

# Symons's Meteorological Magazine.

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## THE LOWEST TEMPERATURE ON THE EARTH'S SURFACE.

THE good news that Commander Robert E. Peary, U.S.N., reached the North Pole on April 6th, 1909, comes to us just as we are leaving on a short holiday. Mr. Peary has striven for this goal for many years, and has won his way to the highest regard of the geographers of the world by his courage, resourcefulness and perseverance. The accuracy of his observations in the past, and the high character which has led him never to minimize failure or exaggerate success, makes his announcement sure of instant credence; but he has earned this credit by twenty-three years of unceasing effort in one direction, and by never making any claim on public faith unbacked by the clearest proofs.

The news came as we were correcting the proof of the following article, which we leave unchanged, the three days of continuous interviewing that Dr. Cook has undergone since it was written having revealed nothing to alter our opinions. He states, however, that the temperatures were Fahrenheit, not Centigrade; and that a glass artificial horizon was used in determining his latitude.

Owing to circumstances connected with the holiday season this number of the Magazine has to go to press at an earlier date than usual, and, when it comes to be read, the references in the newspapers which suggest this article may possibly have been corrected or amplified. The statement is made on the strength of a telegram from Lerwick, by Dr. F. A. Cook, that in the course of a journey to the North Pole he experienced a temperature of  $-83^{\circ}$  C. Dr. Cook is represented as stating that he reached the North Pole on April 21st, 1908, and from the particulars he gives of the route by which he travelled, we see no reason to doubt the accomplishment of the feat; but he states other things which appear to us a great deal more remarkable than reaching the pole, which, after all, only meant going 114 geographical miles farther than Commander Peary did in 1906. We cannot understand how he was able to determine local noon at the North Pole, on April 21st. So far as we understand it is either always local noon at the pole, if noon is taken at the southing of the

sun, or else local noon only occurs once a year, at the moment when the sun stands at its maximum altitude at the summer solstice ; and to determine the precise instant when that occurs on June 22nd, must be an operation of great delicacy. The telegram, which we quote from *The Times*, says "On April 21st the corrected altitude of the sun gave 89 deg. 59 min. 46 sec. The Pole therefore was in sight. We advanced the 14 sec., made supplementary observations, and prepared to stop long enough to permit a double round of observations. The sun indicated local noon, but time was a negative problem, for here all meridians meet." We cannot imagine how time could ever be a negative problem. Dr. Cook will no doubt explain in due time how the position was determined. It will suffice to exhibit the instrument he employed to obtain the altitudes, and prove that he is able to distinguish so small a difference as 14 seconds of arc. This will be necessary before what would otherwise have been a fairly clear and straightforward narrative can be credited and his claim to have reached the North Pole accepted. Most polar explorers consider themselves extremely fortunate if they secure observations to fix their position to within a few minutes of latitude ; and we had no idea that so close an approximation in determining latitude as 14 seconds was possible with any portable instrument.

We have, perhaps, travelled outside our province in this Magazine in referring to this question of latitude, but a precisely similar difficulty attaches to the temperature of  $-83^{\circ}$  C., stated by Dr. Cook to have been measured, presumably in February 1908, "when crossing the heights bordering Ellesmere Sound," presumably in latitude  $74^{\circ}$  N. This temperature corresponds to  $-117^{\circ}$  F., and if authentic, marks the greatest degree of cold ever recorded on the Earth's surface. Temperatures down to  $-120^{\circ}$  F. have been recorded in the ascents of free balloons at altitudes exceeding 30,000 feet ; but so far as we are aware the lowest temperature ever previously recorded on the Earth's surface was  $-90^{\circ}$  F. at Verkhoyansk in eastern Siberia just within the Arctic circle on January 15th, 1885. No temperatures approaching this in severity have previously been encountered on polar expeditions. The lowest at the winter quarters of the *Alert* in  $82^{\circ} 27' N.$ , in March 1876, was  $-73^{\circ} 8' F.$ , and the lowest which occurred during the drift of the *Fram* on Dr. Nansen's expedition of 1893-96, was  $-63^{\circ} F.$ , and the vessel passed one winter north of  $85^{\circ} N.$ \*

The difficulty of managing spirit thermometers is familiar to everyone who conducts the humdrum observations in the moderate warmths and coolnesses of the British climate ; and we are assured

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\* Dr. Cook explains that the word "centigrade" was inserted in his telegram by error instead of "Fahrenheit," but we are not informed how so serious and unusual an error came to be made. He adds that temperatures of  $-83^{\circ} F.$  are common in the Arctic regions, and this we have difficulty in accepting, as  $-73^{\circ} 8' F.$  is the lowest authentic temperature reported by any polar explorer to whose records we are able to refer.

by polar travellers that the troubles are not less but infinitely greater in conditions of extreme cold, and especially when travelling. Unless specially constructed no thermometer could be found to read to one hundred degrees below zero Fahrenheit, and if the degree marks are open enough for easy reading the length of the instrument would be apt to make its transport exceedingly inconvenient. We sincerely trust that Dr. Cook will take an early opportunity of describing his instruments and the methods of using them, and so place in the hands of men of science some data by which they can judge of the limits within which they may be relied upon.

We do not in any way wish to detract from Dr. Cook's remarkable journey, or to throw doubt on anything he has said; but the somewhat hysterical style of the telegrams which have as yet appeared makes it difficult to judge how far the positions and temperatures are to be taken in a scientific sense. We trust that polar exploration will not be neglected even if the stimulus of being first to reach the Pole is withdrawn; and we anticipate a magnificent harvest of meteorological and oceanographical data from the voyage now being arranged for by Captain Roald Amundsen in Dr. Nansen's old ship the *Fram*. Captain Amundsen proposes to enter the Arctic regions by Bering Strait, to allow the *Fram* to become frozen into the sea ice, and leave her to drift across the polar area, while scientific observations are being carried on continuously on the air above, and the water below. He hopes to start in 1910, and intends to take with him provisions for seven years.

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## MEDIÆVAL METEOROLOGY.

By CARLE SALTER.

METEOROLOGY, dignified by the title of a science, may be said to be almost without a history in the ordinary acceptance of the term, but speculations as to the behaviour of the elements figure among the most ancient traditions, and took their place naturally in the writings of mediæval philosophers side by side with alchemy and astrology, from which, indeed, it is sometimes not easy to separate them. Unhampered by the formidable array of observed and verified facts which confronts the theorist of to-day, the savant of the middle ages was wont to allow his imagination, and with it his pen, to run riot in the realms of conjecture, and to take wild plunges into the unplumbed depths of the ocean of unexplained natural phenomena.

Some idea of the vague conceptions which held place in the esteem of our forefathers as the high-water mark of learning, may be gleaned from the following extracts. They are culled from Trevisa's translation of *De Proprietatibus Rerum* of Bartholomew Anglicus, the first Latin version of which famous work was given to the world about the middle of the thirteenth century, and which was for

hundreds of years a standard work of reference all over the then civilized world.

Concerning rain, we read :—

“Fumosities that are drawn out of the waters and off the earth by strength of heat of heaven are drawn to the nethermost part of the middle space of the air, and there by coldness of the place they are made thick, and then by heat dissolving and departing the moisture thereof and not wasting all, these fumositities are resolved and fall and turn into rain and showers.”

Making allowance for a characteristic and inevitable want of precision, this appears to be moderately sound meteorology. We have heard far worse at the present day. The extract continues :—

“If rain be temperate in quality and quantity, and agreeable to the time, it is profitable to infinite things. For rain maketh the land to bear fruit, and joineth it together, if there be many chimes therein, and assaugeth and tempereth strength of heat, and cleareth the air, and ceaseth and stinteth winds, and fatteth fish, and helpeth and comforteth dry complexion. And if rain be evil and distemperate in its qualities, and discording to place and time, it is greivous and noyful to many things. For it maketh deepness and uncleanness and slipperiness in ways and in paths, and bringeth forth much unprofitable herbs and grass, and corrupteth and destroyeth fruit and seeds, and quencheth in seeds the natural heat, and maketh darkness and thickness in the air, and taketh from us the sun beams, and gathereth mist and clouds, and letteth the work of labouring men, and tarrieth and letteth ripening of corn and of fruits, and exciteth rheum and running flux, and increaseth and strengtheneth all moist ills, and is cause of hunger and of famine, and of corruption and murrain of beasts and sheep ; for corrupt showers do corrupt the grass and herbs of pasture, whereof cometh needful corruption of beasts.”

The writer was obviously perfectly at home among the easily observed facts of everyday weather down below, but it is when among the clouds that he becomes more fantastic :—

“Of impressions that are gendered in the air of double vapour, the first is thunder, the which impression is gendered in watery substance of a cloud. For moving and shaking hither and thither of hot vapour and dry, that fleeth its contrary, is beset and constrained in every side, and smit into itself, and is thereby set on fire and on flame, and quencheth itself at last in the cloud, as Aristotle saith. When a storm of full strong winds cometh in to the clouds, and the whirling wind and the storm increaseth, and seeketh out passage : it cleaveth and breaketh the cloud, and falleth out with a great rese and strong, and all to breaketh the parts of the cloud, and so it cometh to the ears of men and of beasts with horrible and dreadful breaking and noise. And that is no wonder : for though a bladder be light, yet it maketh great noise and sound, if it be strongly blown, and afterward violently broken. And with the thunder cometh lightning, but lightning is sooner seen, for it is clear and bright ; and thunder cometh later to our ears, for the wit of sight is more subtle than the wit of hearing. As a man

seeth sooner the stroke of a man that heweth a tree, than he heareth the noise of the stroke.

"The lightning which is called *Clarum* is of a wonderful kind, for it catcheth and draweth up wine out the tuns, and toucheth not the vessel, and melteth gold and silver in purses, and melteth not the purse."

The properties of dew would seem to have been to a certain extent curtailed in these days ; unless, indeed, we moderns fail to recognize its beneficent qualities so fully as did the men of former times. It is difficult to understand how dew could have come to be supposed to be concerned in the formation of the pearl.

"And though dew be a manner of airy substance, and most subtle outward, natheless in a wonder manner it is strong in working and virtue. For it besprinkleth the earth, and maketh it plenteous, and maketh flour, pith, and marrow increase in corn and grains : and fatteth and bringeth forth broad oysters and other shell fish in the sea, and namely dew of spring time. For by night in spring time oysters open themselves against dew, and receive dew that cometh in between the two shells, and hold and keep it ; and that dew so holden and kept feedeth the flesh, and maketh it fat ; and by its incorporation with the inner parts of the fish breedeth a full precious gem, a stone that is called *Margarita*. Also the birds of ravens, while they are whitish in feathers, ere they are black, dew feedeth and sustaineth them, as Gregory saith."

The last quotation, which as a matter of fact precedes the above in the order of the original, is a little more difficult to follow ; but it will be recognized by those familiar with the mediæval methods of reasoning, as containing some good examples of over-strained analogy leading to confusion. We are inclined to think that the idea in the writer's mind was of a symbolic representation of the four elements, but his somewhat ingenuous, although none the less picturesque, explanation, tends to obscure rather than emphasize the fact. We cannot help suspecting, however, that the introduction of a little mystery may have merely served as a convenient cloak for the author's want of a more convincing theory. There would seem to be some mistake about the arrangement of the colour bands, a point in which the most elementary of observers would hardly be expected to err.

The mention of Bede's prophesy of the ultimate drying up of the earth, brings forcibly to mind the gloomy prognostications of a more modern school of seers.

"The Rainbow is impression gendered in an hollow cloud and dewy, disposed to rain in endless many gutters, as it were shining in a mirror, and is shapen as a bow, and sheweth divers colours, and is gendered by the beams of the sun or of the moon. And is but seldom gendered by beams of the moon, no more but twice in fifty years, as Aristotle saith. In the rainbow by cause of its clearness be seen divers forms, kinds, and shapes that be contrary." Therefore the bow seemeth coloured, for, as Bede saith, it taketh colour of the four elements. For therein, as it were in any mirror, shineth figures and shapes and kinds of elements. For of fire he taketh red

colour in the overmost part, and of earth green in the nethermost, and of the air a manner of brown colour, and of water some deal blue in the middle. And first is red colour, that cometh out of a light beam, that touches the outer part of the roundness of the cloud: then is a middle colour some deal blue, as the quality asketh, that hath mastery in the vapour, that is in the middle of the cloud. Then the nethermost seemeth a green colour in the nether part of a cloud; there the vapour is more earthly. And these colours are more principal than others.

"As Beda saith, and the master of stories, forty years tofore the doom, the rainbow shall not be seen, and that shall be token of drying, and of default of elements."

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### REVIEWS.

*The Observer's Handbook.* Approved for the Use of Meteorological Observers by the Meteorological Office, the Royal Meteorological Society, the Scottish Meteorological Society, the British Rainfall Organization. Annual Edition 1909. Published by the authority of the Meteorological Committee. London: for H.M. Stationery Office, 1909. Size  $9\frac{1}{2} \times 6$ . Pp. 154. Price 3s.

DR. SHAW says in the preface: "Since Meteorological Science is entirely of a co-operative character, and observations are only useful in so far as they are comparable with those made in other places or at other times, it is clear that instructions in the use of instruments are only satisfactory in so far as they represent the general consensus of opinion as distinguished from the opinion of a single institution or individual. It is, therefore, an essential condition of progress that the arrangements for making and recording observations should be the subject of common agreement between the institutions responsible for the control of the various parts of the network of stations in this country." Hence the important system of co-operation announced in the title page.

While most of the letterpress is of an eminently practical nature, exactly suited for the use of Observers, some of the particulars with regard to the adjustment of instruments appeal to a much smaller circle. An elaborate discussion of the units theoretically best for meteorological work seems only likely to puzzle and discourage Observers whose difficulties are of a much more elementary character, though it may be useful as a logical basis for the ultimate unification of measures throughout the world.

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*Fourth Annual Report of the Meteorological Committee to the Lords Commissioners of His Majesty's Treasury for the Year ended 31st March, 1909.* London: printed for H.M. Stationery Office. [Cd. 4813.] Size  $9\frac{1}{2} \times 6$ . Pp. 140. Price 1s. 5d.

THIS Report, as usual, contains much material bearing on the progress which is being made in the work of the Meteorological Office. The

frontispiece is a singularly interesting proof of the value of wireless telegraphy in meteorology, for it shows a weather chart extended over the whole of the western Atlantic by ships' observations, received, unfortunately, too late to be of service in the daily reports. An interesting account is given of the organization of the Wireless weather service in the Atlantic; and, as students of the Daily Weather Report know, from time to time a report is received in time to help the daily chart and strengthen the probability of the forecasts. An important criticism is given of the success of the weather forecasts and storm-warnings of the year. The usual statements regarding administration and publications will be read with interest. The most important fact is the completion of the first volume of the British Meteorological Year-book, issued in monthly parts, strictly up to date, and including the Observations at Second Order Stations, the Hourly Readings at the four observatories and the Monthly Weather Review.

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*Some Facts about the Weather.* By W. MARRIOTT, F.R.Met.Soc.  
Second and Revised Edition. London: E. Stanford, 1909. Size  
 $8\frac{1}{2} \times 5\frac{1}{2}$ . Pp. 38. Price 6d.

THIS useful popular pamphlet has been enlarged and considerably improved. It should be read by everyone interested in the study of the weather.

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### METEOROLOGICAL NEWS AND NOTES.

THE DAYLIGHT SAVING BILL has been reported upon adversely by a Parliamentary Committee after a prolonged and careful hearing of all the arguments for and against the proposal to change the hands of the clock twice a year, so as to compel earlier rising in summer. Not a word was said against the wisdom of the purpose which the Bill was intended to serve, and it may be hoped that by calling attention prominently to the waste of daylight the agitation will lead to a general improvement in the early rising habits of the community, while preserving the fundamental principles of the measurement of time.

THE BRITISH ASSOCIATION met this year in Winnipeg, this being the third occasion on which the meeting has been held in Canada, and the fourth outside the British Isles. The reports of the meeting which have been published have not referred to any papers of meteorological interest, but we are awaiting a special report.

MR. SHACKLETON'S ANTARCTIC EXPEDITION, the finances of which were based on the personal guarantee of himself and his friends, has been made the object of a Government grant of £20,000, which was offered by the Prime Minister as a recognition of the valuable scientific results obtained by the expedition and the small expense at which they had been secured.

## THE WEATHER OF AUGUST, 1909.

By FRED. J. BRODIE.

AUGUST opened with a continuation of the cool unsettled weather which had prevailed so extensively in the earlier part of the summer ; and on the 1st, when a shallow barometrical depression passed slowly eastwards across the country, an extremely heavy fall of rain occurred over our northern and eastern counties. Next day a large anticyclone began to spread in from the Atlantic, and although the weather in Ireland and Scotland was less settled than in England, the conditions over the United Kingdom generally during the ensuing fortnight were more seasonable than at any other time in the past inclement summer. With the northerly wind blowing round the edge of the advancing anticyclone the air was at first very cool for the time of year, and on the nights of the 1st and 2nd a slight ground frost was experienced in many parts of the western, northern and central districts, the exposed thermometer falling to  $28^{\circ}$  at Balmoral,  $30^{\circ}$  at West Linton, and  $31^{\circ}$  at Llangammarch Wells. The further extension of the Atlantic high pressure system was followed, however, by a change of wind, and with the bright sunny weather which now set in, the thermometer rose slowly but steadily to a high summer level.

In Ireland and Scotland the highest temperatures were recorded at various times between the 6th and the 11th ; few places experienced a shade reading as high as  $80^{\circ}$ , but Crieff reported a maximum of  $80^{\circ}$  on the 10th, Killarney and Kilkenny a similar value on the 8th and 11th, the reading at Killarney having been preceded by one of  $81^{\circ}$  on the 6th. In most English districts the thermometer rose to  $80^{\circ}$  and upwards on several occasions, the greatest heat occurring on the 12th, when a reading as high as  $85^{\circ}$  was recorded in many parts of the country ; at Greenwich, Shoburyness, Raunds and Hereford, the maximum on this day was as high as  $86^{\circ}$ , while at Cullompton the thermometer touched  $89^{\circ}$ .

After the middle of the month the weather broke up completely, and for the remainder of the time the day temperatures were almost always below the average ; the nights being, however, as a rule, fairly mild for the season. Heavy falls of rain occurred over practically the whole of England on the 17th, and on the south-east coasts both on the 20th and 24th ; the only material break in the spell of cool, unsettled weather occurring about the close of the fourth week, when the brief visit of an anticyclone resulted in a fair amount of bright sunshine, with a shade temperature rising on the 28th and 29th to  $70^{\circ}$ , or a little above it in several parts of England. At the close of the month a bitterly cold wind swept down from the northward and north-westward, and on the 31st the thermometer over by far the greater portion of the United Kingdom failed to reach  $60^{\circ}$ , many places in the north recording a maximum as low as  $55^{\circ}$ .



The mean temperature for the month was in most places in fair agreement with the normal, but over the greater part of England the summer warmth of the first fortnight resulted in a slight excess. In the neighbourhood of London (the remark fails to apply to the south-east of England as a whole) the meteorological conditions during the three summer months showed a steady improvement, August being finer, drier and warmer than July, and July far sunnier and warmer than June. At Westminster, the mean maximum temperatures for the three months were respectively  $61^{\circ}\cdot5$ ,  $68^{\circ}\cdot2$  and  $71^{\circ}\cdot5$ ; the total sunshine values, 91 hours, 166 hours and 216 hours; and the total rainfall, 4.02 in., 2.95 in. and 1.43 in.

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## Correspondence.

*To the Editor of Symons's Meteorological Magazine.*

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### AUGUST METEORS.

A SUCCESSION of very clear nights between August 3rd and 14th enabled these objects to be well seen this year. The display was remarkable for the brilliancy of the individual meteors, rather than for any great abundance. A splendid Perseid fireball appeared on August 12th, 9.42 p.m., and was observed at Greenwich, Bristol, Hayling Island, Aberdare, and other places. Its height was from 87 to 53 miles, luminous course 68 miles long and velocity 35 miles per sec. Its flight was above places 10 miles W. of Ipswich and 15 miles E. of Croydon. A number of other large meteors, equal in brightness to Venus, Jupiter and Mars, were seen at various places. At Bristol, the hourly number of meteors was about 30 on August 11th, between 9 and 12 p.m. (one observer). On the following night the number had declined to 20 per hour, but the objects were of unusual lustre, and their long streaks formed a characteristic feature. The display seems to have been more generally and successfully observed than in any previous year, a fact partly due to the ideal summer weather which prevailed. Shade temperature rose to above  $80^{\circ}$  at Bristol, on nearly every day from August 5th to 14th; and there were pretty dense fogs on the mornings of August 12th and 15th, imparting an autumnal touch to the face of nature.

W. F. DENNING.

*44, Egerton Road, Bristol, August 25th, 1909.*

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### LIGHTNING STORM OF AUGUST 8th, 1909.

AFTER a fine and hot day, with a shade maximum of  $78^{\circ}$ , sheet lightning was first seen in S. at 9.30 p.m. The night was fine and starlight, the only cloud being an irregular layer of stratus to S. and S.E., visible only when lit up by the flashes. The radiant point of the flashes, starting at S., worked slowly round to S.E. The more brilliant of the flashes shot up beyond the zenith from the horizon.

*Table showing Number of Flashes of Sheet Lightning, at intervals of five minutes, from 10 p.m. to 12 p.m.*

10 to 11 p.m.			11 to 12 p.m.		
10	to 10.5	16 flashes.	11	to 11.5	14 flashes.
10.5	„ 10.10	14 „	11.5	„ 11.10	12 „
10.10	„ 10.15	20 „	11.10	„ 11.15	10 „
10.15	„ 10.20	31 „	11.15	„ 11.20	21 „
10.20	„ 10.25	15 „	11.20	„ 11.25	8 „
10.25	„ 10.30	26 „	11.25	„ 11.30	5 „
10.30	„ 10.35	12 „	11.30	„ 11.35	3 „
10.35	„ 10.40	20 „	11.35	„ 11.40	1 „
10.40	„ 10.45	30 „	11.40	„ 11.45	0 „
10.45	„ 10.50	18 „	11.45	„ 11.50	1 „
10.50	„ 10.55	27 „	11.50	„ 11.55	0 „
10.55	„ 11	22 „	11.55	„ 12	0 „
1 hour ..... 251 flashes.			1 hour ..... 75 flashes.		

*Table showing Colour of Flashes of Sheet Lightning, at intervals of fifteen minutes, from 10 p.m. to 12 p.m.*

10 to 11 p.m.	White.	Yellow.	Red.	11 to 12 p.m.	White.	Yellow.	Red.
10 to 10.15	25	10	0	11 to 11.15	17	11	3
10.15 „ 10.30	40	11	2	11.15 „ 11.30	4	28	2
10.30 „ 10.45	37	14	3	11.30 „ 11.45	0	0	4
10.45 „ 11	48	10	0	11.45 „ 12	0	0	1
1 hour.....	150	45	5	1 hour.....	21	39	10

#### *Summary.*

Total number of flashes in 2 hours (10 p.m. to 12 p.m.) ..... 326  
 Total number of colour of flashes in 2 hours (10 p.m. to 12 p.m.) ... 270

#### *Distribution of Colours (10 to 12 p.m.)*

White.                      Yellow.                      Red.  
 171                              84                              15

SPENCER C. RUSSELL.

*Epsom, Surrey, August 10th, 1909.*

### THUNDERSTORMS OF AUGUST 17th—18th.

PERHAPS you would care to hear that between 7 and 9 a.m. on August 18th there was a thunder and lightning storm, with heavy rain, which at 9 a.m. this morning measured in the Snowdon gauge 2.69 inches. There was some rain after, but now, at 2 p.m., it is bright, sunny and warm again.

JAS. W. DUNCAN.

*The Firs, Castle Hill, Maidenhead, 18th August, 1909.*

A LITTLE rain fell here in the late afternoon of August 17th, I should think about .16 in. : then followed a clear starlight night. At about 6.30 a.m. on 18th it grew very dark, and then a great peal of thunder came from the north-east, but close overhead. Then rain, at times mixed with hail, began to fall, and torrential rain continued till about 8.15 a.m., when it ceased for a space. At 9 a.m. 2.66 in. was found in the rain gauge, which, allowing .16 in. for the previous day, makes 2.50 in., in at the most 1 hour 45 minutes, and probably in an hour and a half. After 9 a.m., .31 in fell, and at 11 a.m. it completely ceased. This makes 2.97 in. altogether, or 2.81 in. after 6.30 a.m.

R. W. ROGERS.

*The Vicarage, Cookham, Berks, August 19th, 1909.*

## WEATHER REPORTS BY A FRUIT TREE.

BY P. P. PENNANT.

THERE will be found below weather reports of the summer months for over a quarter of a century, as recorded by a peach tree (River's early). The date given is that on which, each year, the first ripe peach was picked from this particular tree. The tree speaks not merely as to temperature like a thermometer, not merely as to rain or moisture, nor as to the amount of sunshine or light, during the previous months, but as to all three combined.

It will be observed that the fruit ripened latest in 1888, and earliest in 1893 and 1896. A reference to *British Rainfall* for these years shews the description of June and July in the first year to have been extremely dull and very wet, and in the latter to have been very hot and very bright.

This year, on July 31st, the fruit on the tree looked as though it might rival in lateness the crop of 1888, but the very brilliant weather of the first half of August altered all this most quickly.

Sometimes we have for a period bright mornings and dull evenings as a rule, or sometimes the exact opposite. I have observed how quickly fruit on a S.E. or S.W. wall responds to this. A few years ago I had two (Royal George) peach trees of the same age, one on a S.E. wall and the other on a S.W. wall. The gathering of the fruit from these two trees spoke clearly as to the brightness or the dulness of the mornings or the evenings respectively during the previous months.

1882 .....	July 27.	1891 .....	July 28.	1900 .....	Aug. 2.
1883 .....	Aug. 10.	1892 .....	Aug. 7.	1901 .....	July 29.
1884 .....	July 28.	1893 .....	July 17.	1902 .....	Aug. 10.
1885 .....	Aug. 8.	1894 .....	„ 25.	1903 .....	„ 5.
*1886 .....	—	1895 .....	Aug. 5.	1905 .....	„ 2.
1887 .....	Aug. 7.	1896 .....	July 18.	1907 .....	„ 11.
1888 .....	„ 21.	1897 .....	Aug. 1.	1909 .....	„ 9.
1889 .....	„ 6.	1898 .....	July 27.		
1890 .....	„ 8.	1899 .....	„ 25.		

\* A few years have no record, due to no crop or absence from home of the recorder.

## RAINFALL TABLE FOR AUGUST, 1909.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1870-99. in.	1909. in.
Camden Square.....	<i>London</i> .....	51 32	0 8	111	2.33	1.46
Tenterden.....	<i>Kent</i> .....	51 4	*0 41	190	2.37	2.42
West Dean.....	<i>Hampshire</i> .....	51 3	1 38	137	2.60	3.01
Hartley Wintney.....	".....	51 18	0 53	222	2.09	1.65
Hitchin.....	<i>Hertfordshire</i> .....	51 57	0 17	238	2.26	2.18
Winslow (Addington).....	<i>Buckinghamsh.</i> .....	51 58	0 53	309	2.53	2.63
Bury St. Edmunds (Westley).....	<i>Suffolk</i> .....	52 15	*0 40	226	2.40	2.41
Brundall.....	<i>Norfolk</i> .....	52 37	*1 26	66	2.19	1.80
Winterbourne Steepleton.....	<i>Dorset</i> .....	50 42	2 31	316	3.18	3.62
Torquay (Cary Green).....	<i>Devon</i> .....	50 28	3 32	12	2.91	1.82
Polapit Tamar [Launceston].....	".....	50 40	4 22	315	3.19	1.98
Bath.....	<i>Somerset</i> .....	51 23	2 21	67	2.96	3.22
Stroud (Upfield).....	<i>Gloucestershire</i> .....	51 44	2 13	226	2.83	2.66
Church Stretton (Wolstaston).....	<i>Shropshire</i> .....	52 35	2 48	800	3.24	2.12
Coventry (Kingswood).....	<i>Warwickshire</i> .....	52 24	1 30	340	2.77	1.54
Boston.....	<i>Lincolnshire</i> .....	52 58	0 1	25	2.25	2.76
Workshop (Hodsock Priory).....	<i>Nottinghamshire</i> .....	53 22	1 5	56	2.31	3.07
Derby (Midland Railway).....	<i>Derbyshire</i> .....	52 55	1 28	156	2.42	2.45
Bolton (Queen's Park).....	<i>Lancashire</i> .....	53 35	2 28	390	4.36	3.76
Wetherby (Ribston Hall).....	<i>Yorkshire, W.R.</i> .....	53 59	1 24	130	2.59	3.22
Arncliffe Vicarage.....	".....	54 8	2 6	732	5.43	5.92
Hull (Pearson Park).....	<i>E.R.</i> .....	53 45	0 20	6	2.81	5.86
Newcastle (Town Moor).....	<i>Northumberland</i> .....	54 59	1 38	201	3.14	3.41
Borrowdale (Seathwaite).....	<i>Cumberland</i> .....	54 30	3 10	423	11.23	8.46
Cardiff (Ely).....	<i>Glamorgan</i> .....	51 29	3 13	53	4.52	3.19
Haverford west (High Street).....	<i>Pembroke</i> .....	51 48	4 58	95	4.04	1.75
Aberystwyth (Gogerddan).....	<i>Cardigan</i> .....	52 26	4 1	83	4.60	2.75
Llandudno.....	<i>Carnarvon</i> .....	53 20	3 50	72	2.86	3.03
Cargen [Dumtries].....	<i>Kirkcudbright</i> .....	55 2	3 37	80	4.10	2.21
Hawick (Branksholm).....	<i>Roxburgh</i> .....	55 24	2 51	457	3.33	1.63
Edinburgh (Royal Observatory).....	<i>Midlothian</i> .....	55 55	3 11	442	...	1.72
Girvan (Pinnore).....	<i>Ayr</i> .....	55 10	4 49	207	4.34	3.41
Glasgow (Queen's Park).....	<i>Renfrew</i> .....	55 53	4 18	144	3.79	...
Inveraray (Newtown).....	<i>Argyll</i> .....	56 14	5 4	17	5.60	4.62
Mull (Quinish).....	".....	56 36	6 13	35	4.84	3.75
Dundee (Eastern Necropolis).....	<i>Forfar</i> .....	56 28	2 57	199	3.08	1.78
Braemar.....	<i>Aberdeen</i> .....	57 0	3 24	1114	3.83	2.10
Aberdeen (Cranford).....	".....	57 8	2 7	120	3.22	2.17
Cawdor.....	<i>Nairn</i> .....	57 31	3 57	250	3.07	1.86
Fort Augustus (S. Benedict's).....	<i>E. Inverness</i> .....	57 9	4 41	68	3.35	2.40
Loch Torridon (Bendamph).....	<i>W. Ross</i> .....	57 32	5 32	20	6.91	4.82
Dunrobin Castle.....	<i>Sutherland</i> .....	57 59	3 56	14	2.65	1.81
Castletown.....	<i>Caithness</i> .....	58 35	3 23	100	...	3.29
Killarney (District Asylum).....	<i>Kerry</i> .....	52 4	9 31	178	4.92	.89
Waterford (Brook Lodge).....	<i>Waterford</i> .....	52 15	7 7	104	3.71	.94
Broadford (Hurdlestown).....	<i>Clare</i> .....	52 48	8 38	167	3.79	1.30
Abbey Leix (Blandsfort).....	<i>Queeen's County</i> .....	52 56	7 17	532	3.94	1.86
Dublin (Fitz William Square).....	<i>Dublin</i> .....	53 21	6 14	54	3.02	1.30
Mullingar (Belvedere).....	<i>Westmeath</i> .....	53 29	7 22	367	4.03	1.08
Ballinasloe.....	<i>Galway</i> .....	53 20	8 15	160	3.96	.89
Crossmolina (Enniscoe).....	<i>Mayo</i> .....	54 4	9 18	74	4.57	2.49
Collooney (Markree Obsy.).....	<i>Sligo</i> .....	54 11	8 27	127	4.16	2.50
Seaforde.....	<i>Down</i> .....	54 19	5 50	180	3.52	2.04
Londonderry (Creggan Res.).....	<i>Londonderry</i> .....	54 59	7 19	320	3.94	4.04
Omagh (Edenfel).....	<i>Tyrone</i> .....	54 36	7 18	280	4.03	2.53

RAINFALL TABLE FOR AUGUST, 1909—*continued.*

RAINFALL OF MONTH ( <i>con.</i> )					RAINFALL FROM JAN. 1.				Mean Annual 1870-1899.	STATION.
Diff. from Av. in.	% of Av.	Max. in 24 hours.	No. of Days		Aver. 1870-99.	1909.	Diff. from Aver. in.	% of Av.		
in.		in.	Date.		in.	in.			in.	
- '87	63	'42	17	11	15'45	16'49	+1'04	107	25'16	Camden Square
+ '05	102	'88	24	11	16'18	17'72	+1'54	109	28'36	Tenterden
+ '41	116	1'21	17	11	17'83	17'53	- '30	98	29'93	West Dean
- '44	79	'60	17	10	16'06	17'36	+1'30	108	27'10	Hartley Wintney
- '08	96	'50	1	14	15'07	18'17	+3'10	121	24'66	Hitchin
+ '10	104	1'05	17	11	16'58	16'85	+ '27	102	26'75	Addington
+ '01	100	'68	1	14	15'63	16'07	+ '44	103	25'39	Westley
- '39	82	'75	1	14	15'01	14'01	-1'00	93	25'40	Brundall
+ '44	114	1'70	17	11	22'32	22'41	+ '09	100	39'00	Winterbourne Stpltn
-1'09	63	'61	24	11	20'69	18'66	-2'03	90	35'00	Torquay
-1'21	62	'91	24	12	21'57	19'74	-1'83	92	38'85	Polapit Tamar
+ '26	109	1'06	17	12	18'82	16'60	-2'22	88	30'75	Bath
- '17	94	'64	1	12	18'56	16'99	-1'57	92	29'85	Stroud
-1'12	65	'51	17	14	20'21	18'70	-1'51	93	33'04	Wolstaston
-1'23	56	1'02	17	10	18'08	16'71	-1'37	92	29'21	Coventry
+ '51	123	'77	1	12	14'45	17'32	+2'87	120	23'30	Boston
+ '76	133	1'49	17	15	15'63	17'54	+1'91	112	24'70	Hodsock Priory
+ '03	101	'77	17	14	16'53	16'04	- '49	97	26'18	Derby
- '60	86	'58	1, 20	19	25'23	29'08	+3'85	115	42'43	Bolton
+ '63	124	'90	17	17	16'83	20'17	+3'34	120	26'96	Ribston Hall
+ '49	109	1'05	16	18	36'87	41'86	+4'99	114	60'96	Arneliffe Vic.
+3'05	208	2'68	1	13	16'55	21'49	+4'94	130	27'02	Hull
+ '27	109	'84	16	21	17'40	20'84	+3'44	120	27'99	Newcastle
-2'77	75	1'48	15	21	77'96	74'38	-3'58	95	132'68	Seathwaite
-1'33	71	'93	17	13	25'23	19'96	-5'27	79	42'81	Cardiff
-2'29	43	'58	17	7	27'41	22'05	-5'36	80	47'88	Haverfordwest
-1'85	60	'95	17	14	26'46	23'30	-3'16	88	45'41	Gogerddan
+ '17	106	'94	17	15	17'65	18'15	+ '50	103	30'98	Llandudno
-1'89	54	'41	28	15	26'15	...	...	...	43'43	Cargen
-1'70	49	'31	1	16	21'33	20'51	- '82	96	34'80	Braxholm
...	...	'44	28	18	...	18'72	...	...	...	Edinburgh
- '93	79	'85	29	20	28'46	31'34	+2'88	110	48'87	Girvan
...	...	...	...	...	22'09	...	...	...	35'80	Glasgow
- '98	82	'88	28	19	36'60	37'62	+1'02	103	57'90	Inveraray
-1'09	77	'62	12	23	33'06	29'06	-4'00	88	57'53	Quinish
-1'30	58	'78	28	12	18'20	18'18	- '02	100	28'95	Dundee
-1'73	55	...	...	...	21'66	19'60	-2'06	90	36'07	Braemar
-1'05	67	'35	28	17	19'93	22'47	+2'54	113	33'01	Aberdeen
-1'21	61	'83	24	13	18'33	19'14	+ '81	104	29'37	Cawdor
- '95	72	'66	19	19	25'75	20'90	-4'85	81	43'71	Fort Augustus
-2'09	70	1'44	19	20	49'41	43'01	-6'40	87	86'50	Bendampf
- '84	68	'27	14	18	18'92	19'43	+ '51	103	31'60	Dunrobin Castle
...	...	'71	24	23	...	19'33	...	...	...	Castletown
-4'03	18	'19	24	15	34'90	25'74	-9'16	74	58'11	Killarney
-2'77	25	'40	17	8	24'00	20'57	-3'43	86	39'30	Waterford
-2'49	34	'40	29	13	20'85	23'44	+2'59	112	33'47	Hurdlestown
-2'08	47	'76	24	10	22'19	21'94	- '25	99	35'19	Abbey Leix
-1'72	43	'37	21	13	17'53	16'67	- '86	95	27'75	Dublin
-2'95	27	'35	31	9	23'00	21'31	-1'69	93	36'48	Mullingar.
-3'07	22	'25	28	12	23'19	18'59	-4'60	80	37'04	Ballinasloe
-2'08	54	'63	28	20	29'90	27'48	-2'42	92	50'50	Ennisceoe
-1'66	60	'70	28	18	25'32	23'03	-2'29	91	41'83	Markree Obsy.
-1'48	58	'73	22	14	23'84	25'07	+1'23	105	38'61	Seaforde
+ '10	102	1'06	28	22	24'48	28'97	+4'49	118	41'20	Londonderry
-1'50	63	'72	22	13	23'28	23'69	+ '41	102	37'85	Omagh

## SUPPLEMENTARY RAINFALL, AUGUST, 1909.

Div.	STATION.	Rain inches	Div.	STATION.	Rain- inches
II.	Warlingham, Redvers Road	2.29	XI.	Rhayader, Tyrmynydd .....	2.97
„	Ramsgate .....	2.90	„	Lake Vyrnwy .....	2.90
„	Steyning.....	3.07	„	Llangyhanfal, Pläs Draw....	3.36
„	Hailsham .....	3.60	„	Llwydiarth Esgob .....	2.49
„	Totland Bay, Aston House.	2.86	„	Snowdon, Cwm Dyli .....	3.72
„	Stockbridge, Ashley .....	...	„	Lligwy .....	2.20
„	Grayshott.....	2.50	„	Douglas, Woodville .....	2.36
„	Reading, Calcot Place.....	2.27	XII.	Stoneykirk, Ardwell House	1.96
III.	Harrow Weald, Hill House.	2.36	„	Dalry, The Old Garroch ...	2.57
„	Oxford, Magdalen College..	3.37	„	Langholm, Drove Road.....	2.96
„	Pitsford, Sedgebrook.....	2.42	„	Moniaive, Maxwellton House	1.93
„	Huntingdon, Brampton.....	1.71	XIII.	N. Esk Reservoir [Penicuik]	2.65
„	Woburn, Milton Bryant.....	2.47	XIV.	Snowbole, Knockdon Farm..	2.75
„	Wisbech, Monica Road.....	2.37	XV.	Campbeltown, Witchburn...	3.20
IV.	Southend Water Works.....	2.43	„	Glenreadell Mains.....	3.64
„	Colchester, Lexden.....	2.50	„	Ballachulish House.....	4.83
„	Newport, The Vicarage.....	2.42	„	Islay, Ballabus .....	3.94
„	Rendlesham .....	1.83	XVI.	Dollar Academy .....	3.56
„	Swaffham .....	2.32	„	Loch Leven Sluice .....	2.58
„	Blakeney .....	1.89	„	Balquhiddy, Stronvar .....	3.64
V.	Bishops Cannings .....	2.70	„	Perth, The Museum .....	1.91
„	Ashburton, Druid House ...	2.29	„	Coupar Angus .....	1.39
„	Honiton, Combe Raleigh ...	2.29	„	Blair Atholl.....	1.74
„	Okehampton, Oaklands.....	2.17	„	Montrose, Sunnyside Asylum	2.24
„	Hartland Abbey .....	2.16	XVII.	Alford, Lynturk Manse .....	2.53
„	Lynmouth, Rock House ...	1.97	„	Keith Station .....	2.81
„	Probus, Lamellyn .....	1.57	XVIII.	N. Uist, Lochmaddy .....	3.69
„	North Cadbury Rectory ..	2.52	„	Alvey Manse .....	2.33
VI.	Clifton, Pembroke Road ...	2.79	„	Loch Ness, Drumnadrochit.	1.62
„	Ross, The Graig .....	2.02	„	Glencarron Lodge .....	6.68
„	Shifnal, Hatton Grange.....	1.75	„	Fearn, Lower Pitkerrie.....	2.32
„	Blockley, Upton Wold .....	2.85	XIX.	Invershin .....	2.39
„	Worcester, Boughton Park.	1.60	„	Altnaharra .....	3.08
VII.	Market Overton .....	2.87	„	Bettyhill .....	3.70
„	Market Rasen .....	4.07	XX.	Dunmanway, The Rectory..	.32
„	Bawtry, Hesley Hall.....	2.94	„	Cork .....	.25
„	Buxton.....	2.69	„	Mitchelstown Castle .....	.68
VIII.	Neston, Hinderton Lodge...	3.03	„	Darrynane Abbey .....	.84
„	Southport, Hesketh Park...	3.00	„	Glenam [Clonmel] .....	.77
„	Chatburn, Middlewood .....	2.73	„	Nenagh, Traverstown.....	1.05
„	Cartmel, Flookburgh .....	3.27	„	Miltown Malbay.....	1.31
IX.	Langsett Moor, Up. Midhope	2.16	XXI.	Gorey, Courtown House ...	1.40
„	Scarborough, Scalby .....	5.32	„	Moynalty, Westland .....	1.38
„	Ingleby Greenhow .....	4.60	„	Athlone, Twyford .....	1.08
„	Mickleton.....	2.42	XXII.	Woodlawn .....	2.06
X.	Bardon Mill, Beltingham ...	2.72	„	Westport, St. Helens .....	2.35
„	Ewesley, Font Reservoir ...	2.41	„	Mohill .....	1.81
„	Ilderton, Lilburn Cottage..	4.16	XXIII.	Enniskillen, Portora .....	...
„	Keswick, The Bank .....	4.01	„	Dartrey [Cootehill].....	1.99
XI.	Llanfrechfa Grange.....	2.91	„	Warrenpoint, Manor House	1.63
„	Treherbert, Tyn-y-waun ...	3.05	„	Banbridge, Milltown .....	1.90
„	Carmarthen, The Friary.....	2.14	„	Belfast, Springfield .....	3.11
„	Castle Malgwyn [Llechryd].	1.86	„	Bushmills, Dundarave .....	3.00
„	Plynlimon.....	8.70	„	Sion House .....	2.54
„	Crickhowell, Ffordlas.....	2.00	„	Killybegs .....	5.51
„	New Radnor, Ednol .....	1.84	„	Horn Head ... ..	4.10

## METEOROLOGICAL NOTES ON AUGUST, 1909.

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

LONDON, CAMDEN SQUARE.—The first half was fine, dry and hot, the shade max. exceeding  $80^{\circ}$  on 10 consecutive days, from 6th to 15th. Thereafter it was cloudy, showery and cooler, but with a fair amount of sunshine as a rule. TS on 25th. Duration of sunshine, 189.0\* hours, and of R 36.5 hours. Mean temp.  $62^{\circ}8$ , or  $0^{\circ}7$  above the average. Shade max.  $86^{\circ}4$  on 12th; min.  $45^{\circ}1$  on 3rd. F 0, f 0.

TOTLAND BAY.—Duration of sunshine, 249.2\* hours. Mean temp.  $0^{\circ}4$  above the average. Shade max.  $80^{\circ}3$  on 9th, this being only the fourteenth occasion in 23 years when the temp. has risen to  $80^{\circ}$ ; shade min.  $49^{\circ}9$  on 5th. F 0, f 0.

WINTERBOURNE STEEPLETON.—Of the R, 3.51 in. fell on eight consecutive days during mid-harvest, materially injuring the wheat crop. Extreme heat during the week ending on 14th, but otherwise decidedly cold. Shade max.  $85^{\circ}2$  on 11th; min.  $41^{\circ}9$  on 22nd. F 0.

TORQUAY.—Duration of sunshine, 273.3\* hours, or  $65^{\circ}3$  hours above the average. Mean temp.  $62^{\circ}6$ , or  $1^{\circ}1$  above the average. Shade max.  $81^{\circ}9$  on 9th, the highest yet recorded here; min.  $48^{\circ}7$  on 29th. F 0, f 0.

BUXTON.—Mean temp.  $57^{\circ}8$ , or  $1^{\circ}0$  above, and R 1.97 in. below, the average of 35 years. Duration of sunshine 188\* hours, or 45 hours above the average of 25 years. Shade max.  $79^{\circ}3$  on 9th; min.  $42^{\circ}1$  on 3rd. F 0, f 0.

BOLTON.—Duration of sunshine, 147.5\* hours, or  $27^{\circ}7$  above the average. Mean temp.  $57^{\circ}0$ , or  $0^{\circ}2$  above the average. Shade max.  $79^{\circ}1$  on 12th; min.  $44^{\circ}3$  on 3rd. F 0, f 0.

SOUTHPORT.—Duration of sunshine 174.0\* hours, or  $5^{\circ}5$  below, and R .71 in. below, the average. Duration of R 51.1 hours. Mean temp.  $58^{\circ}3$ , or  $1^{\circ}2$  below the average. Shade max.  $71^{\circ}7$  on 15th; min.  $45^{\circ}0$  on 3rd and 7th. F 0, f 0.

HULL.—On 1st floods were caused, the R being 2.68 in.; and on 16th there was a TS with heavy R and large H, .60 in. falling in 20 mins.; heavy R on 17th, when 1.35 in. fell.

HAVERFORDWEST.—Duration of sunshine 227.6\* hours. Shade max.  $79^{\circ}0$  on 7th and 15th; min.  $39^{\circ}0$  on 28th. F 0, f 0.

LLANDUDNO.—Duration of sunshine 201.8\* hours. Shade max.  $75^{\circ}2$  on 12th; min.  $48^{\circ}0$  on 28th. F 0.

DOUGLAS.—August was a decided improvement on June and July, inasmuch as the first 16 days were almost rainless, and included some 10 days of warm summer weather. After 16th it was cold and wet. The R and temp. were below, but the duration of sunshine above, the average.

EDINBURGH.—Shade max.  $74^{\circ}9$  on 8th; min.  $44^{\circ}1$  on 30th. F 0, f 0.

COUPAR ANGUS.—Shade max.  $80^{\circ}0$  on 9th; min.  $34^{\circ}0$  on 26th. F 0, f 0.

FORT AUGUSTUS.—Shade max.  $70^{\circ}8$  on 10th; min.  $36^{\circ}8$  on 3rd. F 0.

CORK.—The driest August on record and probably unprecedented, the R being only one-fourteenth of the average. Shade max.  $79^{\circ}0$  on 12th; min.  $43^{\circ}0$  on 28th and 30th. F 0.

WATERFORD.—The driest August since 1884, and the second driest in 60 years. Shade max.  $80^{\circ}$  on 11th; min.  $42^{\circ}$  on 30th. F 0.

MILTOWN MALBAY.—The best August for harvesting since 1848. All crops were good and over the average, except hay.

DUBLIN.—The early part was dry, but after a fortnight of true summer the weather became changeable and cool, with TSS on 15th and 21st. Shade max.  $77^{\circ}1$  on 12th; min.  $45^{\circ}5$  on 30th. F 0, f 0.

BALLINASLOE.—The lowest August R for 38 years, being 1.41 in. less than the previous lowest. Shade max.  $77^{\circ}0$  on 9th and 15th; min.  $37^{\circ}0$  on 17th. F 0.

MARKREE.—Shade max.  $75^{\circ}0$  on 14th and 15th; min.  $36^{\circ}0$  on 18th. F 0, f 1.

## Climatological Table for the British Empire, March, 1909.

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.									
	60·5	29	18·5	5	45·3	34·2	37·8	86	98·0	17·2	inches	25	7·9
London, Camden Square	60·5	29	18·5	5	45·3	34·2	37·8	86	98·0	17·2	inches	25	7·9
Malta ... ..	63·7	8	47·0	19	60·5	52·4	49·4	79	135·2	...	·94	8	5·5
Lagos ... ..	93·0	16	73·0	19†	88·9	77·2	75·3	75	160·0	70·0	3·36	7	8·1
Cape Town ... ..	92·1	10	50·1	13	75·6	57·9	55·7	71	...	...	3·02	10	4·0
Durban, Natal ... ..	88·5	24	59·8	14	80·1	66·2	...	...	143·0	...	2·80	13	5·4
Johannesburg ... ..	75·8	27	49·8	17	68·4	54·5	54·6	84	141·6	47·5	4·72	14	6·4
Mauritius ... ..	87·0	1	67·0	30	83·0	72·5	71·1	82	159·9	60·5	5·87	27	7·1
Calcutta... ..	102·7	26*	56·5	4	97·4	68·8	60·3	51	156·0	48·5	·00	0	1·2
Bombay... ..	91·7	26	70·6	7	87·0	73·3	69·1	71	134·8	62·9	·00	0	1·6
Madras ... ..	97·4	31	66·3	6	89·3	70·8	71·4	79	142·3	62·7	·00	0	2·2
Kodaikanal ... ..	72·7	9	48·9	26	68·8	51·2	40·9	51	139·7	34·2	4·84	14	3·7
Colombo, Ceylon ... ..	91·4	14	72·3	15	89·1	74·8	73·1	76	156·8	69·7	3·59	13	5·4
Hongkong ... ..	77·8	12	53·0	14	67·6	60·8	58·8	81	128·1	...	2·35	10	9·2
Melbourne ... ..	93·1	3	40·4	27	75·1	55·0	43·9	59	149·6	34·2	1·19	12	5·5
Adelaide ... ..	103·1	3	48·7	26	79·5	58·5	50·0	54	162·7	39·6	·66	7	4·6
Coolgardie ... ..	100·4	21	48·0	29	84·4	56·9	49·6	47	167·0	45·0	·18	2	2·5
Perth ... ..	101·6	1	50·3	5	80·9	61·1	56·6	60	161·6	44·8	·77	4	4·1
Sydney ... ..	88·9	25	55·4	17	76·4	62·7	66·7	69	130·9	45·0	1·30	19	4·5
Wellington ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Auckland ... ..	77·5	8	52·0	31	71·6	60·3	57·9	76	139·0	47·0	4·04	16	4·7
Jamaica, Kingston ... ..	90·8	15	67·2	3	87·6	68·9	65·5	70	...	...	·82	4	4·0
Trinidad ... ..	89·0	31	64·0	3‡	86·6	66·6	71·1	78	154·0	57·0	1·15	7	...
Grenada ... ..	86·0	21	70·0	12	83·3	73·1	68·6	73	143·0	...	1·02	12	5·0
Toronto ... ..	47·2	31	6·8	5	36·3	23·4	...	...	88·0	4·4	...	...	4·4
Fredericton ... ..	43·0	20	-7·8	2	35·1	17·0	...	78	...	...	4·71	9	5·8
St. John's, N.B. ... ..	46·7	25	7·0	1	36·9	24·0	...	...	...	...	4·55	10	5·9
Victoria, B.C. ... ..	55·8	24	30·5	9	50·4	36·9	...	85	...	...	·73	9	6·0
Dawson ... ..	46·0	29	-25·0	8	21·0	3·1	...	...	...	...	1·21	9	5·7

\* and 27. † and 31. ‡ and 10, 15.

Coolgardie	Jan. ...	101·0	15	48·2	9	82·4	58·8	49·6	47	167·9	46·2	1·46	6	4·6
	Feb. ...	102·0	18, 19	51·0	23, 24	87·7	60·3	51·6	46	169·0	49·2	·69	2	3·3
Perth ... ..	Jan. ...	103·8	17	55·3	3	86·5	63·3	56·5	53	165·0	51·9	·22	1	2·9
	Feb. ...	102·4	27	54·3	11	86·5	64·1	58·0	55	154·8	49·6	·70	1	3·2

MALTA.—Mean temp. of air 56°·1. Average sunshine 6·1 hours per day.

Natal.—Rainfall 2·00 in. below 35 years' average.

Johannesburg.—Bright sunshine 177·7 hours.

Mauritius.—Mean temp. of air 0°·3 below, of dew point 0°·5 above, and R 3·34 in. below, averages. Mean hourly velocity of wind 11·3 miles, or 0·9 above average.

KODAIKANAL.—Bright sunshine 256 hours.

COLOMBO.—Mean temp. of air 81°·2, or 0°·9 below, of dew point 0°·2 above, and R ·88 in. below averages. Mean hourly velocity of wind 4·0 miles. TSS on 4 days.

HONGKONG.—Mean temp. of air 64°·1. Bright sunshine 64·2 hours. Mean hourly velocity of wind 16·5 miles.

Melbourne.—Mean temp. of air 0°·4 above, and R ·94 in. below, averages.

Sydney.—Mean temp. of air 0°·3 above, and R 3·79 in. below, averages.

TRINIDAD.—R ·80 in. below 46 years' average.





# RAINFALL OF THAMES VALLEY-SEPTEMBER, 1909.



ALTITUDE  
SCALE

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

SCALE OF MILES

0 5 10 15 20