

# SYMONS'S METEOROLOGICAL MAGAZINE.

No. CCCCXXV.]

JUNE, 1901.

VOL. XXXVI.

## THE SYMONS MEMORIAL FUND.

A MEETING of Subscribers to the fund for the foundation of a Gold Medal in memory of the late Mr. G. J. Symons, F.R.S., was held in the rooms of the Royal Meteorological Society on Tuesday, June 11th. The Executive Committee appointed on May 31st, 1900, consisted of Dr. C. Theodore Williams (Treasurer), Mr. F. Campbell Bayard, Mr. R. Bentley, Mr. C. Hawksley, Mr. J. Hopkinson, Professor R. Meldola, F.R.S., Dr. R. H. Scott, F.R.S., Mr. H. Sowerby Wallis and Mr. W. Whitaker, F.R.S. Professor Meldola and Mr. W. Marriott acted as Secretaries. The Report of this Committee stated that the Subscribers numbered 323, and the subscriptions ranged from twenty-five guineas to half-a-crown, the total amount received being £713 14s. 7d. After paying for the dies for the medal and all preliminary expenses, a sufficient sum remained in hand for the first award of the medal, while the balance had been invested so as to yield an annual income of £18. The Committee had adopted the designs of Mr. J. Pinches for the dies of the medal, the obverse bearing a medallion of Mr. Symons, and the reverse the Tower of the Winds at Athens. The Committee recommended that the following conditions be submitted to the Council of the Royal Meteorological Society :—

- (1). That the Medal be awarded for distinguished work done in connection with Meteorological Science, irrespective of sex or nationality.
- (2). That the Medal be awarded biennially, unless the Council see fit to withhold the award.

Dr. A. Buchan, F.R.S., moved the adoption of the Report, passing a high encomium on the work and on the personality of the late Mr. Symons, and Mr. E. M. Eaton seconded the motion.

Mr. C. Hawksley then proposed that the Treasurer be instructed to transfer the whole of the property of the fund to the Royal Meteorological Society, and after the proposal had been seconded by Mr. Bentley and adopted, Mr. W. H. Dines accepted the trust in the name of the Society. A vote of thanks to the Treasurer, Secretaries and Executive Committee was proposed by Sir Erasmus Ommanney, seconded by Dr. Mill and acknowledged by Dr. Williams.

## INTERNATIONAL INVESTIGATION OF THE SEA AND AIR.

IN 1899 an International Conference was held at Stockholm, at which representatives of the countries bordering the Baltic and North Sea drew up a provisional plan for carrying out a systematic study of the seas bordering North-Western Europe, in the interest mainly of the fishing industry. The governments of Denmark, Finland, Germany, Holland, Norway, Russia, Sweden and (with some reservations) the United Kingdom, agreed to take part in the work, and they, together with Belgium, sent delegates to a second Conference, which met in Christiania from May 6th to 11th of this year, as mentioned in our last number, p. 61.

The work of this Conference consisted in the adoption of a programme for the joint investigation, and the suggestion of a scheme of organization to be submitted to the various governments.

From earlier researches it has been established that fish living in the sea are subject to the influence of the currents, salinity and temperature of the water much as animals living in the air are subject to the influence of wind, rainfall and temperature. Just as the climatic influence on the larger land animals is only partly direct and very largely indirect, working through the stronger influence exercised on the sources of food supply, so the oceanic climates act largely by causing variations in the supply of the small floating organisms, known collectively as plankton, which form the food of the useful fishes. It is accordingly proposed to establish a sort of meteorology of the sea, which shall take account of the seasonal and periodic changes in the nature, movements and temperature of the water, and also a sort of agriculture of the sea, which shall study the conditions necessary for successful harvests of food fishes. The delegates sent by the various governments were therefore chosen to represent not only government departments but also practical fisheries, the scientific study of marine life, and what we may term "marine meteorology." The British delegates were Sir Colin Scott Moncrieff (Permanent Under Secretary of State for Scotland), Professor D'Arcy Thompson, of Dundee (a member of the Scottish Fishery Board), Mr. W. Garstang (of the Marine Biological Station at Plymouth), and Dr. H. R. Mill.

The week spent at Christiania was one of continuous hard work, most harmoniously carried out by all the various nationalities; and it is exceedingly satisfactory to reflect that, after full discussion, every resolution proposed was either accepted or rejected unanimously. The programme for the projected work is divided into two categories—the first Hydrographical, or, as it is more usually termed in English, Oceanographical; the second Biological.

The first naturally possesses most interest for meteorologists, and the resolutions adopted are summarised below.

The first paragraph may be quoted in extenso:—"The hydrographical researches shall have for their object the distinction of the

different water strata, according to their geographical distribution, depth, temperature, salinity, gas contents, plankton and currents, in order to find the fundamental principles, not only for the determination of the external life conditions of useful marine animals, but also for weather forecasts for extended periods in the interests of agriculture."

In order to carry out this object, it was decided that observations of the various conditions should be made as far as possible simultaneously along certain determined lines four times in the year, the middle of the period of working being arranged to fall in the first half of February, May, August and November respectively. It is provided that during the cruises of the exploring vessels the temperature of the air shall be observed every two hours by means of Assmann's aspiration thermometer, and pressure by the barometer, self-recording instruments being used for interpolation. Opportunities for carrying on researches with kites in the upper air are to be offered on board the ships to the meteorological offices of the various countries, and all meteorological observations are to be carried out according to the methods adopted by these offices, with which it is the desire of the international organization to co-operate. The results obtained on each trip are to be tabulated and mapped at the earliest possible date, and published in a special bulletin. Rules are laid down for the observation of temperature in the water at various depths, and for the collection and analysis of samples of sea-water. The unit for measuring depth is to be the metre, but the depth may also be given in fathoms; distances are to be given in sea miles, and either the Centigrade or the Fahrenheit thermometer scale may be used, but all observations are to be reduced to Centigrade for publication. The methods of testing thermometers and conducting the various laboratory determinations are duly specified. The concluding paragraph is of special importance as tending towards continuity in the records of surface observations:—"It is desirable to supplement these investigations by making use of regular liners, lightships, &c., and coast-stations for the purpose of taking temperature observations and collecting samples of sea-water and plankton. These observations are to be taken not only in the typical months but also during the intervening periods."

The biological and fishery observations are laid down and classified with no less care and minuteness; but there is not space to touch on them here.

In order to carry out the scheme of work it is necessary that each nation should provide at least one ship suitably equipped for making the researches. The Norwegian vessel, "Michael Sars," is already at work under the able leadership of Dr. Hjort, who describes her equipment in detail in the last two numbers of *Petermanns Mitteilungen*. The Russians have also a special ship ready for use, and the Germans have specially designed a vessel which is being built. It is not yet known what action our Government will take, but we can hardly afford to take a minor part in so important a movement.

The Conference recommends that an International Council, consisting of two Commissioners, with full powers from each of the governments concerned, should control the whole organization, and that they should meet at Copenhagen as soon as possible in order to appoint the permanent officials of the Central Bureau, whose duty it will be to direct the various cruises, to collect and discuss the data, and to publish reports. The Council will also arrange for the institution of an international laboratory, at which the various instruments will be tested and observers instructed in their use. The Central Bureau and Laboratory are to be independent of each other, and probably in different countries, but both under the direction of the Council. The decision as to the site of both places is left to the various governments, to which a confidential report has been made by the Conference. It may, however, be said that on account of the reserve with which our Government approached the matter at first, there is little probability of either Bureau or Laboratory being established in this country, a fact which makes it all the more important that British interests in this international co-operation shall not be suffered to fall into the background. Any arrangement that can be come to must of necessity be a compromise, and subject to some drawbacks; but the prime requisites are friendly co-operation and uniformity of working between the various nationalities, and this we believe that the Conference has secured. The work is proposed to be carried on for five years, and it is hoped that the simultaneous observations may be commenced not later than May, 1902, and earlier if possible.

Amongst the resolutions passed by the Conference, attention was called to the interest which would result from uniting the study of large fresh water lakes with that of the sea, and to the great importance, both for fisheries and weather forecasting, of establishing a telegraph cable to Iceland.

It is impossible to conclude a notice of the Conference, however brief, without acknowledging the great courtesy and hospitality of the King and Government of Norway, and the hearty welcome given to the foreign delegates by Professor Nansen, Professor Mohn, and other Norwegian men of science.

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#### PROPOSED OBSERVATIONS ON DEW-PONDS.

FOLLOWING on a paper on dew-ponds, read at the Bradford meeting of the British Association by Professor Miall, a scheme of meteorological observations, intended to throw light upon the supply of dew-ponds, has been drawn up by a Leeds Committee, consisting of Mr. F. W. Branson, Dr. J. B. Cohen, Mr. Herbert Ingle, Professor L. C. Miall and Professor W. Stroud.

In order to bring the matter before such of our readers as may have leisure and opportunity for taking part in so interesting a research, we reproduce the programme suggested, and we hope that it may be acted upon in different parts of the country.

1. Observations should be made for at least a week, and longer if possible, at two stations, one being a carefully selected dew-pond, the other a low-lying pond in the same neighbourhood.

2. The observations should be taken day and night at intervals of three hours, and should include the following points:—(a) Temperature of air. (b) Temperature of surface and bottom of pond, the depth being noted, and being the same in each case. The bulb of the surface-thermometer to be immersed. (c) Humidity of air, as measured by wet and dry bulb thermometers. (d) Amount of dew, to be measured either by parcels of wool (see Wells on Dew), or in some other way. (e) Level of the water of the pond, to be measured by an inclined scale dipping into the water. Mr. Ingle has devised a scale which can be read with great ease and considerable accuracy. (f) A tray containing pond-water to be floated on the surface of the pond, and the loss or gain determined morning and evening by weighing the tray and its contents, the outside of the tray being dried. To secure a tranquil area for the floating tray during a breeze a protective ring of wood or coarse wire gauze, not projecting sensibly above the surface, might be arranged to enclose it. A rough landing-stage would be useful for this and other observations. The observations with a floating tray should be repeated on a low-level pond, and a similar tray containing pure water should be exposed at a spot thirty or forty feet away from the dew-pond. All these observations should be simultaneous. (g) Cloud, mist, rain, sunshine, direction and force of wind to be noted.

3. The situation, exposure, shape, depth and superficial area of each pond should be noted. Such part of the margin as can act as a collecting ground should be measured.

4. Sheep or cattle should not have access to the ponds during the period of observation. If absolutely necessary, a measured volume of water should be transferred every day to a trough for their use, but this is undesirable.

5. Observations on rainfall are most desirable. They cannot be made during the time appointed for observations (a—g), which, it is hoped, will be rainless. The best stations for rain gauges would be at the selected dew-pond, at a spot thirty or forty feet away from the dew-pond, and as nearly as possible at the same level, and, lastly, at the low-level pond and at neighbouring stations to windward and leeward during the prevailing winds. It may be necessary, for lack of observers, to employ gauges which will hold the rain of several weeks.

Suggestions as to the organization of an observing party have also been drawn up. As the work is purely voluntary each observer will be expected to pay his own expenses. July or August would probably be the most suitable month for carrying out the observations, and settled weather is considered essential. We should be glad if any reader able and willing to organise an observing party, would communicate on the subject either with the Editor, or directly with Professor Miall, The Yorkshire College, Leeds.

## MEAN TEMPERATURE (SOUTHERN COUNTIES), 1885-1900.

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

The past 16 years, if divided into two periods of 8 years each, show a very remarkable record of temperature. I shall be glad to know whether it agrees with the experience of others. If there is anything of the nature of a cycle in this 8-year alternation, the year 1901 should prove the forerunner of another sequence of cold years. The following means are derived from stations in Sussex, Hants and Surrey, and I give them for what they may be worth:—

FIRST PERIOD, 1885—1892.			SECOND PERIOD, 1893—1900.		
Years.	Mean Temp.		Years.	Mean Temp	
1885	.....	46 <sup>o</sup> 0	1893	.....	47 <sup>o</sup> 7
1886	.....	46 <sup>o</sup> 3	1894	.....	48 <sup>o</sup> 0
1887	.....	45 <sup>o</sup> 2	1895	.....	48 <sup>o</sup> 0
1888	.....	45 <sup>o</sup> 4	1896	.....	49 <sup>o</sup> 9
1889	.....	46 <sup>o</sup> 5	1897	.....	49 <sup>o</sup> 7
1890	.....	45 <sup>o</sup> 7	1898	.....	50 <sup>o</sup> 0
1891	.....	45 <sup>o</sup> 4	1899	.....	49 <sup>o</sup> 2
1892	.....	45 <sup>o</sup> 0	1900	.....	48 <sup>o</sup> 8
		—			—
Mean	...	45 <sup>o</sup> 7	Mean	...	48 <sup>o</sup> 9

Coldest year, 1892, 45<sup>o</sup>0. Warmest, 1898, 50<sup>o</sup>0.

The means for the months show an increase in the second period in every instance, thus:—

	MEANS.		INCREASE.	Sequences of Heat and Cold of 5 years or more.
	1st Period.	2nd Period.	2nd Period. +	
Jan. ...	33 <sup>o</sup> 8	36 <sup>o</sup> 8	3 <sup>o</sup> 0	Cold '85-'89 and '91-'95.
Feb. ...	35 <sup>o</sup> 1	37 <sup>o</sup> 6	2 <sup>o</sup> 5	„ '86-'91.
March ...	37 <sup>o</sup> 3	41 <sup>o</sup> 2	3 <sup>o</sup> 9	„ '85-'92.
April ...	43 <sup>o</sup> 1	47 <sup>o</sup> 5	4 <sup>o</sup> 4	„ '85-'92. Warm '93-'00.
May ...	50 <sup>o</sup> 6	52 <sup>o</sup> 5	1 <sup>o</sup> 9	None.
June ...	57 <sup>o</sup> 2	60 <sup>o</sup> 0	2 <sup>o</sup> 8	None.
July ...	59 <sup>o</sup> 2	63 <sup>o</sup> 2	4 <sup>o</sup> 0	Cold '88-'92. „ Warm '95-'00.
Aug. ...	58 <sup>o</sup> 0	61 <sup>o</sup> 8	3 <sup>o</sup> 8	„ '88-'92.*
Sept. ...	54 <sup>o</sup> 0	56 <sup>o</sup> 5	2 <sup>o</sup> 5	None.
Oct. ...	45 <sup>o</sup> 4	48 <sup>o</sup> 3	2 <sup>o</sup> 9	„
Nov. ...	40 <sup>o</sup> 9	42 <sup>o</sup> 8	1 <sup>o</sup> 9	„
Dec. ...	33 <sup>o</sup> 9	38 <sup>o</sup> 9	5 <sup>o</sup> 0	„ Warm '94-'98.

Mean ... 3<sup>o</sup>2

\* Warm '95, '97, '98, '99.

April is generally considered to be a variable month, but here we have no less than 8 cold Aprils followed by 8 mild Aprils. It remains to be seen whether this year will break the series. The cold periods for February, March and April are very similar, and, with regard to July and August, are identical; and the warm ones are much the same, with the exception of 1896 and 1900 in August, which gave average temperatures.

The number of months over and under average in the two periods shows the situation in a still more striking manner, thus:—

FIRST PERIOD.			SECOND PERIOD.		
	Warm.	Cold.		Warm.	Cold.
1885	1	8	1893	6	3
1886	2	6	1894	6	4
1887	1	8	1895	9	2
1888	1	9	1896	10	1
1889	2	8	1897	10	0
1890	1	8	1898	8	0
1891	0	7	1899	8	1
1892	0	9	1900	7	3
Totals	8	63	Totals	64	14

Out of the whole 192 months, 43 were of average temperature—viz., 25 in the first period and 18 in the second period.

A. F. PARBURY.

*Chiddingfold, Godalming, Surrey.*

TABLES OF MONTHLY RAINFALL AT ACRISE, KENT.

Lat. 51° 8' 15" N. Long. 1° 8' 15" E.

Gauge 8 in. diameter ; 1 ft. above ground ; 500 ft. O.S.D.

By G. C. WOOLLETT.

TABLE I. shows months of the year in order according to their dryness during the past thirty years, 1871 to 1900, both years inclusive, or 10957 days, out of which rain fell on 5673 days yielding 1124·58 in. of rainfall, inclusive of hail, snow and sleet. The thirty years' average is 37·486 inches.

Table II. shows order of months according to number of days rainfall and the average number of rainy days in the month.

TABLE I.			TABLE II.		
	Fall. in.	Monthly Average. in.	Month.	Total Days of Rain.	Average No. of Days in each Month.
1. May...	63·74	2·124	1. June..	362	12·0
2. April..	67·34	2·244	2. May..	378	12·6
3. June ..	69·80	2·326	3. July..	423	14·1
4. March	75·31	2·510	4. Aug...	438	14·6
5. Feb....	82·23	2·741	5. April.	439	14·6
6. July...	83·02	2·767	6. Sept..	455	15·1
7. Aug...	85·87	2·862	7. Mar...	480	16·0
8. Sept...	97·56	3·252	8. Feb...	489	16·3
9. Jan....	100·99	3·366	9. Oct...	524	17·4
0. Dec....	120·56	4·018	10. Jan...	544	18·1
11. Nov...	137·54	4·584	11. Nov...	565	18·8
12. Oct....	140·62	4·687	12. Dec...	576	19·2
	1124·58	37·481			

## THE NORWEGIAN RAINFALL SERVICE.

BY PROFESSOR H. MOHN.

*Director of the Meteorological Institute, Christiania.*

THE Norwegian Meteorological Institute, which was established in 1866, had in 1895 one hundred and two stations for measuring atmospheric precipitation. In 1894 the Norwegian Association of Engineers and Architects impressed with the importance of obtaining fuller information regarding the rainfall of the country, approached the government with the object of bringing before the Storting, or Norwegian Parliament, a proposal for the establishment of 263 new stations for measuring precipitation. The vote was granted, and the whole system was placed under the superintendence of the Meteorological Institute.

The total number of stations now at work in Norway is 438, and most of the observers are paid. The results of the observations are published in a year book entitled "*Nedböriagttagelser i Norge*" (*i.e.*, Observations of Precipitation in Norway). The contents of this Report for each year include :—

A.—Depth of precipitation for each day, measured at 8 a.m., at 202 stations.

B.—Depth, extent and density of the snow covering the ground at the same stations, as far as they make these observations.

C. Part I.—Total depth of precipitation for each month, and for the year, at all stations, the daily maximum for each month, the number of days with observed precipitation for each month, the number of days with precipitation equal to, or greater, than one-tenth of a millimetre ( $\cdot 004$  in.), the number of days with a fall equal to, or greater, than one millimetre ( $\cdot 039$  in.), the number of days with snow or sleet, and with hail, mean and maximum depth of snow, and finally the number of days on which snow covered the ground.

C. Part II.—Normal values of depth of precipitation and of depth of snow, mean maxima and minima, and absolute maximum of depth of precipitation in twenty-four hours for each month, and for the year for all the old stations.

D.—Yearly values of the depth of precipitation for each single year, 1867-95, and the normals of the year.

E.—Yearly depths of precipitation for each year in the period from 1896 to the current year, and their means.

F.—Mean monthly and yearly depths of precipitation expressed as per centages of the normal values.

A map is published for each year, showing the distribution of rainfall by isohyetal lines.

Snow and rain are not measured in the same gauge; the rain-gauge is made of painted metal, in one piece, with a spout, by which the water collected can be poured out\*, and it is exposed on a stand.

\* The pattern is very similar to one of those in use at Greenwich Observatory.—Ed. S. M. M.

The snow-gauge is a rectangular metal box, standing about two feet high, in which the snow is collected and melted for measurement.

It is believed that the continuation of this work will be of the greatest value to Norway as an industrial country. The amount of rain is large, and the fallen water must descend from the higher land to the sea, and on its way it supplies an immense store of power, which may be employed in useful mechanical work, a very important consideration in a country which contains no deposits of mineral fuel.

[We are pleased to receive the foregoing communication from the distinguished chief of the government weather service in Norway. We trust that the last paragraph does not imply that any question has arisen as to the wisdom of continuing observations of so vital and practical a nature as those on rainfall. Even if such observations were only established temporarily, they must be continued for at least ten years, and preferably for twenty, or more, before they can become very useful, while of course they should be kept up in perpetuity, so as to trace the fluctuations of rainfall, as well as to establish normal values. —ED. *S.M.M.*].

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#### ROYAL METEOROLOGICAL SOCIETY.

THE first of the afternoon meetings for the present session was held on Wednesday, May 15th, at the Society's rooms, 70, Victoria Street, Westminster, Mr. W. H. Dines, B.A., President, in the chair.

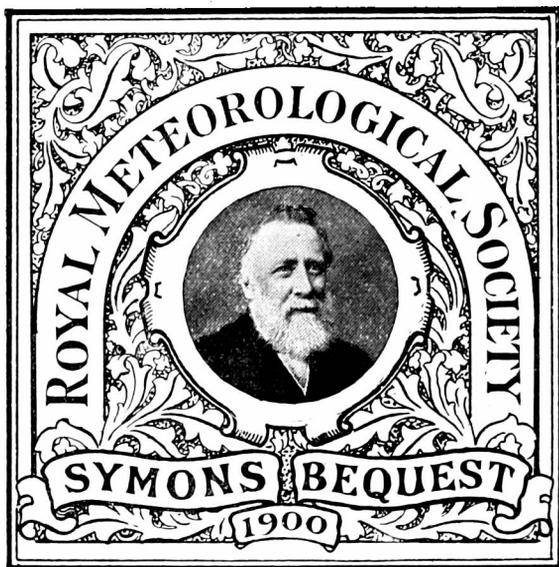
Miss J. Charlesworth was elected a Fellow.

Mr. Rupert T. Smith read a paper entitled "The Periodicity of Cyclonic Winds," which was the result of a discussion of his own observations made in the neighbourhood of Birmingham, during the 26 years 1874-99. He had been accustomed to classify the daily observations of the direction and the force of the wind, under the heads "cyclonic," "anti-cyclonic," and "periodic." The winds were entered as (1) "cyclonic," when the barometric pressure was below 29·8 ins., and the incurving isobars showed that some portion of the circular storm was definitely over the station; (2) "anti-cyclonic," when the barometric pressure was above 30·0 ins., and the weather chart showed the prevalence of anti-cyclonic conditions; and (3) "periodic," when the barometric pressure was about the average for the time of year, and when the weather conditions were doubtful, and so could not be grouped under "cyclonic," or "anti-cyclonic." In this paper the author only dealt with the winds in the first group, viz. "cyclonic." The equinoxes do not appear to be very stormy periods; but from the author's tables it is shown that the greatest frequency and force of cyclonic wind occurs some two weeks before the spring equinox, and some three weeks after the autumn equinox.

The President, Mr. W. Ellis, Mr. R. Inwards, Mr. R. H. Curtis

and Mr. F. J. Brodie, took part in a keen discussion, in the course of which the author's methods were severely criticised. Mr. R. T. Smith replied.

Mr. W. Marriott gave an account of the Bequest by the late Mr. G. J. Symons, F.R.S., to the Royal Meteorological Society. The readers of the *Meteorological Magazine* will remember that Mr. Symons took a great interest in the welfare of the Society, of which he was Secretary for 25 years, and was twice elected President. By his will Mr. Symons bequeathed to the Society his Cross of the Legion of Honour, the gold Albert Medal, awarded to him by the Society of Arts, the Testimonial Album presented to him in 1879 by the Fellows of the Royal Meteorological Society, and the sum of £200, as well as such of his books, pamphlets, maps and photographs as were not already represented in the Society's Library.



Mr. Marriott stated that from Mr. Symons's valuable collection, he had selected for the Society over 5,000 books and pamphlets, and about 900 photographs. Very many of the books were old and rare works, 9 being printed in the 15th century, 128 in the 16th, 214 in the 17th, and 403 in the 18th. By this noble bequest the Society now possesses the most complete and extensive meteorological library in existence. We are happy to be able to present our readers, by the courtesy of the Royal Meteorological Society, with a copy of the design on the special book-plate used for distinguishing the volumes acquired under this bequest.

Mr. Marriott made some reference to the Bibliography compiled by Mr. Symons, which although not included in the bequest, had been purchased by the Society from his executors. This

consists of the titles of all books, pamphlets, papers, and articles bearing on meteorology, of the existence of which Mr. Symons was aware. These titles, together with particulars as to size, date, and place of publication, are entered on cards, either in manuscript, or cuttings from booksellers' catalogues, and other sources. The cards are all placed in boxes, in a strictly alphabetical manner, under the name of the author, and each author's cards are arranged according to date. There are about 60,000 titles. This is a most valuable compilation, and a rich store-house of information on meteorological literature. Mr. Symons greatly prized this Bibliography, to the compilation of which he had devoted many years of his life.

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### REVIEWS.

*Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898-9. Published by the Authority of the Meteorological Council. London, printed for Her Majesty's Stationery Office, 1901. Size  $13 \times 16\frac{1}{2}$ ; pp. 22 and 60 maps. Price 6s. 6d.*

MR. SHAW, Secretary of the Meteorological Council, explains in the preface that the charts which form the basis of this publication were prepared mainly under the superintendence of the late Lieutenant C. W. Baillie, whose death caused some delay in their appearance, and that only the completion of the charts and the compilation of the introduction and notes has devolved upon the present Marine Superintendent, Captain Campbell Hepworth. It is thus obvious that the present officials of the Meteorological Office are not responsible for the system upon which the meteorological data dealt with are charted—a system, which, we should think, could hardly commend itself to the majority of scientific meteorologists.

The object of the work is to investigate the very remarkable weather which prevailed over the North Atlantic, in the winter of 1898-99, and the method adopted was to construct a map showing the distribution of pressure, the direction and force of the wind, and the temperature over the whole area for every day from 18th December, 1898, to 15th February, 1899 inclusive. If temperature were the chief feature to be mapped, it would be reasonable to plot observations made at the same hour of the solar day, say local noon; but temperature is only treated incidentally, no isotherms being shown on the charts. Nevertheless, local noon is selected as the time for plotting the atmospheric pressures and drawing isobars, which thus represent the pressure which existed at each point at a different instant of time. The charts embrace a stretch of longitude from  $40^{\circ}$  E. to  $100^{\circ}$  W.; so that the pressure recorded for central Russia was observed more than nine hours before that recorded for western Canada, and the maps, which look like synoptic charts, are consequently very difficult to interpret. They certainly show the

approximate position of the areas of high and low pressure, but they give only an obscure idea of the actual gradients at any given time. Of course every care has been taken to prevent any reader supposing that the maps are what they are not; each being labelled distinctly "local noon," and the fact is referred to in the introduction, but no explanation or justification is given. We think that separate maps should have been drawn for temperature at local noon, and for pressure and winds synchronously at some hour, say Greenwich noon. We consider that the present maps, dealing with both conditions at local noon, are not worth the amount of public money which has been expended upon them. They are certainly not useless, and it is better to have them rather than nothing, for they are extremely interesting, and the notes and introduction are of real value in presenting a clear picture of an unusual and very remarkable succession of storms with an abnormal distribution of air temperature in Europe and America. (See this Magazine for October, 1900, p. 130.)

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*Rainfall of India, ninth year, 1899. Published by the various provincial governments, and issued under the authority of the Government of India by the Meteorological Department of the Government of India. [JOHN ELIOT, Meteorological Reporter]. Calcutta, 1900. Size,  $13\frac{1}{2} \times 8\frac{1}{2}$ . Not paged.*

THIS ponderous volume is made up of the returns of each day's rainfall for all the stations in each of the provinces of India, and although we cannot give the total number of pages, the size of the book may be guessed from the fact that it weighs about ten pounds.

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*Nautical Meteorological Annual, 1900. Published by the Danish Meteorological Institute. Copenhagen, 1901. Size,  $12 \times 9\frac{1}{2}$ . Pp. xxviii. + 202. Maps and diagrams.*

THIS important annual, which is printed in Danish and English in parallel columns, is of international importance, for it takes account not only of the climate of Denmark, but of the physical conditions of the surface water of the Atlantic Ocean north of  $50^{\circ}$  N. Monthly charts are given showing the position and movements of the Arctic ice, and another series of monthly charts showing the temperature of the surface water of the ocean for every one-degree square, so far as the records are available. In view of the growing importance assigned by meteorologists to the influence of ocean temperature on climate, the enterprise of the Danish Government in undertaking this work for the benefit of all Europe, is greatly to be praised.

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## BOOKS RECEIVED.

- Jahrbuch des Norwegischen Meteorologischen Instituts für 1900. Herausgegeben von Dr. H. Mohn. Christiania, 1901. Size  $13 \times 10$ . Pp. xii. + 122.
- Zanzibar, Annual Report of the Agricultural Department, 1899. Zanzibar, "Gazette" Press, 1900. Size  $8 \times 6\frac{1}{2}$ . Pp. 34.
- Annual Report upon the Meteorology of Cheltenham for 1900, by Richard Tyrer, B. A., F.R. Met. Soc. Cheltenham, 1901. Size  $9\frac{1}{2} \times 6$ . Pp. 8.
1900. Thirty-fifth Annual Report to the Bath Urban Sanitary Authority, by the Medical Officer of Health [Dr. W. H. Symons]. Bath, 1901. Size  $9\frac{1}{2} \times 6$ . Pp. 60. *Map and Rainfall Diagrams.*
- Borough of Southport, Meteorological Department. The Fernley Observatory, Southport. Report and Results of Observations for the year 1900, by Joseph Baxendell, F.R. Met. Soc. Southport, 1901. Size  $9\frac{1}{2} \times 7\frac{1}{2}$ . Pp. 28.
- Totland Bay, Isle of Wight. Report of Meteorological Observations for the year 1900, with extremes and averages for preceding years, by John Dover, M. A., F.R. Met. Soc. Eastbourne, 1901. Size  $9\frac{1}{2} \times 6$ . Pp. 16.
- Record of Results of Observations in Meteorology and Terrestrial Magnetism made at the Melbourne Observatory and other localities in the Colony of Victoria, Australia, from 1st of January to 30th of June, 1900, under the direction of Pietro Baracchi. Melbourne, 1901. Size  $9\frac{1}{2} \times 6\frac{1}{2}$ . Pp. 48.
- The Weather, 1884-1900. Resumé of the Beckford Meteorological Observations for the last seventeen years of the Nineteenth Century, by Frederick Slade, Assoc. M. Inst. C. E., F.R. Met. Soc. Evesham, 1901. Size  $6\frac{1}{2} \times 4\frac{1}{2}$ . Pp. 18.
- The Twelfth Annual Report on the Health and Sanitary Condition of the Town and Urban District of Newquay for 1900, by Arthur Hardwick, M.D. Newquay, 1901. Size  $8\frac{1}{2} \times 5\frac{1}{2}$ . Pp. 24.
- Bulletin Mensuel de l'Observatoire Météorologique de l'Université d'Upsal. Vol. 32, année 1900. Par Dr. H. Hildebrand Hildebrandsson. Upsala, 1901. Size  $13 \times 10$ . Pp. 74.

## METEOROLOGICAL NEWS AND NOTES.

MR. H. HELM CLAYTON makes a spirited reply to the criticisms by Prof. Bigelow on his paper on the Eclipse Cyclone noticed in this column last month. He explains in *Science* for May 10th the reason for the method of investigation which he adopted, and vindicates his results; but as a paper on the subject of the Eclipse Cyclone by Mr. Clayton is announced for reading at the next meeting of the Royal Meteorological Society, it is unnecessary to say more on the subject at present.

THE FRENCH ASSOCIATION for the Advancement of Science differs from the British Association in having a section devoted to Meteorology, and the President of this section, the Abbé Maze, Secretary of the French Meteorological Society, has announced that a special subject for consideration at the meeting at Ajaccio in September will be, "Storms, with special reference to their formation and movement."

AN ENGLISH TRANSLATION of Hann's great work on Meteorology, now appearing in parts, is, of course, an impossibility in England, where no publisher would care to undertake the expense of reproducing a scientific classic, and where no public funds are available for such a purpose. Hence we observe with great pleasure a statement in the last number of the American *Monthly Weather Review* :—"If there is a sufficient demand for an English translation, we believe that the Chief of Bureau will be pleased to provide it, although it may include only a portion of the present work."

ADMIRAL DE BRITO CAPELLO having resigned the post of Director of the "Infante D. Luiz" Meteorological and Magnetic Observatory at Lisbon, General A. A. de Pina Vidal, Professor of Physics in the Lisbon Polytechnic School, has been appointed as his successor.

DR. CHARLES DAVISON publishes in *Knowledge* for June an interesting little map showing the points at which the minute guns fired by the fleet at Spithead, on the occasion of the late Queen's funeral on February 1st, were heard. People who tried to hear the guns within 50 miles of the ships, succeeded in doing so in very few instances; but a very great number heard the rhythmic succession of reports between the distances of 60 and 80 miles, while in one case they were heard at a distance of 139 miles. Dr. Davison attributes this curious variation in audibility to the action of the wind, which on the date in question probably distorted the sound-waves so as to throw the rays of sound upwards, over the heads of observers in the immediate neighbourhood, and downwards again at a greater distance.

FREE HARVEST WEATHER FORECASTS are to be issued by the Meteorological Office this year. They will be prepared at 3.30 p.m. daily, and refer to the 24 hours from the midnight following. The only charge to be made is the actual cost of the telegram, which may be paid in advance for any period. An excellent innovation is the provision by the Meteorological Office of forms on which an observer can record the weather experienced, so that the office may be supplied with data for testing the accuracy of the forecasts. The new service will not interfere with the supply of single daily forecasts by telegraph, on payment of the usual small fee.

A CORRESPONDENT writes, with reference to the photograph of a tree subjected to a prevailing wind, on p. 42 of our April number:—"A friend of mine in one of the Eastern Counties, having occasion to change his gardener, was showing a candidate for the vacant post over the scene of his prospective labours, and mentioned that the charge of a small plantation surrounding the garden would be included in the duties. The man, who had never seen the power of the wind so sharply defined before, looked around carefully and replied that he liked the garden, but must decline the job, for he never could undertake to keep the whole of the trees clipped to that one particular angle."

METEOROLOGICAL OBSERVATIONS AT CAMDEN SQUARE FOR 40 YEARS, 1858-97.

BAROMETRIC PRESSURE.

Months.	MONTHLY MEANS.				MEANS, 9 A.M. AND 9 P.M.				EXTREMES, 9 A.M. AND 9 P.M.				
	Mean 40 Years.	Highest Month.	Lowest Month.	9 a.m.	Highest.		Lowest.		Highest.		Lowest.		Mean of all 9 a. & 9 p.
					9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	9 a.m.	9 p.m.	
Jan.	29.982	30.378	29.373	29.983	30.378	29.564	30.378	29.583	30.378	30.934	28.476	30.529	29.205
Feb.	30.003	30.480	29.537	30.004	30.481	29.536	30.478	29.538	30.478	30.770	28.761	30.509	29.319
March.	29.903	30.202	29.574	29.905	30.208	29.587	30.197	29.561	30.197	30.788	28.693	30.452	29.215
April	29.931	30.180	29.658	29.932	30.184	29.664	30.182	29.664	30.182	30.722	28.911	30.367	29.376
May	29.978	30.236	29.784	29.979	30.244	29.931	30.228	29.781	30.228	30.643	28.980	30.372	29.499
June	29.995	30.216	29.782	29.995	30.221	29.978	30.211	29.773	29.773	30.600	29.312	30.321	29.563
July	29.961	30.193	29.767	29.963	30.197	29.769	30.189	29.766	29.769	30.469	29.247	30.293	29.550
August.	29.946	30.156	29.720	29.947	30.149	29.724	30.480	29.716	29.724	30.488	29.149	30.279	29.503
Sept.	29.970	30.255	29.757	29.971	30.260	29.747	30.250	29.747	29.747	30.532	28.731	30.387	29.451
Oct.	29.906	30.189	29.576	29.906	30.188	29.597	30.191	29.597	29.554	30.683	28.640	30.438	29.260
Nov.	29.929	30.307	29.678	29.931	30.313	29.927	30.301	29.700	29.653	30.741	28.533	30.485	29.179
Dec.	29.947	30.312	29.481	29.948	30.320	29.479	30.304	29.483	29.479	30.784	28.398	30.496	29.187
Means..	29.954	30.259	29.657	29.956	30.262	29.655	30.256	29.659	29.655	30.687	28.821	30.411	29.359
Highest.	30.003	30.480	29.784	30.004	30.481	29.781	30.478	29.781	29.792	30.950	28.312	30.529	29.563
Lowest..	29.903	30.156	29.481	29.905	30.149	29.483	30.163	29.483	29.479	30.469	28.398	30.279	29.179

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, DECEMBER, 1900.

STATIONS.  <i>(Those in italics are South of the Equator.)</i>	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	Cloud.
	Temp.	Date.	Temp.	Date.									
London, Camden Square	56·5	12	28·3	23	50·1	40·6	41·8	87	73·1	23·4	2·55	21	6·5
Malta.....	64·6	7	45·3	16	62·6	52·2	50·6	85	122·0	42·8	1·04	9	2·8
<i>Cape of Good Hope</i> ...	91·0	1	49·9	26	77·1	59·7	56·3	65	...	...	·67	7	3·1
<i>Mauritius</i> .....	87·2	29	66·4	2	84·0	71·5	66·7	72	152·3	60·5	·68	15	5·1
Calcutta.....	83·3	5	54·8	10	80·1	58·1	56·9	66	135·0	49·1	·05	1	1·4
Bombay.....	90·1	18	66·2	28	85·9	72·0	67·3	68	139·7	57·8	·00	0	2·0
Colombo, Ceylon.....	91·7	26	70·0	30	85·5	73·1	72·6	82	154·0	67·0	5·20	10	4·5
<i>Melbourne</i> .....	104·8	30	45·6	24	77·1	53·9	50·3	63	161·1	36·1	1·18	7	5·8
<i>Adelaide</i> .....	105·4	30	48·7	14	85·5	59·5	48·7	44	165·4	43·8	·39	4	3·4
<i>Sydney</i> .....	104·1	17	58·6	12	76·7	63·5	58·7	67	153·0	49·0	2·06	16	5·6
<i>Wellington</i> .....	78·0	19	45·0	11	65·8	51·6	47·4	67	133·0	34·0	4·49	13	4·6
<i>Auckland</i> .....	76·0	19	49·0	26	68·9	55·4	50·8	67	144·0	47·0	2·33	17	4·7
Jamaica, Halfway Tree	90·0	15	65·0	31	86·9	68·7	67·3	77	...	...	1·58	5	2·5
Trinidad.....	90·0	1a	66·0	12b	83·2	77·5	72·3	83	162·0	49·0	2·61	17	...
Grenada.....	87·0	3	71·0	24	83·2	74·1	70·3	70	151·0	...	6·16	24	3·2
Toronto.....	48·4	22	—1·5	14	35·5	30·0	25·0	79	62·4	—4·4	·83	14	7·8
Fredericton	39·9	20	—15·3	16	25·5	5·6	10·0	80	...	...	2·23	7	5·3
New Brunswick,	36·0	21	—25·6	13	19·8	—1·0	...	...	...	...	·67	9	5·9
Winnipeg, Manitoba ...													
Victoria, British Columbia.....													

a—and 3, 7 and 9. b—and 26.

REMARKS.

MALTA.—Mean temp. of air 56°·5 or 0°·2 above the average. Mean hourly velocity of wind 10·3 miles or 0·9 below average. Mean temp. of sea 63°·7. TS on 8th. L on 3rd. H on 2nd.

J. F. DOBSON.

*Mauritius*.—Mean temp. of air 0°·1, of dew point 1°·3, and rainfall 4·02 in., below their respective averages. Mean hourly velocity of wind 10·2 miles, or 0·7 below average; extremes, 22·7 on 4th and 0·0 on 2nd; prevailing direction E. by N.

T. F. CLAXTON.

COLOMBO, CEYLON.—Mean temp. of air 0°·6 above, of dew point 1°·5 above, and rainfall 1·19 in. below, their respective averages. Mean hourly velocity of wind 7·5 miles; prevailing direction N.E. TSS occurred on three days; L was seen on four days.

W. C. S. INGLES.

*Adelaide*.—Mean temp. of air 0°·8 above average. Rainfall ·43 in. below average.

C. TODD, F.R.S.

*Sydney*.—Mean temp. of air 0°·2 above, humidity 1·9 below, and rainfall ·49 in. below, their respective averages.

H. C. RUSSELL, F.R.S.

*Wellington*.—Mean temp. of air 2°·1 below, and rainfall ·68 in. above, their respective averages. Generally showery, especially towards the end of the month. Prevailing wind N.W., and, on the whole, moderate; cool weather for time of year. H on 25th.

R. B. GORE.

*Auckland*.—Mean temp., rainfall and barometric pressure all very close to the average of 32 years.

T. F. CHEESEMAN.

TRINIDAD.—Rainfall 2·20 in. below the 30 years' average.

J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL,  
MAY, 1901.

Div	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
I.	Uxbridge, Harefield Pk.	·73	XI.	Castle Malgwyn .....	·96
II.	Dorking, Abinger Hall ..	·48	„	Builth, Abergwesyn Vic.	1·46
„	Sheppey, Leysdown .....	·80	„	Rhayader, Nantgwilt...	1·15
„	Hailsham .....	·87	„	Lake Vyrnwy .....	·95
„	Crowborough .....	1·12	„	Corwen, Rhug .....	1·09
„	Ryde, Thornbrough .....	...	„	Criccieth, Talarvor .....	·81
„	Emsworth, Redlands ...	·87	„	I. of Anglesey, Lligwy..	·90
„	Alton, Ashdell .....	·66	„	Douglas, Woodville.....	1·55
„	Newbury, Welford Park	1·26	XII.	Stoneykirk, Ardwell Ho.	2·51
III.	Oxford, Magdalen Coll.	1·27	„	New Galloway, Glenlee	1·73
„	Banbury, Bloxham .....	1·20	„	Mouiaive, Maxwellton Ho.	2·77
„	Pitsford, Sedgebrook ...	1·67	„	Lilliesleaf, Riddell .....	2·31
„	Huntingdon, Brampton.	·97	XIII.	N. Esk Res. [Penicuik]	1·95
„	Wisbech, Bank House...	1·15	XIV.	Glasgow, Queen's Park..	1·91
IV.	Southend .....	·68	XV.	Inveraray, Newtown ...	2·03
„	Colchester, Lexden .....	1·10	„	Ballachulish, Ardsheal...	1·60
„	Saffron Waldon, Newport	2·27	„	Islay, Eallabus.....	1·69
„	Rendlesham Hall .....	1·41	XVI.	Dollar.....	1·57
„	Swaffham .....	1·00	„	Balquhider, Stronvar...	3·68
V.	Salisbury, Alderbury ...	1·18	„	Coupar Angus Station...	2·13
„	Bishop's Cannings .....	1·80	„	Blair Atholl .....	1·96
„	Blandford, Whatcombe ...	1·23	XVII.	Keith H. R. S. ....	1·63
„	Ashburton, Druid House	2·36	„	Forres H. R. S. ...	1·20
„	Okehampton, Oaklands.	1·26	XVIII.	Fearn, Lower Pitkerrie..	1·87
„	Hartland Abbey .....	·76	„	S. Uist, Askernish .....	1·76
„	Lynton, Glenthorne .....	...	„	Invergarry .....	·58
„	Probus, Lamellyn .....	1·27	„	Aviemore, Alvie Manse.	1·40
„	Wellington, The Avenue	·76	„	Loch Ness, Drumnadrochit	1·46
„	North Cadbury Rectory	1·52	XIX.	Invershin .....	·97
„	Clifton, Pembroke Road	1·10	„	Durness .....	...
VI.	Ross, The Graig .....	1·21	„	Watten H. R. S. ....	1·26
„	Wem, Clive Vicarage ...	·67	XX.	Dunmanway, Coolkelure	2·58
„	Wolverhampton, Tettenhall	1·17	„	Cork, Wellesley Terrace	2·07
„	Cheadle, The Heath Ho.	·93	„	Killarney, District Asyl.	2·32
„	Coventry, Priory Row ..	·87	„	Caher, Duneske .....	1·91
VII.	Market Overton .....	1·15	„	Ballingarry, Hazelfort...	1·83
„	Grantham, Stainby .....	1·09	„	Limerick, Kilcornan ...	...
„	Horncastle, Bucknall ...	1·15	„	Miltown Malbay .....	1·84
„	Worksop, Hodsck Priory	1·03	XXI.	Gorey, Courtown House	1·08
VIII.	Neston, Hinderton .....	1·15	„	Moyalty, Westland ...	3·97
„	Southport, Hesketh Park	·97	„	Athlone, Twyford .....	2·04
„	Chatburn, Middlewood.	·86	„	Mullingar, Belvedere ...	1·89
„	Duddon Val., Seathwaite Vic.	2·31	XXII.	Woodlawn .....	1·64
IX.	Baldersby .....	·96	„	Crossmolina, Enniscooe ..	2·67
„	Scalby, Silverdale .....	...	„	Collooney, Markree Obs.	2·43
„	Ingleby Greenhow Vic...	1·55	XXIII.	Enniskillen, Model Sch.	2·47
„	Middleton, Mickleton ...	1·21	„	Warrentpoint.....	2·79
X.	Haltwhistle, Unthank H.	...	„	Miltown, Banbridge.....	1·51
„	Bamburgh .....	2·19	„	Belfast, Springfield .....	1·72
„	Keswick, The Bank .....	1·37	„	Bushmills, Dundarave..	2·13
XI.	Llanfrechfa Grange .....	1·23	„	Stewartstown .....	1·93
„	Treherbert, Tyn-y-waun	2·45	„	Killybegs .....	2·41
„	Llandoverly .....	·86	„	Horn Head .....	1·65

MAY, 1901.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.				Days on which ".01 or more fell.	TEMPERATURE.				No. of Nights below 32°.	
		Total Fall.	Differ- ence from average 1890-9.	Greatest Fall in 24 hours.			Max.		Min.			
				inches.	inches.		in.	Dpth	Date	Deg.	Date	Deg.
I.	London (Camden Square) ...	.85	— .71	.39	7	6	83.8	29	36.8	18	0	1
II.	Tenterden .....	1.01	— .80	.39	7	5	80.0	29	34.0	6	0	5
III.	Hartley Wintney .....	.56	+ 1.30	.19	30	9	82.0	29	30.0	5	1	3
III.	Hitchin .....	1.28	— .46	.47	7	9	79.0	29	35.0	17	0	...
IV.	Winslow (Addington) .....	1.69	— .02	.54	7	3	81.0	29	31.0	18	1	3
IV.	Bury St. Edmunds (Westley) .....	.89	— .95	.32	10	6	79.0	29	32.0	1	1	...
V.	Norwich (Brundall) .....	.86	...	.39	7	9	76.7	28	33.4	18	0	11
V.	Winterbourne Steepleton ...	1.31	...	.57	30	6	71.3	22	30.5	8	1	11
VI.	Torquay (Cary Green) ...	1.43	...	.69	30	8	66.2	14	40.0	8	0	0
VI.	Polapit Tamar [Launceston]..	1.28	— .96	.56	7	7	73.2	22	32.8	12	0	...
VI.	Stroud (Upfield) .....	1.14	— .75	.44	8	6	80.0	29	41.0	3d	0	...
VII.	Church Stretton (Woolstaston)	1.02	— 1.28	.26	9	11	76.0	29	37.0	8	0	...
VII.	Worcester (Diglis Lock) .....	1.09	— .65	.45	8	9	...	...	...	...	...	...
VII.	Boston .....	1.49	— .01	.55	29	5	80.0	29	42.0	7	0	...
VIII.	Hesley Hall [Tickhill].....	.74	— .80	.18	9	9	79.0	29	32.0	5e	2	...
VIII.	Derby (Midland Railway)....	.84	— 1.01	.26	8i	8	81.0	29	37.0	5f	0	...
VIII.	Manchester (Plymouth Grove) ..	1.10	— .99	.33	29	10	82.0	29	38.0	16	0	...
IX.	Wetherby (Ribston Hall) ...	.67	— 1.00	.20	29	8	...	...	...	...	...	...
IX.	Skipton (Arneliffe) .....	1.92	— 1.47	.75	29	10	...	...	...	...	...	...
X.	Hull (Pearson Park) .....	.91	— .90	.37	29	7	75.0	28	31.0	15	...	2
X.	Newcastle (Town Moor) .....	2.24	+ .49	1.00	26	13	...	...	...	...	...	...
XI.	Borrowdale (Seathwaite).....	2.77	— 4.57	.92	29	12	74.0	24	36.3	8	0	...
XI.	Cardiff (Ely).....	.95	— 1.40	.40	30	8	...	...	...	...	...	...
XI.	Haverfordwest .....	1.36	— .93	.44	30	6	74.8	22	35.3	12	0	11
XI.	Aberystwith (Gogerddan) ...	.40	— 2.12	.15	6	5	78.0	14	26.0	7	5	...
XI.	Llandudno .....	.96	— .87	.21	27	9	69.0	21	39.0	8g	0	...
XII.	Cargen [Dumfries] .....	2.37	— .27	.82	29	9	75.0	21a	35.0	14	0	...
XIII.	Edinburgh (Royal Observatory)	1.95	...	.52	26	10	68.9	21	36.2	4	0	4
XIV.	Colmonell .....	2.29	— .17	.64	7	8	78.0	22	31.0	11	...	...
XV.	Tighnabruaich .....	2.36	...	.70	29	9	70.0	24	34.0	11	0	...
XV.	Mull (Quinish) .....	1.95	— 1.20	.58	31	9	...	...	...	...	...	...
XVI.	Loch Leven Sluices .....	2.45	+ .16	.72	30	12	...	...	...	...	...	...
XVI.	Dundee (Eastern Necropolis)	1.70	— .06	.40	29	12	73.1	4	36.4	4	0	...
XVII.	Braemar .....	2.48	+ .29	.68	7	12	69.3	21	31.0	4	2	13
XVII.	Aberdeen (Cranford) .....	2.41	+ .40	.70	30	14	65.0	1b	30.0	15	3	...
XVII.	Cawdor (Budgate) .....	1.32	— .78	.37	7	12	...	...	...	...	...	...
XVIII.	Strathconan [Beaully] .....	1.23	— 2.09	.30	7	7	...	...	...	...	...	...
XVIII.	Glencarron Lodge .....	1.60	— 3.65	.38	10	11	74.9	22	33.0	12	0	...
XIX.	Dunrobin .....	2.17	+ .24	.90	30	8	72.0	14	37.2	4	0	...
XIX.	S. Ronaldshay (Roeberry) ...	1.66	— .40	.55	30	10	67.0	23	34.0	16	0	...
XX.	Darrynane Abbey.....	1.70	— .74	.51	10	11	...	...	...	...	...	...
XX.	Waterford (Brook Lodge) ...	1.71	— .94	.45	30	9	71.0	16	32.0	12	1	...
XX.	Broadford (Hurdlestown) ...	1.32	— .91	.30	8	11	71.0	22	36.0	10h	0	...
XXI.	Carlow (Browne's Hill) .....	...	...	...	...	...	...	...	...	...	...	...
XXI.	Dublin (Fitz William Square)	1.20	— .70	.25	27	9	66.7	31	39.1	12	0	0
XXII.	Ballinasloe .....	1.90	— .55	.37	5	11	78.0	21	36.0	13	0	...
XXII.	Clifden (Kylemore) .....	2.93	— 1.69	.62	30	8	...	...	...	...	...	...
XXIII.	Seaforde.....	1.65	— .66	.48	30	9	73.0	21	33.0	11	0	3
XXIII.	Londonderry (Creggan Res.)..	1.49	— 1.15	.38	6	10	...	...	...	...	...	...
XXIII.	Omagh (Edenfel) .....	1.86	— .68	.45	6	12	74.0	15c	33.0	9	0	1

+ Shows that the fall was above the average; — that it was below it.

a—and 24. b—and 4, 21, 22. c—and 21. d—and 5, 10, 11. e—and 15. f—and 17. g—and 12. h—and 11. i—and 29.

## METEOROLOGICAL NOTES ON MAY, 1901.

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.

## ENGLAND.

LONDON, CAMDEN SQUARE.—A dry and sunny month, particularly after the 9th. Unsettled from 6th to 9th, with slight TSS and H at times. Mean temp.  $54^{\circ}\cdot 9$ , or  $0^{\circ}\cdot 9$  above the average. Absolute drought on 19 days, 10th to 28th.

TENTERDEN.—A dry month, except for showers from 6th to 10th, and on 30th. Much E. wind, but not exceptionally strong. Vegetation was backward, but in full beauty at the end, when warmer weather set in with S. wind. Duration of sunshine, 256 hours. Absolute drought 11th to 29th.

HARTLEY WINTNEY.—With the exception of two slight electrical disturbances about the 9th and 29th, the drought which commenced on April 16th continued. There were many cloudless days, and keen E. and N.E. winds throughout. Ozone on 9 days, with a mean of 4·3. Swifts seen on the wing on 5th. May-blossom on 19th.

WINSLOW, ADDINGTON.—Not a drop of R from 9th to 29th, and then just enough to moisten the surface. Absolute drought of 19 days. The temp. was low at night all through the month. Much sunshine, many days being cloudless. Distant T on 8th, 9th and 29th.

BURY ST. EDMUNDS, WESTLEY.—A very dry month. The 23 days of N. and N.E. winds were very injurious to vegetation. T on 5 days.

NORWICH, BRUNDALL.—A very dry month with much brilliant sunshine, but cold on many days. Sharp TSS on 6th. T on 7th, 25th, 26th and 29th; L on 29th.

WINTERBOURNE STEEPLTON.—A dry month, with a good deal of hot sun by day, but cold nights; the mean max. temp. being  $62^{\circ}\cdot 5$ , and the mean min.  $40^{\circ}\cdot 8$ . The wind, until the last week, was almost entirely northerly. Absolute drought of 19 days, 10th to 28th.

POLAPIT TAMAR [LAUNCESTON].—A period without any rain from 11th to 24th; but steady R fell for about seven hours on 30th. Distant T on 8th.

## WALES.

HAVEKFORDEWEST.—A very fine dry month, with small R and a great deal of bright sunshine. From 11th to 28th no R fell, and there was a remarkable absence of dew. Night temp. was low. The winds were generally moderate, and for the most part from N. or E. Hay crops are very scanty, but corn was generally looking well; R, however, was greatly needed. Hours of bright sunshine 283·9. The foliage of the oak was far in advance of that of the ash. TS on 4th.

ABERYSTWICH, GOGERDDAN.—A trying month, with little R for the season. Winds either N. or N.E. Absolute drought of 19 days, 10th to 28th.

## SCOTLAND.

COLMONELL, CLACHANTON.—Mean temp.  $53^{\circ}\cdot 2$ , or  $2^{\circ}\cdot 4$  above the average of 25 years. T and L on 3rd and 7th, with heavy H showers on 7th.

TIGHNABRUACH, CRAIGANDARAICH.—A model month of May, well-balanced in point of moisture, temp. and sunshine. The average max. temp. was  $5^{\circ}$  above that of May, 1900.

ABERDEEN, CRANFORD.—An exceptionally fine month.

S. RONALDSHAY, ROEBERRY.—A very fine month. Mean temp.  $47^{\circ}\cdot 3$ , or  $0^{\circ}\cdot 1$  below the average of eleven years.

## IRELAND.

DARRYNANE ABBEY.—Very dry and warm. Strong gales on 30th and 31st.

WATERFORD, BROOK LODGE.—T on 4th, 5th and 8th. Heavy gale from S.W. on 31st. H showers on 7th.

BROADFORD, HURDLESTOWN.—A very favourable month, with an absolute drought of 15 days from 11th to 26th, the first since July, 1898. T on 3rd. H on 8th. Moderate S. gale on 31st.

DUBLIN, FITZWILLIAM SQUARE.—A delightful month; bright, dry and seasonably warm. As usual N.E. and E. winds prevailed, and as the atmosphere was dry the diurnal range of temp. was large. Sunny, warm days were followed by calm, cold nights. Absolute drought prevailed for 15 days from 11th to 25th inclusive. The mean temp. was  $53^{\circ}6$ , or  $1^{\circ}6$  above the average. High winds were noted on six days, and attained the force of a gale on 31st. H on 5th and 7th; T and L on 5th, and T on 7th.

BALLINASLOE.—Absolute drought for 15 days from 11th to 25th. This has only occurred on seven occasions in 30 years.

OMAGH, EDENFEL.—May was a pleasant surprise. It is seldom indeed that so sudden a reversal of weather as that which took place on April 17th, from a disagreeable spring, has been so permanent through a month usually fickle. With sufficient R during the first and last weeks the settled summer weather of the remainder of the month resulted in a season of unusual beauty and profusion of foliage and flower. On nine days the temp. reached  $70^{\circ}$  or above, a record only once approached in 36 years, but the entire absence of the "cold snap" in May was still more remarkable.

## Correspondence.

## LOW RELATIVE HUMIDITIES IN MAY, 1901.

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

PERHAPS the enclosed record of thermometric and hygrometric readings here on 23rd and 24th May, from 3 p.m. to 6 p.m., may be of sufficient interest to find a place in the monthly Magazine. The relative humidity of 25 per cent. at 4 p.m. on the 24th is the lowest I have registered during my nineteen years' observations here.

May, 1901.	Dry Bulb.	Wet Bulb.	DewPoint.	Relative Humidity.	Wind	Cloud.	
23rd—				per cent.			
3 p.m.	70·6	51·6	37·1	29	E. N. E.	5 to 7	0
3.30 „	69·3	49·1	33·4	27			
4 „	69·3	49·7	34·5	28	„	4 to 6	0
4.30 „	68·4	49·4	34·5	29			
5 „	67·3	49·7	35·7	31	„	„	0
6 „	64·1	47·3	33·4	31	„	„	0
24th—							
3 p.m.	73·1	54·3	40·4	30	E.	4 to 6	0
3.30 „	71·5	51·1	35·2	26			
4 „	71·6	49·9	33·5	25	„	„	0
4.30 „	71·1	50·9	35·6	28			
5 „	69·4	52·4	39·2	33	„	3 to 5	0
6 „	65·9	49·1	35·5	32	„	2 to 4	0

R. H. BARNES.

*Heatherland House, Parkstone, 6th June, 1901.*