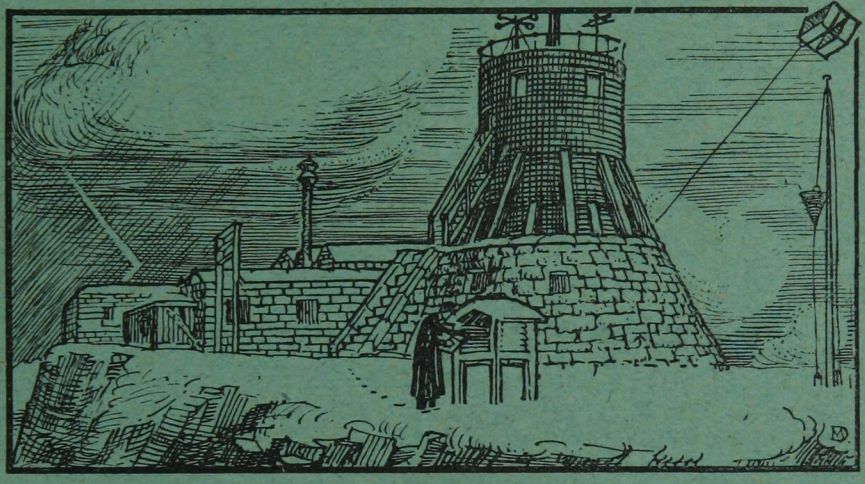
NO. 548 SYMONS'S VOL. 46

METEOROLOGICAL MAGAZINE

EDITED BY HUGH ROBERT MILL



SEPTEMBER, 1911.

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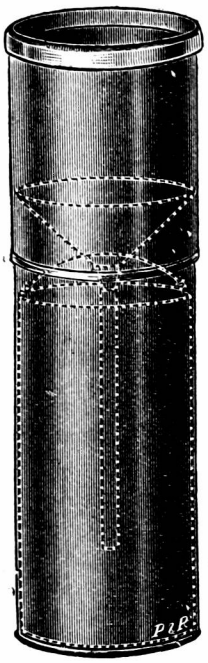

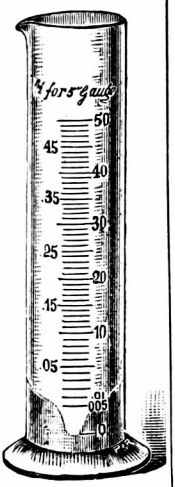

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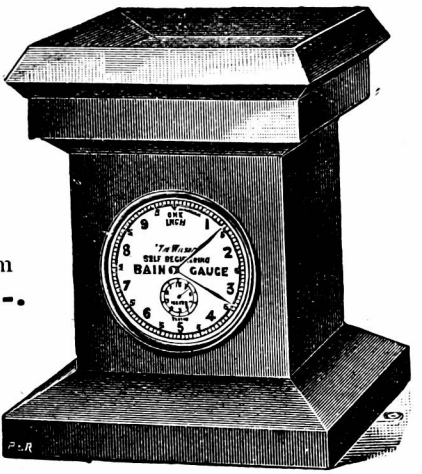

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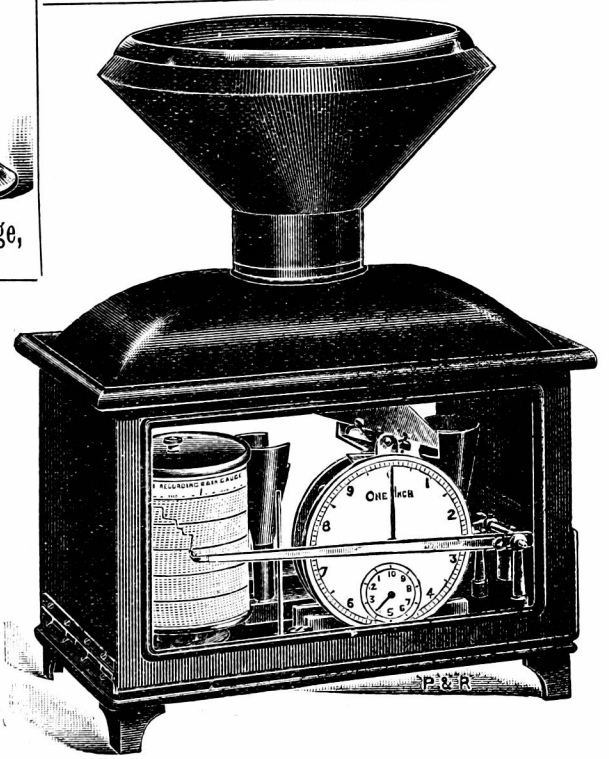

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Symons's
Meteorological Magazine.

No. 548. SEPTEMBER, 1911. Vol. XLVI.

METEOROLOGY AT THE BRITISH ASSOCIATION.

The eighty-first meeting of the British Association for the Advancement of Science, held at Portsmouth, from August 30th to September 6th, will be remembered for the exceptionally fine weather which prevailed throughout, and for a marked revival of interest in the work of the Association on the part of scientific workers and students. The Association had never met in Portsmouth before, and, although the Mayor and Corporation showed hospitality on an unequalled scale, a very small proportion of the members and associates were local residents. On this account, although the funds suffered and the meetings were less full than usual, a larger proportion of those present in the audience was ready and able to take part in the discussions.

The evening lecture to the working people, quaintly termed "the operative classes" of the town, arranged by the British Association, but not part of the official proceedings, was given to a large audience by Dr. H. R. Mill on "Rain," and some reflections suggested by its reception will probably appear next month.

Portsmouth is fortunate in possessing a very fine town hall and municipal college in the centre of the town, with a small but well laid out park with a complete climatological station close by: in and around these the meeting places were grouped, and within easy reach of a fine stretch of common bordering Spithead, where sea-breezes and the sight of the varied shipping of a naval port could be enjoyed.

The meeting presided over by Sir William Ramsay, who is perhaps the widest-minded of British men of science, and the most sympathetic with all branches of scientific work, was a decided success as a whole and with respect to the individual sections. It was, as is always the case, most successful with respect to those subjects which are best established and least in need of encouragement. The conception of the "advancement of science" would almost seem to be to protect and forward all branches which are long-established and obviously flourishing, and to improve the less organized, the less developed and the less recognized branches by the interposition of obstacles and the

withdrawal of opportunities, so that they may gain strength through adversity, or disappear from amongst their robuster rivals.

We refer especially to those observational sciences which are concerned with the surface of the Earth, and while dependent in great measure on Mathematics and Physics, are after all no more closely bound to Section A than are Chemistry and Geology; and although united in many aspects with Geography, are yet as clearly separate from the subject-matter of Section E as are Botany and Zoology. Chief amongst these bond-subjects is Meteorology, towards which Section A shows the solicitude of Pharaoh towards the Hebrews. Again and again signs have appeared that the troublesome group might be allowed to proceed in search of a new position of its own; but again and again Section A has hardened its analogue of a heart and would not let them go. So the old trouble we have complained of year after year has been allowed to go on in the same old way. The meteorological papers have been scattered. On one occasion a few were separated in the agenda of Section A, and it was announced in the Committee that they would be taken in a particular room after the completion of a certain paper in the general meeting of Section A. Guessing at a probable hour, the President of the Royal Meteorological Society and the Director of the British Rainfall Organization sat for a long time alone and expectant, until when driven forth by hunger they heard a familiar voice through the door of a room in a far distant part of the building, and found that the place of meeting had been changed at the last moment. On another occasion the meeting of Section A was announced as divided into three "departments," and a notice-board was displayed "Meteorology, Room 6;" but no hour of meeting was mentioned. We were anxious to hear a paper in Section E bearing on an aspect of the study of the atmosphere, and after an hour left it unfinished and sought Room 6, sure that we would find the meeting half over; but we found Room 6 empty but for the presence of the Director of the Meteorological Office, who having put a series of exhibits in order was patiently waiting for an audience, who had no idea when he was to begin. These are small matters in a way; but they show that Section A is overcharged with work, or that it has not a sufficient organizing staff to carry out its programme, and they spoilt what might have been a very successful meeting from the meteorological point of view.

The Meteorological Breakfast begins a day no more; but the Meteorological Luncheon, arranged by Mr. Gold of the Meteorological Office, appears to fulfil the same function and to be more in harmony with the spirit of the day. A report of the very successful Portsmouth Luncheon will, we hope, appear in our next number.

While blaming Section A for its dog-in-the-manger attitude towards Meteorology, we have in view the element of continuity in Section A which over-rides the personal views of its highest officials duly elected to serve their year. On the present occasion the President of the Section, Professor H. H. Turner, F.R.S., of Oxford,

gave an address, which, while full of encouragement to hundreds of Observers, must have been singularly unpalatable to the exclusive specialists in mathematics and the more recondite branches of physics who regard their own methods as alone worthy of the name of science, and treat with indifference crusted on a kernel of contempt, the work of all who stand outside their circle.

Professor Turner's address was entitled, "The Characteristics of the Observational Sciences," and his views on the policy of his Section must appear as strong as our own, to anyone who reads between his well-spaced lines. He said:—

"The neglect is not confined to Astronomy, but extends, as some of us recently pointed out, to the other sciences of observation; and we thought that, as a corollary, it would be better for the Section to divide, in order that these sciences might not continue the struggle for existence in an atmosphere to which they were apparently ill-suited. But the Section decided against the suggestion, and I have no intention of appealing against the decision. This explicit statement will, I trust, suffice to prevent misunderstanding if I proceed to examine the possible causes of neglect—for I cannot but regard the record as significant of some cause which it will be well to recognise, even if we cannot remove it. Personally, I think the cause is not far to seek, and my hope is to make it manifest; but as the statement of it involves something in the nature of an accusation, I will beg leave to make it as gently as possible by using the words of others, especially of those against whom the mild accusation is to be made."

We cannot give enough of the address to show how completely and powerfully the accusation is driven home; but we must quote a few passages in which the illustrations are drawn from Meteorology, for Professor Turner shows as sympathetic a feeling for the position of our science in the shadow of Section A, as for that of his own science, Astronomy.

He quotes and comments upon the attitude towards Observational science of Professor Bartholomew Price, when President of Section A, in 1860:—

"And finally we come to the facts of meteorology and its kindred subjects, many of which are scarcely yet brought within any law at all."

There is here much that will command ready and universal assent; but is there not also a rather unnecessary social scale? The science of planetary movement had not yet been "brought within any law at all" (as we now use the term) in Tycho Brahé's time; but was the astronomy of Tycho Brahé socially inferior to that of Kepler? . . . .

Or consider the case of M. Teisserenc de Bort, when he began sending up his balloons. "Show me your laws," cries the mathematician. "But they are just what I hope to find," replies M. de Bort. "Yes, but surely you have formulated some law you wish to test?" pursues the invigilator. "How am I to give you proper scientific rank unless you can produce at least a tentative law?" "On the other hand, I wish to keep a perfectly open mind," maintains M. de Bort. "Then I fear I cannot admit you to

our class at present; you must join the infants' class, and I can only give you my best wishes that you may reach maturity some day." Unperturbed, M. de Bort continues to send up his balloons, and almost immediately discovers the great fact about the isothermal region, which will be a permanent factor in the meteorology of the future. The mathematician is now ready to admit him, as a worthy person who has found a law about the constitution of the atmosphere. But was not the merit in sending up the balloons, whatever came of it? Is is not sometimes more courageous to take risks of failure? The mathematician, safe in his stronghold which possesses "probably in the highest degree attainable by human intellect the characteristics of perfect and necessary science," is like a man who has inherited a good old-established business, and he has a distaste for the methods of those who have to try new ventures. No doubt many who make such trials fail; but, on the other hand, great fortunes have been made in that way.

Then, turning to Sir George Darwin's statement, when President of Section A in 1886, that "a mere catalogue of facts, however well-arranged, has never led to any important scientific generalization," he says:—

And I will now definitely formulate the view that the perception of the need for observations, the faith that something will come of them, and the skill and energy to act on that faith—that these qualities, all of which are possessed by any observer worthy the name, have at least as much to do with the advance of science as the formulation of a theory, even of a correct theory. The work of the observer is often forgotten—it lies at the root of the plant; it is easier to notice the theories which blossom and ultimately produce the fruit. But without the patient work of the observer underground there would be neither blossom nor fruit. It is also easy to fix attention on the mechanical nature of much observation; but this is not the principal feature of observing any more than is numerical computation of mathematics.

Later, he cites the disparagement of the inductive method by De Morgan in the "Budget of Paradoxes":—

"There is an attempt at induction going on, which has yielded little or no fruit, the observations made in the meteorological observatories. The attempt is carried on in a manner which would have caused Bacon to dance for joy. . . . And what has come of it? Nothing, says M. Biot, and nothing will ever come of it: the veteran mathematician and experimental philosopher declares, as does Mr. Ellis, that no single branch of science has ever been fruitfully explored in this way."

De Morgan was a mathematician, and I have noticed that mathematicians are apt to be crisp in their statements; but he is a bold man who says, "Nothing will ever come of it." Perhaps an equally crisp statement on the other side may be pardoned. I adventure the remark that if nothing has hitherto come of such observations, it is because observers have been misled by the very teaching of De Morgan and others who share his views; they have been told that they will do no good without a theory until they have come to believe it; whereas the truth probably lies in a quite different direction.

Professor Turner goes on to show that in Astronomy important generalizations have been arrived at by the marshalling of legions of facts by an investigator searching for relationships with an open mind uncramped by hypotheses, and he shows, by reference to his work on Rainfall Records, described in this Magazine for April, 1911, p. 47, that similar results may be expected to reward work carried on in the same spirit in Meteorology also. Finally, in the course of a very just appreciation of the value of the work of the "mere observers," who are usually made to feel their position as destitute aliens in Section A, he says:—

> It should be one of the articles of faith with an observer that the record is sacred, and must not be broken. Most of them, indeed, act on that principle already; but there are heretics, and it pained us to find even Prof. Schuster himself tinged with heresy. On the very occasion when he did so much for the observer by presenting his beautiful method, he suggested that it might even be advisable to drop observing for a time in order to apply the method to accumulated observations. He may possibly be right, but the observer had better believe him wrong. There ought to be an "observer's promise," like the promise of the boy scout; and one part of it should be not to interrupt the record, and another should be to publish the observations regularly, and never to let them accumulate beyond five years.

Professor Turner has taken a bold step in vindicating Observers in the august presence of mathematicians and physicists, and coming from a man who shares with the leaders of mathematical and physical science the highest scientific distinctions this country can afford, the criticism cannot easily be ignored, or depreciated as that of an outsider.

THE HOT JULY AND AUGUST OF 1911 IN LONDON.

It is probably still too early to attempt to review the temperature observations during the prolonged hot spell of the present summer, since up to the time of writing September bids fair to yield some results not so far removed from the unprecedented as to be unworthy of notice. The end of August, however, bringing to a close two months the mean temperature of which at Camden Square reached 68°·6, or no less than 5°·7 above the average and 1°·3 beyond any previous two-monthly period in 53 years, is an event to chronicle.

The great heat which characterized July commenced on the 5th, when the shade temperature rose above 80° for the first time for a month; after that date, however, no fewer than 19 of the remaining days in the month experienced a shade temperature of 80°, five of them of 90°, and the maximum reading, 92°·6, on the 22nd, was the highest in July since 1900. The mean shade maximum for the whole month reached the high figure of 81°·7, or 7°·4 above the

average, and was the highest yet recorded with the single exception of 82°·4 in the remarkable July of 1868. The minimum readings were less remarkable, no doubt on account of the absence of cloud; but the mean, 56°·9, was 2°·7 above the average, and there are only four previous higher figures. The mean temperature for the month was **69°·0**, or 5°·5 above the average. Judged by this standard this was the warmest July in the Camden Square record, its rivals, 1859, 1868 and 1900, having the values 68°·9, 68°·8 and 68°·6.

Taken alone, therefore, July, 1911, although in some respects unprecedented, was hardly so greatly so as to give the year the character of *annus mirabilis* so readily claimed for it by the Press, but the prolongation of the hot spell throughout practically the whole of August provides some reason for the phrase. Temperature readings of 80° in the shade were observed on 14 out of the first 20 days in August, reaching 90° on four days, and on the 9th the unparalleled maximum of 97°·1, to which reference was made in our last issue (p. 129). Although the last 11 days of August were not excessively hot, the mean maximum for the whole month was **80°·8**, or **8°·1** above the average. This is the first occasion on which a mean maximum of 80° or above has been observed in August. The mean minimum exceeded that of July by 1°·0, being **57°·9**, or **4°·5** above the average, and 1°·3 higher than the highest previously recorded, namely 56°·6 in 1899. The mean temperature for the month, **68°·2, 5°·9** above the average, was also beyond precedent.

Taking the months of July and August together, it is easy to see that we may look in vain for any previous year which can challenge comparison with 1911 on the point of high summer temperature.

Shade Temperature, July and August, 1911.

SHADE TEMPERATURE.	1911.				1858—1910. JULY—AUGUST.	
	July.	August.	July—Aug.	July—August. Diff. from Aver.	Highest	Date.
Mean Temp.....	69°·0	68°·2	68°·6	+5°·7	67°·3	1899
,, Maximum	81·7	80·8	81·3	+7·8	79·3	1899
Absolute ,,	92·6	97·1	97·1	...	95·2	July 16, 1900
Mean Minimum	56·9	57·9	57·4	+3·6	57·0	1899
Absolute ,,	48·5	48·4	48·4	...	50·9	1899

It will be observed that the high maximum readings depart more from the normal than the minimum readings, and indeed the small amount of cloud, together with exceptionally large values for duration of sunshine, and the very high temperatures observed by the black-bulb exposed thermometer, go to show that the period was one of intense radiation, when one might quite reasonably have looked for night temperatures below the average for the time of year.

THAMES VALLEY RAINFALL AUGUST, 1911.

Symons's Meteorological Magazine.

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

Rainfall Stations reporting

Isohyetals.

THE WEATHER OF AUGUST.

By FRED. J. BRODIE.

AUGUST, 1911, was distinguished by a meteorological event unparalleled in the history of the previous 70 years, an event whose recurrence is, therefore, barely possible within the lifetime of the present generation. Great extremes of heat have been experienced in England at various times in July, and notably on the 21st and 22nd of the month, when the thermometer rose above 90° in many parts of the eastern, midland and southern counties, and exceeded 95° at Greenwich and Epsom. The earlier half of August witnessed a continuance of very warm weather, culminating on the 9th in shade temperatures of a higher level than any previously recorded at stations for which an extended series of observations is available. At a large number of places in eastern, central and south-eastern England, the thermometer exceeded 95°, a reading as high as 98° being observed at Epsom, Canterbury and Raunds, and a reading of 99° at Ponders End. The highest value was, however, reported at Greenwich, where the thermometer just succeeded in touching 100°, the reading being nearly 3° higher than anything recorded at the Royal Observatory since the commencement of unimpeachable temperature observations in 1841. The remarkable outburst of warmth did not by any means exhaust the capacities of a summer which proved, in many ways, of quite an exceptional character. Four days later, on August 13th, the thermometer again rose to 90° in several parts of England, and touched 92° at Tottenham and Raunds; while in the early days of September, when the summer should, according to recognised rules, have been at an end, still higher readings were observed in inland portions of our southern counties.

Between about the 7th and 18th of the month, the type of pressure distribution over the United Kingdom was mainly anticyclonic, and the winds variable, excepting on the 11th to 13th, when a decided breeze from the eastward or north-eastward prevailed. In the opening week a large shallow cyclonic system extended in from the Atlantic, and occasioned heavy falls of rain on the 4th and 5th in Ireland, Wales, and the neighbouring portions of England. Between the 19th and 22nd another shallow disturbance, which spread up originally from the south-westward, moved slowly eastwards across Ireland and England, its progress being attended by general thunderstorms on the 20th, and by heavy falls of rain in many districts on the 21st. In the closing week, depressions of greater intensity moved north-eastwards across the upper parts of the Atlantic, and produced in these Islands a distinct south-westerly type of conditions, the wind occasionally blowing with considerable strength on our extreme western and northern coasts. Over England there was still a preponderance of fair dry weather, but thunderstorms occurred on the 30th in most districts; in Ireland and Scotland the weather was very changeable. Although the thermometer remained above the average,

no very high temperatures were recorded after the middle of the month. In the last 10 days the nights were cool, ground frosts occurring on the nights of the 22nd, 23rd and 29th in several inland parts of Ireland, Scotland and Wales.

The mean temperature of the month was everywhere above the average, the excess amounting in the south of England to between 5° and 6°. In Ireland and the south-west of England the month was less warm than in 1899, but in the south and west of Scotland it was the warmest August since that of 1893, while in the south and east of England it was the warmest for at least 40 years past. The duration of bright sunshine was largely above the average, excepting in the Scilly Islands, where the excess was slight. In London (at Westminster) the aggregate of 243 hours was 75 hours in excess of the normal, and was 13 hours in excess of any August record since observations commenced in 1883.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

DISAPPEARANCE OF CLOUDS AT EVENING.

MIGHT I be allowed to offer an explanation of the disappearance of clouds in the evening, frequently observed under certain conditions of weather. This phenomenon, so far as I have observed, generally takes place in settled conditions and but little wind. These clouds are due to the sunshine heating the lower air, which rises and carries with it the vapour which has risen during the night and early morning. This hot, moist air rises till expansion cools it below the dew point, when it becomes visible as a cloud, which in reality is only the top of an invisible column of moist air. This cloud goes on rising so long as the sun keeps up a supply of moist air; but as the day advances the supply of moisture gets exhausted, and the sun's heat grows less and less, and the supply at last stops. While the cloud was ascending it was moving in dry air, consequently it was undergoing evaporation all over its upper surfaces, and when the rate of the ascending column slackens and stops, this evaporating process gradually dissolves the cloud as the rate of dissolution becomes greater than the rate of supply. Further, when these clouds become of small dimensions, they tend to fall, and in falling become heated and so dissipated.

With regard to the apparent difference in the amount of cloud overhead and on the horizon, this condition of sky is one that may be observed on any day when the air is clear and there are few clouds. Overhead the sky may be cloudless, yet one will almost always see clouds near the horizon, and if there are a few small clouds overhead,

the sky towards the horizon will probably be quite clouded. As suggested by Mr. Ellis in your last number, part of this may be due to perspective, but there is another and a more important cause, which is that clouds have three dimensions. We only see the length and breadth of clouds overhead, and while these dimensions seem to decrease as the clouds recede from us and approach the horizon, their vertical dimensions only then become visible. If the clouds were infinitely thin, this blocking action would not take place, but as the vertical dimensions of the clouds then come into view, they block the spaces between them. Take a crude illustration. Suppose the sky was one half covered with square patches of cloud distributed equally over the sky; in fact, imagine a chess board, and let the black squares represent clouds and the white clear sky. Suppose one were to look at a cloudy sky arranged like that, and that the clouds were infinitely thin. Then, if we looked vertically, one half of the sky would appear clouded, and if we looked towards the horizon, the sky would also be only one half clouded, but we would see far more clouds within a given angle. Now suppose, in place of the clouds having only length and breadth, we imagine they have a depth equal to their length and breadth. On looking up to such a sky, we would still find it only half covered overhead as before, but at a very slight angle from the vertical, about 45° in this case, the sky would appear wholly covered.

JOHN AITKEN.

Ardenlea, Falkirk, 26th August, 1911.

MR. W. ELLIS explains away the notion that the moon disperses clouds. He has not explained how otherwise they are dispersed at night. Perhaps the following explanation may be reasonable.

Cumulus is the characteristic cloud during daylight, and passes into stratus during night. Before and after sunset detached cumulus begins to disintegrate. The sky, where blue becomes light blue, and soon the welkin has a canopy of haze showing some stars. This is the case especially after hot sunshine. The clouds, descending with the decline of the sun, assume a lower level in passing into stratus, and this attaining a lower level becomes haze. Then, if the air is capable of taking up all the vapour of the haze, the air becomes moister, but is transparent. This going on, the lowest air becomes more and more moist, until the lowest temperature of the night is reached. Even then a thick stratum of air may not be saturated, so that neither rain nor dew can be condensed notwithstanding radiation. If air gets to the dewpoint, then dew or mist may form on the ground, in some localities fog. Even the air upon the ground may remain all night, showing humidity several degrees below 100. If the aqueous meteors are not entirely absorbed, the surplus remains as cloud or haze; or even, with an overcast sky to begin with, rain. Often the air being dry, especially after hot sunshine, the ground

also being hot, takes after sundown all the aqueous meteors, without any rain reaching the ground, so that clouds are dispersed, moon not being visible. It is in hot weather, when the air is nearly charged with vapour that the nights are not only hot, but the air is muggy and oppressive because evaporation from living subjects is impeded.

11, Offord Road, London, Sept. 4th, 1911. R. STRACHAN.

REFERRING to the letter of your correspondent "A.F." in your Magazine of last month, the appearance of cumulus clouds near the horizon when the zenith is clear is very familar to me; although, I must admit, that I have always seen a few small scattered cumuli above when these conditions have obtained.

This appearance seems to me to be largely due to perspective, but also to the fact that an observer, looking towards the horizon, sees through a much greater thickness of cloud-scattered atmosphere than when looking above.

A few small widely separated clouds are hardly noticeable, but when seen in larger numbers apparently near together, attract the attention. Having so very frequently noticed, at sea, the apparent anomally alluded to, I am tempted to offer this explanation.

CAMPBELL HEPWORTH.

2, Amherst Road, Ealing, W., Sept. 9th, 1911.

[Mr. W. Ellis, F.R.S., writes, in regard to the not infrequent occurrence of a certain condition of sky spoken of by A. F. (in the August number, page 140), that he has received a letter from a friend, a keen observer and lover of nature, who, though not suggesting any explanation thereof, writes as follows:—"As regards the prevalence of cloud round the horizon at sunset, I agree with A. F. that this is very common. I have frequently noticed before sunset at Westminster that the sky has apparently been clear from the zenith to as low down as I could see; and I have accordingly gone up to Hampstead Hill, and on arriving there have found the horizon all round, but especially near the sun, clouded up to about 15° or 20° above the horizon, although the rest of the sky was quite clear." We think that Dr. Aitken's theory accounts for this remarkable appearance which we have sometimes observed at sea for many hours, where the zenith of the observer at a given moment was the zenith of the point on the sea-horizon towards which the ship is moving half-an-hour before, and would be the zenith of the point on the sea-horizon directly astern half-an-hour later. When we first saw this effect we explained it by the fact that the sea-horizon was a circle of roughly 12 miles in diameter, while the clouds that were referred to the same imaginary circle were spread over a circle of sea of vastly greater diameter, and so even thinly scattered clouds appeared to be massed on the horizon as the stars do in the milky way. This is the same as Captain Hepworth's explanation, which reached us after the above note was written.—ED. *S.M.M.*]

THE GREENWICH TEMPERATURE OF 100° IN THE SHADE.

THE extraordinary reading of 100°·0 for the maximum temperature on the Glaisher stand on the 9th inst., so much higher than the previous oft-quoted "record" of 1881, July 15th, suggested as a matter of interest some lines of indirect comparison. The stand is, of course, the same stand first used at the end of 1840, but the position was altered at the beginning of 1899, when the standard thermometers were removed from the more and more congested site in the Observatory Grounds to the Magnetic Pavilion enclosure, which reproduced more faithfully the original type of conditions.

The new Thermograph was in use from 1887, but the old one was not finally dismounted until after the summer of that year, so that comparisons are possible for three sets of conditions.

Inferences may be drawn as follows :—

(1.) The high reading of August 9th is substantially confirmed by the Thermograph.

(2.) The new Thermograph is much more satisfactory than the old one.

(3.) The present position of the standard thermometers is at any rate not warmer than the old position.

Of this last inference additional confirmation is forthcoming, as in the Royal Observatory ground and also in the Pavilion Enclosure readings are regularly taken in Stevenson's screens; and with some exceptions we find a general rule that in hot weather the reading in the Royal Observatory ground is about one degree higher than in the Magnetic Pavilion enclosure, and that higher readings are frequently to be obtained of the dry bulb thermometers in both screens than of the maximum thermometers.

I have extracted a few of the highest readings in each period :—

(*a.*)			Stand in R.O. Ground.	Old Thermograph.	Corr. to Thermograph.	
1868.	July	22	96°·6	92°·7	+3°·9	
1881.	July	5	92·8	89·7	3·1	
	,,	15	97·1	93·2	3·9	
1884.	Aug.	11	94·2	91·5	2·7	
1887.	July	3	92·0	87·6	4·4	Mean
	,,	4	92·2	88·0	4·2	+3·7

(*b.*)			Stand in R.O. Ground.	New Thermograph.	Corr. to Thermograph.	
1893.	Aug.	16	93°·0	91°·2	+1°·8	
	,,	17	94·2	92·2	2·0	
	,,	18	95·1	93·3	1·8	Mean
1898.	Sept.	8	92·1	91·9	0·2	+1·5

(c.)			Stand in Mag. Pavilion Enclosure.		New Thermograph.		Corr. to Thermograph.	
			°		°		°	
1900.	July	16	94·0	.....	94·3	.....	−0·3	
	,,	25	93·0	.....	94·2	.....	−1·2	
1906.	Aug.	31	94·3	.....	93·1	.....	+1·2	
	Sept.	2	93·5	.....	93·8	.....	−0·3	
1911.	July	21	93·7	.....	93·0	.....	+0·7	
	,,	22	95·6	.....	95·1	.....	+0·5	Mean
	Aug.	9	100·0	.....	98·3	.....	+1·7	+0·3

On the day in question, the 9th inst., the maximum reading in the Stevenson Screen near the Standard was 96°·6, and in that in the Royal Observatory ground 97°·5.

It may be of interest to mention that I myself took the 3 p.m. observations of the Standard on the 9th inst., when the maximum read exactly 100°·0. I re-set the thermometer and completed the routine duty, and on looking again at the Stand found the maximum again reading 100°·0. The Thermograph also confirms this, for its first maximum occurred at 3 p.m., and after a short drop was repeated almost continuously until 3.30 p.m.

WALTER W. BRYANT.

Royal Observatory, Greenwich, London, S.E., Aug. 15th, 1911.

OUR PERMANENT SNOW SPOTS.

In reply to Mr. Gethin Jones' letter in your last issue, the following information may be of interest. Mr. Gethin Jones' letter is headed "The Latest Snow Spot," but as at least two of the snow beds mentioned in this letter have never been known to disappear, the title "Latest Snow Spots" would not be quite accurate for them. With regard to the snow beds of Ben Nevis, I am indebted to Mr. Miller for the following facts. On August 28th there was on Ben Nevis a good big patch of snow below the place where the ashes from the old Observatory used to be thrown over the cliff, and two other beds looking towards the cliff from the top of the Tower Ridge, Mr. Miller says he does not think these two beds will thaw this year now. One of them, presumably, must be the famous permanent snow bed of the Observatory Gully, described by me in your Magazine, vol. **40** (1905), p. 29, and by Mr. V. H. Gatty in the *Geographical Journal*, vol. **27** (1906), p. 487. During the last fortnight of July Mr. Miller says there were heavy showers of snow on the Ben, and on one or two occasions there were 2 to 3 inches lying on the summit, "except for that experience we have enjoyed more or less a tropical summer, an exceptional experience for the Western Highlands."

With regard to the Cairngorms, Mr. Seton Gordon writes me as follows, under date August 26th :—"Although up to now the summer has been a very dry one on the hills, still, the heat—with the exception of a few days—has been nothing exceptional, and there is still a certain amount of snow in the Cairngorms. Monadh Mhor

(3,651 ft.) still retains a single field which is very slow indeed in disappearing. The snow field on Braeriach is quite as big as last year; but the snow beds on Ben Muich Dhui are, I think, somewhat smaller, and there is some slight chance of their disappearing. There has been a marked absence this season of the strong and soft winds from the S.W., and these, I think, do more to melt the snow than hot calm days." Mr. Gordon hopes to compare the Cairngorm beds with those lying under Ben Nevis and the Aonachs, and in this I hope he will be successful, as the beds of the latter mountain have never been investigated.

R. P. DANSEY.

PLANETARY RAINFALL.

SOME years ago I made a comparison between some annual values of rainfall at Buenos Aires, published by Mr. W. G. Davis, and the annual values at Cape Town. A more detailed investigation would have been of great interest, no doubt, had I been able to get the monthly falls for the South American station. However so far as the available material goes it seems to suggest that Buenos Aires and Cape Town are in the same rain system, and agree better with each other than Cordoba agrees with the north-east of England, as claimed by Mr. Mossman's results given in this Magazine in June last.

The following are percentages of the annual mean for 40 years:—

	Buenos Aires. per cent.	Cape Town. per cent.		Buenos Aires. per cent.	Cape Town. per cent.
1861	60	99	1881	100	99
1862	110	124	1882	109	114
1863	82	99	1883	134	124
1864	83	73	1884	119	109
1865	85	72	1885	98	108
1866	90	74	1886	103	107
1867	62	89	1887	76	89
1868	117	77	1888	107	140
1869	126	125	1889	145	120
1870	103	108	1890	93	102
1871	77	78	1891	103	117
1872	78	114	1892	75	159
1873	87	92	1893	64	91
1874	108	101	1894	85	87
1875	89	100	1895	144	110
1876	104	103	1896	88	66
1877	95	138	1897	87	78
1878	109	159	1898	107	111
1879	70	72	1899	120	104
1880	90	69	1900	215	82

This shows agreement in 32 years, and disagreement in eight years.

The five years' (1906—10) drought at Buenos Aires, which Mr. Mossman mentions, has also been paralleled by a considerable shortage of rain in the same period at Cape Town.

J. R. SUTTON.

Kimberley, July 15th, 1911.

[It should be noted that the relation Mr. Mossman traced between the rainfall of Cordoba and the north-east of England was an inverse resemblance between the seasons, a dry late summer and early autumn (January to March) at Cordoba being followed by a wet late summer and early autumn (July to September) in the north-east of England.—Ed., *S.M.M.*]

Robert Atherton Edwin.

London, 1839 — Wellington, 1911.

Commander Robert Atherton Edwin, R.N., who died at Wellington, New Zealand, on July 15th, at the age of 71, was a veteran meteorologist who, for 25 years, prepared and issued daily weather forecasts for a country extending north and south for nearly a thousand miles.

Captain Edwin was born in London, in 1839, and educated at Wimborne Minster Grammar School, Dorsetshire. On January 14th, 1853, he entered the Royal Navy as a naval cadet. He was wounded at the action of Sevastopol on October 17th, 1854. He was present at the capture of Canton, and was also in New Zealand during the early part of the Maori War. He retired from the Royal Navy in 1871, and became a Nautical Examiner for the New Zealand Government, an office he held until 1900.

Captain Edwin had studied meteorology in England and in the Royal Navy, and he was entrusted with the duty of establishing the Weather Bureau in connection with the Marine Department and the Telegraph Office of New Zealand, and as "Weather Reporter" he developed a system of reports and forecasts which won public approval. The Meteorological Office for climatological work had been established in 1867, and carried on by the late Sir James Hector, F.R.S., but the two branches were kept separate until 1907, when they were united under Captain Edwin as the first Director.

In the beginning of 1909 Captain Edwin retired on a pension, but he was active until almost the last week of his life. His genial nature and wide acquaintance infused a singular brightness and happiness into the eventide of a long and honourable career.

Captain Edwin took the kindliest interest in veteran sailors and soldiers, cheering and helping them in various ways. He was an enthusiastic member of the Navy League, and a founder of the Wellington branch. His principal pastime was the old English game of bowls, in which he was an expert, and he was President of the New Zealand Association for a time.

His work as a meteorologist was necessarily confined very much to his daily labours, but he wrote papers for the Royal Meteorological Society, of which he was a Fellow for several years, and valuable results of his investigations were published in the volumes of the New Zealand Institute for the years 1879 and 1904, and in other journals.

D. C. B.

INTERNATIONAL BALLOON ASCENTS.

FEBRUARY AND MARCH, 1909.

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

February 4th, 1909.

Starting Point.	Country.	A miles.	B ° F.	C miles.	D ° F.	E miles.	F
Petersfield	England	7·5	—92	9·5	—81	268	E.S.E.
Lindenberg....	Germany....	7·1	—71	7·6	(?)	182	S.E.
Paris	France.....	7·5	—72	8·4	—81	164	S.E.
Pavia	Italy.....	8·3	—94	9·8	—76	96	S.S.E.
Pavlovsk	Russia	5·8	—79	8·8	—87	31	E. by S.
Kuchino	,, ...	6·0	—73	9·4	—78	21	E. by N.
Nizhni Olchadaeff	,, ...	5·4	—62	7·7	—56	36	E.S.E.

The isothermal region was high in the west and south and low in the east, and the temperatures not unusual for the time of year. An extensive cyclonic area was moving eastwards over North and Middle Europe, while a high pressure area lay over Spain, with an extension towards the Alps.

March 4th, 1909.

Manchester....	England	5·0	—67	6·6	—62	10	S. by E.
Pyrton Hill....	,, ...	5·0	—55	6·3	—49	11	N.N.W.
Brussels	Belgium	5·1	—63	13·0?	—69	44	N.E.
Lindenberg....	Germany....	4·8	—60	10·4	—49?	46	N.E.
Paris.....	France	4·7	—58	8·2	—54	63	E.?
Strassburg	Germany....	4·7	—62	5·7	—58	48	N.N.E.
Kuchino	Russia	6·2	—87	9·7	—72	48	N.

A large and deep depression lay over the Channel with high pressure over Iceland and Russia. At many stations the wind was so strong that no ascent could take place. In accordance with the general rule, the isothermal in the low pressure regions was very low, and the temperature high. The consistency of the observations is unusually good. Taking the type of weather into account, the small distances travelled by the balloons are noticeable. On this occasion at least the depression was not an eddy produced by a strong westerly upper current.

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.

RAINFALL TABLE FOR AUGUST, 1911.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875—1909.	1911.
		° ′	° ′		in.	in.
Camden Square	*London*	51 32	0 8	111	2·39	·49
Tenterden	*Kent*	51 4	*0 41	190	2·42	1·20
Arundel (Patching)	*Sussex*	50 51	0 27	130	2·52	1·26
Southampton (Cadland)	*Hampshire*	50 50	1 22	52	2·85	·86
Oxford (Magdalen College)	*Oxfordshire*	51 45	1 15	186	2·44	1·04
Wellingborough (Croyland Abbey)	*Northampton*	52 18	0 41	174	2·38	1·77
Shoeburyness	*Essex*	51 31	*0 48	13	1·74	1·55
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	2·52	1·56
Geldeston [Beccles]	*Norfolk*	52 27	*1 31	38	2·22	·46
Polapit Tamar [Launceston]	*Devon*	50 40	4 22	315	3·17	1·78
Rousdon [Lyme Regis]	,,	50 41	3 0	516	2·84	·41
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·90	1·87
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	3·43	1·58
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	2·81	1·57
Boston	*Lincolnshire*	52 58	0 1	25	2·39	2·78
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	2·55	1·65
Macclesfield	*Cheshire*	53 15	2 7	501	3·76	2·74
Southport (Hesketh Park)	*Lancashire*	53 38	2 59	38	3·73	3·62
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	2·78	2·18
Arncliffe Vicarage	,, ,,	54 8	2 6	732	5·62	4·21
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	3·05	2·23
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	3·20	3·12
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	11·47	9·93
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	4·54	2·11
Haverfordwest	*Pembroke*	51 48	4 58	95	4·21	4·20
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	4·88	5·91
Llandudno	*Carnarvon*	53 20	3 50	72	3·16	2·94
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	4·23	3·47
Marchmont House	*Berwick*	55 44	2 24	498	3·54	1·54
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	4·54	2·31
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	3·62	2·42
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	6·02	7·95
Mull (Quinish)	,,	56 34	6 13	35	5·00	3·64
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	3·34	1·13
Braemar	*Aberdeen*	57 0	3 24	1114	3·63	1·14
Aberdeen (Cranford)	,,	57 8	2 7	120	3·07	1·11
Cawdor	*Nairn*	57 31	3 57	250	3·05	·56
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	3·52	3·99
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	6·61	6·31
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·71	·78
Wick	*Caithness*	58 26	3 6	77	2·73	1·23
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	4·57	2·70
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	3·73	2·56
Nenagh (Castle Lough)	*Tipperary*	52 54	8 24	120	4·04	2·36
Miltown Malbay	*Clare*	52 52	9 26	400	4·98	2·65
Gorey (Courtown House)	*Wexford*	52 40	6 13	80	3·31	2·34
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	3·94	3·15
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	3·08	·87
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	4·00	1·99
Ballinasloe	*Galway*	53 20	8 15	160	3·96	2·61
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	4·68	2·97
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	4·30	3·47
Seaforde	*Down*	54 19	5 50	180	3·64	1·85
Bushmills (Dundarave)	*Antrim*	55 12	6 30	162	4·06	1·68
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	4·22	3·21

RAINFALL TABLE FOR AUGUST, 1911—*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. 1875—1909. in.	1911. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1875-1909. in.	STATION.
—1·90	21	·22	20	7	15·92	12·54	—3·38	79	25·11	Camden Square
—1·22	50	·88	20	5	16·07	11·06	—5·01	69	27·64	Tenterden
—1·26	50	·46	30	8	17·44	11·66	—5·78	67	30·48	Patching
—1·99	30	·39	30	8	18·58	11·67	—6·91	63	31·87	Cadland
—1·40	43	·24	25	10	15·47	9·18	—6·29	59	24·58	Oxford
— ·61	74	·82	21	12	16·06	10·57	—5·49	66	25·17	Croyland Abbey
— ·19	89	·88	21	6	11·47	8·85	—2·62	77	19·28	Shoeburyness
— ·96	62	1·16	21	6	15·96	12·21	—3·75	76	25·40	Westley
—1·76	21	·19	25	7	14·20	10·14	—4·06	71	23·73	Geldeston
—1·39	56	·48	5	15	21·79	15·95	—5·84	73	38·27	Polapit Tamar
—2·43	14	·14	28	7	19·85	10·56	—9·29	53	33·54	Rousdon
—1·03	64	·66	21	13	18·73	12·05	—6·68	64	29·81	Stroud
—1·85	46	·58	27	11	20·31	12·92	—7·39	64	32·41	Wolstaston
—1·24	56	·34	21	13	18·16	9·60	—8·56	53	28·98	Coventry
+ ·39	116	·99	21	11	14·60	11·39	—3·21	78	23·35	Boston
— ·90	65	·62	27	13	15·70	8·58	—7·12	55	24·46	Hodsock Priory
—1·02	73	·86	27	14	21·93	16·38	—5·55	75	34·73	Macclesfield
— ·11	97	1·11	5	13	19·61	15·11	—4·50	77	32·70	Southport
— ·60	78	·90	20	11	16·97	13·16	—3·81	78	26·87	Ribston Hall
—1·41	75	·95	7	14	37·59	39·78	+2·19	106	61·49	Arncliffe
— ·82	73	·68	27	11	16·52	12·83	—3·69	78	26·42	Hull
— ·08	98	1·62	21	15	17·65	15·67	—1·98	89	27·94	Newcastle
—1·54	87	2·50	4	14	76·76	82·60	+5·84	108	129·48	Seathwaite
—2·43	46	·50	27	12	25·02	18·10	—6·92	72	42·28	Cardiff
— ·01	100	1·48	4	13	27·05	21·72	—5·33	80	46·81	Haverfordwest
+1·03	121	1·27	27	15	27·03	23·97	—3·06	89	45·46	Gogerddan
— ·22	93	·97	4	12	18·05	14·29	—3·76	79	30·36	Llandudno
— ·76	82	1·02	31	12	26·49	26·95	+ ·46	102	43·47	Cargen
—2·00	43	·41	5	13	21·22	15·97	—5·25	75	33·76	Marchmont
—2·23	51	·53	24	15	29·37	27·24	—2·13	93	49·77	Girvan
—1·20	67	·80	31	12	22·04	21·53	— ·51	98	35·97	Glasgow
+1·93	132	2·50	31	18	40·06	52·50	+12·44	131	68·67	Inveraray
—1·36	73	·82	28	18	32·67	33·82	+ 1·15	104	56·57	Quinish
—2·21	34	·23	19	14	18·20	7·60	—10·60	42	28·64	Dundee
—2·49	31	...	...	...	21·43	15·79	—5·64	74	34·93	Braemar
—1·96	36	·30	9	15	20·09	13·48	—6·61	67	32·73	Aberdeen
—2·49	18	·16	31	6	18·70	15·76	—2·94	84	29·33	Cawdor
+ ·47	113	·88	31	17	26·72	25·60	—1·12	96	44·53	Fort Augustus
— ·30	95	1·22	7	19	49·35	59·41	+10·06	121	83·61	Bendamph
—1·93	29	·23	20	10	19·90	15·85	—4·05	80	31·90	Dunrobin Castle
—1·50	45	·26	20	18	18·11	17·05	—1·06	94	29·88	Wick
—1·87	59	·86	1	17	32·97	27·19	—5·78	82	54·81	Killarney
—1·17	69	·76	4	12	24·26	19·90	—4·36	82	39·57	Waterford
—1·68	58	·43	2	17	24·57	20·84	—3·73	85	39·43	Castle Lough
—2·33	53	·55	11	19	27·28	21·13	—6·15	77	45·11	Miltown Malbay
— ·97	71	·98	5	14	21·63	14·32	—7·31	66	34·99	Courtown Ho.
— ·79	80	·49	28	19	22·77	20·45	—2·32	90	35·92	Abbey Leix
—2·21	28	·16	28	15	17·83	11·59	—6·24	65	27·68	Dublin
—2·01	49	·35	23	16	23·17	20·24	—2·93	87	36·15	Mullingar
—1·35	66	·40	5	16	23·18	20·30	—2·88	88	36·64	Ballinasloe
—1·71	64	·45	31	22	31·32	26·71	—4·61	85	52·87	Enniscoe
— ·83	81	·54	2	20	26·49	23·04	—3·45	87	42·71	Markree
—1·79	51	·49	23	12	24·38	16·71	—7·67	69	38·91	Seaforde
—2·38	41	·25	5	15	22·83	17·76	—5·07	78	37·56	Dundarave
—1·01	76	·72	31	15	24·66	22·60	—2·06	92	39·38	Omagh

SUPPLEMENTARY RAINFALL, AUGUST, 1911.

Div.	STATION.	Rain inches	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road	·48	XI.	Lligwy	3·33
,,	Ramsgate	·91	,,	Douglas	1·93
,,	Hailsham	1·28	XII.	Stoneykirk, Ardwell House	1·85
,,	Totland Bay, Aston House.	·50	,,	Dalry, The Old Garroch	3·96
,,	Stockbridge, Ashley	...	,,	Langholm, Drove Road	4·72
,,	Grayshott	1·25	,,	Beattock, Kinnelhead	4·24
,,	Reading, Calcot Place	1·07	XIII.	StMary'sLoch,CramiltLdge	2·68
III.	Harrow Weald, Hill House.	·88	,,	North Berwick Reservoir	1·28
,,	Pitsford, Sedgebrook	1·56	,,	Edinburgh, Royal Observty.	1·19
,,	Woburn, Milton Bryant	1·31	XIV.	Maybole, Knockdon Farm..	2·50
,,	Chatteris, The Priory	2·21	XV.	Campbeltown, Witchburn	2·56
IV.	Colchester, Lexden	·96	,,	Glenreasdell Mains	3·05
,,	Newport	·42	,,	Holy Loch, Ardnadam	7·15
,,	Rendlesham	·73	,,	Ballachulish House	2·77
,,	Swaffham	·69	,,	Islay, Eallabus	2·67
,,	Blakeney	1·48	XVI.	Dollar Academy	2·97
V.	Bishops Cannings	2·05	,,	Balquhidder, Stronvar	7·12
,,	Winterbourne Steepleton	·76	,,	Coupar Angus	1·59
,,	Ashburton, Druid House	1·97	,,	Glenlyon, Meggernie Castle.	5·48
,,	Okehampton, Oaklands	1·76	,,	Blair Atholl	2·53
,,	Cullompton	2·67	,,	Montrose,SunnysideAsylum	·91
,,	Hartland Abbey	2·84	XVII.	Alford, Lynturk Manse	1·44
,,	Lynmouth, Rock House	2·49	,,	Fyvie Castle	1·33
,,	Probus, Lamellyn	1·19	,,	Keith Station	·81
,,	North Cadbury Rectory	2·24	XVIII.	Glenquoich, Loan	13·30
VI.	Clifton, Pembroke Road	1·80	,,	Skye, Dunvegan	7·63
,,	Ross, The Graig	1·59	,,	N. Uist, Lochmaddy	3·89
,,	Shifnal, Hatton Grange	1·17	,,	Alvey Manse	1·25
,,	Blockley, Upton Wold	1·50	,,	Loch Ness, Drumnadrochit.	1·80
,,	Droitwich	1·79	,,	Glencarron Lodge	5·57
VII.	Market Overton	1·49	XIX.	Invershin	·99
,,	Market Rasen	1·69	,,	Loch Stack, Ardchullin	4·39
,,	Bawtry, Hesley Hall	1·44	,,	Melvich	1·89
,,	Derby, Midland Railway	1·69	XX.	Skibbereen Rectory	2·49
,,	Buxton	2·75	,,	Dunmanway, The Rectory..	3·39
VIII.	Nantwich, Dorfold Hall	1·82	,,	Cork	2·32
,,	Chatburn, Middlewood	3·06	,,	Mitchelstown Castle	1·96
,,	Cartmel, Flookburgh	3·49	,,	Darrynane Abbey	2·89
IX.	Langsett Moor, Up. Midhope	3·28	,,	Glenam [Clonmel]	2·06
,,	Scarborough, Scalby	3·76	,,	Newmarket-on-Fergus,Fenloe	2·22
,,	Ingleby Greenhow	2·46	XXI.	Laragh, Glendalough	2·41
,,	Mickleton	2·54	,,	Balbriggan, Ardgillan	2·34
X.	Bellingham, High Green Manor	4·35	,,	Moynalty, Westland	2·28
,,	Ilderton, Lilburn Cottage	1·77	XXII.	Cong, The Glebe	3·75
,,	Keswick, The Bank	3·69	,,	Westport, St. Helens	3·33
XI.	Llanfrechfa Grange	2·55	,,	Achill Island, Dugort	3·67
,,	Treherbert, Tyn-y-waun	6·70	,,	Mohill, The Rectory	2·90
,,	Carmarthen, The Friary	4·05	XXIII.	Enniskillen, Portora	...
,,	Castle Malgwyn [Llechryd].	3·05	,,	Dartrey [Cootehill]	1·66
,,	Plynlimon	8·20	,,	Warrenpoint, Manor House	1·70
,,	New Radnor, Ednol	3·54	,,	Banbridge, Milltown	1·04
,,	Rhayader, Tyrmynydd	5·46	,,	Belfast, Cave Hill Road	2·54
,,	Lake Vyrnwy	4·42	,,	Glenarm Castle	2·36
,,	Llangyhanfal, Plâs Draw	3·60	,,	Londonderry, Creggan. Res.	2·57
,,	Dolgelly, Bryntirion	7·19	,,	Killybegs	4·23
,,	Bettws-y-Coed, Tyn-y-bryn	4·64	,,	Horn Head	2·92

METEOROLOGICAL NOTES ON AUGUST, 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, extremely hot and sunny throughout. An absolute drought extended from 2nd to 18th, this being the third of the present year. Mean temp. 68°·2, or 5°·9 above the average, and the highest yet recorded in August.‡ Duration of rain 9·2 hours and of sunshine 207·4* hours; one sunless day. Evaporation 3·19 in. Shade max. 97°·1 on 9th, the highest shade temperature ever recorded at Camden Square; min. 48°·4 on 31st. F 0, f 0.

TENTERDEN.—Hot and dry, with temp. on three days over 90°·0. Drought broke on 20th with severe TS in evening. Shade max. 95°·0 on 9th; min. 46°·0 on 31st. F 0, f 0.

TOTLAND BAY.—The R was the lowest for 25 years. Duration of sunshine, 252* hours, the greatest yet recorded in August. Partial drought from June 30th—August 27th, with ·38 in. of R. Shade max. 86°·6 on 13th, the highest reading for 25 years; min. 48°·3 on 31st. F 0, f 0.

PITSFORD.—R ·31 in. below the average. Mean temp. 65°·9. Shade max. 96°·5 on 9th; min. 43°·6 on 31st. F 0.

POLAPIT TAMAR.—A very hot and dry month. Shade max. 85°·0 on 14th; min. 41°·0 on 31st. F 0, f 0.

ROSS.—From May 27th to August 20th (86 days) the R was only 1·62 in. Shade max. 92°·6 on 9th; min. 43°·9 on 31st. F 0, f 0.

HODSOCK PRIORY.—The mean temp. and the extreme max. were the highest recorded in any month since the record commenced in 1879. Shade max. 94°·4 on 9th; min. 41°·7 on 17th. F 0, f 0.

BUXTON.—Mean temp. 61°·6, or 4°·8 above the average of 35 years. Duration of sunshine 205·5* hours, or 62 above 25 years' average. Shade max. 88°·4 on 9th, the highest temp. ever recorded here; min. 43°·0 on 31st. F 0, f 0.

SOUTHPORT.—Duration of sunshine 264·4* hours, or 85·5 hours above the average, and 40 hours above the highest previous value in 20 years. Mean temp. 63°·9, or 4°·4 above the average, and the highest value for any month in the 41 years' record. Duration of R, 42·5 hours. Shade max. 87°·4 on 13th; min. 47°·9 on 16th. F 0, f 0.

HULL.—Shade max. 88°·0 on 9th; min. 46°·0 on 17th. F 0, f 0.

HAVERFORDWEST.—Shade max. 84°·9 on 13th; min. 41°·2 on 3rd. F 0, f 0.

CARGEN.—Absolute drought for 18 days, from 7th to 24th. Shade max. 86°·0 on 13th; min. 41°·0 on 23rd. F 0.

EDINBURGH.—Shade max. 78°·7 on 9th; min. 45°·6 on 16th. F 0, f 0.

COUPAR ANGUS.—R 1·86 in. below the average. Mean temp. 60°·9, the highest yet recorded. Shade min. 40°·0 on 17th. F 0, f 0.

FORT AUGUSTUS.—Shade max. 76°·9 on 9th; min. 42°·7 on 17th. F 0.

CORK.—Shade max. 73°·0 on 13th; min. 45°·0 on 10th and 30th. F 0, f 0.

DUBLIN.—A very fine, warm month. Mean temp. 62°·8. The R was the smallest recorded in August since 1884. TS 8 on 12th, 13th and 28th. Shade max. 78°·1 on 17th. F 0, f 0.

MARKREE.—Duration of sunshine 193·5* hours. Shade max. 82°·2 on 13th; min. 35°·3 on 23rd. F 0, f 1.

WARRENPOINT.—A fine, warm month. A peculiarly warm wind sprang up about 8.30 p.m. on 8th, coming from W.N.W. in alternately cool and warm gusts. Shade max. 76°·0 on 13th; min. 53°·0 on 5th. F 0 0.

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* Campbell-Stokes. † Jordan ‡ See p. 153.

Climatological Table for the British Empire, March, 1911.

STATIONS (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	61·5	22	28·8	17	49·2	36·4	37·8	87	94·9	24·4	1·73	18	6 9
Malta	72·5	27	45·5	6	61·6	52·9	49·7	81	132·5	...	1·21	8	5·8
Lagos	92·0	4*	69·9	5	87·9	75·2	74·3	73·8	151·0	67·2	11·26	13	...
Cape Town	97·0	4	50·4	21	80·2	59·2	57·9	67	...	...	·26	7	3·0
Johannesburg	80·9	2	43·4	24	70·5	53·6	52·9	79	147·6	43·1	2·59	12	5·3
Mauritius	85·3	16	65·2	24	82·0	71·9	70·0	81	159·4	57·9	12·13	20	6·8
Calcutta...	96·2	1	58·6	24	90·5	69·0	61·8	64	...	51·3	1·95	3	2·2
Bombay...	90·0	15	69·3	20	85·9	72·8	67·5	70	135·0	61·9	0·00	...	1·2
Madras	94·9	8	64·6	1	90·0	72·9	72·2	77	142·2	61·5	0·00	...	1·0
Kodaikanal	73·4	24	46·0	2	70·0	50·6	44·0	60	141·3	29·2	·14	5	3·0
Colombo, Ceylon ...	96·1	11	72·8	31	90·2	74·7	72·6	75	142·9	70·0	2·39	4	3·3
Hongkong	79·1	16	54·2	18	69·5	61·8	60·5	83	125·5	...	3·81	12	8·1
Sydney	85·0	27	55·9	21	75·3	61·6	56·6	66	158·0	46·8	1·95	19	5·1
Melbourne	88·3	5	49·1	20	72·1	56·6	53·8	69	146·5	43·8	7·50	17	6·3
Adelaide	100·0	5	49·9	16‡	77·9	58·0	51·8	58	161·9	39·7	·88	6	5·2
Perth	96·8	8	46·9	18	79·9	60·0	54·4	61	155·3	39·3	·14	5	5·3
Coolgardie	1·0·0	9	42·2	18	82·5	57·6	48·7	51	169·0	39·2	·35	4	4·3
Hobart, Tasmania ..	80·1	11	44·2	20	67·5	53·4	50·1	70	146·4	39·3	5·41	18	6·4
Wellington	73·2	18	48·0	11	67·6	57·7	53·7	73	120·0	39·0	·34	8	6·9
Auckland	76·5	3	55·5	26	72·4	60·2	62·5	88	151·0	52·0	2·32	11	6·3
Jamaica, Kingston ..	86·6	6	63·2	7	85·8	66·3	64·6	74	...	...	2·05	6	3·2
Grenada	90·0	9†	68·0	11	85·3	71·9	...	66	142·0	...	·96	14	3·5
Toronto	55·2	27	1·3	16	37·3	23·0	...	...	64·4	—0·8	2·05	18	4·9
Fredericton	49·5	26	—10·0	7	34·6	10·9	...	80	...	...	3·48	8	5·3
St. John, N.B. ...	46·1	28	2·3	1	34·5	19·6	...	71	...	...	4·71	12	4·8
Victoria, B.C.	57·1	15	27·2	2	51·8	35·7	...	78	...	...	1·93	9	5·0
Dawson	37·0	28	—47·0	13	15·5	—7·5	...	...	...	...	0·77	11	5·1

* and 11. † and 27. ‡ and 31.

Kodaikonal—Jan.	71·9	14	43·0	26	65·2	48·2	28·1	52	120·6	19·2	·21	3	3·5
,, —Feb.	74·2	25	39·8	7	66·7	45 2	35·9	53	132·9	19·3	·24	2	2·2

MALTA.—Mean temp. of air, 56°·2. Average bright sunshine, 6·6 hours per day.

Mauritius.—Mean temp. of air 1°·3, dew point 0°·9 below, and R 2·85 in. above, averages. Mean hourly velocity of wind 12·8 miles, or 3·4 above average.

COLOMBO.—Mean temp. of air 80°·6, or 1°·4 below, of dew point 0°·3 above, and R 1·94 in. below, averages. Mean hourly velocity of wind 4·3 miles. TSS on 2 days.

HONGKONG.—Mean temp. of air 65°·5, or 2°·8 above, R ·95 in. above, and bright sunshine 24 hours above, averages. Mean hourly velocity of wind 14·8 miles.

Sydney.—Mean temp. of air 0°·6 below, and R 3·13 in. below, averages.

Melbourne.—Mean temp. of air 0°·3 below, and R 5·39 in. above, averages.

Perth.—Mean temp. of air 1°·2 below, and R ·61 in. below, averages.

Coolgardie.—Mean temp. of air 2°·0 below, and R ·28 in. below, averages.

Hobart, Tasmania.—Mean temp. of air 1°·0 above, and R 3·80 in. above, averages.

Wellington.—Mean temp. of air 2°·3 above, and R 3·12 in. below, averages.

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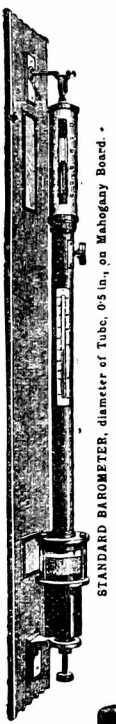

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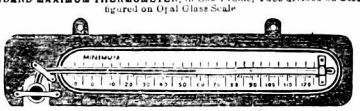

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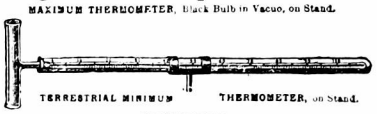

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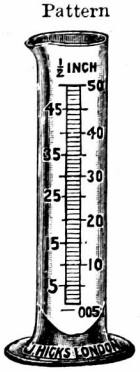

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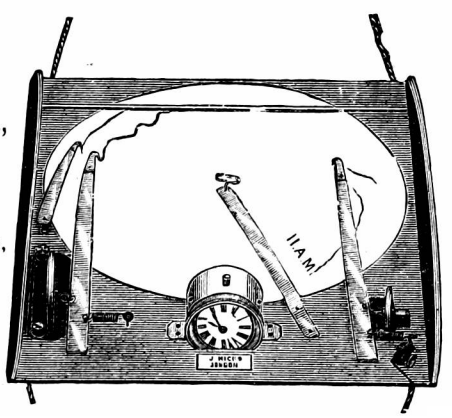

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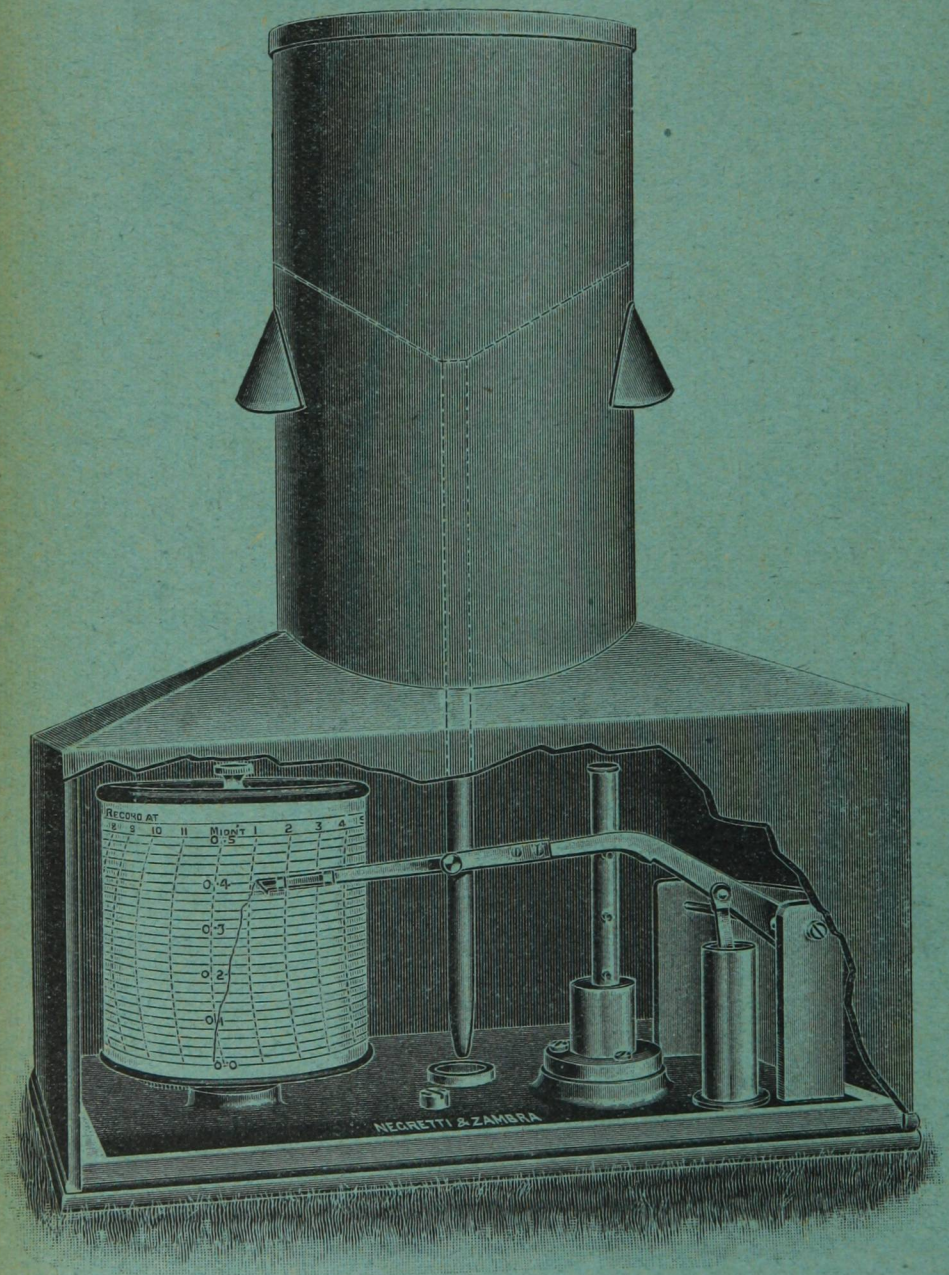

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