

Symons's Meteorological Magazine.

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PROPOSED IMPERIAL METEOROLOGICAL ORGANIZATION.

At the meeting of the British Association in Winnipeg, in 1909, the meteorologists who happened to be present met in an informal conference, and a small but representative committee, consisting of Dr. W. N. Shaw, Director of the British Meteorological Office, Mr. R. F. Stupart, Director of the Canadian Meteorological Service, and Mr. J. Patterson, Imperial Meteorologist to the Government of India, were appointed to draw up a circular to the various government meteorological authorities of the Empire inviting co-operation in contributing data on a common plan for publication by a central agency. Some particulars regarding the draft circular appeared in the London press in October last ; but as the source of the information was not indicated we deferred mentioning the matter until we had an opportunity of seeing the proposals in question.

As our pages have for more than thirty years contained, month by month, comparison of the climate of different parts of the British Empire, so far as we know, the only tables of the kind compiled, we are deeply interested in any proposals to expand and render more systematic the work which, in the small way possible to us, we have been not proposing but carrying out, unnoticed and practically unknown so far as the great public is concerned, for so long a time. In making this small contribution to the comparative meteorology of the Empire we are dependent on the generous and ungrudging co-operation of the heads of meteorological observatories and government departments in 27 widely scattered places, representing originally 18 different units of government, though now reduced by the confederation of Australia and about to be farther reduced by the unification of South Africa. No one will welcome more heartily than we the establishment of a more general system with all the wider means of obtaining for it public attention which the authority of official organization conveys, because no one realizes more fully the advantages to meteorological study which should result from such a scheme.

The draft letter to which we have referred recapitulates the facts

known to our readers as to the summoning by the Royal Society of Canada of an Imperial Meteorological Conference at Quebec, in 1908,* and states that "the death of Sir J. Eliot and the inability of a number of the important Colonial Governments to send representatives made it necessary to postpone the meeting."

The letter, which we understand has been forwarded to the heads of the Meteorological Departments of India, the Commonwealth of Australia, Ceylon, the Transvaal Colony, Cape Colony, New Zealand and the Straits Settlements, deals as follows with the various matters involved in "the exchange on an organized basis of meteorological data between the different portions of the British Empire."

1. *Data required*.—Primarily, information is required as to pressure, temperature and rainfall, and their fluctuations from the normal.

It is suggested that the form adopted by the Solar Commission of the International Meteorological Committee should be followed, giving :—

Pressure :—

- (a) Mean of the month derived from daily observations at a fixed specified hour reduced to 32° F. and 45° lat. for station level.
- (b) Variation from normal.

Temperature :—

- (a) Mean of the daily maximum temperatures in the shade for the month.
- (b) Absolute maximum shade temperature for the month and the date of its occurrence.
- (c) Mean of the daily minimum for the month.
- (d) Mean of the maximum and minimum for the month (or of readings at fixed hours) corrected to give the true 24-hour mean temperature.
- (e) Variation of the last from normal.

Rainfall :—

- (a) Total fall for the month.
- (b) Variation from normal.

2. *Number and Distribution of Stations*.—In accordance with the scheme of publication of terrestrial and solar data adopted by the Solar Commission the limit to the number of stations required for data as to pressure and temperature may be set at two for each square of ten degrees of latitude and longitude.

In the case of rainfall the information conveyed by the total fall at the stations which also give results for pressure and temperature should be supplemented by a more general statement applicable to the districts represented.

If, in the ordinary course of the work of the Department with which the station is connected, pressure is reduced to sea level, or to some other level, such as that of 1,000 metres, the reduced mean of the values for the month should be given *in addition*, with a reference to the mode of making the reduction in each case.

* See this Magazine, Vol. 43, pp. 19, 57, 119.

It is to be noted that the scheme provides for entering the variations from the normal of the several meteorological elements. The columns provided for these entries can only be filled for the stations for which appropriate normal values have been obtained. The normal values referred to should, if practicable, be the monthly averages for the 25 years ending with 1905. When other normals are used a reference to the normals should be given. When no normals have been obtained for a station, a note to that effect should be given, and the columns for the variations should be left blank.

Also the figures for the true mean daily temperature are desired. These are computed either from :—

- (a) hourly readings ;
- (b) readings at fixed hours suitably selected ;
- (c) readings of maximum and minimum thermometers with an appropriate correction.

The determination of the appropriate correction requires special investigation, and if the determination has not been made, the means for the fixed hours of observation should be given.

[Here follows a list of stations in the various ten degree squares, the number named being about 130 ; and § 3 which refers to the government organizations which collect meteorological data at present and the suggestion that the Meteorological Office in London should collect those not already dealt with.]

4. *Publication of the Information.*—It is understood that the Solar Commission is engaged upon a scheme of publication of meteorological data for the whole Globe, of which the data for the various British Possessions would form part. Since the headquarters of the Commission is at the present time in London, in connection with the Solar Physics Observatory at South Kensington, it may be understood that the data contributed to the London Office in accordance with the foregoing suggestion, or a copy of them, would be passed on to the Solar Commission to be included in that publication. But in case it is found that the monthly information can be exchanged sufficiently early to afford information to the public concerning the course of the seasons in the various parts of the Empire, it may be desirable to arrange for the monthly publication of a short report with that object in view.

5. *Units of Measurement for Publication.*—It is evident that in present circumstances a collection of meteorological data for the Globe will bring into prominence the diversity of practice between different countries in regard to the units employed to represent the meteorological elements. The meeting at Winnipeg expressed an opinion in favour of the use of absolute units for pressure on the centimetre-gramme-second system already adopted for all electrical work, and of centigrade degrees measured from 273° below the freezing-point of water—"absolute temperature"—for temperature, as being likely to tend to a final understanding for a common system for the Globe. Units based upon this system have been employed by the London Meteorological Office for the publication of the results of the investigation of the upper air since 1st January, 1909.

The suggestion is one of special importance to meteorologists of the English speaking countries, because their present practice is not only at

variance with that of other countries, but also with that of other sciences in their own countries.

For the present, however, in view of the fact that there is little difference of practice as regards the units of measurement for meteorological elements in the different parts of the empire, it is not necessary to ask the various authorities to come to any final decision upon the point.

We sincerely hope that the effort now being made will have a happy outcome. The only matter we would prefer not to see raised is that of introducing a new system of expressing meteorological observations. In a science the data for which must be collected in largest measure by voluntary observers it seems to us unwise to introduce what must be and remain to the majority of these humble but zealous helpers an unknown tongue. It would surely suffice for those to whom the new units would afford assistance in their discussions or calculations to translate for themselves from the units which have meaning for the general educated reader, and in which the observations for many years to come must necessarily be made, since practically all the meteorological instruments in use in the British Empire are graduated in inches or Fahrenheit degrees.

THE WEATHER OF JANUARY.

By FRED. J. BRODIE.

THE extreme changeability, which seems likely to prove the distinguishing feature in the weather of the present winter, was as much in evidence in January as in December. For about 10 days, commencing with the 8th, the type of pressure distribution over these islands was pretty constantly south-westerly or westerly. At other times no clearly defined type was in existence for more than three or four days at a time, the changes in wind direction and the consequent fluctuations in temperature being frequent, and often very considerable.

The month opened with a flow of mild south-westerly air, and on the 2nd the thermometer rose slightly above 55° at many places situated in the eastern parts both of Great Britain and Ireland. A large anticyclone, which subsequently extended over the country from the southward, was accompanied by much cloud, so that while the day temperatures were lower than during the prevalence of the former equatorial current, the nights were not unduly cold for the time of year. After the 7th the anticyclone receded south-eastwards to central and southern Europe, and for the next 10 or 11 days the weather was influenced by large cyclonic depressions which extended down from the neighbourhood of Iceland. The prevailing winds were, therefore, westerly or south-westerly, with a gale at frequent intervals, and temperature was usually above the average, the highest readings being observed on the 9th, when the thermometer rose to 55° , or a trifle above it in nearly all districts. During a temporary shift o

RAINFALL OF THAMES VALLEY — JANUARY. 1910.



wind to the north-westward, which occurred on the 11th and 12th, the thermometer fell very decidedly, and sharp frost occurred either in the screen or on the surface of the ground in most districts. By the sheltered thermometer readings as low as 20° were recorded at Balmoral and West Linton, and 21° at Fort Augustus; while on the grass a reading of 14° was observed at West Linton and a reading of 15° at Cambridge.

After the 18th a northerly type of weather set in, and wintry weather became general, hard frost occurring over north Britain on the 21st and 22nd. At a large number of Scottish stations the sheltered thermometer on one or other of these dates fell below 20° , a reading as low as 11° being recorded at Balmoral and West Linton. On the grass readings below 15° were equally common in the north, and were observed also at a few of the more central stations in England and Wales, the exposed thermometer at Balmoral falling to 9° . The sharpest weather of the whole month was experienced, however, in the interval between the passage of two deep cyclonic disturbances which traversed these islands respectively on the 24th and 28th. The progress of each system was marked by gales on nearly all coasts, with heavy rains in the south and snowstorms further north, the latter being especially severe on the 28th, in the northern parts of England and Ireland. The frost which occurred between the nights of the 25th and 27th was in many places of unusual intensity. In the south-east of England the sheltered thermometer scarcely fell below 15° , and in the east of England and the south of Ireland it did not quite reach that level. In all the more northern and north-western parts of the kingdom, however, readings below 10° were common, and readings below 5° fairly numerous. At Fort Augustus the thermometer fell to 2° , at Buxton to 1° , and at Balmoral and Kilmarnock to zero, while at West Linton it sank 5° below zero. On the surface of the grass readings below zero were recorded at many northern stations, Buxton recording a reading as low as -9° , and West Linton -8° . In the closing days of the month the strong wind which blew in the rear of the disturbance of the 28th gradually subsided, and with the appearance of a new low pressure system over Iceland on the 30th it backed to west and south-west, with a decided rise of temperature.

Owing very largely to the spell of severe cold just noted, the mean temperature of January was below the average in north Britain and in many parts of Ireland, the deficit being large in the north of Scotland. Over eastern, central and southern England, there was a slight excess of warmth. In spite of so much unsettled weather, the total duration of bright sunshine for the month was above the average in all but the south-western districts; in London (at Westminster) the aggregate of 35 hours was as many as 16 hours in excess. Thunder and lightning were unusually prevalent for the time of year.



THE GREAT PARIS FLOOD OF 1910.

It has been found impossible to obtain data as to the meteorological conditions which led to the widespread floods in France during the last ten days of January in time for a satisfactory account of the disaster in the present issue. We hope to deal with the subject at a later date. It is curious that in the many columns devoted daily by the London press to the spread of the floods, the amount of the rainfall has not been definitely stated, and it remains for the present a matter of speculation. Heavy and continuous rains had fallen for some days before January 21st, and rivers were in flood all over France, but public attention was naturally concentrated on the state of matters in Paris, where damage was done on a scale unequalled in human memory. Indeed, the flood may prove to have been the highest on record. At the Pont Royal the height of floods in the Seine has been recorded for many years, and we quote, on the authority of the Paris correspondent of *The Times*, the following extreme measurements of the height of the river at this point—in 1615 over 32 feet, in 1802 nearly 30 feet, in 1876 about 26 feet, and on January 29th, 1910, over 31 feet. The height of the great flood of 1658 at the Pont de la Tournelle was 29 feet, and that of 1876 was about 21 feet. If we may take 5 feet as the difference in level between the two datum marks it would appear that the present flood fell slightly short of that of 1658.

If data of scientific value have been scanty in the English press, descriptions of the extent of the inundations on both sides of the Seine and of the damage done have been bewilderingly abundant. While the waters were rising traffic was stopped over many of the bridges; but although only a few inches of the central arch of the Pont d'Alma remained above water, none of the bridges collapsed, and traffic was resumed before the flood abated. It is said that 200,000 people were seriously affected by the flood, being either driven from their homes or thrown out of work in consequence of the stoppage of factories or the closing of shops. The low-lying parts of the underground railway system were completely filled with water, and several of the great railway termini were cut off and closed for traffic. This was the case with the Gare de Lyon and the Gare d'Orleans; the traffic to the Mediterranean coast through Paris was suspended, and Mr. Asquith made his way to Nice after the General Election by a roundabout route through Bâle and Genoa. More than 15,000 telephone subscribers in Paris were cut off, and most of the telegraph wires out of Paris also failed for a time. Water invaded many public buildings, and divers were employed to rescue the archives of the Palais de Justice from under 8 feet of water. The Louvre was seriously threatened, and the spread of the flood was only controlled by the exertions of troops with bags of cement, sand and stones torn from the pavements, which were used to form barricades against the water. Sailors and boats from the Navy were hurried to Paris to

save the inhabitants of the inundated streets, and there was practically no loss of life, thanks to the admirable organization shown in dealing with the situation. The extent of the damage is unknown at the time of writing, and must amount to many million pounds. The chief danger is to the stability of buildings by subsidences in the streets as the water goes down, and to health by the accumulation of sewage from the burst sewers. It is probably not too much to say that the flood has been more widespread and productive of distress than any previously known in Europe, though, considering its extent, it has been singularly free from loss of life.

The complete disorganization of the life of a great city in consequence of some unfortunate combination of meteorological conditions is very rarely seen, and it has been pointed out in Paris that the area inundated would have been far less and the resulting suffering not nearly so great if the quay-walls along the river had not been so frequently cut in recent years for facilitating traffic, and if the system of underground railways had not been so greatly developed.

SCOTTISH METEOROLOGICAL SOCIETY.

A MEETING of this Society was held in the Natural Philosophy Class Room of Edinburgh University on the evening of 24th January, Mr. E. M. Wedderburn, W.S., in the chair.

The resources of the Physics Laboratory of the University of Edinburgh had been placed at the disposal of the Society, and Dr. George A. Carse delivered a lecture, with experimental illustrations, on "Ions in relation to Atmospheric Phenomena." The lecture covered a field even wider than that suggested by its title. The properties of ions as produced by various ionising agents, such as Röntgen rays, radium and ultra-violet light, were first of all described and illustrated, and the question of the efficiency of ions, positive and negative, as condensers of water vapour was considered experimentally. Passing to the phenomenon of lightning, a number of points were touched on from the days of Franklin's experiments to the Report of the Lightning Research Committee of 1905. Finally the various methods of detecting and measuring atmospheric electricity were described, from Volta's burning match to Kelvin's water-dropper, and the later apparatus of Elster and Geitel, Ebert and C. T. R. Wilson. The results of recent observations were discussed, including a series made by the lecturer at Edinburgh; various theories were examined, and Simpson's latest results at Simla as regards the charge carried by snow and rain were described.

ROYAL METEOROLOGICAL SOCIETY.

THE annual general meeting of this Society was held on January 19th at the Institution of Civil Engineers, Great George Street, Westminster, Mr. H. Mellish, President, in the chair.

The Council in their report stated that they had forwarded a memorial to the Royal Commission, which is now enquiring into the work of the University of London, urging that the time is fully ripe for placing the study of meteorology on a more satisfactory basis, and for its inclusion among the subjects for Degree Examinations. The researches into the meteorological conditions of the upper atmosphere by means of balloons had been continued, under the auspices of the Joint Committee appointed by the British Association and the Society. This committee has sent out to Barbados two specially constructed theodolites, together with a supply of balloons and hydrogen, for use by some gentlemen who have agreed to carry out observations on the drift of the currents in the upper air.

The report was adopted, and the thanks of the Society were given to the Council for their services during the past year, and also to the President and Council of the Institution of Civil Engineers for permitting the meetings to be held in the rooms of the Institution.

The President then presented to Dr. W. N. Shaw, F.R.S., the Symons Gold Medal for 1910, which had been awarded to him by the Council in consideration of his distinguished work in connection with meteorological science, and Dr. Shaw replied.

Mr. H. Mellish, in his presidential address, referred to some relations of meteorology with agriculture. The close dependence of agriculture upon climate, and upon the periodical variations of the weather, has been recognised from the earliest times, but the relations are of such a complicated character, and the difficulty of separating the effects of the different factors is so considerable, that as much progress as might have been expected has perhaps not been made in applying the data of meteorology to the purposes of agriculture. The President first referred to the writings of various authors on the subject of temperature and rainfall as affecting the wheat and other crops, and then proceeded to deal with such questions as the liability of some crops, and especially of fruit, to injury from frosts; the influence exercised by forests upon climate, and especially upon rainfall; and the study of phenology. He next considered what steps meteorologists could take to further the application of the data of their science to the various problems of agriculture. For most statistical enquiries the meteorological information available was far more complete than the agricultural. He said that during the winter months perhaps the feature of the weather which is most important to all interests in the country is that of frost or thaw. A difference of a few degrees in the neighbourhood of the freezing point is of far more consequence than very much larger differences in any other part of the thermometer scale, and yet we rarely find either

word mentioned in the daily Reports and forecasts. It is doubtful whether farmers make as much use of the forecasts and Weather Reports as they might. Possibly this may arise because they are not familiar with the technical terms in which the reports are necessarily couched. This might be remedied in the course of time if instruction on the subject could be worked into the courses at the agricultural schools and colleges. The Royal Meteorological Society has lost no opportunity of urging the importance of the subject to farmers, and also the inclusion of meteorology under the head of Nature Study in the schools, and there are reasons to think that this is having some effect. Mr. Mellish, in conclusion, said that "from the opportunities which their life throws in their way, farmers should make the best of observers, and if they once become familiar with the teaching of our science and of its importance to their affairs, we may hope to derive considerable advantages from their co-operation, while we may look to the staffs of the agricultural colleges, when adequate funds are available to enable them to fill the place they ought to in this country, to encourage and direct research in the application of meteorology to the practical needs of agriculture."

A hearty vote of thanks was passed to Mr. Mellish for his address, and the following gentlemen were then elected on the Council :—

President—Henry Mellish. *Vice-Presidents*—W. W. Bryant, H. N. Dickson, D.Sc., F. Druce, Capt. M. W. C. Hepworth, C.B. *Treasurer*—C. Theodore Williams, M.D. *Secretaries*—F. C. Bayard, LL.M., Capt. W. F. Caborne, C.B. *Foreign Secretary*—R. H. Scott, D.Sc., F.R.S. *Councillors*—F. J. Brodie, C. J. P. Cave, W. H. Dines, F.R.S., E. Gold, R. H. Hooker, R. Inwards, R. G. K. Lempfert, Capt. C. H. Ley, Capt. H. G. Lyons, F.R.S., Col. H. E. Rawson, C.B., C. Salter, Capt. R. C. Warden.

During the evening the following new Fellows were elected :—Mr. A. C. Brown, Prof. R. J. H. De Loach, Mr. G. Drake, Mr. J. S. Fowler, Capt. A. S. Gibb, Mr. W. Hayhurst, Mr. W. S. Hill, Lieut. A. E. House, R.N., Prof. C. W. Peake, Mr. W. Sotheby, Capt. H. G. Staunton ; and Miss E. G. R. Taylor.

FLOODS IN JAMAICA, NOVEMBER, 1909.

IN connection with the rainfall of November, 1909, in Jamaica, we have received the following note from Mr. P. R. A. Willoughby, C.E. :—

Fortunately the floods were confined to the eastern end of the island, the centre of heaviest rainfall being at Hagley Gap in the Blue Mountains. There 135 inches fell in nine days, and chiefly during the last six. Falls of 108 and 115 inches respectively at Clifton Beach and Radnor are authentic, as a demi-john was substituted for the ordinary receiver. At King's House, Kingston, we had 40 inches in six days, the average year's fall being 36 inches. It has cost my department £25,000 to make good the damage, and many coffee planters suffered severely.

NOTES ON A WATER SPOUT.

By LIEUTENANT G. K. GANDY, R.N.R.

DURING a recent cruise of the *Dunottar Castle* in the Mediterranean, we had a magnificent view of a waterspout, sketches and details of which may be of interest. The rough sketches here reproduced are my own handiwork, but Mr. Charles Dixon, an artist who was on board, made a very good sketch of the waterspout, which I have sent together with my log to the Meteorological Office.

The waterspout took place in latitude $39^{\circ} 57' N.$, longitude $12^{\circ} 45' E.$, on our way from the Straits of Messina to the Straits of Bonifacio. The following are the observations recorded in the log-book :—

October 17th, 1909.

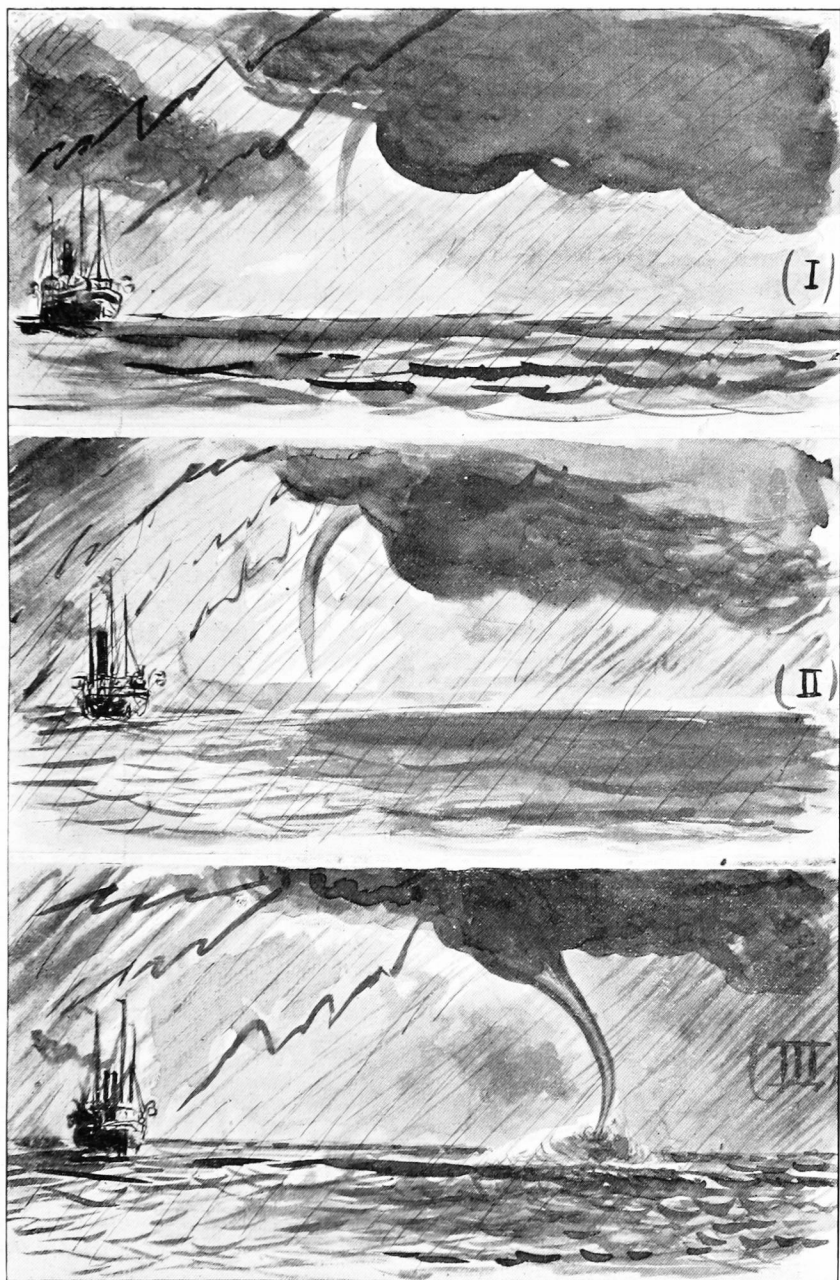
| | Bar. | Dry Ther. | Wet Ther. | Wind. | Force. | Clouds. | Remarks. |
|----------|-------|-----------|-----------|-------|--------|---------------------|--|
| Noon... | 29.86 | 70° | 67° | S.W. | 2 | Cirrus and Stratus. | Light breeze, cloudy but fine, sea slight. |
| 4 p.m... | 29.81 | 69° | 66° | Var. | 2 | Stratus and Nimbus. | Light breeze, overcast, heavy thunder and lightning. |
| 8 p.m... | 29.80 | 66° | 65° | Var. | 0 | Nimbus. | Light variable wind, and dull rainy weather. |

Course steered, N. 52° W. Corr. to Aneroid Bar., + .12.

At 4 p.m.—Observed heavy rain clouds coming up from the southward. Wind light and variable.

At 5 p.m.—Very heavy rain squall from S.E., with vivid lightning and crackling thunder, passed over the ship; a deluge of rain (equal, as far as I could judge, to my Panama record of 2 inches in twenty minutes); the sea a seething mass of white mist, occasioned by the force of the rain falling on the surface of the water.

At 5.10 p.m.—Rain somewhat clearing, when we observed a waterspout forming on the starboard bow, bearing about north, distance from the ship about one mile; altered course to west to avoid it. The waterspout appeared first as in sketch I. It then gradually extended itself from a very heavy rain cloud until it was prolonged nearly to the sea surface (sketch II.). The wind at the time was variable both in force and direction, from about force 2 to 7. The spout when formed kept altering its shape continually in various forms from the perpendicular (sketch III.), as if contrary currents of air affected the apex and base. I and my officers observed no circular movement in the spout, only a sort of wavy motion in its constant change. The sea at the base of the spout was whitened as if from very heavy rain falling on it, the spume rising a considerable height, as is observed at the base of waterfalls.



WATER SPOUT AS OBSERVED ON BOARD R.M.S. "DUNOTTAR CASTLE,"
OCTOBER 17TH, 1909.

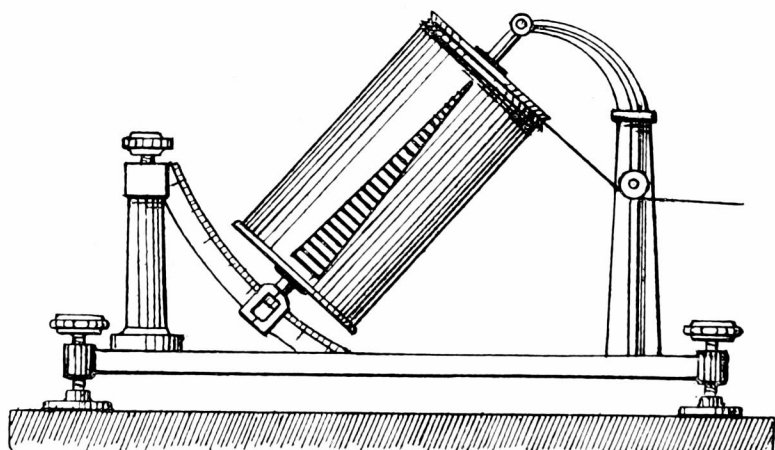
The spout lasted fully twenty minutes, and was gradually lost to view in a drizzly rain that set in and shut out this most interesting phenomenon. I almost imagine that the spout passed over the ship at five o'clock when the lightning was very vivid, and by the thunder-claps and intervals between flashes must have been quite near and overhead. The spout was denser at the sides than in the centre, giving it a cylindrical appearance, and through the centre there appeared to be an attenuated streak of light. We observed no mass of water rising from the sea to meet the spout, only after the spout was formed was the sea observed to be in a turmoil and very much agitated. As one of the passengers observed to me, it appeared to be like a very heavy shower bath with big holes in it.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

THE EARLIEST SUNSHINE RECORDER.

I WAS interested to read in this month's *Meteorological Magazine* the letters of Mr. Wilson Fox and Mr. R. H. Curtis in connection with the above subject. With reference to Mr. Curtis's observations, it may be of interest to point out that the "Heliograph" instrument invented by my father, Mr. T. B. Jordan, in 1838, was, in the following year, considerably modified, and the details of its reconstruction were described in the seventh annual report of the



Royal Cornwall Polytechnic Society in 1839 (pp. 115-116). The main object of the alteration in the form of the instrument was to reduce its indications to a scale, so that the ever-varying activity of solar light might be more definitely expressed. This was done by the adoption of a triangular aperture cut down the whole length of

the outer revolving cylinder, which carried with it the scale of the instrument. This scale was composed of a sheet of metal foil divided into one hundred parts longitudinally, every other part being cut out to admit the light to the prepared paper placed on an inner fixed cylinder. The lengths of the extreme divisions, measuring round the cylinder, were proportioned to each other as one to one hundred, consequently the lower division would be one hundred times longer in passing over its own length than the upper one over its own length. The number of lines marked on the paper (resulting from the revolution of the aperture) thus furnished a comparative measure of the actinic power of diffused light at every moment, which would be registered as so many degrees on the scale of the instrument, in the same way that we now register the degrees of a thermometer.

Mr. Curtis states that "the instrument appears never to have come into use." In this connection, I may quote a remark made in a work by the late Mr. Robert Hunt, F.R.S., entitled "A Manual of Photography," published by John Griffin & Co., London, in 1853. After describing the heliograph, Mr. Hunt observes: "An instrument of this kind was made by me for the British Association, and experiments were carried on with it at intervals for some years. Many of the results were very curious, but the instrument being placed in the Observatory at Kew, the observations were unfortunately discontinued." Mr. Hunt's report on the subject was made to the meeting of the British Association held at that time in Edinburgh.

Since then all knowledge of this apparently useful instrument seems to have been lost. I am not aware if anything was done with it at the Kew Observatory.

The sketch given above was made from my father's own drawing, it may perhaps be of interest to your readers.

JAMES B. JORDAN.

"Hayfield," Hythe, Kent, January 20th, 1910.

FEBRUARY'S SPRING DAYS.

FEBRUARY often provides one or two days on which we experience a delightful foretaste of spring. There is a soft southerly breeze and a shade temperature of 57° to 62° . Nothing can be more pleasant than a walk into the fields on such an inviting afternoon. The novelty of so genial an atmosphere coming immediately upon wintry weather makes a genuine spring day in February more impressively attractive than the sunny days of April or May. The latter months offer so many favours of this kind that we cannot appreciate them as we do in February when just a few hours of the blush of early spring awaken sensations of a most enjoyable kind.

I have collected a few recorded maximum temperatures, as under :—

| | | | |
|-------------------|-------|-------|-------------------------|
| 1878, February 17 | | 59°·6 | W.F.D., Bristol. |
| „ „ 18 | | 60°·5 | Royal Observatory. |
| 1885 „ 24 | | 59°·5 | W.F.D., Bristol. |
| „ „ „ | | 59°·0 | R. F. Sturge, Clifton. |
| 1891 „ — | | 62°·0 | „ „ |
| 1899 „ 10 | | 58°·8 | H. H. Harding, Bristol. |
| 1900 „ 23 | | 58°·4 | W.F.D., Bristol. |
| 1903 „ 19 | | 59°·5 | „ „ |

These are only quoted as examples. Meteorological records must contain many other instances of comparatively high maximum readings in February, and some may have occurred during the last few years, but I have been occupied more with astronomy than with its kindred science meteorology.

W. F. DENNING.

Bristol, February 1st, 1910.

RAINFALL MEASUREMENTS.

MAY I point out that the Rainfall Rule No. 11 quoted on p. 227 of your last volume does not provide for every case which may occur? We are instructed what to do when the measurement is either more or less than ·005 in., but not how to treat a measurement which appears to be exactly that amount. Realising that there must always be a loss from wetting of surfaces in the gauge, I have for 35 years, when in doubt as to the measurement being more or less than ·005 in., entered it as ·01 in., and in the few returns carried to three places of decimals which I receive from the numerous rainfall observers of Hertfordshire, I consider that all entries of ·005 ought to have been entered ·01, and that they therefore represent a day of rain.

In the recent correspondence on this subject one observer (p. 184) states that by keeping the measuring-glass in the gauge, except during severe frosty weather, “every drop of a small fall is secured for record,” but this is not the case; some is always lost on the inner surface of the funnel—probably more than in the usual receiving vessel*, owing to the much larger surface wetted. From the amount shown by experiments (p. 226) to be lost, I feel fully justified in continuing my present procedure, and I venture to suggest that in Rule 11, in order to provide for apparent measurements of ·005 in., the words “more than” in the second line be read “at least,” otherwise while most observers probably enter that amount as ·01, others may neglect it.

JOHN HOPKINSON.

Weetwood, Watford, February 5th, 1910.

[We deprecate further correspondence on this subject. It is impossible to deal with such small quantities of rainfall as ·005 in. with any certainty of exact measurement, nor is it required. Mr.

* This, in my 5 in. Snowdon gauge, is a copper can 2½ ins. in diameter.

Hopkinson's rule introduces no serious error, though it differs from the rule which has been adopted for use in the British Rainfall Organization. Our experience is that an observer can always read to the nearest hundredth of an inch if he wishes to, and we believe that the rule introduced by Mr. Symons is the fairest and best that can be adopted. At the same time those Observers who prefer to dissent from the rules, which are of course only in the nature of recommendations, are quite at liberty to do so, only they are earnestly requested to mention the fact of their dissent, so that their records may either be omitted from comparative discussions or brought into conformity with the practice of the overwhelming majority.

—ED. S.M.M.]

REVIEW.

Handbuch der Klimatologie, von DR. JULIUS HANN, Professor an der Universität Wien. Band II. Klimatographie. I. Teil Klima der Tropenzone. Mit 7 Abbildungen im Text. Dritte, wesentlich umgearbeitete und vermehrte Auflage. [Handbook of Climatology, by Dr. Julius Hann, Professor in the University of Vienna. Vol. II., Climatology. Part I., Climate of the Tropical Zone. With 7 illustrations in the text. Third Edition, thoroughly revised and enlarged.] Stuttgart: J. Engelhorn, 1910. Size $9 \times 6\frac{1}{2}$. Pp. xii + 426. Price 14 marks.

PROFESSOR HANN is, we believe, unique amongst men of science, and very certainly amongst meteorologists, for the ease with which he combines a prodigious capacity for detail with the clear deduction of general principles. The former gift is naturally most apparent in the volume before us, which deals with the climate of tropical Africa and America, southern Asia, northern Australia and the islands of the tropical oceans; but the latter gift also finds place in the short but inspiring general chapter on tropical climate. The body of the work is essentially a compendium of observed facts, and by the index one can turn up a concise statement of all that is known of the climate of every country, island and province in the tropics; while the innumerable footnotes give the titles of the voluminous literature which Professor Hann has concentrated and bottled in his pages for handy reference.

The introductory chapter deals first with the limits of the Tropical Zone, which are taken to be not the mathematical lines of the tropics, but the boundaries of the typical tropical climate, which may be taken practically as the annual isotherm of 20° C. (68° F.); then the conditions of temperature, pressure, wind, rainfall, cloudiness and humidity characteristic of the zone are summarized, and finally a short but deeply interesting section on the action of tropical climate on mankind. The general section is short, for it is only required as an introduction to the mass of organized detail which makes this volume a treasure-house of facts regarding tropical climate.

RAINFALL TABLE FOR JANUARY, 1910.

| STATION. | COUNTY. | Lat. N. | Long. W. [*E.] | Height above Sea. ft. | RAINFALL OF MONTH. | |
|--------------------------------|-------------------|------------|----------------------|--------------------------------|--------------------------------|--------------|
| | | | | | Aver. 1875— 1909. in. | 1910. in. |
| Camden Square..... | London..... | 51 32 | 0 8 | 111 | 1'83 | 1'57 |
| Tenterden..... | Kent..... | 51 4 | *0 41 | 190 | 2'14 | 3'09 |
| Stevington..... | Sussex..... | 50 53 | 0 20 | 80 | 3'08 | 3'46 |
| Southampton (Cadland) .. | Hampshire..... | 50 50 | 1 22 | 52 | 2'75 | 3'24 |
| Hitchin..... | Hertfordshire .. | 51 57 | 0 17 | 238 | 1'74 | 1'68 |
| Oxford (Magdalen College). | Oxfordshire..... | 51 45 | 1 15 | 186 | 1'78 | 1'46 |
| Bury St. Edmunds (Westley) | Suffolk..... | 52 15 | *0 40 | 226 | 1'70 | 1'84 |
| Geldeston [Beccles]..... | Norfolk..... | 52 27 | *1 31 | 38 | 1'53 | 1'85 |
| Polapit Tamar [Launceston] | Devon..... | 50 40 | 4 22 | 315 | 3'59 | 6'30 |
| Rousdon [Lyme Regis]..... | "..... | 50 41 | 3 0 | 516 | 2'94 | 3'23 |
| Stroud (Upfield)..... | Gloucestershire.. | 51 44 | 2 13 | 226 | 2'33 | 2'20 |
| Church Stretton (Wolstaston).. | Shropshire..... | 52 35 | 2 48 | 800 | 2'51 | 2'47 |
| Coventry (Kingswood) | Warwickshire .. | 52 24 | 1 30 | 340 | 2'22 | 2'37 |
| Market Overton .. | Rutland..... | 52 44 | 0 41 | 475 | 1'94 | 2'04 |
| Boston..... | Lincolnshire..... | 52 58 | 0 1 | 25 | 1'54 | 1'16 |
| Worksop (Hodsock Priory). | Nottinghamshire | 53 22 | 1 5 | 56 | 1'70 | 1'91 |
| Macclesfield..... | Cheshire..... | 53 15 | 2 7 | 501 | 2'66 | 3'00 |
| Southport (Hesketh Park).. | Lancashire..... | 53 38 | 2 59 | 38 | 2'55 | 3'48 |
| Wetherby (Ribston Hall) ... | Yorkshire, W.R. | 53 59 | 1 24 | 130 | 1'89 | 4'05 |
| Arneliffe Vicarage..... | "..... | 54 8 | 2 6 | 732 | 6'26 | 11'27 |
| Hull (Pearson Park) | "..... E.R. | 53 45 | 0 20 | 6 | 1'70 | 1'78 |
| Newcastle (Town Moor) ... | Northumberland | 54 59 | 1 38 | 201 | 1'90 | 3'28 |
| Borrowdale (Seathwaite) ... | Cumberland..... | 54 30 | 3 10 | 423 | 13'44 | 15'31 |
| Cardiff (Ely)..... | Glamorgan..... | 51 29 | 3 13 | 53 | 3'65 | 5'65 |
| Haverfordwest (High Street) | Pembroke..... | 51 48 | 4 58 | 95 | 4'69 | 4'24 |
| Aberystwyth (Gogerddan).. | Cardigan..... | 52 26 | 4 1 | 83 | 3'91 | 4'53 |
| Llandudno..... | Carnarvon..... | 53 20 | 3 50 | 72 | 2'51 | 3'61 |
| Cargen [Dumfries]..... | Kirkcudbright... | 55 2 | 3 37 | 80 | 4'10 | 3'49 |
| Marchmont House..... | Berwick..... | 55 44 | 2 24 | 498 | 2'40 | 2'19 |
| Girvan (Pinnmore)..... | Ayr..... | 55 10 | 4 49 | 207 | 4'78 | 4'36 |
| Glasgow (Queen's Park) ... | Renfrew..... | 55 53 | 4 18 | 144 | 3'53 | 3'95 |
| Inveraray (Newtown) | Argyll..... | 56 14 | 5 4 | 17 | 7'34 | 9'76 |
| Mull (Quinish)..... | "..... | 56 36 | 6 13 | 35 | 5'55 | 5'54 |
| Dundee (Eastern Necropolis) | Forfar..... | 56 28 | 2 57 | 199 | 2'01 | 1'73 |
| Braemar..... | Aberdeen..... | 57 0 | 3 24 | 1114 | 2'92 | 4'03 |
| Aberdeen (Cranford) | "..... | 57 8 | 2 7 | 120 | 2'36 | 1'77 |
| Cawdor..... | Nairn..... | 57 31 | 3 57 | 250 | 2'28 | 3'26 |
| Fort Augustus (S. Benedict's) | E. Inverness .. | 57 9 | 4 41 | 68 | 5'58 | 7'23 |
| Loch Torridon (Bendamph) | W. Ross..... | 57 32 | 5 32 | 20 | 9'26 | 12'45 |
| Dunrobin Castle..... | Sutherland..... | 57 59 | 3 56 | 14 | 2'75 | 3'33 |
| Wick..... | Caithness..... | 58 26 | 3 6 | 77 | 2'48 | 2'14 |
| Killarney (District Asylum) | Kerry..... | 52 4 | 9 31 | 178 | 5'94 | 6'35 |
| Waterford (Brook Lodge)... | Waterford..... | 52 15 | 7 7 | 104 | 3'78 | 2'22 |
| Nenagh (Castle Lough)..... | Tipperary..... | 52 54 | 8 24 | 120 | 3'88 | 5'31 |
| Miltown Malbay..... | Clare..... | 52 52 | 9 26 | 400 | 4'01 | 4'50 |
| Gorey (Courtown House) .. | Wexford..... | 52 40 | 6 13 | 80 | 3'19 | 2'07 |
| Abbey Leix (Blandsfort).... | Queen's County.. | 52 56 | 7 17 | 532 | 3'15 | 3'77 |
| Dublin (Fitz William Square) | Dublin..... | 53 21 | 6 14 | 54 | 2'14 | 2'99 |
| Mullingar (Belvedere) | Westmeath..... | 53 29 | 7 22 | 307 | 3'10 | 4'41 |
| Ballinasloe..... | Galway..... | 53 20 | 8 15 | 160 | 3'35 | 3'76 |
| Crossmolina (Enniscoe)..... | Mayo..... | 54 4 | 9 18 | 74 | 5'35 | 7'64 |
| Collooney (Markree Obsy.). | Sligo..... | 54 11 | 8 27 | 127 | 3'87 | 5'18 |
| Seaforde..... | Down..... | 54 19 | 5 50 | 180 | 3'41 | 2'12 |
| Bushmills (Dundarave)..... | Antrim..... | 55 12 | 6 30 | 162 | 3'19 | 4'65 |
| Omagh (Edenfel)..... | Tyrone..... | 54 36 | 7 18 | 280 | 3'46 | 4'64 |

RAINFALL TABLE FOR JANUARY, 1910—*continued.*

| RAINFALL OF MONTH (<i>con.</i>) | | | | | RAINFALL FROM JAN. 1. | | | | Mean Annual 1875- 1909. in. | STATION. |
|-----------------------------------|----------------|----------------------|--------|-------------------|--------------------------------|--------------|-------------------------------|----------------|---|-----------------|
| Diff. from Av. in. | % of Av. | Max. in 24 hours. | | No. of Days | Aver. 1875- 1909. in. | 1910. in. | Diff. from Aver. in. | % of Av. | | |
| | | in. | Date. | | | | | | | |
| — '26 | 86 | '37 | 23 | 14 | ... | ... | ... | ... | 25'11 | Camden Square |
| + '95 | 144 | '64 | 23 | 18 | ... | ... | ... | ... | 27'64 | Tenterden |
| + '38 | 112 | '62 | 23 | 16 | ... | ... | ... | ... | 33'58 | Steyning |
| + '49 | 118 | '68 | 23 | 20 | ... | ... | ... | ... | 31'86 | Cadland |
| — '06 | 97 | '60 | 27 | 15 | ... | ... | ... | ... | 25'16 | Hitchin |
| — '32 | 82 | '37 | 27 | 16 | ... | ... | ... | ... | 24'58 | Oxford |
| + '14 | 108 | '30 | 24 | 18 | ... | ... | ... | ... | 25'40 | Westley |
| + '32 | 121 | '31 | 11 | 20 | ... | ... | ... | ... | 23'73 | Geldeston |
| +2'71 | 175 | 1'17 | 23 | 25 | ... | ... | ... | ... | 38'27 | Polapit Tamar |
| + '29 | 110 | '83 | 23 | 23 | ... | ... | ... | ... | 33'54 | Roundon |
| — '13 | 94 | '54 | 27 | 18 | ... | ... | ... | ... | 29'81 | Stroud |
| — '04 | 98 | '45 | 10 | 21 | ... | ... | ... | ... | 32'41 | Wolstaston |
| + '15 | 107 | '39 | 23 | 16 | ... | ... | ... | ... | 28'98 | Coventry |
| + '10 | 105 | '50 | 23 | 19 | ... | ... | ... | ... | 27'10 | Market Overton |
| — '38 | 75 | '26 | 23 | 20 | ... | ... | ... | ... | 23'35 | Boston |
| + '21 | 112 | '38 | 24 | 16 | ... | ... | ... | ... | 24'46 | Hodsock Priory |
| + '34 | 113 | '49 | 23 | 18 | ... | ... | ... | ... | 34'73 | Macclesfield |
| + '93 | 137 | '76 | 23 | 18 | ... | ... | ... | ... | 32'70 | Southport |
| +2'16 | 214 | '78 | 27 | 22 | ... | ... | ... | ... | 26'87 | Ribston Hall |
| +5'01 | 180 | 2'88 | 15 | 22 | ... | ... | ... | ... | 61'49 | Arneliffe |
| + '08 | 105 | '52 | 27 | 19 | ... | ... | ... | ... | 26'42 | Hull |
| +1'38 | 173 | '91 | 27 | 22 | ... | ... | ... | ... | 27'94 | Newcastle |
| +1'87 | 114 | 3'15 | 15 | 23 | ... | ... | ... | ... | 129'48 | Seathwaite |
| +2'00 | 155 | '85 | 23 | 21 | ... | ... | ... | ... | 42'28 | Cardiff |
| — '45 | 90 | '54 | 27 | 26 | ... | ... | ... | ... | 46'82 | Haverfordwest |
| + '62 | 116 | '57 | 15, 23 | 24 | ... | ... | ... | ... | 45'46 | Gogerddan |
| +1'10 | 144 | '58 | 15 | 21 | ... | ... | ... | ... | 30'36 | Llandudno |
| — '61 | 85 | '56 | 8 | 17 | ... | ... | ... | ... | 43'47 | Cargen |
| — '21 | 91 | '34 | 15 | 20 | ... | ... | ... | ... | 33'76 | Marchmont |
| — '42 | 91 | '80 | 19 | 24 | ... | ... | ... | ... | 49'77 | Girvan |
| + '42 | 112 | '68 | 13 | 16 | ... | ... | ... | ... | 35'97 | Glasgow |
| +2'42 | 133 | 1'26 | 13 | 20 | ... | ... | ... | ... | 68'67 | Inveraray |
| — '01 | 100 | '73 | 15 | 25 | ... | ... | ... | ... | 56'57 | Quinish |
| — '28 | 86 | '30 | 10 | 17 | ... | ... | ... | ... | 28'64 | Dundee |
| +1'11 | 138 | ... | ... | ... | ... | ... | ... | ... | 34'79 | Braemar |
| — '59 | 75 | '24 | 24 | 21 | ... | ... | ... | ... | 32'73 | Aberdeen |
| — '98 | 143 | '52 | 16 | 16 | ... | ... | ... | ... | 29'33 | Cawdor |
| +1'65 | 130 | 1'03 | 8, 13 | 23 | ... | ... | ... | ... | 44'53 | Fort Augustus |
| +3'19 | 134 | 2'42 | 8 | 24 | ... | ... | ... | ... | 83'61 | Bendampf |
| + '58 | 121 | '44 | 13 | 17 | ... | ... | ... | ... | 31'90 | Dunrobin Castle |
| — '34 | 86 | '20 | 24 | 24 | ... | ... | ... | ... | 29'88 | Wick |
| + '41 | 107 | '65 | 24 | 23 | ... | ... | ... | ... | 54'81 | Killarney |
| —1'56 | 59 | '53 | 27 | 22 | ... | ... | ... | ... | 39'57 | Waterford |
| +1'43 | 137 | '63 | 27 | 20 | ... | ... | ... | ... | 39'43 | Castle Lough |
| + '49 | 112 | '57 | 10 | 26 | ... | ... | ... | ... | 45'11 | Miltown Malbay |
| —1'12 | 65 | '53 | 27 | 19 | ... | ... | ... | ... | 34'99 | Courtown Ho. |
| + '62 | 120 | '65 | 27 | 22 | ... | ... | ... | ... | 35'92 | Abbey Leix |
| + '85 | 140 | 1'31 | 27 | 17 | ... | ... | ... | ... | 27'68 | Dublin |
| +1'31 | 142 | '75 | 10 | 18 | ... | ... | ... | ... | 36'14 | Mullingar. |
| + '41 | 112 | '49 | 10 | 21 | ... | ... | ... | ... | 36'64 | Ballinasloe |
| +2'29 | 143 | '95 | 15 | 25 | ... | ... | ... | ... | 52'87 | Enniscoe |
| +1'31 | 134 | '60 | 17 | 25 | ... | ... | ... | ... | 42'71 | Markree |
| —1'29 | 62 | '30 | 17, 23 | 21 | ... | ... | ... | ... | 38'91 | Seaforde |
| +1'46 | 146 | '86 | 23 | 25 | ... | ... | ... | ... | 37'56 | Dundarave |
| +1'18 | 134 | '49 | 17 | 21 | ... | ... | ... | ... | 39'38 | Omagh |

SUPPLEMENTARY RAINFALL, JANUARY, 1910.

| Div. | STATION. | Rain inches | Div. | STATION. | Rain. inches |
|-------|------------------------------|----------------|--------|-----------------------------|-----------------|
| II. | Warlingham, Redvers Road | 2.86 | XI. | Llangyhanfal, Plás Draw.... | 2.34 |
| " | Ramsgate | 2.62 | " | Dolgelly Bryntirion | 5.70 |
| " | Hailsham | 3.70 | " | Bettws-y-Coed, Tyn-y-bryn | 7.26 |
| " | Totland Bay, Aston House. | ... | " | Lligwy | 3.68 |
| " | Stockbridge, Ashley | 3.00 | " | Douglas, Woodville | 4.22 |
| " | Grayshott..... | 3.21 | XII. | Stoneykirk, Ardwell House | 1.77 |
| " | Reading, Calcot Place..... | 2.08 | " | Dalry, The Old Garroch ... | 6.02 |
| III. | Harrow Weald, Hill House. | 1.97 | " | Langholm, Grove Road..... | 5.17 |
| " | Pitsford, Sedgebrook..... | 2.10 | " | Moniaive, Maxwellton House | 4.48 |
| " | Huntingdon, Brampton..... | 1.50 | XIII. | Cramilt Lodge..... | 3.95 |
| " | Woburn, Milton Bryant.... | 1.57 | " | Edinburgh, Royal Observty. | 2.78 |
| " | Wisbech, Monica Road..... | 1.71 | XIV. | Maybole, Knockdon Farm.. | 3.70 |
| IV. | Southend Water Works.... | 1.43 | " | Muirkirk, Glenbuck | ... |
| " | Colchester, Lexden..... | 1.30 | XV. | Campbeltown, Witchburn... | 4.43 |
| " | Newport | 1.72 | " | Glenreadell Mains..... | 4.56 |
| " | Rendlesham | 1.27 | " | Ballachulish House..... | 10.62 |
| " | Swaffham | 2.14 | " | Islay, Ballabus | 5.22 |
| " | Blakeney | 2.61 | XVI. | Dollar Academy | 3.04 |
| V. | Bishops Cannings | 2.80 | " | Balquhider, Stronvar | 9.64 |
| " | Winterbourne Steepleton .. | 4.65 | " | Coupar Angus | 2.92 |
| " | Ashburton, Druid House ... | 6.39 | " | Blair Atholl | 5.24 |
| " | Honiton, Combe Raleigh ... | 4.58 | " | Montrose, Sunnyside Asylum | 1.54 |
| " | Okehampton, Oaklands..... | 7.06 | XVII. | Alford, Lynturk Manse ... | 2.01 |
| " | Hartland Abbey | 3.89 | " | Keith Station | 2.44 |
| " | Lynmouth, Rock House ... | 6.00 | XVIII. | Laon | 18.20 |
| " | Probus, Lamellyn | 4.92 | " | N. Uist, Lochmaddy | 4.65 |
| " | North Cadbury Rectory ... | 3.76 | " | Alvey Manse | 3.51 |
| VI. | Clifton, Pembroke Road ... | 3.75 | " | Loch Ness, Drumnadrochit. | 4.28 |
| " | Ross, The Graig | 2.66 | " | Glencaron Lodge | 9.55 |
| " | Shifnal, Hatton Grange..... | 1.81 | " | Fearn, Lower Pitkerrie..... | 1.99 |
| " | Blockley, Upton Wold | 2.64 | XIX. | Invershin | 2.89 |
| " | Worcester, Boughton Park. | 2.28 | " | Altnaharra | 6.24 |
| VII. | Market Rasen | 2.26 | " | Bettyhill | 4.30 |
| " | Bawtry, Hesley Hall..... | 1.69 | XX. | Dunmanway, The Rectory.. | 6.43 |
| " | Derby, Midland Railway ... | 2.47 | " | Cork | 2.79 |
| " | Buxton..... | 4.41 | " | Mitchelstown Castle | 3.77 |
| VIII. | Nantwich, Dorfold Hall..... | ... | " | Darrynane Abbey | 6.44 |
| " | Liscard | 3.18 | " | Glenam [Clonmel] | 2.65 |
| " | Chatburn, Middlewood | 7.90 | " | Nenagh, Traverston | 5.33 |
| " | Cartmel, Flookburgh | 4.96 | " | Newmarket-on-Fergus, Fenloe | 3.57 |
| IX. | Langsett Moor, Up. Midhope | 4.75 | XXI. | Laragh, Glendalough | 5.91 |
| " | Scarborough, Scalby | 4.45 | " | Moynalty, Westland | 3.60 |
| " | Ingleby Greenhow | 2.48 | " | Athlone, Twyford | 3.21 |
| " | Mickleton..... | 3.00 | XXII. | Woodlawn | 4.74 |
| X. | Bardon Mill, Beltingham ... | 4.37 | " | Westport, St. Helens | 4.52 |
| " | Ilderton, Lilburn Cottage... | 1.83 | " | Dugort | 8.30 |
| " | Keswick, The Bank | 6.03 | " | Mohill | 3.41 |
| XI. | Llanfrechfa Grange..... | 5.78 | XXIII. | Enniskillen, Portora | 3.87 |
| " | Treherbert, Tyn-y-waun ... | 11.28 | " | Dartrey [Cootehill]..... | 3.47 |
| " | Carmarthen, The Friary..... | 4.47 | " | Warrenpoint, Manor House | 2.78 |
| " | Castle Malgwyn [Llechryd]. | 3.59 | " | Banbridge, Milltown | 1.80 |
| " | Plynlimon..... | 11.10 | " | Belfast, Springfield | 3.88 |
| " | Crickhowell, Ffordlas..... | 5.10 | " | Glenarm Castle..... | 4.86 |
| " | New Radnor, Ednol | 5.23 | " | Londonderry, Creggan. Res. | 4.48 |
| " | Rhayader, Tyrmynydd | 7.00 | " | Killybegs | 6.48 |
| " | Lake Vyrnwy | 8.30 | " | Horn Head ... | 5.5 |

METEOROLOGICAL NOTES ON JANUARY, 1910.

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

LONDON, CAMDEN SQUARE.—Dull, sunless conditions with temp. much above the normal occurred in the first half, but some considerable amounts of sunshine were recorded in the latter half with a low temp. Duration of sunshine 49·5* hours, and of R 33·8 hours. Mean temp. 39°·8 or 1°·2 above the average of 50 years. Shade max. 55°·7 on 2nd, the highest temp. recorded in January since 1899; shade min. 19°·6 on 27th. F 11, f 21.

TEXTERDEN.—Duration of sunshine, 70·0† hours. Shade max. 52°·0 on 10th and 14th; min. 20°·5 on 26th. F 11, f 16.

PITSFORD.—R 44 in. above the average. Mean temp. 37°·6. Shade max. 54°·5 on 2nd; min. 17°·6 on 27th. F 12.

LYNMOUTH.—Shade max. 54° on 2nd and 9th; min 19° on 26th and the lowest temp. recorded since observations began in 1896. F 5.

NORTH CADBURY.—A high barometer with intense calm and deep gloom prevailed in the first week. The rest of the month was rather boisterous with frequent though not deep S. Shade max. 55° on 2nd; min. 17° on 27th. F 11, f 18.

WORCESTER.—Shade max. 57° on 4th; min 14° on 26th. F 12, f 21.

HODSOCK PRIORY.—Shade max. 57°·0 on 2nd; min. 12°·5 on 27th. F 12, f 23.

SOUTHPORT.—R 78 in. above the average of 35 years. Duration of sunshine 63·4* hours, or 18·6 hours above the average. Duration of R 83·9 hours. Mean temp. 38°·8. Shade max. 53°·3 on 9th; min. 16°·0 on 26th. F 8, f 15.

ILDERTON.—Mild and fine in the first half, then colder. Very stormy on 28th and 29th with considerable S fall. The roads and railways were much blocked in the south of Northumberland and in Durham.

HAVERFORDWEST.—Duration of sunshine 43·7* hours. Shade max. 51°·4 on 3rd; min. 16°·4 on 27th. F 3, f 9.

LLANDUDNO.—Shade max. 55°·2 on 8th; min. 22°·5 on 27th. F 7.

DOUGLAS.—Stormy and generally cold with an unusual number of frosts, but with a considerable excess of bright sunshine. S fell heavily on 23rd, 27th and 28th.

CARGEN.—The mild weather of the first three weeks was followed by 10 days of severe frost, causing serious loss to the potato and turnip crops. Drake's comet was clearly seen between 5.30 and 6 p.m. on 24th and several days following. Shade max. 54°·0 on 2nd; min. 10°·0 on 26th. F 12.

EDINBURGH.—Shade max. 55°·1 on 2nd; min. 16°·6 on 27th. F 14, f 17.

COUPAR ANGUS.—A succession of slight S storms occurred in the latter half, and a noteworthy feature was the sudden and capricious changes of temp. Mean temp. 33°·3 or 2°·3 below the average. Shade max. 53°·5 on 2nd; min. -6° on 28th, and the lowest temp. registered since January, 1899.

FORT AUGUSTUS.—Shade max. 53°·1 on 1st; min. 1°·9 on 28th. F 16.

WATERFORD.—Shade max. 51°·5 on 8th and 9th; min. 23°·0 on 26th. F 11.

DUBLIN.—The first week was fine and mild but the remainder of the month was broken, often cold and a violent S storm occurred on 28th. Mean temp. 40°·9. Shade max. 56°·4 on 2nd; min. 24°·1 on 27th. F 8, f 14.

MARKREE.—Shade max. 55°·0 on 9th; min. 7°·0 on 27th. F 10, f 19.

WARRENPOINT.—Shade max. 53° on 1st, 2nd and 9th; min. 28° on 26th. F 7, f 12.

* Campbell-Stokes.

† Jordan.

Climatological Table for the British Empire, August, 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. | | | | | | | | | |
| London, Camden Square | 86°·4 | 12 | 45°·1 | 3 | 73°·3 | 53°·4 | 55°·9 | 81 | 130°·6 | 41°·0 | 1·46 | 10 | 5·3 |
| Malta | 91°·4 | 2 | 67°·5 | 6 | 82°·2 | 71°·7 | 65°·6 | 72 | 147°·6 | ... | ·66 | 2 | 2·4 |
| Lagos | 88°·0 | 23* | 71°·0 | 23 | 83°·7 | 73°·8 | 74°·2 | 81 | 159°·0 | 69°·0 | 1·40 | 17 | 8·6 |
| Cape Town | 72°·0 | 20 | 41°·0 | 14 | 65°·8 | 48°·1 | 49°·3 | 82 | ... | ... | 7·32 | 17 | 6·2 |
| Durban, Natal | 99°·9 | 31 | 50°·4 | 17 | 76°·3 | 56°·4 | ... | ... | 140°·1 | ... | ·11 | 7 | 3·5 |
| Johannesburg | 74°·6 | 24 | 26°·9 | 16 | 66°·5 | 44°·7 | 37°·5 | 59 | 124°·8 | 24°·2 | 1·39 | 2 | 1·1 |
| Mauritius | 76°·7 | 21 | 56°·4 | 11 | 74°·6 | 61°·6 | 59°·8 | 76 | 145°·6 | 46°·8 | 2·39 | 21 | 5·9 |
| Calcutta... .. | 92°·3 | 13 | 74°·0 | 14 | 88°·1 | 77°·9 | 77°·6 | 87 | 158°·9 | 72°·5 | 15·17 | 20 | 8·3 |
| Bombay... .. | 88°·0 | 14 | 74°·8 | 1 | 85°·1 | 77°·2 | 75°·6 | 85 | 133°·5 | 73°·6 | 7·82 | 22 | 7·4 |
| Madras | 96°·5 | 1, 2 | 73°·2 | 20† | 91°·5 | 76°·9 | 75°·9 | 84 | 141°·3 | 72°·3 | 5·07 | 16 | 5·4 |
| Kodaikanal | 65°·5 | 6 | 50°·7 | 1 | 62°·0 | 52°·8 | 53°·5 | 89 | 138°·4 | 42°·3 | 16·01 | 29 | 7·8 |
| Colombo, Ceylon | 86°·2 | 19 | 71°·8 | 12 | 84°·6 | 75°·9 | 73°·6 | 81 | 158°·3 | 70°·1 | 7·48 | 24 | 7·4 |
| Hongkong | 90°·5 | 2 | 74°·9 | 8 | 87°·5 | 78°·8 | 76°·4 | 81 | 141°·1 | ... | 8·34 | 17 | 6·4 |
| Melbourne | 67°·4 | 19 | 32°·5 | 25 | 56°·6 | 43°·2 | 41°·8 | 75 | 121°·4 | 26°·7 | 3·59 | 24 | 7·2 |
| Adelaide | 67°·4 | 18 | 36°·3 | 5 | 59°·2 | 45°·6 | 45°·1 | 78 | 136°·5 | 29°·3 | 5·59 | 20 | 6°·5 |
| Coolgardie | 70°·0 | 15 | 34°·0 | 23‡ | 59°·8 | 42°·3 | 40°·9 | 68 | 140°·0 | 31°·0 | 1·82 | 13 | 5·6 |
| Perth | 63°·7 | 14 | 40°·5 | 11 | 62°·9 | 48°·2 | 47°·8 | 75 | 130°·0 | 35°·4 | 9·93 | 17 | 5·5 |
| Sydney | 71°·6 | 12 | 39°·1 | 4 | 61°·7 | 46°·6 | 43°·7 | 74 | 105°·8 | 26°·1 | 2·16 | 23 | 4·6 |
| Wellington | 66°·0 | 28 | 36°·0 | 9 | 55°·6 | 45°·7 | 40°·2 | 68 | 108°·0 | 27°·0 | 5·46 | 19 | 7·4 |
| Auckland | 63°·5 | 1 | 39°·0 | 18 | 58°·3 | 47°·8 | 49°·4 | 87 | 121°·0 | 34°·0 | 7·13 | 22 | 6·1 |
| Jamaica, Kingston | 92°·8 | 22 | 69°·9 | 25 | 88°·8 | 73°·1 | 72°·5 | 76 | ... | ... | 4·11 | 14 | ... |
| Trinidad | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Grenada | 88°·8 | 15 | 70°·8 | 18 | 85°·1 | 74°·6 | 74°·5 | 78 | 140°·6 | ... | 7·70 | 24 | 4°·0 |
| Toronto | 96°·0 | 25 | 46°·0 | 30 | 79°·0 | 59°·0 | ... | ... | 114°·0 | 41°·0 | 1·33 | 5 | ... |
| Fredericton | 92°·0 | 8 | 43°·0 | 16 | 76°·0 | 52°·0 | ... | 75 | ... | ... | 5·07 | 12 | 5°·1 |
| St. John's, N.B. | 82°·0 | 2 | 46°·0 | 31 | 71°·0 | 55°·0 | ... | ... | ... | ... | 2·86 | 11 | 4°·3 |
| Victoria, B.C. | 76°·0 | 28 | 44°·0 | 23 | 69°·0 | 50°·0 | ... | 73 | ... | ... | ·47 | 3 | 4°·0 |
| Dawson | 80°·0 | 2 | 26°·0 | 28 | 66°·0 | 41°·0 | ... | ... | ... | ... | ·81 | 12 | 5°·2 |

* and 31. † and 22. ‡ and 29.

MALTA.—Mean temp. of air 76°·5. Average bright sunshine 12·1 hours per day.

Johannesburg.—Bright sunshine 302·5 hours. Snow on 17th and 18th, depth 12 inches. No such fall since Johannesburg was founded in 1886–7.

Mauritius.—Mean temp. of air 0°·3 below, of dew point 0°·4 above, and R ·08 in. above, averages. Mean hourly velocity of wind 10·8 miles or 1·6 below average.

KODAIKANAL.—Bright sunshine 106 hours. A record rainfall.

COLOMBO.—Mean temp. of air 77°·6 or 3°·1 below, of dew point 0°·3 above, and R 3·86 in. above, averages. Mean hourly velocity of wind 7 miles. TS on 11th.

HONGKONG.—Mean temp. of air 82°·8, or 1°·5 above average. Bright sunshine 215·3 hours. Mean hourly velocity of wind 7·8 miles. R 5·86 in. below average.

Melbourne.—Mean temp. of air 1°·0 below, and R 1·79 in. above, averages.

Adelaide.—A cold and wet month, one of the wettest in the history of South Australia.

Sydney.—Mean temp. 0°·6 and R 1·11 in. below, averages.

Wellington.—Bright sunshine 147·1 hours. TS on 5th.

Auckland.—Wet and stormy, R nearly double previous 40 years' average.