made the opening contribution from the side of Section A to the joint discussion on Aeronautics, that Dr. Shaw's paper on the thunderstorm which occurred in London at the end of July and the line squall of the following day was taken in the main meeting room immediately after that discussion, that the remaining meteorological papers were grouped together for reading on the Tuesday morning immediately after the discussion on Stellar motion and before the Meteorological Luncheon, and that such of those papers as were not completed in the hour-and-a-half on Tuesday morning were put down for reading in full section early on Wednesday morning, when a good audience was actually present. The real fault of such a pessimistic account

lies, not so much in its largely undeserved censure of the Association and the organising staff of Section A, but rather in its effect on Meteorologists, who ought to be encouraged in every way to support the Association. They receive the impression that the meetings are no place for Meteorology or for them, and they stay away. The result will be to depreciate meteorological stock in the eyes of the Association and of the community; and the goal of a separate section for Cosmical Physics, towards which we strive, will be made harder of attainment. We shall reach that goal only when we have shown that there are enough members of the Association interested in Cosmical Physics to run a separate section for a week, with papers and discussions worthy of the high traditions of the Association, and especially of Section A, of which we have hitherto formed an important constituent part. To that end it is important that accounts of Meteorology at the meetings should be fair when made by Officers of the Association, and fair and generous when made by critics.

E. GOLD.

[We gladly publish Mr. Gold's letter and hope that the discussion will not drop here. We wrote from twenty-five years personal experience of Meteorology in Section A, remembering that a sub-section on Cosmical Physics had been deliberately abandoned, and that the President of Section A this year, while not approving the abandonment, accepted it without appeal. To anyone who attended all the meetings of Section A the fact that Dr. Shaw's paper on Thunderstorms was taken in the main meeting room was entirely satisfactory; but to those who desired to hear that paper and could not come to the preceding discussion, the change of room was less agreeable. To refer to this, as Mr. Gold truly says, was seizing on an incident, but it was an illustrative incident and that is why it was seized on. Mr. Gold is seeking the same end as we; he still thinks it may be reached by submission to the dominant party in Section A; we, after watching the working of submission for many years, think that expostulation may now be tried; but if Meteorology is brought to more honour by any means in the British Association and in the mind of the scientific, as well as of the larger public, we shall be content.—Ed. *S.M.M.*]

THE DISAPPEARANCE OF EVENING CLOUD.

IN the communication to the Magazine for July, which seems to have led to an interesting correspondence, my object was simply to show, from the statistics of cloud, that the supposed tendency of the full moon to disperse evening cloud was a misconception, to which may be added the further not unimportant remark that cloud conditions have relation with temperature, but that no heat is received from the moon. It was not my purpose to discuss in detail the nature of the changing aspect of cloud in an evening sky, but it is very interesting to read the views of others thereon.

W. ELLIS.

HOW OUR HOTTEST SUMMER ON RECORD WOULD APPEAR IN THE SOUTH OF EUROPE

Now that the hot weather has gone, and with it the great fuss made about it in the daily press, it may be well to compare the mean temperature of July and August, 1911, in England, with normal conditions for July and August in Italy or Spain. The mean temperature, day and night, for July and August, 1911, in the South of England, we may put at about 68° , and the average mean temperature for July and August all over the lowlands of Italy, as varying between 75° and 80° . It thus appears that our hottest summer on record would be one of the coldest on record in southern Europe. Even *I* am astonished at this result, who am perhaps more interested in climatic differences than most meteorologists. But, great as is the difference in air temperature between northern and southern Europe in summer, the difference in the power of the sun is still more striking.

In England, even on our hottest days, it is not dangerous for anyone in *good health* to take moderate exercise in the open—in fact, anything short of a game of “rugger”; but in Italy, to cross an open court-yard in the full glare of the mid-day sun is like stepping into a “fiery furnace,” and nothing but a pressing duty will induce anyone to do so. It is enough, during the hottest hours of the day, to sit in darkened rooms, with the sun shut out by thick double shutters, perspiring from head to foot.

I really think such a summer as we have had this year in England is, taking it all round, far more enjoyable and salubrious than that terribly inclement Atlantic type of summer we so often experience. It is noteworthy that our hottest day, August 9th, with 100° in the shade at Greenwich, fell just one day outside what we may define, according to the altitude of the sun, as the three months constituting the midsummer period—May 8th to August 8th.

The very high temperatures which were continued till the 12th of September were, of course, favoured by the heat of the previous months, and it is hardly possible for the equinoctial sun of September in latitude 50° to raise the temperature to 90° in the shade, except after a universally hot summer, such as occurred this year, in 1906, and in 1898.

L. C. W. BONACINA.

September 23rd, 1911.

BLACK HAZE.

IN reply to Mr. Piffe Brown's remarks on the black haze, p. 115, I would say that I have never seen atmospheric conditions that suggested the presence of sufficient smoke or minute dust in the atmosphere to cause this unusual blackness. In some cases everything was opposed to such an idea. Before the commencement of the haze, distant objects as a rule could be easily seen as on any ordinary fine day, and

after the northerly haze had disappeared, the atmosphere would be clearer and in one instance brilliant. And further, they are only occasionally, or we might say rarely, seen in this district when very black and dense. If smoke or dust is necessary for their formation, how are we to account for a dark haze appearing in the midst of a heavy and prolonged rainfall. Surely the atmosphere in such a case must have been cleansed somewhat during a four hours' drenching rain.

All the blackest hazes I have seen lasted barely an hour. I witnessed one while on the top of the highest hill south of the Vale of Belvoir. The vale was soon black up to the southern slope. It all cleared away rapidly (or evaporated), and the air became clearer than before. Smoke could not have been the cause of this haze, as the few large chimneys to the north were 16 to 20 miles away. I am not referring to haze caused by the passing of a **V** depression, but to those that appear and disappear without leaving a trace behind them.

F. S. GRANGER.

2, Colville Street, Nottingham.

REVIEWS.

Climatic Control. By L. C. W. BONACINA. Illustrated with sketch maps, diagrams and weather charts. London: Adam and Charles Black, 1911. Size 7 x 5. Pp. viii. + 168.

THIS is one of the series of books entitled "Black's School Geography," edited by Professor L. W. Lyde, and it has many points of originality not often shown in ordinary school books of the size. It appeals in our opinion as much to the intelligent general reader as to the teacher or schoolboy, and we have no hesitation in recommending it to our readers. While the individuality of the author is more apparent in a few passages than some readers may care for, the almost passionate intensity of his feeling for the phenomena of the atmosphere gives a refreshing air of reality to every chapter. One cannot but feel in reading the book that climate is one of the things that really matters, and is worth careful study. We do not agree with all the opinions expressed, and we feel in particular that the author has taken a somewhat lugubrious view of the climate of the British Isles and especially of that of Scotland. We should be inclined to give more weight to the compensating advantages of the long summer days when set against the gloom of the winter months, and to give prominence to the exhilaration of the Highland air which makes a "soft" day a very light affliction, and modifies the heat of dry summer weather to the stimulating temper of the sub-tropical plateaux of America and Africa. The winter storms are short and fleeting visitations, and they are nearly as often warm as cold. We

consider that Mr. Bonacina's favourite adjective "treacherous" is too anthropomorphic to be applied to climate in a scientific book, and we suspect that his outlook on climate is dominated by extreme types of weather. On the other hand we fully recognise the powerful impression which the impassioned presentation of climate and its effects must produce on a fresh mind, and in the present state of Climatology as a subject of popular ignorance we feel sure that Mr. Bonacina's book will do much good. So far as we are aware the facts adduced are correctly stated, the one oversight of importance we have noticed being the rainfall of over 200 inches for a spot in the Lake District, referred to on p. 62. It is true that the rainfall at the Styne in 1872 amounted to 240 inches, but the average rainfall cannot be more than 170 inches, and there is only a small area with so much as 100 inches.

The plan of the book is excellent. It commences with two introductory chapters on the General Principles of Climatology and Types of Land in relation to Climate, goes on to discuss Well-known Lands in relation to Climatic Control (two chapters), The Influence of Climate upon Man (three chapters), and ends with a condensed chapter on Meteorology, which many readers would have dispensed with if they could have had instead an expansion of the earlier chapters. There is always much difficulty in writing a little book of this sort from original data; it would probably have been easier for Mr. Bonacina to have prepared a work on a much more ambitious scale, and then to have condensed and adapted it to the purpose of the present series. While we have felt it right to point out the limitations of the work we feel none the less that it is one of solid merit and deserves a large circulation.

Weather Wisdom in Agriculture with hints on forecasting. By R. W. DUNLOP. London [1911]: Vinton & Co. Size $5\frac{1}{2} \times 3\frac{1}{2}$. Pp. 48. Price 1s. net.

THIS dainty little volume is a reprint of a series of articles which appeared in the *Agricultural Gazette*, and it contains much sound practical advice, with hints on the interpretation of the Meteorological Office weather reports and suggestions for supplementing the official forecasts by local observations. It will be found useful by many besides farmers and gardeners, and we have only one fault to find with it—that is the recommendation of the Howard rain gauge, and the suggestion that a still cheaper instrument could be constructed at home. It cannot be too widely known that a funnel of the Snowdon pattern is essential for every rain gauge; only the price stands in the way, and we hope that some instrument maker will have the courage to produce a Snowdon pattern rain gauge at a cost of 7s. 6d. We do not see why it cannot be done here just as profitably as it is done in the case of similar instruments in Germany.

RAINFALL TABLE FOR SEPTEMBER, 1911.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1911. in.
Camden Square.....	London.....	51 32	0 8	111	2'00	1'31
Tenterden.....	Kent.....	51 4	*0 41	190	2'25	1'42
Arundel (Patching).....	Sussex.....	50 51	0 27	130	2'58	1'75
Southampton (Cadland) ...	Hampshire.....	50 50	1 22	52	2'60	1'29
Oxford (Magdalen College)...	Oxfordshire.....	51 45	1 15	186	1'98	1'21
Wellingborough (Croyland Abbey)...	Northampton.....	52 18	0 41	174	2'14	1'29
Shoeburyness.....	Essex.....	51 31	*0 48	13	1'70	1'04
Bury St. Edmunds (Westley)...	Suffolk.....	52 15	*0 40	226	2'18	1'86
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	2'13	2'06
Polapit Tamar [Launceston]...	Devon.....	50 40	4 22	315	3'11	2'72
Rousdon [Lyme Regis].....	".....	50 41	3 0	516	2'69	1'23
Stroud (Upfield).....	Gloucestershire.....	51 44	2 13	226	2'39	1'45
Church Stretton (Wolstaston)...	Shropshire.....	52 35	2 48	800	2'40	2'14
Coventry (Kingswood).....	Warwickshire.....	52 24	1 30	340	2'35	1'63
Boston.....	Lincolnshire.....	52 58	0 1	25	2'07	1'95
Workshop (Hodsock Priory)...	Nottinghamshire.....	53 22	1 5	56	1'84	1'52
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'92	3'13
Southport (Hesketh Park)...	Lancashire.....	53 38	2 59	38	3'09	4'65
Wetherby (Ribston Hall) ...	Yorkshire, W.R.....	53 59	1 24	130	2'11	2'30
Arncliffe Vicarage.....	".....	54 8	2 6	732	4'55	4'96
Hull (Pearson Park).....	"..... E.R.....	53 45	0 20	6	2'05	3'32
Newcastle (Town Moor) ...	Northumberland.....	54 59	1 38	201	2'00	2'75
Borrowdale (Seathwaite) ...	Cumberland.....	54 30	3 10	423	1'28	7'30
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	3'61	2'50
Haverfordwest.....	Pembroke.....	51 48	4 58	95	3'91	3'09
Aberystwyth (Gogerddan)...	Cardigan.....	52 26	4 1	83	3'89	3'78
Llandudno.....	Carnarvon.....	53 20	3 50	72	2'50	4'67
Cargen [Dumfries].....	Kirkcudbright.....	55 2	3 37	80	3'34	1'95
Marchmont House.....	Berwick.....	55 44	2 24	498	2'67	1'49
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	4'30	2'49
Glasgow (Queen's Park) ...	Renfrew.....	55 53	4 18	144	2'99	1'82
Inveraray (Newtown).....	Argyll.....	56 14	5 4	17	6'15	3'84
Mull (Quinish).....	".....	56 34	6 13	35	5'20	5'00
Dundee (Eastern Necropolis)...	Forfar.....	56 28	2 57	199	2'34	'91
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'73	'64
Aberdeen (Cranford).....	".....	57 8	2 7	120	2'69	1'05
Cawdor.....	Nairn.....	57 31	3 57	250	2'55	1'54
Fort Augustus (S. Benedict's)...	E. Inverness.....	57 9	4 41	68	3'54	2'58
Loch Torridon (Bendamph)...	W. Ross.....	57 32	5 32	20	7'28	8'59
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'51	1'56
Wick.....	Caithness.....	58 26	3 6	77	2'57	2'36
Killarney (District Asylum)...	Kerry.....	52 4	9 31	178	3'79	4'14
Waterford (Brook Lodge)...	Waterford.....	52 15	7 7	104	3'19	4'43
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	3'16	2'61
Miltown Malbay.....	Clare.....	52 52	9 26	400	4'18	3'88
Gorey (Courtown House) ...	Wexford.....	52 40	6 13	80	2'78	3'54
Abbey Leix (Blandsfort)....	Queen's County.....	52 56	7 17	532	2'93	2'00
Dublin (Fitz William Square)...	Dublin.....	53 21	6 14	54	2'06	1'01
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	307	3'02	2'25
Ballinasloe.....	Galway.....	53 20	8 15	160	2'99	...
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 18	74	4'42	2'76
Collooney (Markree Obsy.)...	Sligo.....	54 11	8 27	127	3'65	2'23
Seaforde.....	Down.....	54 19	5 50	180	3'25	1'18
Bushmills (Dundarave).....	Antrim.....	55 12	6 30	162	3'49	1'56
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	3'39	1'73

RAINFALL TABLE FOR SEPTEMBER, 1911—*continued.*

RAINFALL OF MONTH (<i>con.</i>)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION.
Diff. from Av. in.	% of Av.	Max. in 24 hours.	No. of Days	Date.	Aver. 1875-1909.	1911.	Diff. from Aver. in.	% of Av.		
		in.			in.	in.			in.	
— 69	65	41	13	11	17.92	13.85	—4.07	77	25.11	Camden Square
— 83	63	52	13	8	18.32	12.48	—5.84	68	27.64	Tenterden
— 83	68	41	29	10	20.02	13.41	—6.61	67	30.48	Patching
—131	50	28	19	8	21.18	12.96	—8.22	61	31.87	Cadland
— 77	61	30	13. 20	8	17.45	10.39	—7.06	60	24.58	Oxford
— 85	60	36	23	8	18.20	11.86	—6.34	65	25.17	Croyland Abbey
— 66	61	39	13	8	13.17	9.89	—3.28	75	19.28	Shoeburyness
— 32	85	54	30	7	18.14	14.07	—4.07	78	25.40	Westley
— 07	97	68	30	11	16.33	12.20	—4.13	75	23.73	Geldeston
— 39	87	48	19	13	24.90	18.67	—6.23	75	38.27	Polapit Tamar
—146	46	27	19	11	22.54	11.79	—10.75	52	33.54	Rousdon
— 94	61	47	13	11	21.12	13.50	—7.62	64	29.81	Stroud
— 26	89	74	12	11	22.71	15.06	—7.65	66	32.41	Wolstaston
— 72	69	...	...	...	20.51	11.23	—9.28	55	28.98	Coventry
— 12	94	53	23	12	16.67	13.34	—3.33	80	23.35	Boston
— 32	83	42	23	10	17.54	10.10	—7.44	58	24.46	Hodsock Priory
+ 21	107	87	27	12	24.85	19.51	—5.34	78	34.73	Macclesfield
+156	150	1.75	12	16	22.70	19.76	—2.94	87	32.70	Southport
+ 19	109	55	29	14	19.08	15.46	—3.62	81	26.87	Ribston Hall
+ 41	109	1.25	12	12	42.14	44.74	+2.60	106	61.49	Arlcliffe
+127	162	1.05	23	11	18.57	16.15	—2.42	87	26.42	Hull
+ 75	137	74	11	13	19.65	18.42	—1.23	94	27.94	Newcastle
—398	65	2.15	19	13	88.04	89.90	+1.86	102	129.48	Seathwaite
—111	69	58	23	14	28.63	20.60	—8.03	72	42.28	Cardiff
— 82	79	67	23	14	30.96	24.81	—6.15	80	46.81	Haverfordwest
— 11	97	1.47	12	14	30.92	27.75	—3.17	90	45.46	Gogerddan
+217	187	1.26	12	14	20.55	18.96	—1.59	92	30.36	Llandudno
—139	58	57	29	8	29.83	28.90	— 93	97	43.47	Cargen
—118	56	78	29	10	23.89	17.46	—6.43	70	33.76	Marchmont
—181	58	50	28	15	33.67	29.73	—3.94	88	49.77	Girvan
—117	61	49	29	12	25.03	23.35	—1.68	93	35.97	Glasgow
—231	62	48	28	20	46.21	56.34	+10.13	122	68.67	Inveraray
— 20	96	1.08	19	24	37.87	38.82	+ 95	103	56.57	Quinish
—143	39	30	8	10	20.54	8.51	—12.03	41	28.64	Dundee
—209	23	...	...	...	24.16	16.43	—7.73	68	34.93	Braemar
—164	39	30	8	12	22.78	14.53	—8.25	64	32.73	Aberdeen
—101	60	35	8	11	21.25	17.30	—3.95	81	29.33	Cawdor
— 96	73	40	26	18	30.26	28.18	—2.08	93	44.53	Fort Augustus
+131	118	1.45	26	26	56.63	68.00	+11.37	120	83.61	Bendamp
— 95	62	32	1	12	22.41	17.41	—5.00	78	31.90	Dunrobin Castle
— 21	92	76	28	18	20.68	19.41	—1.27	94	29.88	Wick
+ 35	109	1.42	12	15	36.76	31.33	—5.43	85	54.81	Killarney
+124	139	1.82	25	12	27.45	24.33	—3.12	89	39.57	Waterford
— 55	83	77	11	13	27.73	23.45	—4.28	85	39.43	Castle Lough
— 30	93	60	19	17	31.46	25.01	—6.45	80	45.11	Miltown Malbay
+ 76	127	1.68	26	11	24.41	17.86	—6.55	73	34.99	Courtown Ho.
— 93	68	60	25	14	25.70	22.45	—3.25	87	35.92	Abbey Leix
—105	49	37	25	11	19.89	12.60	—7.29	63	27.68	Dublin
— 77	74	55	11	12	26.19	22.49	—3.70	86	36.15	Mullingar
...	...	...	...	...	...	...	...	...	36.64	Ballinasloe
—166	62	48	19	19	35.74	29.47	—6.27	82	52.87	Enniscoe
—142	61	36	20	17	30.14	25.27	—4.87	84	42.71	Markree
—207	36	42	22	9	27.63	17.89	—9.74	65	38.91	Seaforde
—193	45	29	29	15	26.32	19.32	—7.00	73	37.56	Dundarave
—166	51	35	22	14	28.05	24.33	—3.72	87	30.38	Omagh

SUPPLEMENTARY RAINFALL, SEPTEMBER, 1911.

Div.	STATION.	Rain inches	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road	1.43	XI.	Lligwy	3.71
„	Ramsgate	1.55	„	Douglas	...
„	Hailsham	1.53	XII.	Stoneykirk, Ardwell House	1.30
„	Totland Bay, Aston House	1.22	„	Dalry, The Old Garroch	2.81
„	Stockbridge, Ashley	1.25	„	Langholm, Drove Road	4.09
„	Grayshott	1.33	„	Beattock, Kinnelhead	3.30
„	Reading, Calcot Place	1.40	XIII.	St Mary's Loch, Cramilt Edge	1.83
III.	Harrow Weald, Hill House	1.46	„	North Berwick Reservoir	1.09
„	Pitsford, Sedgebrook	1.33	„	Edinburgh, Royal Observty.	1.17
„	Woburn, Milton Bryant	1.13	XIV.	Maybole, Knockdon Farm	2.52
„	Chatteris, The Priory	2.13	XV.	Campbeltown, Witchburn	3.52
IV.	Colchester, Lexden	1.47	„	Glenreadell Mains	2.67
„	Newport	1.28	„	Holy Loch, Ardnadam	4.13
„	Rendlesham	1.61	„	Ballachulish House	3.88
„	Swaffham	2.52	„	Islay, Ballabus	3.07
„	Blakeney	1.67	XVI.	Dollar Academy	1.79
V.	Bishops Cannings	1.03	„	Balquhider, Stronvar	2.60
„	Winterbourne Steepleton	1.37	„	Coupar Angus	1.00
„	Ashburton, Druid House	2.72	„	Glenlyon, Meggernie Castle	2.29
„	Okehampton, Oaklands	2.95	„	Blair Atholl	.51
„	Cullompton	1.59	„	Montrose, Sunnyside Asylum	1.00
„	Hartland Abbey	2.55	XVII.	Alford, Lynturk Manse	.81
„	Lynmouth, Rock House	3.47	„	Fyvie Castle	1.34
„	Probus, Lamellyn	2.67	„	Keith Station	1.13
„	North Cadbury Rectory	1.37	XVIII.	Glenquoich, Loan	15.80
VI.	Clifton, Pembroke Road	1.61	„	Skye, Dunvegan	5.74
„	Ross, The Graig	1.14	„	N. Uist, Lochmaddy	3.21
„	Shifnal, Hatton Grange	1.55	„	Alvey Manse	2.14
„	Blockley, Upton Wold	1.75	„	Loch Ness, Drumnadrochit	2.20
„	Droitwich	1.36	„	Glencarron Lodge	9.64
VII.	Market Overton	1.83	XIX.	Invershin	1.93
„	Market Rasen	1.99	„	Loch Stack, Ardchullin	8.67
„	Bawtry, Hesley Hall	1.74	„	Melvich	3.64
„	Derby, Midland Railway	1.51	XX.	Skibbereen Rectory	5.35
„	Buxton	2.94	„	Donmanway, The Rectory	4.29
VIII.	Nantwich, Dorfold Hall	2.70	„	Cork	2.58
„	Chatburn, Middlewood	4.14	„	Mitchelstown Castle	3.12
„	Cartmel, Flookburgh	4.98	„	Darrynane Abbey	4.76
IX.	Langsett Moor, Up. Midhope	2.32	„	Glenam [Clonmel]	3.37
„	Scarborough, Scalby	3.44	„	Newmarket-on-Fergus, Fenloe	3.45
„	Ingleby Greenhow	2.39	XXI.	Laragh, Glendalough	3.04
„	Mickleton	2.24	„	Balbriggan, Ardgillan	.81
X.	Bellingham, High Green Manor	2.04	„	Moynalty, Westland	1.34
„	Ilderton, Lilburn Cottage	1.75	XXII.	Cong, The Glebe	2.23
„	Keswick, The Bank	3.65	„	Westport, St. Helens	2.56
XI.	Llanfrecfha Grange	2.02	„	Achill Island, Dugort	4.90
„	Treherbert, Tyn-y-waun	6.18	„	Mohill, The Rectory	1.89
„	Carmarthen, The Friary	3.82	XXIII.	Enniskillen, Portora	1.73
„	Castle Malgwyn [Lechryd]	3.22	„	Dartrey [Cootehill]	1.48
„	Plynlimon	8.20	„	Warrenpoint, Manor House	1.80
„	New Radnor, Ednol	2.99	„	Banbridge, Milltown	1.42
„	Rhayader, Tyrmynydd	4.65	„	Belfast, Cave Hill Road	1.57
„	Lake Vyrnwy	...	„	Glenarm Castle	1.27
„	Llangyhanfal, Plas Draw	3.93	„	Londonderry, Creggan. Res.	2.14
„	Dolgelly, Bryntirion	5.12	„	Killybegs	3.96
„	Bettws-y-Coed, Tyn-y-bryn	4.76	„	Horn Head	2.34

METEOROLOGICAL NOTES ON SEPTEMBER, 1911.

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.—Fine, sunny weather with almost cloudless skies prevailed throughout and with unusually high temp. in the first half.† Mean temp. $60^{\circ}4$, or $2^{\circ}7$ above the average. Duration of R $25\cdot1$ hours and of sunshine $198\cdot2^*$ hours; two sunless days. Evaporation $1\cdot96$ in. The shade max. $92^{\circ}3$ on 8th, was the highest temp. ever recorded in September, excepting only $94^{\circ}0$ on 2nd September, 1906; min. $39^{\circ}0$ on 22nd and 29th. F 0, f 0.

TENTERDEN.—Brilliant month almost throughout and with great heat till after 12th. Violent gale on 30th. Duration of sunshine, $255\cdot0\dagger$ hours. Shade max. $90^{\circ}0$ on 8th; min. $39^{\circ}0$ on 29th. F 0, f 0.

TOTLAND BAY.—The ninth successive month with less than the average R. A partial drought 75 days with $\cdot70$ in. of R terminated on 12th. Shade max. $79^{\circ}3$ on 5th and 7th; min. $43^{\circ}1$ on 18th. F 0, f 0.

PITSFORD.—R $1\cdot27$ in. below the average. Mean temp. $57^{\circ}5$. Shade max. $91^{\circ}4$ on 8th; min. $35^{\circ}6$ on 22nd. F 0.

NORTH CADBURY.—A month of extremes and with violent changes. The wind movement was almost the least for September in the record, and the duration of sunshine was almost the greatest. In the first 12 days the lowest shade max. was $75^{\circ}0$, but after that $73^{\circ}5$ was the highest. Shade max. $94^{\circ}2$ on 8th; min. $36^{\circ}0$ on 22nd. F 0, f 4.

ROSS.—Shade max $89^{\circ}8$ on 8th; min. $32^{\circ}8$ on 23rd. F 0, f 0.

HODSOCK PRIORY.—Shade max. $88^{\circ}0$ on 8th and the highest in September, except $93^{\circ}0$, which occurred on two days in 1906; min. $32^{\circ}2$ on 22nd. F 0, f 6.

SOUTHPORT.—Duration of sunshine $184\cdot5^*$ hours, or $46\cdot4$ hours above the average. Duration of R $58\cdot2$ hours. Mean temp. $56^{\circ}0$. Shade max. $74^{\circ}9$ on the 8th; min. $39^{\circ}3$ on 22nd. F 0, f 0.

HULL.—Fine warm days at the beginning with frequent dew and mist at night. Unsettled on most days from 19th to the end. A gale caused damage to trees and property on 30th. Shade max. $82^{\circ}0$ on 7th; min. $37^{\circ}0$ on 22nd. F 0, f 1.

HAVERFORDWEST.—Fine and warm to 11th. Colder broken weather after a strong gale on 25th. Duration of sunshine, $188\cdot5^*$ hours. Shade max. $81^{\circ}5$ on 8th; min. $38^{\circ}4$ on 17th. F 0, f 0.

LLANDUDNO.—Shade max. $75^{\circ}2$ on 10th; min. $44^{\circ}2$ on 21st.

CARGEN.—No R in the first 18 days. The earliest and shortest harvest on record; the yield was little below the average. Water very scarce and pastures bare. Shade max. $72^{\circ}0$ on 3rd; min. $31^{\circ}3$ on 22nd. F 1.

EDINBURGH.—Shade max. $71^{\circ}6$ on 11th; min. $35^{\circ}2$ on 30th. F 0, f 0.

COUPAR ANGUS.—The R was only half the average and it was the ninth successive month with deficient fall. A water famine is threatened in some districts here. Shade max. $72^{\circ}0$ on 6th; min. $27^{\circ}5$ on 22nd.

FORT AUGUSTUS.—Shade max. $67^{\circ}0$ on 10th; min. $32^{\circ}0$ on 21st. F 1.

CORK.—Shade max. $73^{\circ}0$ on 8th; min. $39^{\circ}0$ on 16th and 29th. F 0, f 0.

DUBLIN.—Fine, dry and warm at first. Temp. gave way after 11th, and the rest of month was distinctly cool. Mean temp. $56^{\circ}5$. Shade max. $73^{\circ}1$ on 5th; min. $41^{\circ}7$ on 21st. F 0, f 0.

MARKREE.—The first part was fine, dry and warm. Showers on most days after with some ground frosts. Shade max. $70^{\circ}6$ on 13th; min. $36^{\circ}0$ on 21st. F 0, f 4.

WARRENPOINT.—Shade max. $70^{\circ}0$ on 1st; min. $40^{\circ}0$ on 20th. F 0, f 0.

* Campbell-Stokes.

† Jordan.

‡ See p. 173.

Climatological Table for the British Empire, April, 1911.

STATIONS (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
London, Camden Square	67.5	22	25.5	6	56.1	39.7	39.8	78	112.8	24.1	1.80	11	7.8
Malta	70.0	30	49.0	16	63.1	54.5	51.4	80	135.2	...	1.50	10	5.4
Lagos	92.0	1	70.0	12	88.2	73.4	74.3	73	157.0	68.0	7.87	12	...
Cape Town	94.5	4	48.8	24	73.5	55.7	54.4	73	...	...	1.77	10	5.3
Johannesburg	73.4	1	41.8	27	67.6	49.6	52.0	77	138.6	39.5	2.76	10	3.7
Mauritius ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Calcutta... ..	101.9	28	68.1	21	95.0	76.1	72.9	71	...	64.5	2.03	2	2.6
Bombay... ..	92.2	26	72.8	5	88.1	76.0	71.8	74	132.7	65.9	.00	0	1.4
Madras	102.2	18	73.3	2	93.7	78.1	75.6	78	144.1	70.9	.00	0	2.3
Kodaikanal	74.9	5	51.6	28	71.3	54.9	47.7	62	138.1	39.5	4.37	15	4.0
Colombo, Ceylon	91.2	4	73.7	24	88.7	77.6	74.2	76	145.6	70.1	1.97	6	5.6
Hongkong	86.9	26	61.3	1	74.0	66.4	64.3	82	139.1	...	5.94	13	7.6
Sydney	87.1	9	45.9	28	70.4	55.5	47.8	65	141.2	35.9	3.58	16	4.3
Melbourne	82.8	4	35.5	29	65.6	49.0	46.5	67	136.1	27.9	1.12	4	5.7
Adelaide	86.9	3	42.0	20	72.0	52.6	47.2	60	144.0	31.7	.31	7	4.7
Perth	89.1	15	50.8	30	75.5	56.1	53.1	67	147.0	39.7	3.40	9	3.7
Coolgardie	98.0	2	45.0	10*	79.8	52.4	45.6	54	157.0	40.0	.03	1	...
Hobart, Tasmania	77.2	4	38.0	30	61.6	47.0	42.8	67	129.5	36.0	2.50	15	6.0
Wellington	73.8	23	45.0	19	65.8	57.0	53.6	75	113.0	37.0	2.53	13	8.0
Auckland	75.0	7	53.0	30	71.1	59.9	60.4	84	136.0	49.0	7.43	21	6.7
Jamaica, Kingston	91.8	22	66.0	21	88.1	69.4	67.4	67	...	...	1.36	5	4.0
Grenada	87.0	sev.	71.0	15	85.0	73.9	...	71	141.2	...	1.67	13	4.5
Toronto	76.0	28	16.3	2	52.0	34.6	...	...	90.8	10.3	1.54	10	4.2
Fredericton	78.0	29	7.5	3	49.1	25.7	...	66	...	...	1.93	6	4.6
St. John, N.B.	66.5	29	11.5	3	45.1	29.7	...	...	...	...	1.34	10	4.4
Victoria, B.C.	66.8	23	27.7	13	54.7	36.2	...	67	...	...	.59	4	4.0
Dawson	59.0	30	-25.0	10†	38.6	8.9	...	...	...	...	1.30	6	5.1

* and 14.

† and 11.

MALTA.—Mean temp. of air, 58°·3. Average bright sunshine, 7.9 hours per day.

Johannesburg.—Bright sunshine, 232.5 hours.

KODAIKANAL.—Bright sunshine, 216 hours.

COLOMBO.—Mean temp. of air 80°·7, or 1°·8 below, of dew point 0°·3 below, and R 7.96 in. below, averages. Mean hourly velocity of wind 6.6 miles. TS on 2 days.

HONGKONG.—Mean temp. of air 69°·7. Bright sunshine 138.8 hours. Mean hourly velocity of wind 13.3 miles.

Sydney.—Mean temp. of air 1°·6 below, and R 1.41 in. below, averages.

Melbourne.—Mean temp. of air 2°·3 below, and R 1.22 in. below, averages.

Adelaide.—Rainfall, 1.50 in. below average.

Perth.—Mean temp. of air equal to average, and R 1.76 in. above average.

Coolgardie.—Mean temp. of air 0°·7 above, and R .62 in. below, averages.

Hobart, Tasmania.—Mean temp. of air 1°·0 below, and R .69 in. above, averages.

Wellington.—Mean temp. of air 4°·6 above, and R 1.51 in. below, averages.

Auckland.—Mean temp. of air 4°·0 above average.

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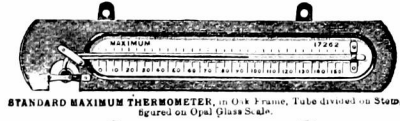
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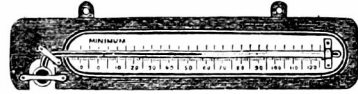
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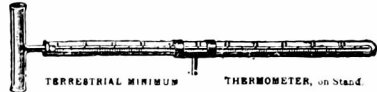
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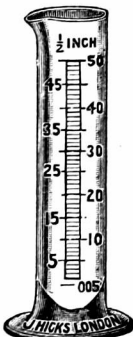
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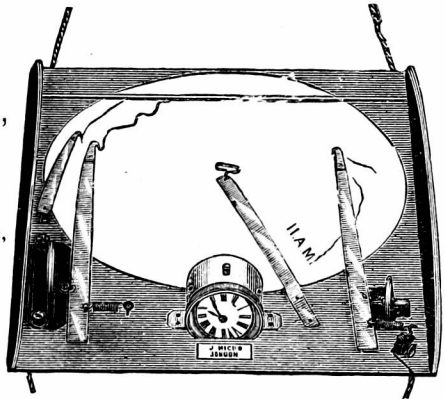
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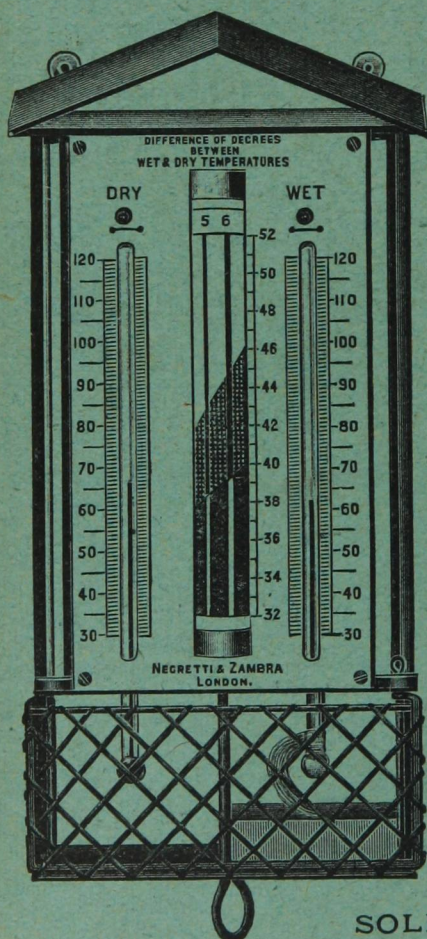
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