REPORT

OF THE

METEOROLOGICAL COUNCIL,

For the Year ending 31st of March, 1904,

TO THE

PRESIDENT AND COUNCIL

OF THE

ROYAL SOCIETY.

Presented to both Houses of Parliament by Command of His Majesty.

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,
By DARLING & SON, Ltd., 34-40, Bacon Street, E.

And to be purchased, either directly or through any Bookseller, from
EYRE & SPOTTISWOODE, East Harding Street, Fleet Street, E.C.;
and 32, Abingdon Street, Westminster, S.W. ;
or OLIVER & BOYD, Edinburgh ;
or E. PONSONBY, 116, Grafton Street, Dublin.

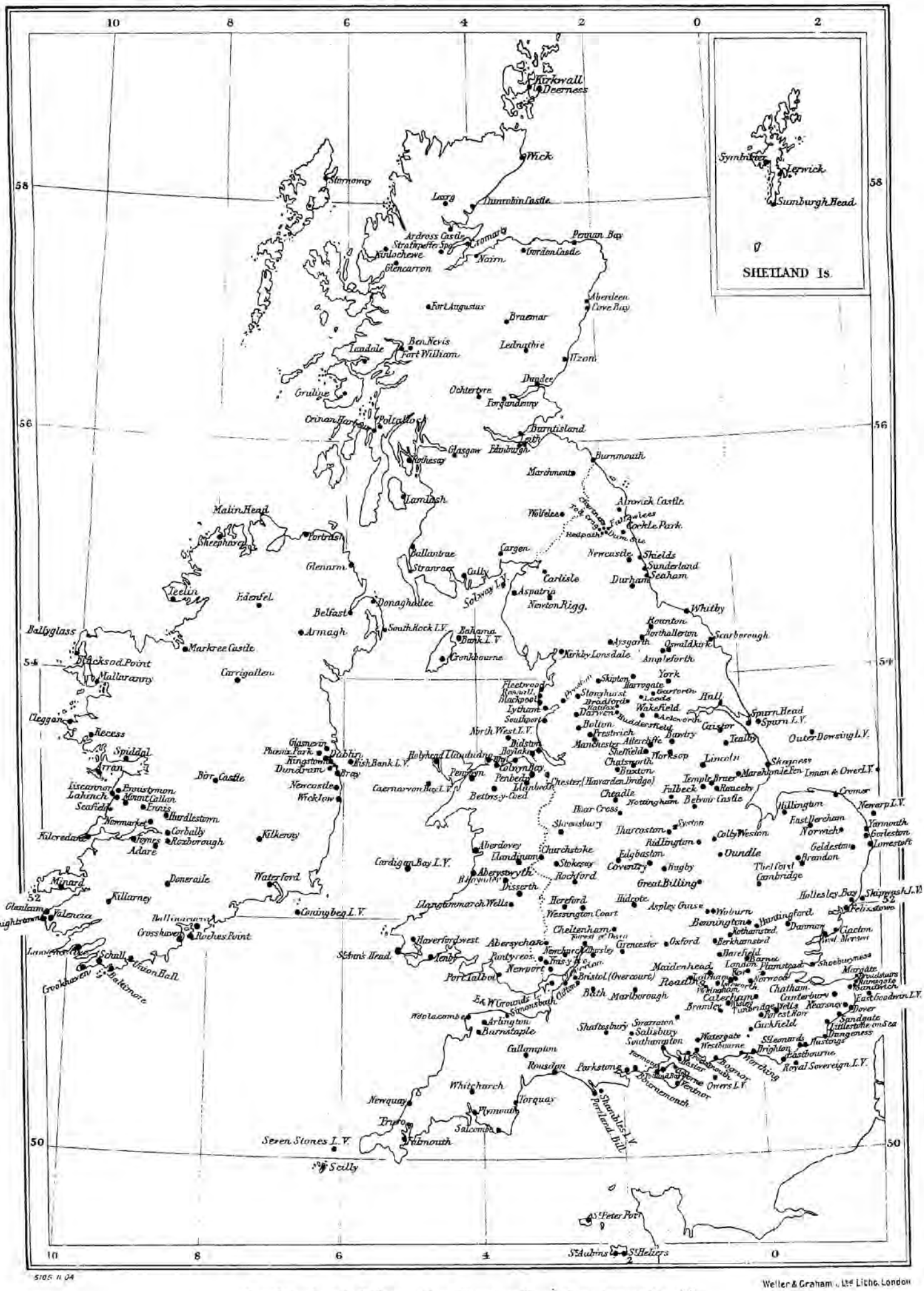
1904.

[Cd. 2302.] *Price* 1*s.* 2*d.*

To face title.

(REPORT OF METEOROLOGICAL COUNCIL 1903-1904)

MAP SHOWING THE APPROXIMATE POSITIONS OF THE STATIONS FROM WHICH OBSERVATIONS HAVE BEEN RECEIVED.



5105 11 04

Weller & Graham, Ltd Litho. London

For details of Information Received – See Appendix II.

CONTENTS.

MAP OF STATIONS IN CONNEXION WITH THE OFFICE ... ... Faces Title.

PAGE.

LIST OF COUNCIL 3, 43

REPORT.

General 5

I.—Marine Branch 20

II.—Forecast and Storm-warning Branch 23

III.—Statistics and Library Branch 28

IV.—Observatory Branch 34

V.—Correspondence and Accounts Branch 34

APPENDICES.

I. Conspicuous Meteorological Occurrences in 1903 36

II. Statement of provisions for the supply of information to the Public, including :—

Telegraphic Information 44

Forecasts and Storm Warnings 45, 47

Information received weekly 49

Other Information from Stations in the British Isles ... 52

Information from Land Stations outside the British Isles... 53

The Library 54

Marine Observations 54

Supply of Instruments to Observers 55

Fishery Barometers 56

List of Stations in the British Isles and on the Continent from which Observations are received 57

List of Documents received from Foreign and Colonial Stations 82

List of Office Publications 85

III. List of Observers who have returned "excellent" Logs during the year 90

IV. List of Logs and Documents received from Ships 91

V. Disposal of Instruments (Royal Navy) 107

VI. Disposal of Instruments (Mercantile Marine) 108

VII. Reports on Inspections 109

VIII. Checking of Storm Warnings issued in 1903 132

IX. Comparison of the Forecasts issued at 8h. 30m. p.m., with the Weather subsequently experienced, 1903-04 134

X. Accessions to Library 135

XI. List of Subjects of Meteorological Papers included in various Reports issued by the Office from the year 1866 184

XII. List of Persons and Institutions to whom the publications are presented 191

XIII. Account of Receipts and Payments 196

Index 197

THE METEOROLOGICAL COUNCIL,

1903–1904.

Directors.

Lieutenant-General SIR RICHARD STRACHEY, R.E., G.C.S.I., LL.D., F.R.S., Chairman.

MR. ALEXANDER BUCHAN, M.A., LL.D., F.R.S., F.R.S.E.

Professor GEORGE HOWARD DARWIN, M.A., LL.D., Sc.D., F.R.S.

Rear-Admiral SIR WILLIAM J. L. WHARTON, K.C.B., F.R.S., Hydrographer to the Admiralty.

MR. WILLIAM NAPIER SHAW, M.A., Sc.D., F.R.S., Secretary.

Other Members of the Council.

The EARL OF ROSSE, K.P., D.C.L., LL.D., F.R.S.

MR. JOHN YOUNG BUCHANAN, M.A., F.R.S., F.R.S.E.

MR. WILLIAM HENRY DINES, B.A.

Professor ARTHUR SCHUSTER, Ph.D., F.R.S., F.R.A.S.

MR. ROBERT HENRY SCOTT, M.A., D.Sc., F.R.S.

1125 Wt 766 11/04 D & S 23 17921r A 2

REPORT

OF THE

METEOROLOGICAL COUNCIL,

For the Year ending 31st of March, 1904,

TO THE

PRESIDENT AND COUNCIL

OF THE

ROYAL SOCIETY.

Constitution of the Council.

No change has taken place in the Council during the year. Seventeen ordinary meetings of the directors were held. The annual general meeting of the Council was held on November 3rd, 1903.

The administration remains in charge of the Secretary, with the assistance of the Marine Superintendent, Commander Campbell Hepworth, C.B., R.N.R., and a staff of 44 clerks and attendants. In addition, Mr. R. G. K. Lempfert, M.A., has continued to act as special Scientific Assistant of the Secretary, and Mr. F. Gaster has been engaged upon a special inquiry.

International Meteorological Committee.

In accordance with the arrangements mentioned in last year's report (p. 5), a meeting of the International Meteorological Committee was held in the Town Hall, Southport, through the courtesy of the Mayor and Corporation, during the session of the British Association. Meetings of the Sub-Committee for International Telegraphy were also held. The Sub-Committee on Clouds presented its final report at the first meeting of the Committee; the Sub-Committees on Terrestrial Magnetism, on Solar Radiation, and on Aeronautics did not meet.

Of the seventeen members of the International Committee eleven were present at Southport, viz.:—Professor Mascart (President), representing the Bureau Central Météorologique of France; Professor Hildebrandsson (Secretary), Sweden; Professor Mohn, Norway; Dr. Paulsen, Denmark; Dr. Snellen, Netherlands; Dr. Hellmann, Germany; Professor Pernter, Austria; General Rykatcheff, Russia; Major Chaves, Azores, Portugal; Professor Willis Moore, United States; and Mr. W. N. Shaw, Meteorological Council. Professor Billwiller, Switzerland, and Professor Palazzo,

Italy, were prevented at the last moment from attending. The other members absent were Sir J. Eliot, India; Mr. W. G. Davis, the Argentine; Mr. Russell, New South Wales; and Professor Hepites, Roumania.

Of the members of Sub-Committees, Professor van Bebber, of the Seewarte, Professor Hergesell, of Strassburg, Monsieur Teisserenc de Bort, of Paris, and Mr. A. L. Rotch, of Blue Hill, attended the meetings of the Committee.

The official report of the proceedings at the Meetings of the Committee is published by the Bureau Central Météorologique of Paris; an edition in English will be issued in due course as an official publication of the Council.

The report of the Sub-Committee on Cloud Observations gives a summary, by Professor Hildebrandsson, of the results of observations of the direction of Motion of Clouds in all parts of the world, extending over a long series of years. The conclusions drawn from the observations constitute the first attempt to test in a comprehensive manner, by direct reference to observation, the suggestions as to the general circulation of the atmosphere, derived upon theoretical grounds by James Thomson, Ferrel and others. The results are in agreement with conclusions to be drawn from the isobaric lines for the 4,000-meter level computed for the months of January and July by M. L. Teisserenc de Bort in 1886.

The report was issued by Professor Hildebrandsson as a separate publication in Upsala, and is not reprinted in the report of the International Committee. A short account of the conclusions is given by Professor Hildebrandsson in a paper read before the British Association,* but the subject is of such importance that the Council hope to arrange for the issue of an English edition of the report, with the diagrams of the original issue, showing the average motion of clouds of various types for different months of the year at a number of very widely distributed stations, together with the tables upon which the diagrams are based.

Units of measurement.

Among the subjects raised at the meeting of the International Committee is the very important question of the units adopted in different countries for meteorological measurements. In the United Kingdom, its Colonies and Dependencies, and in the United States of America, as well as on board the ships of those countries, the inch and the Fahrenheit degree have always been used for the measurement of pressure and temperature, whereas in the rest of the world the millimetre and the centigrade degree have been adopted. There are few meteorological investigations that are limited to the observations of a single country, and the use of the two systems of units for work on similar lines, by adjacent countries, is a source of much inconvenience, especially in the combination of weather charts for adjacent areas. In such a case isobaric and isothermal lines have to be redrawn from the original observations.

---

* B. A. Report, 1903, p. 562.

The International Committee called the attention of the British Association to the inconvenience arising from the use of the two systems, and the Council of the Association appointed a Committee to report upon the matter. At the request of this Committee the Secretary has drawn up a memorandum upon the considerations which should guide the choice of units for meteorological measurements, and the Council have approved of the memorandum as affording a suitable basis for the discussion of the adoption of a common system of units.

The Council are aware that any change in an established practice should only be introduced after very careful consideration, and they recognise that the system which has been in use in English-speaking countries for so many years has certain advantages, particularly the comparative rareness of negative readings of temperature, which they cannot forego. At the same time they do not fail to notice that the inconveniences which arise from change in long established practice, only become greater if a change, ultimately to be adopted, is delayed, and, therefore, if they can obtain a satisfactory consensus of opinion as to the method of measurement which will probably in course of time commend itself to the approval of all civilised countries, they are prepared to co-operate in giving effect to proposals for the adoption of that method in this country without delay.

They note, however, that any change that might be introduced would refer in the first instance to units adopted for the publication of results, and would not involve any immediate and general change in the instruments used by observers. The initial inconvenience of reducing the observer's readings into the scales adopted would fall upon the person, or institution undertaking the publication, and not upon the observers.

Charts.

While the question of uniformity of units is being considered, the Council would be glad to bear their part in promoting arrangements for the adoption of a uniform system of projection, and, as far as practicable, a uniform scale for synoptic and other charts, so that charts for adjacent areas may be easily combined. The progress of meteorology tends so much in the direction of considering the circulation of air from wider points of view, that the want of facility for effectually combining the information given in charts of separate areas, is a hindrance frequently felt in practice.

Solar and terrestrial changes.

Another question of great importance discussed at the Southport meeting, is the relation between solar and terrestrial changes, which was raised upon a paper by Sir Norman Lockyer printed as an appendix to the report of the Committee. From time to time attention has been called to correspondence between the variations in solar phenomena and the meteorological records of temperature and rainfall, as well as those of terrestrial magnetism and aurora. Various suggestions have been made, particularly in connexion with Indian rainfall, to the effect that the correspondence between solar changes and meteorological phenomena is so regular that laws established for changes in the sun may be used to anticipate changes in the general character of terrestrial weather. The

practical importance of such an inference, if it were securely established, is so great, that the investigation deserves the fullest consideration ; and, at the same time, the difficulties of arriving at a satisfactory conclusion can only be overcome by the co-operation of competent representatives both of solar physics and meteorology. The International Committee appointed a small sub-committee to conduct the initial stages of the organisation. It is hoped that a meeting of those interested in the subject will take place at the meeting of the British Association at Cambridge in August, 1904, and the Sub-Committee definitely constituted. Meantime, in the absence of any organisation, the Secretary of the Council conducts the correspondence, and undertakes the arrangements until a regular meeting of the Sub-Committee is held.

Future international meetings.

Announcement was made at the meeting of proposals for a meeting of the Sub-Committee on Terrestrial Magnetism and Atmospheric Electricity at Cambridge during the session of the British Association in August, 1904, of the Sub-Committee for Scientific Aeronautics at St. Petersburg in August or September, 1904, and of a Conference of Directors of Meteorological Institutes and Observatories at Innsbrück in 1905.

Exhibition at Southport.

In connexion with the meeting of the International Committee an exhibition of objects of interest in meteorology, terrestrial magnetism, and allied subjects was arranged at Southport.

In response to an invitation conveyed in a circular issued by a Committee of members of the Council, the Astronomer Royal, representatives of the Meteorological Societies, and a few other persons interested in the subject, apparatus or diagrams were offered for exhibition by the following :—

The Admiralty, Hydrographic Department.
The Astronomer Royal.
The National Physical Laboratory.
The Radcliffe Observatory, Oxford.
The Royal Meteorological Society.
The Scottish Meteorological Society.
The Solar Physics Observatory.
Mr. John Aitken, F.R.S.
Mr. J. Baxendell.
Mr. F. F. Blackman, M.A.
Mr. F. J. Brodie.
Dr. Buchan, F.R.S.
The Cambridge Scientific Instrument Company.
Captain E. W. Creak, R.N., C.B., F.R.S.
M. L. Teisserenc de Bort.
Mr. W. H. Dines.
Mr. F. L. Halliwell.
Mr. F. W. Harmer, F.G.S.
Mr. J. J. Hicks.
Mr. A. Lander.
Dr. W. J. S. Lockyer.
Dr. H. R. Mill, F.R.S.E.
Mr. R. W. Munro.
Messrs. Newton and Co.

Professor J. M. Pernter.
Mr. A. Lawrence Rotch.
Dr. R. H. Scott, F.R.S.
Mr. W. N. Shaw, F.R.S.
Professor F. T. Trouton, F.R.S.
Dr. W. Mansergh Varley.
Mr. C. T. R. Wilson, F.R.S., and
Commander Wilson-Barker, R.N.R.

The exhibits included a large collection of diagrams, illustrating meteorological and magnetic data and the results of observations in solar physics, also a number of charts, photographs and books. The apparatus included a new arrangement for the combination of a direction anemoscope with the Dines pressure tube anemograph by Mr. Baxendell, a new self-recording thermometer by Mr. Dines, and a sunshine recorder by Mr. Lander, of Canterbury, that recorded on ordinary photographic printing paper the sunshine for each day of a month in successive lines. Callendar's electrical recorders were also fully represented. The applications of meteorology, apart from the relation to solar physics, were illustrated by diagrams by Mr. F. W. Harmer representing a suggested average distribution of isobars in the glacial epoch, and an apparatus by Mr. F. F. Blackman, of Cambridge, showing the rapid evaporation of water from the leaves of plants.

A map of the British Isles, showing the distribution of stations in connexion with the Office, and maps of the world, showing the isobars for 21st March, 1903, 21st June, 21st September, and 21st December, 1901, were prepared in the Office to be included in the Exhibition with a number of other objects of interest in the possession of the Council.

The arrangements for the collection of the exhibits in London, and their despatch to Southport were made by Mr. Lempfert. In compliance with the suggestion of the Committee, Mr. W. Marriott, Assistant Secretary of the Royal Meteorological Society, went to Southport a week before the commencement of the meeting to receive the exhibits and superintend their arrangement.

A descriptive catalogue of the Exhibition was printed in Southport.

The incidental expenses of the exhibition were defrayed by the Council.

Local issue of Daily Weather Reports.

In order to illustrate, for the information of the International Committee and members of the British Association, the method adopted by the Council for dealing with telegraphic weather intelligence a local telegraphic and forecast department was maintained in operation at Southport during the period of the meetings of the Committee. Daily charts with remarks and forecasts were prepared from telegraphic information sent from the Office. Maps 1 and 2 corresponded with those of the Daily Weather Report, but maps 3, 4, and 5 represented the distribution of sunshine, rainfall and temperature over the British Isles during the preceding day. A supply of blue stone lithographic forms was sent down to Southport for the charts and the information

prepared in Southport was lithographed in black upon the blue forms by a local lithographer. Mr Brodie was in charge of the preparation of the reports and forecasts. The local arrangements worked satisfactorily. The Southport edition of the report appeared each day from Thursday, 10th September, to Wednesday, 16th September inclusive (except Sunday). On Thursday, 10th September, a violent gale occurred and all telegrams were delayed. On the other days though it was not found possible to get the report prepared before 12 o'clock or later, the copies were ready for issue at from 1.30 to 2 p.m.

One of the practical bearings of the experiment was the demonstration it afforded of the conditions which would be necessary, if it were found desirable, to extend the distribution of Daily Weather Reports on the day of issue beyond the range now accessible from London, by the issue of local editions of the Daily Weather Report, as for example at Edinburgh and Dublin.

International co-operation: cloud observations.

Instruments for the observation of the direction of motion and "relative velocity" of clouds in accordance with the scheme of observations on the days of international balloon ascents (*see* Report, 1902–3, p. 6) have been supplied to the observatories at Kew, Aberdeen, and Valencia. At the suggestion of the Council similar instruments have been obtained for corresponding observations at Greenwich Observatory by the Astronomer Royal, and at Fort William Observatory by the Directors of the Ben Nevis Observatories. The observations are reported to the Office for transmission to Professor Hergesell.

International co-operation: telegraphic service.

Correspondence has passed between the Office on the one hand and the Deutsche Seewarte and the Meteorological Institute of the Netherlands on the other, with regard to the extension of the 7 a.m. service of telegraphic reports. In order to obtain reports at that hour from the East Coast of England, a special station has been established at Skegness through the effective co-operation of Mr. S. Coetmore Jones, agent for the Earl of Scarbrough. Reports have also been obtained from Portland Bill, and Malin Head has taken the place of Blacksod Point. A station is still required on the South Coast of Ireland to complete the requirements of the two Continental Offices.

In other respects the arrangements for the service of weather telegrams between this country and the Continent of Europe, the Azores, and the United States of America, have remained as in the preceding year.

The Council regret that the practical extension of wireless telegraphy has not enabled them to increase the area of observation to the westward by information obtained from Atlantic liners by this means. They are glad to learn that there is a prospect of communication between this country and the Faroë Islands and Iceland by means of wireless telegraphy, as reports from those islands would be of special value.

International co-operation: North Sea investigation.

In connexion with the international investigation of the North Sea in the interest of the fishing industry, the Council have been in communication with Dr. E. J. Allen, of the Marine Biological

Association, and Professor D'Arcy W. Thompson, C.B., of Dundee, and have made arrangements for facilitating the investigation by the supply of copies of weather reports, readings of sea temperature at certain light vessels, and in other ways.

Kite observations.

Pending the report of the Committee appointed by the Treasury to inquire into the administration of the Parliamentary grant, the Council have been unable to come to any conclusion as to taking part in the international scheme for the exploration of the upper air by means of balloons and kites, upon which, as reported last year, an official representation received from the German Embassy was forwarded by the Foreign Office and referred to the Royal Society.

They have, however, been able to lend assistance to the Joint Committee of the British Association and the Royal Meteorological Society in connexion with the loan of H.M.S. "Seahorse" by the Admiralty, for meteorological observations by means of kites, off the West Coast of Scotland, in the summer of 1904.

They have also been in correspondence with the Department of Fisheries and Technical Instruction for Ireland with reference to a proposal for occasional kite ascents from the deck of the S.S. "Helga," which is in the fishery service of the Department. They have learned with satisfaction from the Department that arrangements may be made for occasional ascents, provided that the expenses can be provided for without charge upon the Department. They have ascertained that the necessary instruments and gear can be lent by the Joint Committee referred to above, and they have arranged with Mr. W. H. Dines to undertake some trial ascents.

The sea off the coasts of Ireland, particularly the Western coast, is of such exceptional interest from the point of view of the meteorology of the upper air, that the Council regard the prospect of obtaining occasional observations from the deck of a vessel usually stationed off those coasts with great satisfaction.

Antarctic exploration.

Negotiations with the Royal Society with the object of providing the means for undertaking the reduction, tabulation, and discussion of the meteorological observations obtained in connexion with the British Antarctic Expeditions in co-operation with the foreign countries which have taken part in the exploration of the Southern regions, are still in progress.

In this connexion it may be mentioned that early in the year a report was received from Mr. W. S. Bruce, of the Scottish Antarctic ship "Scotia," giving an account of a programme of operations in southern latitudes during the current year in co-operation with the Meteorological Organisation of the Argentine Republic, and requesting the extension of regular observations on board British ships in those regions during the year. The Council have taken steps to comply with the request as far as practicable.

Colonial observations.

The Council have received a number of offers of observations from missionaries and other residents at various remote stations in British Colonies and Dependencies, on condition that instruments

are supplied for the use of the observers. They consider that the organisation of meteorological observations, upon a uniform basis with appropriate equipment, in countries that are little known, is of great practical importance, but they are unable to undertake the gratuitous supply of instruments. They have accordingly, when such applications have been received, made representations to the public departments concerned, in the hope that means may be found for ordering the collection of trustworthy meteorological information from the districts in question in a systematic manner.

East Africa.

They are glad to learn that in the case of British East Africa, where the system of observations initiated by a Committee of the British Association had fallen into arrears, the Marquis of Lansdowne has taken steps to render the returns sent from the Protectorate more complete.

The summaries of observations at stations in Africa, compiled by Mr. Ravenstein have been passed through the press, and will be issued in the summer of the current year.

South Africa.

The Office has been in communication with the Crown Agents with reference to the supply and inspection of instruments for the new meteorological organisations of the Transvaal and the Orange River Colony. The instruments dealt with under this head are enumerated on p. 23.

London Fog Inquiry.

Mr. Lempfert's report upon the observations of the winter of 1902-3, with an appendix giving a detailed account of the relation of the Office forecasts to the occurrence of fog in London, has been completed, and will be issued with Captain Carpenter's report, and a summary of the whole inquiry, in the course of the current year.

Geographical Exhibition.

The Council have lent a number of maps and other publications for exhibition in London and the chief towns of Great Britain on the application of Mr. A. J. Herbertson, Secretary of the Geographical Association.

Miscellaneous Investigations.

The investigation of the "trajectories" or actual paths of air during the progress of barometric changes of recognised type has been continued, and has led to some interesting results. The investigation of the storm of February 27th, 1903, by this method, was referred to in last year's report, p. 13. The paper upon the subject was read before the Royal Meteorological Society on June 17th, 1903, and was published in the Society's Quarterly Journal, Vol. XXIX., p. 233.

The mathematical computation of the paths of air in an ideal storm of a type approximately represented by that of February 27th, was contributed to the Monthly Weather Review for July, 1903.

By the aid of a number of synoptic charts for the North Atlantic and adjacent land areas, Mr. Lempfert obtained the trajectories for the air reaching the British Isles and parts of the Continent of Europe during the remarkable falls of dust and red rain in February, 1903 (*see* Report, 1902–3, p. 12), and was able to trace a clear distinction between an air supply from

North-Western Africa which came round the Spanish Peninsula and reached the regions where a red deposit fell, with or without rain, and a cooler air supply which came from the Western Atlantic and carried no dust. He was thus able to give a satisfactory explanation of the origin of the red deposit, in a paper presented by himself in conjunction with Dr. H. R. Mill, to the Royal Meteorological Society and published in the Quarterly Journal, Vol. XXX., p. 57.

The application of a similar method to account for the difference between the meteorological characteristics of a very rainy cyclonic storm which passed over the British Isles on November 11th to 13th, 1901, and gave a rainfall of upwards of four inches in certain parts of the country, and another storm, not very dissimilar as regards the isobaric distribution, but producing less than an inch of rainfall at any station reporting to the Office, was given on the Pilot Chart for February, 1904.

The same method has been applied to trace the course of air for long distances across the Atlantic and neighbouring land areas for certain selected periods, using for this purpose the Synoptic Charts for 13 months, August, 1882 to September, 1883, published by the Council in 1886. Hourly or Two-hourly Maps have been constructed and the trajectories drawn for the following typical cases :—

1. "V-shaped" depression, January 5th, 6 p.m., to January 7th, 6 p.m., 1900.
2. Development of a circular storm from a small secondary depression in the Atlantic, December 30th and 31st, 1900.
3. Cyclonic disturbance, passing eastward, heavy rainfall, November 11th, 6 p.m., to November 13th, 6 p.m., 1901.
4. Cyclonic disturbance, passing eastward, light rainfall, March 23rd, 6 p.m., to March 25th, 8 a.m., 1902.
5. Sudden decrease in the force of the wind at many Stations in the west, February 24th, 1903.
6. Cyclonic disturbance, passing north-eastward, February 26th to 27th, 1903.
7. Cyclonic disturbance, causing strong gales, particularly in the Channel, and passing eastward, September 10th, 8 a.m., to September 11th, 8 a.m., 1903.
8. Development of a circular storm over the British Isles, October 7th, 6 p.m., to October 9th, 6 p.m., 1903.
9. Disturbance, changing direction of its path from N.E. to S.E. or S., October 14th, 6 p.m., to October 17th, 6 p.m., 1903.

The diagrammatic work is now complete and a paper embodying the results of the whole investigation is in preparation. It has led incidentally to the conclusion that air traverses much greater distances upon the earth's surface than is sometimes supposed, and this has led further to the consideration of the flow of air in middle and higher latitudes as forming part of a

general circulation round the earth, rather than an interchange of air between adjacent regions of high and low pressure. The subject has been treated in a paper by the Secretary contributed to the Royal Society, extending the work of M. L. Teisserenc de Bort. It is shown therein that the average distribution of pressure at the earth's surface for the month of January can be regarded as consisting of two parts; the one due to the upper air, *i.e.*, to the layers above the 4,000-meter level, which would if it acted alone, cause a circulation round the polar axis from West to East; and the other, due to the stratum below the 4,000-meter level, would, on the other hand, if it acted alone, cause a circulation, in the opposite direction, along lines similar in general position and shape to those of the westerly circulation of the upper air, while the lines of both component distributions follow closely those of surface temperature.

The result is of considerable importance, because the formation of the surface distribution of pressure by the superposition of the two distributions for the upper and lower portions of the atmosphere affords a reasonable explanation of the position of the average track of storms in the higher latitudes of the Northern and Southern hemispheres. It also suggests a means of tracing the effect of variations in the average distribution of surface temperature over considerable regions of the earth. Hitherto attention has not been directed so clearly to the tendency for the motion of air to be maintained along the isothermal lines, rather than across them, though the former is quite in accordance with the effects due to the deflecting force arising from the earth's rotation. The introduction of this method of regarding the effect of surface temperature may throw light upon the relation of the average distribution of the meteorological elements and possibly also upon the daily distribution.

Detailed Examination of the Meteorology of the Forecast Districts.

During the greater part of the year an investigation has been in progress of the Meteorology of the several stations included in one or other of the eleven districts into which the British Isles are divided for the purposes of forecasting. The line taken in the inquiry may be briefly indicated as follows. A forecast issued for a certain district aims at specifying the direction and force of the wind, the temperature, the state of the sky, and the weather in the ensuing 24 hours. All these elements as observed at any given station are liable to be affected by local conditions, but the extent to which they are affected has never been definitely ascertained. It is, however, not likely to be the same for all types of weather. With few exceptions it has been the universal practice, in obtaining mean values for a station, to deal with the observations chronologically, grouping the observations in years or months or weeks. Such a method of grouping the observations tends to obliterate any peculiarities belonging to any station for special types of weather, whereas a forecast is in reality a brief description of the type of weather which may be expected for a district; from the nature of the case, it takes no adequate account of the peculiarities which may be experienced at any specific station while that type prevails. In the inquiry, therefore, the days of the month have been

grouped according to the type of weather indicated by the isobaric distribution which may be said to correspond with a perfectly successful forecast for the district, because the barometric distribution and its associated weather form the basis of forecasting. To avoid too great elaboration, six general types only have been taken, depending upon the general trend of the isobars, and all days of the months have been referred to one or other of the six types. The meteorological elements have then been taken out for each day and for each station. They have been grouped according to the days on which the assigned types occurred and the average taken.

The work of analysis of the observations in this manner is very laborious. A single month does not afford enough examples of days of all types to give a satisfactory mean, so that corresponding months of three consecutive years have been taken and the results collected in one table.

A system of diagrammatic representation has been worked out by which the results can be easily inspected. The work has been completed for 10 stations in the district No. 7. England, N.W., for January and July, and the diagrams plotted with results that promise to be interesting and useful as a means of indicating the relative peculiarities of the stations for the various types of weather.

The conspicuous differences as regards rainfall for winds from easterly and westerly quarters, and as regards cloud and other elements, at certain stations, show that the method of analysis brings out differences that are not disclosed by the simpler chronological arrangement.

The work is being continued and the results for 12 stations in the district called the "Midland Counties" are nearly completed.

It has been arranged that the Secretary shall give an account of results in a paper before the Scottish Meteorological Society in November next.

The arrangement of the data in this manner for all the stations in the several districts is too voluminous for the work to be completed in the Office; accordingly it is hoped that the co-operation of the observers may be obtained in an arrangement whereby the data derived from current observations will be grouped according to days assigned to specific types by the Forecast Branch of the Office.

Indirectly the inquiry may lead to a closer and more definite analysis of the relation of weather to types of barometric distribution.

Wind Measurements.

The investigation of the relation between wind velocities as recorded on the Anemometers and the numbers of the Beaufort Scale has been continued. The average results had been already obtained, but the hourly velocity corresponding to the several observers' estimates of a particular Beaufort Scale number were shown to range over such wide limits that it seemed doubtful whether the mean wind velocity for the hour within which the

estimate was made was the most appropriate element with which to compare the estimate. With the Robinson Anemometer no other wind measure than the average hourly velocity is available but with the Dines instrument separate gusts are recorded, and it was thought that inquiry might show that the limits might be reduced if an average of the velocity in gusts were taken, for example, instead of the average velocity.

It was also considered desirable to examine the effect of the differences in the conditions of exposure for winds from different quarters. With these objects in view the data have been re-examined and the results are now completed. A report upon the question is in preparation.

An anemometer has been maintained for many years at St. Helena in the S.E. trade wind with the object of ascertaining the variations in intensity and direction of the flow of air. A report upon the results of the inquiry is in preparation.

Anemometers at Holyhead.

The experimental anemometers at Holyhead have been maintained in action in the charge of Mr. F. M. Cotton, C.E. The comparison of the pressure plate recorder having a circular exposed plate, one square foot in area, has shown satisfactory agreement with the force in pounds weight per square foot, computed from the velocity as recorded on the Dines anemometer according to the formula, $P = \cdot 003\ V^2$, where P is expressed in pounds, V in miles per hour ($k = \cdot 0068\ v^2$, where k is expressed in kilogrammes and v in metres per second). The circular plate has been replaced by a square one of the same area, in order to make the same comparison for the square plate before changing the size of the plate.

Mr. Munro of the Granville Works, King's Cross, has offered to the Council the use (for the purpose of experiment) of a pressure plate anemometer of new design by Mr. W. H. Dines, in which the total force on the exposed plate made up of the increased pressure on the front with the reduced pressure at the back, is recorded upon a drum, in a manner similar to that in which the records of the pressure tube anemometer are obtained. The Council hope to avail themselves of this offer, and to instal the new instrument at Holyhead in place of the Stokes bridled anemometer, which has been fully compared there with other instruments and for which provision will be made at the Cambridge Observatory.

Meteorological observations at Cambridge.

In August, 1903, the Council were informed by Sir R. Ball, F.R.S., director of the University Observatory at Cambridge, that the Staff of the Observatory was not able to continue the Climatological Observations at that Station, which had been carried on there from 1899, in continuation of the observations for telegraphic reports, dating back to a revision of the system of telegraphic reporting in the year 1872. The Council at once expressed their sense of the great disadvantage under which the science of meteorology would be placed if the University of Cambridge were to withdraw the official recognition and co-operation which it had been accustomed to afford for so many years, and they appealed to the Observatory Syndicate to assist them by not only maintaining the

observations already in use, but also initiating observations on the physical properties of the atmosphere, which are less commonly observed, but for which Cambridge affords special opportunities of study. The appeal was cordially supported by Sir R. Ball, and, in consultation with him and Mr. A. R. Hinks, arrangements have been made for the climatological observations to be continued, with the superintendence of the authorities of the Observatory, at the University Botanic Garden, under the charge of Mr. R. I. Lynch, the Curator. At the observatory a self-recording electrometer, presented by Mr. Shaw, has been installed under the supervision of Mr. C. T. R. Wilson, F.R.S., who has undertaken the charge of the measurements made therewith. The Council have lent the Dines self-recording mercury barograph, which was on trial at the office, to furnish records of the pressure for the purpose of comparison, and a Callendar electrical recorder has been obtained for the purpose of recording solar radiation. For use with this instrument, Mr. W. E. Wilson, F.R.S., of Daramona, offered a special thermometric receiver, and an equatorial mounting to carry the receiver, so that it may receive the direct rays of the sun. Mr. Wilson also undertook to defray the cost of a suitable clock for driving the equatorial. Provision will be made for comparing the readings of the Callendar recorder with Standard readings of an Ångström's Pyrheliometer.

It has also been arranged that the bridled anemometer, which was designed by the late Sir G. G. Stokes, Bart., Lucasian Professor, for many years a member of the Council, and has been exposed for the purpose of comparison at Holyhead, shall be removed to the Cambridge Observatory.

The Council have, moreover, placed the Halliwell self-recording rain gauge which was on trial on the roof of the Office, at the Botanic Garden, in charge of Mr. Lynch, on the understanding that the record shall be exhibited in the grounds which are open to the public.

In the course of the negotiations, inquiry was made as to the willingness of the authorities of Newnham College to undertake the Climatological Observations; and although it was in the end decided that the Botanic Garden site afforded greater facilities for observations to be made both morning and evening, Mrs. Sidgwick expressed the wish of the College to undertake observations of temperature and rainfall under the supervision of Miss Stephen. It was therefore arranged that the College should provide itself with the instruments required for an auxiliary Climatological Station. The Council has lent a hygrograph by Richard Frères, and a screen for exposing it, in order that comparison might be made between its readings and those of the wet and dry bulb in the Newnham College Grounds at 9 a.m. and 2 p.m., with the intention of comparing the indications of moisture at those hours with those at corresponding hours at Kew Observatory.

With the apparatus thus installed through the co-operation of the authorities mentioned, opportunity is provided for the study of many interesting meteorological questions, and the Council look

forward to the further development of the several inquiries, with the anticipation of very valuable additions to the knowledge of the atmosphere as a first step in the investigation of certain details of climatology which are not adequately represented in the observations at the usual hours in this country.

Magnetic observations at Valencia.

Magnetic observations at Valencia have been continued at the request of the Committee, consisting of the Earl of Rosse and Professor J. Joly. The results are reported to the National Physical Laboratory for incorporation with other magnetic observations.

Acknowledgments.

For many parts of the work of the Office the Council depend upon the co-operation of public bodies and private observers and they desire to make acknowledgment of such assistance received in the course of the past year from the following :—

The Lords of the Admiralty, for the loan of log books of H.M. Ships, for facilities for the use of Coastguard Stations as telegraphic reporting stations, storm signal stations and sea temperature stations.

The Board of Trade, for the sale of pilot charts to the captains and officers of the mercantile marine, for notices of ice in the Atlantic and for meteorological observations at lighthouses in the West Indies and the Falkland Isles.

The Foreign Office and the Colonial Office, for the collection of returns from the Dependencies and Colonies.

H.M. Postmaster-General, for the use of post offices for telegraphic reporting stations and for assistance in many other ways.

The Corporation of Trinity House, for the use of lighthouses as telegraphic reporting stations, of lighthouses and light-ships as sea temperature stations, and for the loan of the log books of lighthouses and light-ships for the checking of storm warnings.

The Irish Lights Office and the Scottish Meteorological Society for the loan of the log books of light-ships and lighthouses for checking storm warnings.

The Mersey Docks and the Harbour Board, for similar assistance and for a telegraphic reporting station at Bidston.

Lloyd's, for the use of signal stations, at home and abroad, as telegraphic reporting stations or as observing stations.

The Royal Meteorological Society, for the loan of documents in connexion with the inquiry into the local meteorological characteristics of the several forecast districts.

The University of Cambridge, for the installation of instruments at the Observatory and the Botanic Garden.

The officers of the Navy and the captains and officers of the mercantile marine named in Appendix IV., and especially those named on p. 90, for observations at sea and to the shipping companies, there mentioned, for their assistance in the collection of marine observations, and in addition the following steam ship companies: the New Zealand Shipping Company, the Shaw

Savill Company, Compagnie Générale Transatlantique, Compañia Transatlantica of Barcelona, Compania La Veloce, Navigazione Generale Italiana.

The authorities of the Observatories enumerated in Group A, p. 71.

The contributors of automatic records enumerated in Groups B, C, and S.

Captain Kendall of the Dublin Mail Packet Company in connexion with the anemometers at Holyhead.

The Ordnance Survey Offices at Southampton and Phœnix Park; and the Corporations named in the lists of stations in Groups D, E, G, R, and W, for facilities afforded, and the observers named in the same lists for their skill and care in taking the observations and in replying to inquiries arising from their discussion.

Major Chaves, Director of the meteorological service of the Azores, and the Portuguese Government, for daily reports from the Azores.

The Commercial Cable Company and the Eastern Telegraph Company, for the free transmission of the reports. The Eastern Telegraph Company also for the free transmission of reports from Spain and Portugal.

The Corporation of Nottingham, for the establishment of a telegraphic reporting station at that town.

The Corporations of Bath, Bettws-y-Coed, Blackpool, Brighton, Clacton-on-Sea, Harrogate, Margate, Scarborough and Skegness, for telegraphic reports.

The Corporation of Camberwell, for copies of the records from automatic rain-gauges.

The observers named in the Colonial and Foreign list, p. 82, who forward returns to the Office.

The recipients of Harvest forecasts, named on p. 79, who have contributed returns for the purpose of checking the forecasts.

The Board of Agriculture, the Royal Agricultural Society, the Agricultural Organisation Society, the Central Chamber of Agriculture, the Royal Dublin Society, The Scottish Highland Society and the Press, for the distribution of information.

The Council also desire to recognise the courtesy of many persons who have lent records from automatic instruments, etc., for the illustration of special meteorological occurrences.

Office staff

The staff of the Office is divided into five branches. The branches co-operate as may be required in the various scientific investigations indicated above. The work of a routine character which is assigned to the several branches will be referred to under the following headings :—

I. THE MARINE BRANCH, which deals with (*a*) ocean meteorology—the collection, tabulation and discussion of meteorological data for all parts of the ocean traversed by British ships; the

preparation and issue of charts or other publications exhibiting the results obtained from the discussion of the observations: (*b*) the supply of meteorological instruments to the ships of the Royal Navy, to the mercantile marine, to the stations in connexion with the Office, and to observers in this country and in the Colonies or elsewhere.

II. THE TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH, which takes charge of the collection of daily telegraphic reports from stations in the United Kingdom, the Azores, and the Continent of Europe, and the preparation of reports, charts, forecasts, and storm warnings based upon them. This branch is associated with the Observatory branch for the examination and tabulation of automatic records.

III. THE STATISTICS AND LIBRARY BRANCH, which deals with (*a*) the climatology of the British Isles, and takes charge of (*b*) meteorological information and statistics regarding British Colonies and dependencies, and foreign countries. This branch also deals with (*c*) the distribution of meteorological reports and publications, with (*d*) inquiries from all sources upon meteorological questions, not specifically assigned to one of the other branches, and (*e*) with the arrangement of the Library.

IV. THE OBSERVATORY BRANCH, which deals with the automatic registers received from self-recording instruments of all kinds at observatories and other stations in connexion with the Office.

V. CORRESPONDENCE AND ACCOUNTS BRANCH, which deals with finance, the arrangement of correspondence, and the registration of documents.

The general method of dealing with the information which is regularly collected by the Office is indicated in Appendix II. No important change has been made in the arrangements during the past year. Some details of the year's work of the several branches are given in the following notes.

I.—MARINE BRANCH.

(*a.*) OCEAN METEOROLOGY.

Collection of Information.

The arrangements for the systematic collection of data with respect to the meteorology of the ocean from the Royal Navy and the Mercantile Marine have been continued as heretofore. An indication of the system adopted is given in Appendix II.

Information received.

The meteorological observations made on board H.M. ships are reported to the Admiralty.

A large number of ship's logs have been lent to the Council by the Admiralty for the purpose of extracting the meteorological data relating to the Indian Ocean.

The meteorological registers of all kinds, other than those from lighthouses, received by the Office during the year from Officers of the Navy or from the Mercantile Marine numbered 2094. A list is given in Appendix IV.

Of the meteorological logs, 147 have been classed as "excellent" or "very good," as compared with 131 of the previous year.

The following list shows the number of vessels observing, for the different lines of route :—

North Atlantic	66	Eastern, via Suez Canal...	31
Mediterranean	28	Far Eastern, via Cape of Good Hope	15
South America (East Coast)	10	Far Eastern, via Suez Canal	37
„ „ (West „)	1	Pacific	17
South Africa	11	Polar	7
Eastern, via Cape of Good Hope	11		

Appendix III. (p. 90) contains a list of the observers who, during the past year, have contributed logs classed as "excellent." Several of these observers have co-operated with the Office for many years. The names which appear in the list for the first time are as follows :—

Observer's Name.	Ship.
Bailey, J. J.	S.S. "Brooklyn City."
Blight, F.	S.S. "Assyria."
Corner, F. W., R.N.R.	"Macquarie."
Eagleton, H.	S.S. "Trojan Prince."
Edmonds, T. D.	S.S. "Courtfield."
Hurford, R.	S.S. "Romney."
Simmons, S. N.	S.S. "Port Maria."
Webster, G. S., R.N.R.	S.S. "Mount Royal."
Young, W. G.	S.S. "Clan Gordon."

As a mark of recognition of valuable co-operation, the Council have presented various publications of the Office to observers who have returned well-kept logs.

The Council note with regret the death of five of their old observers. Captain G. M. Lawrison, of ship "Eaton Hall," in March, 1902 ; Captain-Superintendent A. T. Miller, R.N., of H.M.S. "Conway," in April, 1903 ; Captain C. Gadd, of P. & O. S.S. "India," in June, 1903 ; Captain E. Crewe, of P. & O. S.S. "Victoria," in August, 1903 ; and Captain R. Woolward, of R.M.S. "Don," in August, 1903.

Supplementary Information

The arrangements for obtaining meteorological registers from the captains and officers of ocean-going ships who use their own instruments, have been continued, and a very large amount of information has thereby been collected, which is immediately utilised in the Monthly Pilot Charts of the North Atlantic and Mediterranean. The arrangements are indicated in Appendix II., p. 54.

Pilot charts.

It may be noted that Monthly Pilot Charts for the North Atlantic and North Pacific are now issued by the U.S. Hydrographic Office, for the North Atlantic and Mediterranean by the London Meteorological Office and the German Seewarte, and Quarterly Charts of the North Sea and Baltic by the Seewarte.

Quarterly Charts are proposed for the South Atlantic and the South Pacific by the U.S. Hydrographic Office.

Use of Information received.

Charts of the distribution of the temperature of the surface water of the Atlantic for successive months have been compiled for insertion in the Pilot Charts for the North Atlantic and Mediterranean as in the previous year. The maps thus prepared are issued within six weeks of the close of the month in which the observations are taken. For each of the months recently dealt with the number of observations tabulated extends to some 4,000.

Daily Charts of pressure over the North Atlantic showing the distribution of isobars are also prepared in the department, in order to obtain the mean pressure values for the month. The monthly results for pressure are shown on the sea temperature charts, and the daily charts are occasionally reproduced to illustrate any prominent meteorological occurrence which has been noted.

Besides continuing the issue of the Monthly Pilot Charts and the examination of all logs and documents received, the marine department of the Office has been engaged upon the discussion of the meteorological data for the Indian Ocean, extending to 30° S.

Permission was given to Captain Schück of Hamburg to extract information in possession of the Office relating to the China Sea and North Sea.

Information supplied for the Admiralty.

Climatological tables have been compiled for various places in South America, the North Sea, and China Sea, at the request of the Admiralty.

Hydrographic notices have been extracted from the meteorological logs and forwarded to the Admiralty. Among those sent during the year were notes by Captain J. D. S. Phillips, S.S. "Aorangi"; Captain F. J. Bayldon, R.N.R., S.S. "Tambo"; and Captain F. C. Mullan, F.R.G.S., S.S. "Ramsay."

(*b.*) Supply of Instruments.

Royal Navy.

The arrangements for the supply of instruments are indicated in Appendix II. The establishment at Bermuda has been increased; at other dockyards it remains as heretofore.

During the year 1,240 instruments of various kinds have been issued to H.M. ships as compared with 1,028 in the previous year. Particulars are given in Appendix V., p. 107.

913 have been despatched from the Office to H.M. Dockyards as compared with 750 in the previous year.

Mercantile Marine.

Of the mercantile marine, 153 ships have been supplied with instruments and log-books, as compared with 140 in 1902–3. The total number of instruments issued to the mercantile marine in the past year was 864, as compared with 696 in the previous year. Details are given in Appendix VI. The approximate number of ships employing instruments belonging to the Office for observations during the year was 162, as compared with 152.

Stations.

The instruments at the telegraphic reporting stations have been maintained in proper order and replaced when necessary. Instruments have been supplied to Nottingham and Skegness.

Fishery Barometers

A fishery barometer has been supplied to Mullaghmore on the recommendation and with the co-operation of the Department of Agriculture and Technical Institution for Ireland. There are now 229 stations on the coast of the British Isles supplied by the Council with barometers for the benefit of sailors and fishermen. Of these, 67 stations are in England, 7 in Wales, 64 in Ireland, 86 in Scotland, 4 in the Isle of Man, and 1 in Jersey. A list of the stations is given in Appendix II.

The fishery barometer is in each case placed in charge of some responsible person who undertakes the duty of forwarding to the Office a chart of the readings of the barometer and thermometer during each month.

Instruments have been lent to establish a station at Southampton Island (Hudson's Bay) and at Ocean Island (Pacific).

Observers.

A considerable number of instruments have been supplied upon repayment to observers, including the following :—

To Mr. Philip Baylis, for the Forest of Dean, six rain-gauges.

To the Provost and Seniors of Trinity College, Dublin ; Lieut. Sladen, R.E., Ordnance Survey Office, Shrewsbury ; The Urban District Council, Bettws-y-Coed ; King William's College, Isle of Man ; and Ballinacurra, Co. Cork, the instruments for a normal climatological station, together with sunshine recorders in most cases.

The following have been supplied or inspected for the Crown Agents for the South African Colonies :—

21 Mercury Barometers.
1 Standard Thermometer.
72 Ordinary Thermometers.
29 Maximum do.
29 Minimum do.
212 Rain-gauges and Measuring Glasses.
— Additional Measuring Glasses.
40 Stevenson Screens.
2 Solar Radiation Thermometers.
1 Grass Minimum Thermometer.
2 Sunshine Recorders.
1 Mercury Barograph.
2 Aneroid Barographs.
1 Thermograph.
1 Hygrograph.
1 Evaporation Tank.
1 Hand-pressure Tube Anemometer.
1 Nephoscope.
1 Dines-Baxendell Anemograph.
1 Dines' Dewpoint Hygrometer.
— Callendar Electrical Recorders, with Electrical Thermometers and Sunshine Receiver.
1 Stereo Telescope.

Various other instruments have been supplied for use at stations.

II.—Forecast and Storm Warning Branch.

Daily Weather Reports

Daily reports, giving the state of the weather over the British Isles and the adjacent parts of the Continent at 8 a.m. and the changes which have taken place in the previous 24 hours, together

with forecasts of the probable weather over the United Kingdom for the period ending at noon on the following day, have been regularly issued to certain public offices and institutions, to the press, and to subscribers. Similar reports referring to the weather at 6 p.m., with forecasts for the following civil day, have been issued each evening for the morning editions of the daily papers.

Telegraphic reporting stations.

The stations from which telegraphic reports are received are shown in the lists given on pp. 78, 79.

By arrangement with the Corporation of Nottingham, a station has been established there to take the place of Loughborough, which was discontinued in consequence of the illness of Mr. W. Berridge, who had reported for 20 years with unfailing regularity and accuracy. The Council regret to record that Mr. Berridge has since died.

Inspection of the Stations.

Inspection of the Telegraphic Reporting Stations.—The stations indicated in the list in Appendix II., p. 59, have been inspected during the year. The Reports of the Inspectors, p. 109, show that efficiency has been maintained.

The Daily Weather Report.

Discussion and Publication of the Information received.—A detailed account of the manner in which the meteorological information received by telegraph is utilised for the preparation of the Daily Weather Report is given in Appendix II. An account of modifications introduced in the form of the Daily Weather Report in August, 1900, was given in the Report for 1900–1, p. 15. No important change has been introduced in the past year. The Supplementary Charts on page 2 of the report have represented the average distribution of temperature at 8 a.m., the average distribution of sunshine, greatest and least monthly rainfall, and monthly mean temperatures respectively; but from the 1st of January of the current year, charts, showing the aggregate rainfall and the aggregate sunshine recorded at the reporting stations up to the end of the preceding week, have been introduced on Wednesdays and Thursdays respectively, in place of Map IV. on p. 2.

The information as to the weather in the British Islands has been supplemented by telegraphic reports sent daily from volunteer observers, by data as to sunshine for the preceding day from a number of coast stations which report by post, and by postal reports of maximum and minimum temperature, rainfall, and sunshine for a number of inland stations which have proved a useful addition to the telegraphic reports of the first page.

Distribution of Daily Weather Reports.

The arrangements for the issue of the Reports have remained as previously reported. About 300 copies of the Reports have been distributed daily, without charge, to Government Offices and public institutions, to seaports for public exhibition, to newspapers, to correspondents of the Office, and to foreign meteorological institutions. The issue to subscribers has amounted to about 174 copies. The provisional arrangement for the sale of single copies of the Daily Weather Report at a penny each, from about 3 o'clock of the afternoon of the day of issue, has been continued. The places where single copies can be obtained have been, as before, viz., the Meteorological Office, the railway bookstalls of the following terminal

with forecasts of the probable weather over the United Kingdom for the period ending at noon on the following day, have been regularly issued to certain public offices and institutions, to the press, and to subscribers. Similar reports referring to the weather at 6 p.m., with forecasts for the following civil day, have been issued each evening for the morning editions of the daily papers.

Telegraphic reporting stations.

The stations from which telegraphic reports are received are shown in the lists given on pp. 78, 79.

By arrangement with the Corporation of Nottingham, a station has been established there to take the place of Loughborough, which was discontinued in consequence of the illness of Mr. W. Berridge, who had reported for 20 years with unfailing regularity and accuracy. The Council regret to record that Mr. Berridge has since died.

Inspection of the Stations.

Inspection of the Telegraphic Reporting Stations.—The stations indicated in the list in Appendix II., p. 59, have been inspected during the year. The Reports of the Inspectors, p. 109, show that efficiency has been maintained.

The Daily Weather Report.

Discussion and Publication of the Information received.—A detailed account of the manner in which the meteorological information received by telegraph is utilised for the preparation of the Daily Weather Report is given in Appendix II. An account of modifications introduced in the form of the Daily Weather Report in August, 1900, was given in the Report for 1900–1, p. 15, No important change has been introduced in the past year. The Supplementary Charts on page 2 of the report have represented the average distribution of temperature at 8 a.m., the average distribution of sunshine, greatest and least monthly rainfall, and monthly mean temperatures respectively; but from the 1st of January of the current year, charts, showing the aggregate rainfall and the aggregate sunshine recorded at the reporting stations up to the end of the preceding week, have been introduced on Wednesdays and Thursdays respectively, in place of Map IV. on p. 2.

The information as to the weather in the British Islands has been supplemented by telegraphic reports sent daily from volunteer observers, by data as to sunshine for the preceding day from a number of coast stations which report by post, and by postal reports of maximum and minimum temperature, rainfall, and sunshine for a number of inland stations which have proved a useful addition to the telegraphic reports of the first page.

Distribution of Daily Weather Reports.

The arrangements for the issue of the Reports have remained as previously reported. About 300 copies of the Reports have been distributed daily, without charge, to Government Offices and public institutions, to seaports for public exhibition, to newspapers, to correspondents of the Office, and to foreign meteorological institutions. The issue to subscribers has amounted to about 174 copies. The provisional arrangement for the sale of single copies of the Daily Weather Report at a penny each, from about 3 o'clock of the afternoon of the day of issue, has been continued. The places where single copies can be obtained have been, as before, viz., the Meteorological Office, the railway bookstalls of the following terminal

railway stations in London : Victoria (S. E. & C. and L. B. & S. C.), Charing Cross, St. Pancras, King's Cross, and Euston.

The substance of the morning and afternoon reports received by telegraph as to the state of the weather at certain stations on the sea coasts, has been displayed on the balcony of the Office at 63, Victoria Street, S.W., and charts have been suspended in the portico of the street door exhibiting the latest information from all our coasts, and the latest forecasts and storm warnings that have been issued.

Weather Forecasts.

Weather Forecasts.—The means adopted for the distribution of the forecasts drawn up in the Office have been continued during the past year. They are detailed in Appendix II., pp. 44, 45.

In addition, at the request of a firm of opticians, arrangement has been made for communicating forecasts by telephone for exhibition, upon payment of a fee for the special service.

Copies of the 11 a.m. forecasts based on the 8 a.m. observations have been regularly called for by messengers from newspapers or news agencies, and printed copies have been delivered to subscribers and distributed for exhibition as follows : in the City, at the Mansion House, Lloyd's Rooms, Messrs. R. & J. Beck's, Cornhill, and Messrs. de la Rue & Co.'s, Bunhill Row; in the West End, in the Libraries of the House of Lords and the House of Commons ; at Messrs. Elliott's, Leicester Square ; Messrs. Stanford's, Charing Cross ; Messrs. Negretti & Zambra's, Regent Street ; Messrs. Curry & Paxton's, 195, Great Portland Street.

8.30 p.m. Forecasts.—These are based upon the 6 p.m. observations and are distributed with the evening report to the representatives of newspapers and news agencies for insertion in the morning papers.

Forecasts have been supplied occasionally to His Majesty's Yacht as requested by the Commodore. At the request of the Admiralty, forecasts for the S.W. of England and the Bay of Biscay have been regularly supplied to the Commander-in-Chief, Devonport. Arrangement has also been made with the Admiralty for the supply of forecasts to a number of H.M. ships as occasion requires. Forecasts for separate districts have been sent by telegraph to certain provincial newspapers.

Harvest Forecasts.

During the summer months (June to September inclusive) the special service of afternoon forecasts for the benefit of agriculturists and others was arranged as last year, and special telegraphic reports of observations at 2 p.m. were obtained for this purpose. These forecasts are sent by telegraph at 3.30 p.m. to those who express a wish to receive them regularly, and who defray the cost of the telegrams. The number of recipients of the forecasts for various periods in the summer of 1903 was 74, the same as in 1902. There were no applications from persons residing in any part of Scotland. In other districts the number ranged from 23 in the Midland counties and 18 in England, S., to 2 in Ireland, S., and 1 in England, N.E., and Ireland, N.

By many of the recipients a record of the weather experienced during the time the forecasts were sent was kept and supplied to

the Office. A comparison between the forecasts issued and the subsequent weather, as entered on the returns, shows that for the country generally 48 per cent. of the forecasts were completely successful, and 33 per cent. partially successful. The results are less satisfactory than those for the previous year.

Telegraphic inquiries for forecasts.

The number of inquiries for forecasts by telegraph was 217.

Transcripts of observations.

No important changes have been made in the supply of transcripts of observations received by telegram. It has long been the practice to prepare specially drawn maps for the "Times," and for some time past transcripts of observations have been furnished to the "Daily Mail" and the Press Agencies. The Liverpool Underwriters' Association has for many years past received a daily telegram from the Office of observations at a number of coast stations. The "Daily Telegraph" has been supplied with special observations made at Valencia at 10 p.m. each night. A weekly summary has been prepared for the "Fish Trades Gazette" during the winter months. For these services a charge has been made.

Results of Forecasts.

A comparison for the year of the Forecasts for the United Kingdom issued at 8.30 p.m., with the subsequent weather actually experienced, is given in detail in Appendix IX. The complete success, partial success, partial failure, and complete failure of the forecast, are estimated according to definite rules which are designed to eliminate bias as far as possible.

It will here suffice to state that partial success means that the Forecast was correct for more than half the six elements (viz., wind direction and force, temperature, rainfall, state of the sky, thunderstorms, &c.) dealt with at the places of observation situated in the district in question, and a corresponding interpretation is to be applied to the term partial in the case of the failures.

The detailed comparison of the Forecasts with actuality may be summarised as follows :—

SUMMARY of RESULTS of 8.30 p.m. FORECASTS, 1903–1904.

Districts.	Per-centages.				
	Complete Success.	Partial Success.	Partial Failure.	Complete Failure.	Sum of Successes, Complete and Partial.
SCOTLAND, N. ...	59	32	6	3	91
,, E. ...	60	26	11	3	86
ENGLAND, N.E. ...	58	31	8	3	89
,, E.	56	32	9	3	88
MIDLAND COUNTIES...	52	31	13	4	83
ENGLAND, S.	56	33	9	2	89
SCOTLAND, W. ...	61	27	8	4	88
ENGLAND, N.W. ...	56	29	12	3	85
,, S.W. ...	54	31	11	4	85
IRELAND, N.	55	29	13	3	84
,, S.	51	30	14	5	81
Summary ...	56	30	11	3	86

The following table shows the success of the Forecasts of the year in comparison with those of previous years. It gives for each year of the decade 1894–1903 the percentages of complete and partial successes of the Forecasts issued at 8.30 p.m. The number of successes in the past year was above the average for the 10 years.

PER-CENTAGES of SUCCESS in the FORECASTS for the whole of the BRITISH ISLES.

Year.	Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1894	56	27	83
1895	55	25	80
1896	54	27	81
1897	55	26	81
1898	55	28	83
1899	55	27	82
1900	57	27	84
1901	58	26	84
1902	53	35	88
1903	56	30	86
Average	55·4	27·8	83·2

Storm Warnings.

Storm Warnings for the Coasts of the United Kingdom.— Warnings of coming storms have been dispatched by telegraph to stations on the coast supplied with signals to be hoisted as warnings to mariners of expected storms. The signals are defined in Circular 717 of the Board of Trade, issued in February, 1874.

A list of the stations at which the signals are exhibited is given in Appendix II., p. 47. At the end of March, 1904, there were 231, of which 123 were in England and Wales, 68 in Scotland, 33 in Ireland, 4 in the Isle of Man, and 3 in the Channel Islands. Noman's Fort on the Solent, and Dungarvan, have been added to the list in the course of the year.

The drawbacks referred to in the reports of the last two years as incidental to the existing arrangements for the transmission of storm warnings and exhibition of signals, still remain. Representation upon the matter was made to the Treasury Committee of Inquiry.

A comparison between the warnings issued during the year and the subsequent weather, in accordance with the method indicated in the Report for 1888–9, Appendix VII., p. 64, is given in Appendix VIII.

Comparison of results for 1903 with previous years.

The following table contains a statement of the amount of success of storm warnings in each year and the average for the decade 1894–1903 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1894 ...	502	68·5	23·5	92·0	6·0
1895 ...	523	63·3	26·4	89·7	8·0
1896 ...	467	67·7	23·8	91·5	5·6
1897 ...	596	60·1	31·7	91·8	4·5
1898 ...	581	59·8	27·5	87·3	8·2
1899 ...	594	59·3	31·9	91·2	4·8
1900 ...	512	66·2	25·8	92·0	6·3
1901 ...	498	62·3	26·1	88·4	7·4
1902 ...	535	55·5	32·0	87·5	9·0
1903 ...	757	62·6	27·3	89·9	7·3
1894–1903	548	62·4	27·7	90·1	6·7

Averages.

The corresponding figures for the average of the ten years 1873–1882, 1883–1892, and 1893–1902 are as follows :—

Decade.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
1873–82...	390	54·2	25·1	79·3	16·8
1883–92...	512	57·6	25·9	83·5	14·1
1893–1902	529	62·4	27·7	90·1	6·1

III.—Statistics and Library Branch.

(*a.*) Climatology. British Isles.

Returns of various kinds from stations in all parts of the kingdom have been received as indicated in the table on pp. 59–70. Some of these returns are from the stations which are supported by the Office, but the greater number are furnished by volunteer observers. The nature of the information supplied is indicated by the letters in the fifth column of the table, which are explained on pp. 57 and 58.§ The names of the observers at the stations

§ Particulars as to the principles of classification of stations, and the instruments in use at the stations in connexion with the Office are given in the Report for 1901-2, p. 20, and in previous Reports.

Comparison of results for 1903 with previous years.

The following table contains a statement of the amount of success of storm warnings in each year and the average for the decade 1894–1903 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1894 ...	502	68·5	23·5	92·0	6·0
1895 ...	523	63·3	26·4	89·7	8·0
1896 ...	467	67·7	23·8	91·5	5·6
1897 ...	596	60·1	31·7	91·8	4·5
1898 ...	581	59·8	27·5	87·3	8·2
1899 ...	504	59·3	31·9	91·2	4·8
1900 ...	512	66·2	25·8	92·0	6·3
1901 ...	498	62·3	26·1	88·4	7·4
1902 ...	535	55·5	32·0	87·5	9·0
1903 ...	757	62·6	27·3	89·9	7·3
1894–1903	548	62·4	27·7	90·1	6·7

Averages.

The corresponding figures for the average of the ten years 1873–1882, 1883–1892, and 1893–1902 are as follows :—

Decade.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
1873–82...	390	54·2	25·1	79·3	16·8
1883–92...	512	57·6	25·9	83·5	14·1
1893–1902	520	62·4	27·7	90·1	6·1

III.—Statistics and Library Branch.

(*a.*) Climatology. British Isles.

Returns of various kinds from stations in all parts of the kingdom have been received as indicated in the table on pp. 59–70. Some of these returns are from the stations which are supported by the Office, but the greater number are furnished by volunteer observers. The nature of the information supplied is indicated by the letters in the fifth column of the table, which are explained on pp. 57 and 58.§ The names of the observers at the stations

§ Particulars as to the principles of classification of stations, and the instruments in use at the stations in connexion with the Office are given in the Report for 1901-2, p. 20, and in previous Reports.

belonging to the several groups are given on pp. 71–78. The stations which have been added to the list since last year are marked *, and those which have been discontinued since the close of last year are marked †.

The list may be summarised as follows :—

Number and Description.	Class.	Nature of the Information received. (*See* p. 59.)
13 Observatories	I.	A.
11 Additional Anemograph stations	—	B.
19 „ Barograph stations	—	C.
2 „ Thermograph stations	—	C'.
93 „ Sunshine stations	—	S.
87 Normal Climatological stations. Second Order stations.	II.	D.E.
28 Telegraphic stations—British	III.	T.
31 „ Foreign	—	—
69 Auxiliary Climatological stations	III.	G.
81 Additional Rainfall stations	III.	R.
51 Sea Temperature stations, and	—	W.
229 Fishery Barometer stations	—	—

STATIONS OF THE FIRST ORDER : OBSERVATORIES.—The Council have continued to maintain the observatory at Valencia (Cahirciveen), and have also continued their contributions to the maintenance of the meteorological observatories at Kew, Falmouth, Aberdeen, and Fort William, at which the self-recording instruments, installed by the Council, are under the management of the National Physical Laboratory, the Royal Cornwall Polytechnic Society, the University of Aberdeen, and the Scottish Meteorological Society respectively. The arrangement with the observatories at Glasgow and Stonyhurst, under which copies of the records of the self-recording instruments are supplied to the Office, have been likewise continued. The records obtained from the observatories and the anemograph stations are dealt with in the Observatory Branch, *see* p. 34. The cards from the sunshine stations are also examined in that branch.

Ben Nevis observatories

The Council have also made a contribution to the Scottish Meteorological Society towards the cost of the hourly observations at the summit of Ben Nevis.

The grant to the Fort William Observatory has been continued under the circumstances mentioned in last year's report, pending the report of the Treasury Committee.

ANEMOGRAPH STATIONS.—No change has been made in the list of anemograph stations in connexion with the Office.

A large number of barographic and anemographic records have been lent to the Council by private observers in connexion with the inquiry into the trajectories of air referred to on p. 12.

Sunshine stations.

SUNSHINE STATIONS.—Complete returns of the original cards for the year have been received from 68 stations and for a portion of the year from 13 stations.

In addition to these records, which are all from instruments of the Campbell-Stokes design, tabulations of the daily amount of sunshine have been received from 29 other stations for insertion in the Weekly Weather Report, &c. Of these, five were derived from the records of the Jordan recorder, which depends upon the exposure of sensitive paper to the sun's light, and the others from the Campbell-Stokes instruments.

The distribution of the Sunshine Stations on the 31st March was as follows :—

SUNSHINE STATIONS (110) AT MARCH 31, 1904.

Stations.	No.	Stations.	No.
Scotland, N.	6	England, N.E.	10
,, E.	3	,, N.W. and N. Wales	15
,, W.	3	,, Midland Counties	14
Ireland, N.	2	,, E.	11
,, S.	6	,, S.	24
Channel Islands	3	,, S.W. and S. Wales	13

Additional stations desired.

The Council would welcome additional observations, especially from Scotland and Ireland and the inland parts of Wales and of the south-west of England.

For the purpose of uniformity in the returns, they deem it desirable that the observations should be made with the Campbell-Stokes instrument, and in order that the published returns may be strictly comparable, they have decided that in future only the results obtained with the Campbell-Stokes or some other equiva lent instrument shall be included in the official publications.

NORMAL CLIMATOLOGICAL STATIONS. STATIONS OF THE SECOND ORDER OF THE INTERNATIONAL CLASSIFICATION.—These stations, as well as many of the sunshine stations, and all the stations supplying information indicated by the letters F, G, and R, are maintained by private persons or local authorities or institutions, who provide their own outfit of instruments. Returns for 1903 were received from 87 stations. The arrangement with the Royal Meteorological Society and the Scottish Meteorological Society, under which, for a certain payment, the Societies forward to the Office returns already prepared for publi cation, as well as returns for the Weekly Weather Report, has been continued. These returns are incorporated with those received directly from the observers and prepared for publication in the Office. Under this arrangement the Royal Meteorological Society has forwarded to the Office copies of observations from 4 stations on the International Form A, from 12 on Form B, and from 10 on the Weekly Forms; the Scottish

Meteorological Society observations from 3 stations on Form A, from 15 on Form B, and from 7 on the Weekly Forms. The stations from which these returns have been received are marked ℳ. and $. respectively in the list of stations in Appendix II.

The stations of the Second Order for 1903 were distributed as follows :—

Stations.	No.	Stations.	No.
Scotland, N.	7	England, N.E.	11
„ E.	6	„ N.W., and N. Wales	8
„ W.	9	„ Midland Counties	14
Ireland, N.	4	„ E.	9
„ S.	5	„ S.	9
Channel Islands	1	„ S.W., and S. Wales	5

AUXILIARY CLIMATOLOGICAL STATIONS.—These include all stations which make climatological returns of a less complete character than those of a normal station, or at which the hours of observation do not correspond with those of a normal station. Particulars of the information received from the several stations are given in the general list of stations, pp. 59–78, under groups G, H, and R. Those which have been added in the course of the year are marked *, those which have lapsed since last year are marked †.

SEA TEMPERATURE STATIONS.—No change has taken place in the list of sea temperature stations. Sea temperature stations.

The returns from these stations are used in connexion with monthly charts of the surface temperature of the North Atlantic Ocean, embodied in the Monthly Pilot Charts.

Inspection of the Stations.—In order to secure uniformity of method and to guard against instrumental errors, the stations classified under the heads A, B, C, D, S, and T, in the list on pp. 71, 78, are regularly inspected, while the others are visited as opportunity offers. The stations which belong to the Royal Meteorological Society, are visited by an Inspector appointed by that Society. In accordance with the recommendation of the Treasury Committee (1877), a contribution towards the cost of this inspection is made by the Office. An account of the inspections in the year 1903 is given in Appendix VII. Inspection of stations.

The information collected from the stations is carefully arranged and kept ready for reference. The returns required for the current publications of the Office referred to in (*c.*), Part III., p. 32, are examined, checked and prepared for the press ; the information is also utilised in other ways. Use of the information from climatological stations.

The statistical tables of the Weekly Weather Reports and its monthly, quarterly, and annual summaries have been prepared as in previous years.

Normal Climatological Stations.—The returns from all the Second Order Stations are arranged to give monthly means of pressure and temperature at 9 a.m. and 9 p.m., with the means of maximum and minimum temperature for the month, as well as data concerning rainfall, the direction and force of the wind, &c. These are arranged in a Form "B," adopted for International use by the Meteorological Congress at Rome in 1879; while for certain selected stations the details of the actual observations made at 9 a.m. and 9 p.m. are set out *in extenso* in a Form "A," adopted in a similar manner. These returns are prepared with a view to the publication of an annual volume, which is entitled "*Meteorological Observations at Stations of the Second Order*," of which twenty-four volumes have been issued, the last being that for 1899. That for 1900 was in the press at the close of the year.

Reports supplied to Registrars-General for England and Ireland.

Weekly summaries for 22 stations, and quarterly summaries for 73 stations have been prepared for the reports of the Registrars-General of Births, Deaths, and Marriages for England and Wales and for Ireland.

Rainfall observations.

Copies of observations at Rainfall Stations have also been sent for the use of the British Rainfall Organisation to Dr. H. R. Mill.

Ben Nevis observations.

A transcript of Ben Nevis observations has been sent to Dr. Hergesell at his request, in connexion with the International Aeronautical Investigation.

(*b.*) Climatology. Foreign and Colonial Stations.

A list of Foreign and Colonial Stations from which documents have been received in the course of the year is given in Appendix II., p. 79.

Of these stations, one, St. Helena, has an anemograph in addition to the usual climatological instruments. Six are in Cyprus and have been in operation since 1882. Eight are in the West Indies, of which six are in the Bahamas. Five of the Bahamas returns are lighthouse registers. Eight stations are in the West of Africa, 10 in Central Africa, and one in British East Africa. Five are on the Mediterranean Coast. Two are in Central or South America, one in the Falkland Islands, one at Teneriffe, two in the Indian Ocean (Madagascar and Mauritius), and one in the South Pacific Ocean.

(*c.*) Publications.

Applications for free copies of one or more of the current publications of the Office, from the Royal Observatory, O'Gyalla, Hungary; Geheimrath von Neumayer, formerly director of the Deutsche Seewarte; The Schools of Geography, Oxford; University College, Dundee; Observatorio Meteorológico del Colegio de Nuestra Señora del Recuerdo, Madrid; Transvaal Meteorological Department; Meteorological Service of Chili, Valparaiso; Department of Agriculture, Victoria; Meteorological Service of Monte Video; and the Observatory of the University of Malta, have been granted.

The statistical tables of the Weekly Weather Reports and its monthly, quarterly, and annual summaries have been prepared as in previous years.

Normal Climatological Stations.—The returns from all the Second Order Stations are arranged to give monthly means of pressure and temperature at 9 a.m. and 9 p.m., with the means of maximum and minimum temperature for the month, as well as data concerning rainfall, the direction and force of the wind, &c. These are arranged in a Form "B," adopted for International use by the Meteorological Congress at Rome in 1879; while for certain selected stations the details of the actual observations made at 9 a.m. and 9 p.m. are set out *in extenso* in a Form "A," adopted in a similar manner. These returns are prepared with a view to the publication of an annual volume, which is entitled "*Meteorological Observations at Stations of the Second Order*," of which twenty-four volumes have been issued, the last being that for 1899. That for 1900 was in the press at the close of the year.

Reports supplied to Registrars-General for England and Ireland.

Weekly summaries for 22 stations, and quarterly summaries for 73 stations have been prepared for the reports of the Registrars-General of Births, Deaths, and Marriages for England and Wales and for Ireland.

Rainfall observations.

Copies of observations at Rainfall Stations have also been sent for the use of the British Rainfall Organisation to Dr. H. R. Mill.

Ben Nevis observations.

A transcript of Ben Nevis observations has been sent to Dr. Hergesell at his request, in connexion with the International Aeronautical Investigation.

(*b.*) Climatology. Foreign and Colonial Stations.

A list of Foreign and Colonial Stations from which documents have been received in the course of the year is given in Appendix II., p. 79.

Of these stations, one, St. Helena, has an anemograph in addition to the usual climatological instruments. Six are in Cyprus and have been in operation since 1882. Eight are in the West Indies, of which six are in the Bahamas. Five of the Bahamas returns are lighthouse registers. Eight stations are in the West of Africa, 10 in Central Africa, and one in British East Africa. Five are on the Mediterranean Coast. Two are in Central or South America, one in the Falkland Islands, one at Teneriffe, two in the Indian Ocean (Madagascar and Mauritius), and one in the South Pacific Ocean.

(*c.*) Publications.

Applications for free copies of one or more of the current publications of the Office, from the Royal Observatory, O'Gyalla, Hungary; Geheimrath von Neumayer, formerly director of the Deutsche Seewarte; The Schools of Geography, Oxford; University College, Dundee; Observatorio Meteorológico del Colegio de Nuestra Señora del Recuerdo, Madrid; Transvaal Meteorological Department; Meteorological Service of Chili, Valparaiso; Department of Agriculture, Victoria; Meteorological Service of Monte Video; and the Observatory of the University of Malta, have been granted.

The following publications have been issued :—i. The Daily Weather Report (*see* p. 24) ; ii. The Weekly Weather Report (*see* p. 49), with monthly, quarterly, and annual supplements ; iii. Monthly Pilot Chart of the Atlantic and Mediterranean.

A complete list of the publications which have been issued by the Office is given in Appendix II., p. 85, and in Appendix XI., p. 184, is given a list of important contributions to meteorology, which have not been issued as separate publications, but have been included in various Reports issued by the Office since 1866.

(*d.*) INQUIRIES.

The inquiries dealt with in the Statistical and Library Branch during the year were 792 in number, of which 166 were by letter and the rest personal inquiries. The whole number may be classified as follows :—Inquiries for scientific and industrial purposes, 258 : for evidence in legal proceedings, 94 ; for forecasts of weather, 158 ; from newspaper correspondents for special weather information, 217 ; miscellaneous, 65.

(*e.*) LIBRARY.

The main part of the Library consists of the weather maps and other publications of the Weather Offices of different countries, and meteorological reports and publications received from all quarters of the globe. Most of these are presented or obtained by way of exchange, but a few standard works and serial publications are purchased. The Library consists at present of about 17,800 volumes and pamphlets.

Appendix X., p. 135, gives a list of the accessions to the Library during the year. These amounted to 605 books and pamphlets. The list has been arranged as nearly as possible on the lines of the International Catalogue of Scientific Literature, so that the nature of the contents of the various contributions to the Library may be more easily understood.

Among the publications presented to the Library may be mentioned the new edition of the Atlas of the Atlantic Ocean by the Deutsche Seewarte, and the Meteorological Atlas of the Municipal Observatory of Paris giving very full particulars of the conditions observed in the air of that City during sixteen years ; among those acquired by purchase have been the set of daily synoptic charts of the North Atlantic and adjacent countries, for the year from December, 1896, to November, 1897, prepared by the German and Danish Meteorological Authorities jointly.

The Library is available for the use of students and others between the hours of 10 a.m. and 4 p.m. A number of persons have availed themselves of this accommodation.

The following publications have been issued :—i. The Daily Weather Report (*see* p. 24) ; ii. The Weekly Weather Report (*see* p. 49), with monthly, quarterly, and annual supplements ; iii. Monthly Pilot Chart of the Atlantic and Mediterranean.

A complete list of the publications which have been issued by the Office is given in Appendix II., p. 85, and in Appendix XI., p. 184, is given a list of important contributions to meteorology, which have not been issued as separate publications, but have been included in various Reports issued by the Office since 1866.

(*d.*) Inquiries.

The inquiries dealt with in the Statistical and Library Branch during the year were 792 in number, of which 166 were by letter and the rest personal inquiries. The whole number may be classified as follows :—Inquiries for scientific and industrial purposes, 258 ; for evidence in legal proceedings, 94 ; for forecasts of weather, 158 ; from newspaper correspondents for special weather information, 217 ; miscellaneous, 65.

(*e.*) Library.

The main part of the Library consists of the weather maps and other publications of the Weather Offices of different countries, and meteorological reports and publications received from all quarters of the globe. Most of these are presented or obtained by way of exchange, but a few standard works and serial publications are purchased. The Library consists at present of about 17,800 volumes and pamphlets.

Appendix X., p. 135, gives a list of the accessions to the Library during the year. These amounted to 605 books and pamphlets. The list has been arranged as nearly as possible on the lines of the International Catalogue of Scientific Literature, so that the nature of the contents of the various contributions to the Library may be more easily understood.

Among the publications presented to the Library may be mentioned the new edition of the Atlas of the Atlantic Ocean by the Deutsche Seewarte, and the Meteorological Atlas of the Municipal Observatory of Paris giving very full particulars of the conditions observed in the air of that City during sixteen years ; among those acquired by purchase have been the set of daily synoptic charts of the North Atlantic and adjacent countries, for the year from December, 1896, to November, 1897, prepared by the German and Danish Meteorological Authorities jointly.

The Library is available for the use of students and others between the hours of 10 a.m. and 4 p.m. A number of persons have availed themselves of this accommodation.

IV.—Observatory Branch.

The curves received from the observatories (*see* p. 29) and the tabulations of readings at each hour made by the observers up to the close of the year have been carefully examined.

The form adopted for the publication of these observations has been varied from time to time. For some years the curves themselves were reproduced. From 1874 to 1886 the hourly readings at the several observatories were published; in 1887 the plan of giving the five-day means was adopted, while in the volume for 1895, at the suggestion of the International Conference at Paris, the hourly readings at Kew and Valencia were included in addition, and these were continued in the succeeding volumes up to 1899.

In 1902 the Council decided to revise the form of publication of the results of observations from the observatories, and to issue the complete hourly readings from each of the four observatories —Aberdeen, Kew, Falmouth, and Valencia—for each month upon four quarto pages. As provision is made elsewhere for the publication of hourly readings at Fort William and Ben Nevis, the hourly values at Fort William are not included.

The first volume of the new series giving hourly readings has been prepared for 1900, and was still in the press at the close of the year. It contains readings for each hour of barometric pressure, temperature of the dry and wet bulbs, wind direction and velocity, rainfall and sunshine, with the hourly means for the month and for a long series of years.

Provision has been made by the introduction of a printing and adding machine for the acceleration of the work of preparing the returns for the press, and it is hoped that the work may soon be brought up to date.

The records from the auxiliary anemographic stations have been tabulated up to date for the purpose of checking the storm warnings.

The sunshine cards for the year from all stations have been examined, and any questions arising from the examination have been dealt with.

The supervision of the anemometric experiments at Holyhead, the discussion of the relation between the numbers of Beaufort's scale of wind forces and the corresponding wind velocities, and the discussion of the records of the St. Helena anemometer, also devolve upon the Observatory Branch.

V.—Correspondence and Accounts Branch.

Appendix XIII., p. 196, shows the receipts and payments during the year ending 31st March, 1904. The amount voted by Parliament was £15,300, as in the previous year, and the miscellaneous receipts amounted to £2,100 8*s.* 8*d.*

The following abstract of expenditure shows approximately the net charge against the Parliamentary grants of this and the preceding year, together with the increase or decrease in 1903–4, as compared with the previous year :—

NET EXPENDITURE.	1902–3.	1903–4.	Increase.	Decrease.
GENERAL ADMINISTRATION :	£	£	£	£
Payment of Council and Secretary	1,476	1,451	—	25
Office	1,053	1,082	29	—
Rent, Fuel, and Lighting	723	717	—	6
Alterations to premises and contingencies ...	359	449	90	—
Expenses incidental to International Meteorological Congress ...	—	85	85	—
SPECIAL RESEARCHES ...	789	842	53	—
LAND METEOROLOGY ...	3,795	4,109	314	—
WEATHER INFORMATION ...	3,123	3,029	—	94
INSPECTIONS	429	405	—	24
OCEAN METEOROLOGY ...	2,422	2,209	—	213
SUPERANNUATION ACCOUNT	1,243	1,261	18	—
Total ... ... £	15,412	15,639	589	362

NOTES.—The increase under "Land Meteorology" is chiefly due to the transfer to this head of a sum previously charged to special researches. The sum of £1,907 11*s.* 7*d.* was paid to the Post Office during the year 1903-4, on account of inland and foreign telegrams, allowances to telegraph clerks, rental of private wires, &c.

R. STRACHEY,
Chairman.

APPENDIX.

APPENDIX I.

Conspicuous Meteorological Occurrences during 1903.

The following were the more striking features in the weather of 1903, noticed in connexion with the issue of the daily and weekly reports :—

1. *Gales.*—The year, as a whole, was of an exceptionally disturbed character, owing to the abnormally large number of barometric depressions, and their secondaries, affecting our islands. High winds were consequently very frequently experienced, but the gales, although numerous, were not, except in a few instances, marked by any great violence. Of the storms the most important were :—

(*a.*) On January 25th, when a strong gale from the South-Westward and Westward was felt generally over our northern and western districts, the force of a whole gale or storm being reported at various places in Ireland and the west of Scotland.

(*b.*) From February 18th to 27th was a very stormy period, due to the passage, on a general north-easterly course, of a series of Atlantic disturbances, their centres keeping outside our coasts, except in the case of the last one, which moved across Scotland on the 27th. The winds were throughout from between South and West, and every day blew with the force of a strong gale and upwards in many localities, culminating, in the night of the 26th–27th, in a very severe gale over England and Ireland, "storm" and "hurricane" force being reported in many places.

(*c.*) On September 10th and 11th the centre of a deep depression moved due east from the Atlantic to Holland, occasioning a violent gale from between South-West, North and North-East over England and Ireland, "storm" and "hurricane" force being felt on many sections of the southern and western coasts.

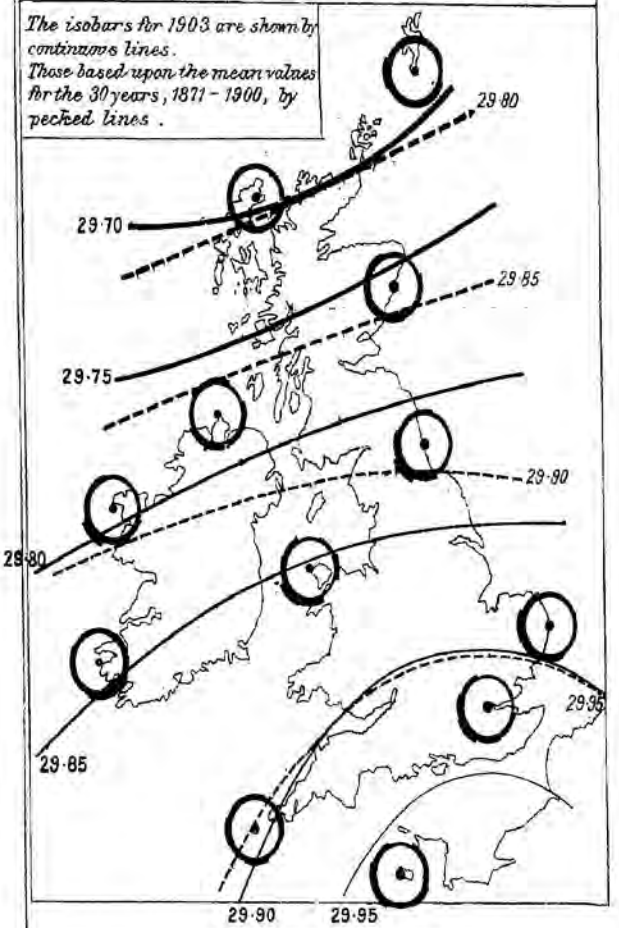
For a summer gale that of July 5th and 6th was severe over the northern half of the kingdom, a strong or whole gale from North-West or North blowing at a number of places. At Fleetwood the anemometer registered a wind velocity of 80 miles in an hour (factor 3) equivalent to 59 miles actual.

ANNUAL WEATHER CHART, 1903.

To face p. 37.

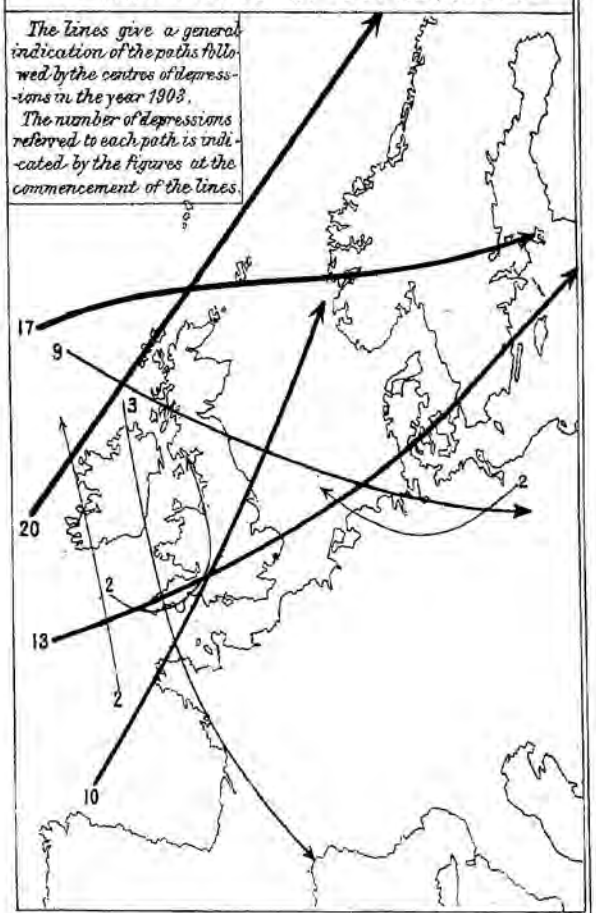
1. BAROMETER AND WIND AT 8 A.M.

The isobars for 1903 are shown by continuous lines.
Those based upon the mean values for the 30 years, 1871 - 1900, by pecked lines.



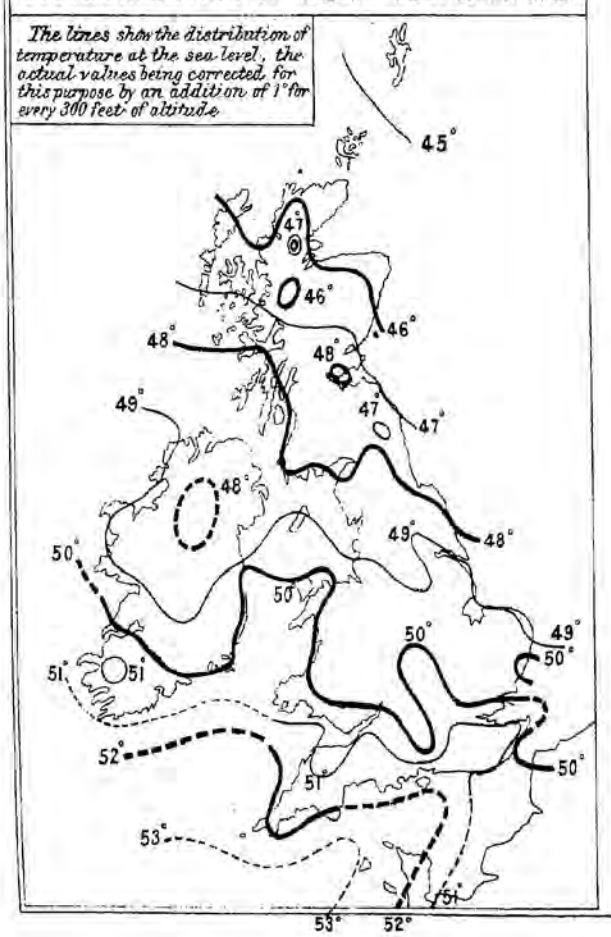
2. MOVEMENTS OF DEPRESSIONS.

The lines give a general indication of the paths followed by the centres of depressions in the year 1903.
The number of depressions referred to each path is indicated by the figures at the commencement of the lines.



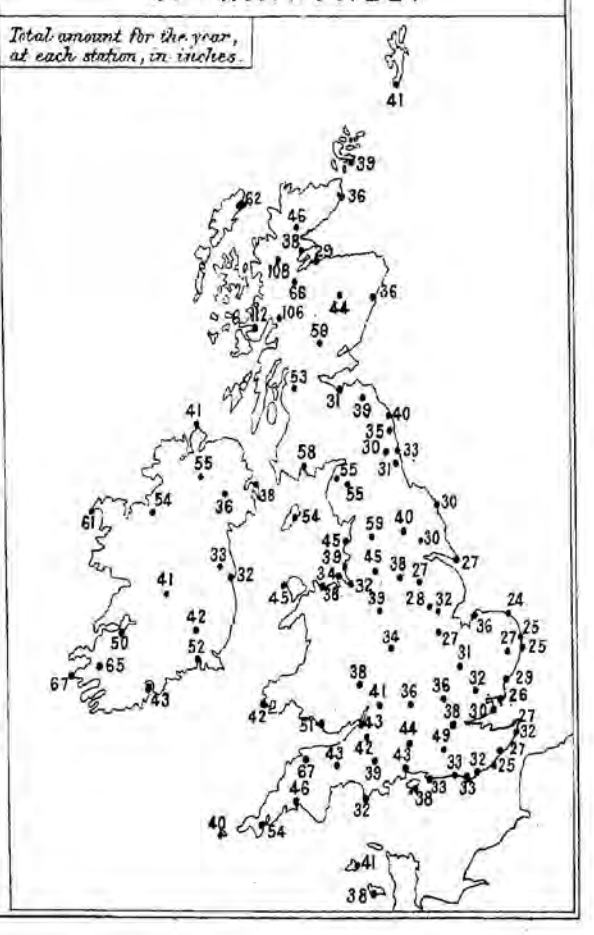
3. DISTRIBUTION OF MEAN TEMPERATURE.

The lines show the distribution of temperature at the sea-level, the actual values being corrected for this purpose by an addition of 1° for every 300 feet of altitude.



4. RAINFALL.

Total amount for the year, at each station, in inches.



5105, H. 04.

Waller & Graham, Ltd Litho, London.

A record of the extreme wind velocities recorded during these gales and others of less importance will be found in the following table :—

READINGS OF ANEMOMETERS amounting to, or exceeding a VELOCITY OF 44 MILES per hour, as recorded on the "Dines" Pressure-tube anemometer, or upon the "Robinson" anemometer with the factor adjusted to give the corresponding result, equivalent to an Estimated Force of 9 by Beaufort's Scale.

Date.	Station.	Duration of Severe Gale, 44 miles per hour, or above.	Wind Direction.	Maximum	
				Hourly Velocity (Actual).	Rate in a Gust.
1903.					
Jan. 8 ..	Deerness	0.30 p.m. to 1.30 p.m. ..	W. by S.	46	—
„ 10-11..	Kingstown	2.30 p.m. to 6.30 p.m. ..	N.E. to N.E. by N.	51	—
	Holyhead	7.40 p.m. to 8.10 p.m. ..	N. by E.	44	54
	Scilly ..	9.40 p.m. 10th to 1.15 a.m. 11th.	N.	47	6
„ 15 ..	Scilly ..	9.30 p.m. to 10.30 p.m. ..	S.E.	44	48
„ 16 ..	Scilly ..	3.30 a.m. to 2.30 p.m. ..	S.E.	47	56
„ 25 ..	Kingstown	11.30 a.m. to 4.30 p.m. ..	W.S.W.	48	—
	Alnwick..	0.30 p.m. to 4.30 p.m., and 6.30 p.m. to 7.30 p.m.	S.W. by W. to W. by S.	51	—
	Deerness	7.30 p.m. to 9.30 p.m. ..	W.	47	—
„ 29 ..	Deerness	4.30 p.m. to 5.30 p.m. ..	W.S.W.	45	—
„ 30-31	Alnwick..	6.30 p.m. to 7.30 p.m., and 10.30 p.m. to 0.30 a.m. 31st.	W.S.W. to S.W. by W.	48	—
„ 31 and Feb. 1.	Scilly .	9.30 p.m. 31st to 2.30 a.m. Feb. 1st.	W. to W.N.W.	47	6
„ 1-2 ..	Holyhead	1 a.m. to 3 a.m.	W. by N.	45	63
	Fleetwood	3.30 a.m. to 5.30 a.m. ..	W.N.W.	53	—
	Deerness	2.30 p.m. to 7.30 p.m., and 10.30 p.m. to 3.30 a.m. 2nd.	N.N.W.	48	—
„ 6 ..	Deerness	5.30 p.m to 8.30 p.m. ..	S. to W.S.W.	54	—
„ 7 ..	Alnwick..	4.30 p.m. to 10.30 p.m. ..	W.S.W.	56	—
„ 8 ..	Alnwick..	9.30 a.m. to 10.30 a.m. ..	W. by S.	45	—
„ 23 ..	Deerness..	0.30 a.m. to 7.30 a.m. ..	S.S.W. to W.	56	—
„ 24 ..	Deerness..	10.30 a.m. to 11.30 a.m. and 0.30 p.m. to 1.30 p.m.	S.S.E.	46	—
	Scilly ..	10.30 a.m. to 3.30 p.m. ..	S.S.W.	46	63
	Shoebury-ness.	6 p.m to midnight ..	S.	44	60
„ 26 ..	Scilly ..	0.30 p.m. to 1.30 p.m. ..	W. by N.	44	?
„ 26-27	Valencia..	10.30 p.m. 26th to 2.30 a.m. 27th.	S.W. to W. by S.	63	—
	Kingstown	9.30 p.m. to 11.30 p.m. 26th; and 0.30 a.m. to 7.30 a.m. 27th.	S. to W.S.W.	66	—
	Holyhead	10.30 p.m. 26th to 2.30 a.m. 27th; and 3.30 a.m. to 9.30 a.m. 27th.	S.E. by S. to S.W. by W.	53	87
	North Shields.	5.30 a.m. to 9.30 a.m. 27th	S.S.W. to S.W. by W.	55	—
	Scilly ..	6.30 p.m. 26th to 1.30 a.m. 27th.	S. by E. to S.S.W.	53	?

READINGS OF ANEMOMETERS amounting to, or exceeding a VELOCITY OF 44 MILES per hour, &c.—*continued.*

Date.	Station.	Duration of Severe Gale. 44 miles per hour, or above.	Wind Direction.	Maximum	
				Hourly Velocity (Actual).	Rate in a Gust.
1903.					
Feb. 27 ..	Shoebury-ness.	3.0 a.m. to 6.0 a.m. 27th ..	?	48	63
Mar. 2-3 ..	Scilly ..	7.30 a.m. to 8.30 a.m. 2nd; and 6.30 p.m. 2nd to 3.30 a.m. 3rd.	W.S.W. to W.N.W.	61	?
„ 7 ..	Scilly ..	6.30 a.m. to 8.30 a.m. ..	W. by N. to N.W.	44	57
„ 16 ..	Kingstown	9.30 a.m. to 10.30 a.m. ..	W.	48	—
„ 28 ..	Scilly ..	10.30 a.m. to 11.30 a.m. ..	W. by S.	46	58
	Deerness .	6.30 p.m. to 9.30 p.m. ..	W.S.W.	53	—
„ 30 ..	Kingstown	0.30 p.m. to 6.30 p.m. ..	W.S.W. to W.	48	—
	Holyhead .	0.30 p.m. to 1.30 p.m., and 3.30 p.m. to 4.30 p.m.	W.S.W., and W. by N.	45	70
April 7 ..	Fleetwood	10.30 a.m. to 11.30 a.m., 1.30 p.m. to 6.30 p.m., and 8.30 p.m. to 10.30 p.m.	W.N.W. to N.W. by N.	48	—
	Deerness..	2.30 p.m. to 3.30 p.m. ..	N.W.	44	—
July 6 ..	Fleetwood	0.30 a.m. to 7.30 p.m. ..	W.N.W. to N.W.	59	—
Aug. 14-15	Scilly ..	11.30 p.m. 14th to 4.30 a.m. 15th.	W.	45	59
„ 15-16	Fleetwood	8.30 p.m. 15th to 7.30 a.m. 16th.*	W.S.W.	44	—
„ 18 ..	Scilly ..	0.30 a.m. to 3 a.m.	W.	44	48
„ 31 ..	Fleetwood	2.30 a.m. to 3.30 a.m. ..	W.S.W.	47	—
Sept. 9 ..	Fleetwood	3.30 a.m. to 4.30 a.m. ..	W.N.W.	45	—
„ 10-11	Scilly ..	2.30 p.m. to 1 a.m. 11th ..	S.W. to N.W.	64	71
	Valencia. .	2.30 p.m. to 3.30 p.m 10th	W.	50	—
	Holyhead	7.30 p.m. to 9.30 p.m. ..	S.W. to N.N.E.	52	75
*	Kingstown	5.30 p.m. to 6.30 p.m. ..	N.	45	—
	Shoebury-ness.	8 p.m. to 10 p.m. 10th, and 2.40 a.m. to 6 a.m. 11th.	—	44	67
Oct. 6 ..	Scilly ..	2.30 p.m. to 3.30 p.m. ..	W. by S.	47	54
	Kingstown	4.30 p.m. to 7.30 p.m. ..	W.S.W.	55	—
	Holyhead	6.30 p.m. to 9.30 p.m. ..	W.S.W.	47	73
	Fleetwood	7 p.m. to 11.30 p.m. ..	S.W. to W.	53	—
„ 12-13	Scilly ..	4.30 p.m. to 9 p.m. 12th ..	W. by N.	48	59
	Fleetwood	1.30 a.m. to 2.30 a.m. 13th	W.	44	—
„ 16-17	Holyhead	10.30 p.m. 16th to 1.30 a.m. 17th.	W. by N. to W.N.W.	48	60
	Fleetwood	8.30 p.m. 16th to 0.30 a.m. 17th.	W. by N. to N.W.	46	—
„ 22 ..	Scilly ..	11.30 a.m. to 1.30 p.m. ..	W.N.W.	44	52
„ 25 ..	Shoebury-ness.	9 p.m. to 10 p.m.	—	41	53
Nov. 21 ..	Scilly ..	11.30 a.m. to 2.30 p.m. ..	N.W. by W.	45	51
	Kingstown	9.30 a.m. to 10.30 a.m. ..	W. by N.	52	—
	Holyhead	2.30 p.m. to 3.30 p.m. ..	N.W. by W.	48	60

* During the interval the force did not exceed the minimum of 44 miles per hour, and at times fell slightly below it.

READINGS OF ANEMOMETERS amounting to, or exceeding a VELOCITY OF 44 MILES per hour, &c.—*continued.*

Date.	Station.	Duration of Severe Gale, 44 miles per hour, or above.	Wind Direction.	Maximum	
				Hourly Velocity (Actual).	Rate in a Gust.
1903.					
Nov. 21 ..	Fleetwood	6.30 a.m. to 6 p.m.	W. to N.W.	57	—
„ 23 ..	Kingstown	8.30 p.m. to 9.30 p.m. ..	W.S.W.	54	—
„ 25 ..	Fleetwood	9.30 p.m. to 10.30 p.m. ..	N.W. by W.	44	—
„ 27-28-29.	Scilly ..	9 a.m. 27th to 1 p.m. 28th; and 7.30 p.m. 28th to 5.30 a.m. 29th.	S.W. to N.W.	63	73
Dec. 3 ..	Fleetwood	10.30 a.m. to 11.30 a.m. ..	S.S.W.	45	—
„ 4 ..	Shoeburyness.	2.30 a.m. to 3.30 a.m. ..	—	41	49
„ 7 ..	Shoeburyness.	Noon to 2 p.m.	S.	42	53
„ 7-8..	Scilly ..	8.30 p.m. to 10.30 p.m. 7th, and 3.30 a.m. to 1.30 p.m. 8th.	W. by N.	48	62
	Valencia..	0.0 a.m. to 4 a.m. 8th ..	W.S.W.	44	—
	Kingstown	1.30 a.m. to 2.30 a.m. 8th..	W.S.W.	44	—
„ 18 ..	Scilly ..	8 a.m. to 9.30 a.m.	E.S.E.	45	48

NOTE.—As some uncertainty existed with regard to the zero of the Pressure-tube Anemometer at Pendennis Castle, Falmouth, its records were not used in preparing the above table. The instrument has since been examined and found to be in good working order.

The Anemometer at Fleetwood was under repair from February 5 to May 19; and the Anemometer at Alnwick Castle was out of order or under repair from the beginning of March to the end of the year.

At Aberdeen, Yarmouth, Kew, Falmouth Observatory, Dublin (Phœnix Park), and Armagh, a mean hourly velocity of 44 miles was not recorded during the year.

2. *Heavy Rains.*—The most remarkable characteristic of the year was its abnormal wetness, and this was especially so from about June 10th, the summer and autumn proving disastrous to agriculturists and others through the persistent rains and floods. Yarmouth and Roche's Point were the only stations where the year's rainfall was less than the average. An excess of 10 ins. and upwards was recorded at a large number of places. At Laudale the total fall was 112·2 ins., or 36·9 ins. above the average, other places in the west of Scotland showing an excess of from 20 ins. to 30 ins. Even London's total of 38 ins. was an excess of 13·6 ins., being considerably larger than any previous record. The rain days numbered 290 at Valencia, and above 270 at other western and northern coast stations, against 157 at Shoeburyness and less than 170 at various other points on the east coast of England. The exceptional nature of the season is well illustrated by the London records, which show that there were as many as eight instances of more than an inch of rain in a day, twice in each of the months June, July, and August, and once in September and November, the previous highest number for any year being four.

The heaviest of the summer falls were recorded :—

(*a.*) On May 30th, when from an inch to nearly 4 ins. fell over western and southern London and in various parts of Surrey. A severe thunderstorm raged.

(*b.*) Between June 13th and 15th, very heavy over a great portion of the south of England, especially within the Thames area. Falls exceeding an inch in 24 hours in many places, 2 ins. at Oxford, 2·1 ins. at Shoeburyness. In London rain fell without interruption from noon 13th until midnight 15th, the total for the 60 hours being 2·9 ins. On June 25th or 26th amounts ranging up to nearly 2 ins. were measured at stations in the south of Ireland, North Wales, and Lancashire.

(*c.*) On July 5th over the north and west of Scotland, 2·5 ins. recorded at Wick. On July 14th and 15th in many parts of Ireland and round the Irish Sea. Between July 16th and 21st numerous large falls in various parts of the Kingdom, 2 ins. at Dublin (Phœnix Park), and 3·2 ins. at Alton, Hants. In the night of July 23rd–24th another very heavy storm over the south-eastern quarter of England, many falls exceeding 2 ins., and in the eastern and south-eastern suburbs of London from 3 ins. to 4 ins. On July 29th, at Fassaroe, Bray, Ireland, 1·8 in. fell in about 30 minutes.

(*d.*) On August 24th over the central and southern parts of England, as much as 2·8 ins. falling at Nottingham.

(*e.*) On September 10th an inch or more measured in many parts of England and Ireland.

In the early and late months falls of an inch or more were neither so frequent nor so general (except during October, which partook of the summer features), and there were few instances of as much as 2 ins. in a day. The most important were :—

(*a.*) On January 4th over the south-west of England and South Wales; and on the 9th in various parts of Scotland and the north of Ireland.

(*b.*) On February 8th in the east and south of Scotland ; and on the 27th along the south coast of England.

(*c.*) On October 8th a severe rainstorm over the north-east of England, with from 2 ins. to 3 ins. in Durham and Northumberland ; on October 11th in many parts of the southern half of England, 2 ins. at Bramley ; and from October 26th to 28th at numerous stations in Ireland and the western half of England, 2·2 ins. at Chester.

(*d.*) On November 27th over the southern portions of England.

(*e.*) On December 12th over the south-western counties.

The very wet period round the middle of June was associated with winds from between North and East, small shallow

disturbances moving about on most erratic paths over the southern counties, the English Channel, and the north of France.

3. *Snowstorms.*—As a general rule the falls of snow reported during the year were of an unimportant character, the amounts measured being usually very small. At Laudale snow fell on 59 days, at Deerness on 31, and at Morpeth (Cockle Park) on 30, but at about half the stations on 10 days or less, there not being one day of snow at Bath.

4. *Thunderstorms.*—November and December were practically free from thunderstorms, and very few were noted in April. In all other months they were of fairly frequent occurrence, but in the main somewhat local in character, some of them rather severe, and in many cases attended by heavy falls of rain and hail. One of the most notable was that of May 30th and 31st in and around London, the storm commencing early in the afternon of the 30th, and being very violent, with deluging rain for several hours. After an interval, it was renewed after midnight, the thunder and lightning being more violent than during the early visitation, but the rainfall not so heavy. Thunderstorms were most numerous along a belt extending from Lancashire to Kent, Dunmow reporting them on 27 days, Stonyhurst on 20, Dungeness on 19, and London on 18. Over the western and northern districts, and down the east coast, the frequency in nearly all places was less than 10 days, Bath returning no instance of a storm.

5. *Droughts.*—In such a remarkably wet year rainless periods of long duration were naturally very rare. It is interesting to note that when the southern and eastern parts of England were suffering from the deluging rains of mid-June, the weather over the northern and western portions of the Kingdom was very dry. The conditions afterwards became reversed, and on June 20th the only notable drought of the year set in over the south and east of England, no rain being registered for 21 consecutive days at Felixstowe, 22 at Clacton-on-Sea, Oxford, and in London, and 24 at Rothamsted.

6. *Temperature.*—The *highest* temperatures registered during the year occurred either at the beginning or end of June or in the second week of July. In Scotland on June 4th the thermometer rose to 81° at Leith, and to 80° at Ochtertyre, while Aberdeen's maximum of 79° was reached on July 9th. At Sumburgh Head no higher value than 60° was recorded—on June 27th and September 20th and 22nd. There was no instance of a maximum of 80° in Ireland. Dublin (City and Phœnix Park) touched 79° on July 9th, while Birr Castle had 78° on June 5th, and Killarney on June 8th and July 11th. Over England and the Channel Islands readings of 80° and upwards were experienced mainly between July 9th and 11th, when Cambridge, Bawtry, Hillington, Fulbeck, and Colly Weston attained 86°, and a number of other stations returned 83° to 85°. Geldeston, however, had a maximum of 86° on June 28th, when Shoeburyness had 84°. Southampton rose to 83° on June 1st, as well as on July 11th.

In connexion with the abnormal wetness of the season low afternoon maxima were rather common during the summer, in numerous instances below 55°, while those of 50° and under were frequent for the time of year. On June 19th the extreme readings at the Royal Observatory, Greenwich, were 46·2° and 48·5°, the Astronomer Royal noting "A very cold day, and the range of temperature was very small. The maximum temperature for the day is the lowest daily maximum recorded in June in the years 1841–1903, and the mean temperature (47·2°) is lower than the mean for any day in June in the preceding 62 years, with the exception of June 4th, 1871, when the same mean value was recorded."

The *lowest* temperatures of the year were experienced in the months of January and December, in most parts of Scotland and England about the middle of January, and in the extreme south of England and in Ireland early and late in December.

Between January 13th and 15th minima were registered as low as 1° at Braemar, 6° at Lairg, 12° at Newton Rigg, 13° at Harrogate and Ochtertyre, 14° at Bawtry and Durham, and 15° at Glencarron. Both on the 13th and the 14th temperature touched 32° at Scilly, the only occasions at that station as low as the freezing point, all other places experiencing lower readings.

On December 2nd or 3rd Edenfel went down to 13°, Littlestone-on-Sea to 15°, Markree Castle and Swarraton to 18°, and Birr Castle to 19°; on the 31st, Bramley to 13°, and Shaftesbury to 18°.

7. *Fog.*—In some of the summer and autumn months thick mist or fog was rather frequent, especially along the coasts, but generally the fogs of the year presented no unusual feature—those of November were neither so frequent nor so dense as usual. On December 5th the greater part of England was covered by fog, which was exceptionally dense and dark locally, but, being associated with a very shallow "V-shaped" disturbance travelling quickly eastward, the fog proved of brief duration.

8. *Dust Fall.*—At many places in the southern half of England and Wales a peculiar dust haze was observed on February 21st. On the following day there were numerous reports of a sandy or reddish-brown powder deposited on vegetation and other objects, and as a sediment in the rain gauges. Subsequent investigation proved that the phenomenon had been noted over an unusually extensive region—from the Equator northward to the Azores and across to England, and eastward through Germany into Austria. From an examination of the atmospheric circulation over the ocean and the land at this period it seems clear that the dust came from the sandy districts of Africa.

9. *Earthquake Shock.*—Early in the afternoon of March 24th an earthquake shock was felt at Fulbeck, and at Chatsworth and many other parts of Derbyshire, as well as in Staffordshire and Lincolnshire.

10. *Magnetic Storm and Auroral Display.*—A very severe magnetic storm, which interrupted telegraphic communication in our islands, as well as throughout Europe and America, was experienced on the evening of October 31st, when there was a brilliant display of aurora borealis in many places.

In connexion with the abnormal wetness of the season low afternoon maxima were rather common during the summer, in numerous instances below 55°, while those of 50° and under were frequent for the time of year. On June 19th the extreme readings at the Royal Observatory, Greenwich, were 46·2° and 48·5°, the Astronomer Royal noting "A very cold day, and the range of temperature was very small. The maximum temperature for the day is the lowest daily maximum recorded in June in the years 1841–1903, and the mean temperature (47·2°) is lower than the mean for any day in June in the preceding 62 years, with the exception of June 4th, 1871, when the same mean value was recorded."

The *lowest* temperatures of the year were experienced in the months of January and December, in most parts of Scotland and England about the middle of January, and in the extreme south of England and in Ireland early and late in December.

Between January 13th and 15th minima were registered as low as 1° at Braemar, 6° at Lairg, 12° at Newton Rigg, 13° at Harrogate and Ochtertyre, 14° at Bawtry and Durham, and 15° at Glencarron. Both on the 13th and the 14th temperature touched 32° at Scilly, the only occasions at that station as low as the freezing point, all other places experiencing lower readings.

On December 2nd or 3rd Edenfel went down to 13°, Littlestone-on-Sea to 15°, Markree Castle and Swarraton to 18°, and Birr Castle to 19°; on the 31st, Bramley to 13°, and Shaftesbury to 18°.

7. *Fog.*—In some of the summer and autumn months thick mist or fog was rather frequent, especially along the coasts, but generally the fogs of the year presented no unusual feature—those of November were neither so frequent nor so dense as usual. On December 5th the greater part of England was covered by fog, which was exceptionally dense and dark locally, but, being associated with a very shallow "V-shaped" disturbance travelling quickly eastward, the fog proved of brief duration.

8. *Dust Fall.*—At many places in the southern half of England and Wales a peculiar dust haze was observed on February 21st. On the following day there were numerous reports of a sandy or reddish-brown powder deposited on vegetation and other objects, and as a sediment in the rain gauges. Subsequent investigation proved that the phenomenon had been noted over an unusually extensive region—from the Equator northward to the Azores and across to England, and eastward through Germany into Austria. From an examination of the atmospheric circulation over the ocean and the land at this period it seems clear that the dust came from the sandy districts of Africa.

9. *Earthquake Shock.*—Early in the afternoon of March 24th an earthquake shock was felt at Fulbeck, and at Chatsworth and many other parts of Derbyshire, as well as in Staffordshire and Lincolnshire.

10. *Magnetic Storm and Auroral Display.*—A very severe magnetic storm, which interrupted telegraphic communication in our islands, as well as throughout Europe and America, was experienced on the evening of October 31st, when there was a brilliant display of aurora borealis in many places.

APPENDIX II.

THE METEOROLOGICAL OFFICE, 63, Victoria Street, London, S.W.

STATEMENT OF PROVISIONS FOR THE SUPPLY OF INFORMATION TO THE PUBLIC.

COUNCIL.

Directors :

Lieutenant-General Sir Richard Strachey, R.E., G.C.S.I., LL.D., F.R.S., Chairman.
Mr. Alexander Buchan, M.A., LL.D., F.R.S., F.R.S.E.
Professor George Howard Darwin, M.A., LL.D., Sc.D., F.R.S.
Rear-Admiral Sir William J. L. Wharton, K.C.B., F.R.S., Hydrographer to the Admiralty.
Mr. William Napier Shaw, M.A., Sc.D., F.R.S., Secretary.

Other Members of the Council :

The Earl of Rosse, K.P., D.C.L., LL.D., F.R.S.
Mr. John Young Buchanan, M.A., F.R.S., F.R.S.E.
Mr. William Henry Dines, B.A.
Professor Arthur Schuster, Ph.D., F.R.S., F.R.A.S.
Mr. Robert Henry Scott, M.A., D.Sc., F.R.S.

Marine Superintendent :

Commander Campbell Hepworth, C.B., R.N.R.

The Meteorological Office was established in the year 1867 under the control of a Committee appointed by the Royal Society, at the instance of the Board of Trade, the Admiralty, and the Treasury, to take over the duties of the Meteorological Department of the Board of Trade, which had been established in 1854.

The Office was accordingly charged with the duty of collecting meteorological reports by telegraph from stations in the British Isles and their immediate neighbourhood, with a view to the issue of storm warnings and forecasts of weather; of collecting for public use statistics about the weather from land stations in the British Isles and elsewhere; of providing trustworthy meteorological instruments for observations to be taken aboard the ships of the Royal Navy and the Mercantile Marine, and of compiling and

discussing the information upon Ocean Meteorology derived therefrom; and of promoting the practical applications of the science of meteorology by special researches.

A parliamentary grant was assigned for the maintenance of the Office. Changes have been made from time to time in the arrangements, and the control is now vested in a body of Directors appointed by the Royal Society.

The Office receives a large number of daily reports, and has gradually accumulated a valuable store of information about the weather in all parts of the world. The arrangements specified below have been made to enable the public to take advantage of this information.

Office hours. The Office is open for general inquiries between the hours of 10 a.m. and 4 p.m. on week days (Saturdays, 1 p.m.), and for telegraphic inquiries from 8.30 a.m. to 8 p.m. on week days, and from 6 to 8 p.m. on Sundays.

A. Telegraphic Information.

Daily Weather Reports. Forecasts and Storm Warnings.

Daily information received. Between 8 a.m. and 10 a.m. telegraphic messages are received daily, reporting meteorological observations at 27 stations (*see* list of stations, p. 78) in the British Isles, chiefly on the coast, and at 28 stations (p. 79) on the Continent of Europe. The observations in the British Isles are made at 8 a.m., and on the Continent partly at 7 a.m. and partly at 8 a.m. A certain number of stations report evening observations (6 p.m.), also by telegram, and those that do not report in the evening include the evening observations with the following morning reports, so that a complete schedule of morning and evening observations is drawn up daily. The information refers to the readings of the barometer, dry and wet bulb thermometers, maximum and minimum thermometers, rainfall, and in some cases, sunshine, with estimates of the direction and force of the wind, and reports of the weather and state of the sea.

These reports are supplemented by telegraphic reports from the Azores, through the courtesy of the Portuguese Government and the Eastern Telegraph Company and the Commercial Cable Company, and by a number of additional observations made at various stations in the United Kingdom, and sent either by telegram or by post through the courtesy of private persons or local officials. Moreover, the "Bulletin International," published in Paris, reproducing meteorological telegrams from the whole of Europe, is received by post on the morning of the day after publication, and supplements the information previously received in the Office by telegram.

The telegraphic information is tabulated and charted by about 10 a.m. for the morning observations, and 7 p.m. for the evening

ones. A general report is then drawn up, and forecasts of the weather **for the twenty-four hours following the next noon, or midnight, as the case may be,** are formulated.

Daily Weather Report.

A Daily Weather Report, which includes a transcript of the observations for the day, with some of those for the previous day, illustrative charts, descriptive remarks on the state of the weather, and forecasts for the several districts of the British Isles, is prepared for press and sent to the lithographers at 12 noon daily, except Sundays and Bank Holidays. It is ready for issue by 2 p.m., and is then delivered by hand or posted by book post at 2.30 p.m. to those addresses which can be reached in the regular course of post on the same day. Copies for those who are outside this limit are posted by the evening mails.

Subscriptions.

The Daily Weather Report may be obtained on payment at the Meteorological Office of a subscription in advance (for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c.) at the rate of £1 per annum for delivery by book post, £2 for delivery, where feasible, by hand. Single copies, price 1*d.* each, can be obtained after 3 p.m. on the day of issue at the Office, and at Messrs. W. H. Smith & Son's railway bookstalls at the following terminus stations :—Victoria, Charing Cross, King's Cross, St. Pancras, Euston.

Special Reports for the Press.

Special advance copies of the descriptive remarks on the state of the weather and forecasts, based upon the morning or evening observations, are prepared at 11 a.m. and 7.30 p.m. respectively, and supplied gratis to the representative of any newspaper or press agency calling for them at the Office, at the hours named.

As far as practicable the Council make arrangements for daily or weekly reports of the state of the weather, in special form, upon terms which may be had upon application at the Office personally or by letter.

Printed forecasts.

Printed copies of the morning forecasts for all districts are ready at 11 a.m., and are distributed by hand to clubs and societies situated in or near Pall Mall at a charge of 10*s.* per annum. They are sent by post at a charge of 2*s.* 6*d.* per official quarter or any part thereof, in addition to the cost of transmission. Copies of the evening forecasts are sent by post for a similar charge.

Written forecasts for separate districts, and other extracts from the daily Reports.

For the purposes of the forecasts of weather the British Isles are divided into eleven districts, as indicated in the accompanying map. A written copy of the latest forecast for a single district can be obtained at the Office between 9.30 a.m. and 8 p.m. upon payment of 6*d.* A written copy of the latest information in possession of the Office as to the state of the weather in any district of the British Isles, and for the neighbouring parts of the continent of Europe, can be obtained in like manner. The latest reports, with a map, are exhibited as early as possible for the information of the public at the entrance to the Office, and abbreviated reports for a few coast stations are displayed in the Street, on the balcony of the Office.

FORECAST DISTRICTS.

0. SCOTLAND, NORTH.
1. SCOTLAND, EAST.
2. ENGLAND, N.E.
3. ENGLAND, EAST.
4. MIDLAND COUNTIES.
5. ENGLAND, SOUTH, and English Channel.
6. SCOTLAND, WEST, and Isle of Man.
7. ENGLAND, N.W., and North Wales.
8. ENGLAND, S.W., and South Wales.
9. IRELAND, NORTH.
10. IRELAND, SOUTH.

Inquiries by telegraph.

By arrangement with H.M. Postmaster-General the latest information as to the state of the weather in various parts of the United Kingdom, or the Continent, and forecasts for one day in advance can be obtained from the Meteorological Office, upon payment at any Postal Telegraph Office of a fee of 6*d.* in addition to the cost of a telegram of inquiry addressed "Weather, London," and of the reply. Ten words, in addition to the address, must be allowed for the reply.

Telegrams of inquiry should state the nature of the information required, and the name and address to which the information is to be sent, as in the following examples :—

To "Weather, London."

Latest Information from [*Straits of Dover*].

or,

Latest Forecast for [*Forfarshire*].

or,

Next Forecast for [*Dublin*].

From (Name), (Address).

Inquiries by post.

The latest information for any district, or the latest forecast, will be sent by telegraph to any address if a request be received by post stating when the information or forecast is to be sent, and enclosing 6*d.* *in addition to the cost of a telegram*, allowing ten words in addition to the address. It should be noted that forecasts are prepared for issue at 11 a.m. and 7.30 p.m. To avoid delay, letters of request for information or forecasts should be marked on the outside "Forecast Branch."

Forecasts for a single district will be sent regularly to public bodies for exhibition without any charge beyond the cost of the telegrams, and to private persons at an additional charge of 3*d.* per telegram for a forecast for a single district, and 6*d.* for two or more districts.

Harvest forecasts.

The Council have made arrangements for a special service of afternoon reports during the season of the Hay and Corn Harvests (June 1st to September 30th), whereby they are enabled to issue a special series of forecasts daily (Sundays excepted) at 3.30 p.m.

The forecasts for any district are supplied by telegraph to agriculturists and others upon prepayment of the cost of the telegrams (nine words daily, in addition to the address) for the period during which the forecasts are required. Forms of application for these forecasts can be obtained at the Office.

The Postmaster-General has sanctioned the exhibition of Forecasts at Local Post Offices, provided space is available, if the persons to whom they are addressed desire them to be so exhibited.

Transcripts of the observations

As far as practicable the Council, upon application, will make arrangements for the transcription of the whole or a selection of the morning or evening telegraphic reports, to be sent by telegraph, in code form, to newspapers or public associations desiring to make use of this means of accelerating the distribution of the latest information about the weather. The special terms for this service can be obtained on application to the Office.

Storm Warnings.

The Office issues notices of threatening atmospherical disturbances on or near the coasts of the British Islands (free of charge) to ports and fishing stations recommended by responsible local authorities.

Storm Signals.

The fact that one of these notices has been received at any station is made known by hoisting a black canvas cone, 3 feet high, and 3 feet wide at base, which has the appearance of a triangle when hoisted. The telegram directing the cone to be hoisted is exhibited near the signal staff.

At dusk, whenever a signal ought to be flying if it were daylight, a night signal, consisting of three lanterns hung on a triangular frame, may be hoisted in place of the cone.

The Meteorological Office supplies the canvas cone, but does not supply the lanterns. In all cases the local authorities must undertake the charges incidental to the hoisting of the signal, such as flagstaff and gear, oil, &c., and also as to the keeping of the apparatus in repair, painting, &c.

The following is a List of Stations to which Storm-warning telegrams are sent :—

Northern.

Scotland, N.E.—Lerwick, Scalloway, Dunrossness, Sumburgh Head L.H., Fair Isle L.H., Noup Head L.H., Stromness, Kirkwall, Cantick Head L.H., Holborn Head, Dunnet Head, Wick, Tarbet Ness L.H., Avoch, Inverness, Nairn, Burghead, Lossiemouth, Buckie, †Port Knockie, Cullen, Portsoy, Banff, Fraserburgh, Peterhead, †Aberdeen, Girdleness L.H.

Scotland, E. — * Stonehaven, Montrose, Scurdy Ness L.H., Broughty Ferry, Dundee, St. Andrews, Anstruther, Pittenweem,

---

* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at night.

Buckhaven, Methil, Wemyss West, Burntisland, Grangemouth, Bo'ness, Granton, †Newhaven, †Leith, Fisherrow, Dunbar, Cockburnspath, St. Abb's Head, Eyemouth.

Scotland, N.W.—C. Wrath L.H., Stourhead L.H., Port of Ness, Stornoway, Island Glass L.H., Portnaguran.

Scotland, W.—*Glasgow, †Greenock, Rothesay, Lamlash, Carradale, Campbelton, Mull of Cantire L.H., Rhuvaal L.H., Rhinns of Islay L.H., Ardrossan, Girvan, Ballantrae, Cairn Ryan, Corsewall Point L.H., Mull of Galloway L.H.

WESTERN.

Ireland, S.W.—Tuskar L.H., New Ross, Dunmore East, Dungarvan, Helvick Head, Minehead L.H., Youghal, Queenstown, Cork, Passage, Kinsale, Kinsale (Old Head), Galley Head L.H., Castletownshend, Fastnet Rock L.H., Brow Head, Tralee, †Limerick, Loophead L.H., Galway.

Ireland, N.W.—Killybegs L.H., Tory Island L.H., Lough Swilly L.H., Rathmullan, Malin Head, Portrush, Port Ballintrae, Ballycastle.

Irish Sea.—†Belfast, Donaghadee, Burr Point, Howth, Kingstown, Point of Ayre (I. of M.), Ramsey (I. of M.), Douglas (I. of M.), *Castletown (I. of M.), Silloth, Maryport, Workington, †Whitehaven, Barrow, Walney Island L.H., Morecambe, Fleetwood, Blackpool, Preston, †Southport, Formby, Liverpool, Runcorn, Hoylake, New Brighton, Connah's Quay, Penmaenmawr, Port Penrhyn, Point Lynas L.H., Skerries L.H., Holyhead, South Stack L.H., Caernarvon, Port Dinorwic.

St. George's Channel.—Courtown, Aberystwyth, Smalls L.H., Milford.

Bristol Channel.—Caldy L.H., †Tenby, Pembrey, Llanelly, Swansea, Briton Ferry, Porthcawl, Nash L.H., Penarth, Cardiff (Bute Dock), Cardiff (Barry Dock), Newport, Weston-super-Mare, Burnham, *Bridgwater, Ilfracombe, Bull Point L.H., *Barnstaple, Appledore, Hartland Point L.H., Lundy Island, Boscastle, Port Isaac, Newquay, Godrevy L.H., Hayle, St. Ives, St. Sennen, Newlyn West, Penzance.

SOUTHERN.

England, S.W.—Scilly, The Lizard, Falmouth, Pendennis Castle, Mevagissey, Mount Batten, Plymouth (Mount Batten and *Milbay Docks), †Devonport (Mount Wise), Prawle Point, Teignmouth, Exmouth.

England, S.—Guernsey, St. Helier's (Jersey), Gorey (Jersey), Portland L.H., Weymouth, Anvil Point L.H., Poole, Hurst Castle L.H., Southampton, Hamble, Yarmouth (I. of W.), Cowes, Ryde, St. Catherine's Point, Portsmouth, Portsmouth (Noman's Fort), Littlehampton, Brighton, †Newhaven.

---

* Telegrams only exhibited.

† Arrangements made for showing signals or illuminating the cone at night.

England, S.E.—Beachy Head, Eastbourne, †Hastings, Rye, Sandgate, Folkestone, Dover, Deal, Ramsgate, Margate, Faversham, Sheerness, Chatham, Greenhithe.

EASTERN.

England, N.E.—Berwick-on-Tweed, Cullercoats, *Tynemouth, South Shields, Souter Point L.H., Sunderland, Hartlepool, †Middlesborough, Redcar, Whitby, Filey, Flamborough Head, Bridlington, Hull, Goole, Grimsby, Boston.

England, E.—Sutton Bridge, Lynn, Sheringham, Cromer, Great Yarmouth, Southwold, Orford Ness L.H., Ipswich, Harwich, Gunfleet L.H., West Mersea.

B. INFORMATION RECEIVED WEEKLY.

METEOROLOGICAL STATISTICS FOR AGRICULTURAL AND SANITARY PURPOSES.

WEEKLY WEATHER REPORT, WITH MONTHLY AND ANNUAL APPENDICES.

Weekly Weather Report.

The Weekly Weather Report, which has been continued in its present form since 1890, is published on Thursdays, and gives, for the week ended on the preceding Saturday, a summary of temperature, rainfall, and duration of bright sunshine in the United Kingdom, for agricultural and sanitary purposes. To this is added a series of maps showing the distribution of pressure and wind over the whole of Europe at 8 a.m. and 6 p.m. on each day, and the temperature, weather, and sea disturbance at 8 a.m. each day. The maps for each day are accompanied by a brief account of the distribution of weather for that day and the changes that have taken place. There is also appended a general summary of the weather over Europe for the week.

For the maps and descriptive account, the daily telegraphic reports are used, and are supplemented by the information contained in the "Bulletin International" already referred to (p. 44), so that the area represented is much larger than that covered by the Daily Weather Report.

For the statistical summaries, the information from the 27 telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from about 88 other stations. Of these 31 supply only the daily amounts of bright sunshine. The summaries refer to districts which are identical with the forecast districts of the Daily Weather Report, and they are grouped into wheat producing districts and grazing districts.

In the data for temperature are included not only statistics of mean and extreme temperatures for the week, but also weekly and progressive statistics of accumulated temperature, of which the following brief explanation may be given.

---

* Telegrams only exhibited.
† Arrangements made for showing signals or illuminating the cone at night.

Tables of Accumulated Temperature.

The tables of *Accumulated Temperature* are designed to give persons engaged in agriculture better means for estimating the manner in which vegetation is affected by temperature than that afforded by the more usual methods of treating the readings of the thermometer. They show for each week, and for the whole period from the beginning of the year, the weekly and progressive values respectively of the combined amount and duration of the excess or defect of the air temperature, above or below a suitably fixed standard, or *base temperature*. The base value adopted is 42° Fahr.

Accumulated Temperature is expressed in *Day degrees*, a Day degree signifying 1° F. of excess or defect of temperature above or below the base (42° F.) continued for 24 hours, or any other number of degrees for an inversely proportional number of hours.*

The following are the rules for computing, from the observed maxima and minima, the accumulated temperature above or below 42° F. for a weekly period :—

1. Obtain the mean temperature, from the means of the seven observed maxima and minima, suitably corrected for non-periodic changes of temperature.

2. In obtaining the accumulated temperature four cases may occur, to which the following rules will apply :—

Conditions of Temperature.	To obtain the daily Accumulated Temperature.	
	Above 42° F.	Below 42° F.
If the minimum is *above* 42° F., or *equal* to 42° F.	Subtract 42° F. from the mean.	There is none.
If the minimum is *below* 42° F., but the mean for the day is *above* 42° F.	From the difference between the mean for the day and the minimum, deduct the accumulated temperature below 42° F., calculated as stated in the next column.	The required quantity is the excess of 42° F. over the minimum, multiplied by the coefficient 0·4.
If the mean for the day is *below* 42° F., but the maximum is *above* 42° F.	The required quantity is the excess of the maximum over 42° F., multiplied by the coefficient 0·4.	From the difference between the mean for the day and the minimum, deduct the accumulated temperature above 42° F., calculated as stated in the preceding column.
If the maximum is *below* 42° F., or *equal* to 42° F.	There is none.	Subtract the mean from 42° F.

In each of the above cases the result will be the average *daily* value, and must be multiplied by 7 in order to obtain the value for the whole week.

The coefficient varies with the duration of the period, and also with the base temperature.

The coefficient given in the second and third rules of the preceding table is for a weekly period, and for the base temperature 42° F. The following are its values for other base temperatures :—for 32° F., 0·4 ; for 52° F., 0·33 ; for 62° F., 0·25.*

* A full explanation of the principles on which these rules are based will be found in Appendix II. to the Quarterly Weather Report for 1878.

Tables of Accumulated Temperature.

The tables of *Accumulated Temperature* are designed to give persons engaged in agriculture better means for estimating the manner in which vegetation is affected by temperature than that afforded by the more usual methods of treating the readings of the thermometer. They show for each week, and for the whole period from the beginning of the year, the weekly and progressive values respectively of the combined amount and duration of the excess or defect of the air temperature, above or below a suitably fixed standard, or *base temperature*. The base value adopted is 42° Fahr.

Accumulated Temperature is expressed in *Day degrees*, a Day degree signifying 1° F. of excess or defect of temperature above or below the base (42° F.) continued for 24 hours, or any other number of degrees for an inversely proportional number of hours.*

The following are the rules for computing, from the observed maxima and minima, the accumulated temperature above or below 42° F. for a weekly period :—

1. Obtain the mean temperature, from the means of the seven observed maxima and minima, suitably corrected for non-periodic changes of temperature.

2. In obtaining the accumulated temperature four cases may occur, to which the following rules will apply :—

Conditions of Temperature.	To obtain the daily Accumulated Temperature.	
	Above 42° F.	Below 42° F.
If the minimum is *above* 42° F., or *equal* to 42° F.	Subtract 42° F. from the mean.	There is none.
If the minimum is *below* 42° F., but the mean for the day is *above* 42° F	From the difference between the mean for the day and the minimum, deduct the accumulated temperature below 42° F., calculated as stated in the next column.	The required quantity is the excess of 42° F. over the minimum, multiplied by the coefficient 0·4.
If the mean for the day is *below* 42° F., but the maximum is *above* 42° F.	The required quantity is the excess of the maximum over 42° F., multiplied by the coefficient 0·4.	From the difference between the mean for the day and the minimum, deduct the accumulated temperature above 42° F., calculated as stated in the preceding column.
If the maximum is *below* 42° F., or *equal* to 42° F.	There is none.	Subtract the mean from 42° F.

In each of the above cases the result will be the average *daily* value, and must be multiplied by 7 in order to obtain the value for the whole week.

The coefficient varies with the duration of the period, and also with the base temperature.

The coefficient given in the second and third rules of the preceding table is for a weekly period, and for the base temperature 42° F. The following are its values for other base temperatures :—for 32° F., 0·4 ; for 52° F., 0·33 ; for 62° F., 0·25.*

* A full explanation of the principles on which these rules are based will be found in Appendix II. to the Quarterly Weather Report for 1878.

Subscribers for the Weekly Weather Report receive also the following supplements and appendices:—

Monthly, Annual, and Quinquennial Supplements to the Weekly Weather Report.

I. *A Monthly Supplement* giving (1) a general account of the weather for the month under the headings—Pressure, Depressions, Anticyclones, Winds, Temperature, Rainfall and Bright Sunshine; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at certain of the Normal Climatological Stations; (3) a summary of maximum and minimum temperature, rainfall, and sunshine at the additional stations which furnish weekly returns, with in each case—for most of the stations—the differences from the average pressure, temperature, rainfall and sunshine; (4) four maps showing the monthly distribution of barometer and wind, the movements of barometric depressions, the distribution of mean temperature, and the distribution of rainfall.

Beginning with January, 1902, this Monthly Summary has been enlarged, and the number for March, 1904, contains complete tables of results for 147 stations, namely:—26 telegraphic stations and 30 selected normal climatological stations, together with a summary of temperature, rainfall and sunshine, or one or more of these elements, at 91 other stations.

An Annual Summary on similar lines was added for the year 1903.

II. An *Appendix*, issued annually, containing (1) quarterly and annual summaries of the rainfall and mean temperature of each district compared with the corresponding quarter, or the whole year, for each of certain recent years, and with each of the corresponding five yearly means for thirty-five years;

(2) A table of the driest and wettest, the coldest and warmest corresponding quarters and years since 1866;

(3) The totals for periods of four weeks and five weeks of rainfall, accumulated temperature and sunshine, together with the progressive totals for each period of the quarter.

III. An *Appendix*, also issued annually, giving weekly and progressive totals of rain days, rainfall, accumulated temperature, and duration of sunshine with percentage of its possible amount for the whole year for the several districts.

IV. An *Appendix* computed every fifth year and giving the weekly and progressive values of the different elements in the five years and for the whole period since 1881.

V. An *Appendix* which also appears every fifth year and gives for each district a comparison of the mean of the average temperature of successive weeks for the preceding five years, with the corresponding value for the whole period defined above.

VI. An *Appendix*, which is also prepared every fifth year, giving the monthly averages of rainfall, rain days, maximum temperature, minimum temperature, mean temperature, duration of bright sunshine and percentage of possible bright sunshine, for as many as possible of the stations included in the Weekly Weather Report.

Advance copy for the use of newspapers.

An advance copy of the MS. of the Report is prepared on Tuesday in each week, and is supplied free of charge to newspapers together with the weekly summary which occupies the first page of the Report.

The Report is published every Thursday afternoon by the Publishers to H.M. Stationery Office, Messrs. Eyre & Spottiswoode, East Harding Street, E.C., Oliver & Boyd, Edinburgh, and E. Ponsonby, 116, Grafton Street, Dublin. The annual subscription is £1 10*s.*, post paid. Single copies are sold at 6*d.* each, exclusive of postage, and the separate appendices are priced at from 4*d.* to 1*s.*

C. Other Information from Stations in the British Isles.

Observatories with self-recording instruments.

The Council maintain a fully equipped meteorological Observatory at Valencia (Cahirciveen), Co. Kerry, Ireland. They have also established instruments and subsidised the observatories at Kew, Falmouth, Aberdeen, and those at the foot (Fort William) and the summit of Ben Nevis. They receive in return from the four first-named observatories, curves and hourly tabulations of pressure, dry bulb temperature, wet bulb temperature, rainfall, direction and velocity of the wind, and sunshine, together with regular observations of the character and movement of the clouds and the state of the weather; from Fort William similar information except for wind, the position of Fort William Observatory not being suitable for an anemometer; and from the observatory on the summit of Ben Nevis full copies of the hourly observations.

An annual volume embodying the results of the observations at the five Observatories is issued in the usual way. That for 1900 has recently been issued, price 6*d.* per month each station.

The Council also receive, in return for an annual grant, duplicates of the curves from the self-recording instruments at Glasgow, Armagh, and Stonyhurst, and the tabulations of these curves are available if required.

Anemographic records are also received from Alnwick Castle, Deerness, Dublin, Falmouth (Pendennis Castle), Fleetwood, Holyhead, Kingstown, North Shields, Scilly, Shoeburyness, and Yarmouth.

Sunshine returns are received from 110 stations, 79 of which furnish a continuous record from the Campbell-Stokes Recorder, while the remaining 31 stations report the daily amounts.

Continuous records of pressure by some form of self-recording aneroid are received from 18 stations.

Continuous records of temperature are received from one station in addition to the observatories; of humidity from one station; and of rainfall from five stations.

Normal Climatological Stations.

Normal climatological stations, equipped and maintained by volunteer observers or by local authorities at their own expense, supply monthly returns of readings of all the meteorological elements at 9 a.m. and 9 p.m. each day.

The following extract from the complete Form will show the headings under which observations are recorded :—

Twice daily (at 9 a.m. and 9 p.m.).														Once daily.							
Barometer.			Temp.		Humidity.‡			Wind.	Cloud.			Weather.		Rain.		Temp.		Extra Observations.			
Attached Thermometer	Uncorrected.	Corrected and reduced to 32° Fahr. at mean sea level.	Corrected. Dry bulb.	Wet bulb.	Dew point.	Elastic Force of Aqueous Vapour	Percentage.	Direction.	Force (0-12).	Amount (0-10).	Form.	Direction of lower Stratus, whence coming.	Article of Observation.	Since last Observation	At 9 a.m.	Estimated duration.	Corrected readings at 9 p.m. Max.	Corrected readings at 9 p.m. Min.	Duration of Bright Sunshine.	Weather Symbols.	Remarks.	Earth Temp. 1 ft.	Earth Temp. 4 ft.

‡ Deduced from readings of dry-bulb and wet-bulb.

An annual volume embodying the results of these observations is published ; that for 1899 has been issued, price 22*s.* 6*d.*

Other stations.

Other Climatological Stations (including those which have already been referred to as contributing weekly returns) equipped and maintained in like manner, furnish periodical returns with less extensive information than that supplied by the normal climatological stations, or information of the same extent but with different hours of observation. Other stations furnish daily readings of sea temperature.

The names of all the stations in the British Isles from which information of any kind is received, and a statement of the nature of the information, are given in the list of stations appended hereto, pp. 57 to 70.

Supply of information and charge

The returns thus collected, whether published in the manner described or in manuscript, may be consulted or copied at the Office between 10 a.m. and 4 p.m., by any person, by permission of the Secretary. Extracts from them are supplied to any person making written application to the Secretary specifying precisely the details of the information required. For these extracts a charge is made to cover the cost of the time required for selecting and making them. The extracts will, if required, be attested by a sworn declaration before a Commissioner for oaths, at a fee of £1 1*s.* (in addition to the charge of 1*s.* 6*d.* made by the Commissioner for oaths). A special fee of £2 2*s.* for each day's attendance is charged if a representative of the Council is required to attend in court with reference to the statements contained in the extracts supplied.

D.—Information from Land Stations outside the British Isles.

Periodical returns are received by the Council from stations in different British Colonies and dependencies, or in foreign countries, as follows :—Bahamas (6 stations), Barbados, Beyrout, British East Africa (1 station), Falkland Islands, Cape Spartel, Cyprus (6 stations), Eastern Soudan, British Guiana, Gibraltar,

The following extract from the complete Form will show the headings under which observations are recorded :—

Twice daily (at 9 a.m. and 9 p.m.).																						Once daily.							
Barometer.			Temp.		Humidity.‡			Wind.		Cloud.				Weather.		Rain.		Temp.			Extra Observations.							
Attached Thermometer	Uncorrected.	Corrected and reduced to 32° Fahr. at mean sea level.	Corrected. Dry bulb.	Corrected. Wet bulb.	Dew point.	Elastic Force of Aqueous Vapour.	Percentage.	Direction.	Force (0-12).	Amount (0-10).	Form.	Direction of lower Stratum, whence coming.	At time of Observation.	Since last Observation.	At 9 a.m.	Estimated duration.	Corrected readings at 9 p.m. Max	Corrected readings at 9 p.m. Min.	Duration of Bright Sunshine.	Weather Symbols.	Remarks.	Earth Temp. 1 ft.	Earth Temp. 4 ft.						

‡ Deduced from readings of dry-bulb and wet-bulb.

An annual volume embodying the results of these observations is published ; that for 1899 has been issued, price 22*s.* 6*d.*

Other Climatological Stations (including those which have already been referred to as contributing weekly returns) equipped and maintained in like manner, furnish periodical returns with less extensive information than that supplied by the normal climatological stations, or information of the same extent but with different hours of observation. Other stations furnish daily readings of sea temperature. Other stations.

The names of all the stations in the British Isles from which information of any kind is received, and a statement of the nature of the information, are given in the list of stations appended hereto, pp. 57 to 70.

The returns thus collected, whether published in the manner described or in manuscript, may be consulted or copied at the Office between 10 a.m. and 4 p.m., by any person, by permission of the Secretary. Extracts from them are supplied to any person making written application to the Secretary specifying precisely the details of the information required. For these extracts a charge is made to cover the cost of the time required for selecting and making them. The extracts will, if required, be attested by a sworn declaration before a Commissioner for oaths, at a fee of £1 1*s.* (in addition to the charge of 1*s.* 6*d.* made by the Commissioner for oaths). A special fee of £2 2*s.* for each day's attendance is charged if a representative of the Council is required to attend in court with reference to the statements contained in the extracts supplied. Supply of informa and cha

D.—Information from Land Stations outside the British Isles.

Periodical returns are received by the Council from stations in different British Colonies and dependencies, or in foreign countries, as follows :—Bahamas (6 stations), Barbados, Beyrout, British East Africa (1 station), Falkland Islands, Cape Spartel, Cyprus (6 stations), Eastern Soudan, British Guiana, Gibraltar,

Gold Coast (7 stations), Madagascar, Malden Island, Mauritius, Panama, St. Helena (3 stations), Sierra Leone, Sombrero, Tenerife, Uganda (9 stations), and West Africa (2 stations).

From Tenerife continuous records of temperature and pressure are received; from the Falkland Islands, and from Georgetown, Demerara, continuous records of sunshine; and from St. Helena continuous records of wind direction and velocity.

A list of the stations is given on pp. 82 to 84.

The information contained in these returns is available upon the same terms as that contained in the returns of British Stations.

E.—The Library.

In return for copies of publications issued by the Council, the Office receives the weather reports and other publications of the official meteorological organisations of the world, and of many private organisations. (*See* Appendix XII., pp. 191 to 195.)

The library has also gradually acquired a large collection of pamphlets and books bearing upon meteorological subjects. These publications are available, free of charge, for the purposes of study and research, upon application at the Office, between the hours of 10 a.m. and 4 p.m.

F.—Marine Observations.

The information as to the meteorology of the sea collected by the Office since 1855, is contained in a large number of logs kept by the officers of the Royal Navy, or of the Mercantile Marine, and forwarded to the Office. The information is regularly discussed and arranged according to the squares of latitude and longitude, embracing 10 degrees in each direction, and again sub-divided according to one degree squares. The information is then compiled statistically, and is represented by a series of publications, of which a list is appended. *See* pp. 88 and 89.

Pilot charts.

A series of Pilot Charts of the North Atlantic and Mediterranean was commenced in April, 1901, and is still being issued. These are supplied by the Superintendents of the Mercantile Marine Offices at the principal British ports to captains and officers of merchant ships, at the price of 6*d.* each. Copies can also be obtained from the Admiralty Agents for the sale of charts, and from the Agents for H.M. Stationery Office at Edinburgh and at Dublin, at the price of 5*s.* for an annual series of 12 charts, or 6*d.* for each chart, in addition to the cost of transmission.

The marine observations are by voluntary observers. Those officers whose names are on the list of observers for the Office receive the Pilot Charts free, and also receive from time to time copies of the other marine publications issued by the Office.

G.—Supply of Instruments to Observers.

In accordance with the terms of the Parliamentary grant the Council do not lend instruments for the use of observers except in the following cases :— Loan of instruments

(1.) To the Ships of the Royal Navy.

(2.) To the Captains of Merchant vessels who undertake to keep a Meteorological log during their voyage and forward it to the Office.

(3.) To the Telegraphic Reporting Stations in the British Isles.

(4.) To the First Order Stations in connexion with the Office.

(5.) To a few Coast Stations in less frequented parts of the world where observations are deemed to be specially desirable.

(6.) To fishing communities in remote districts of the British Isles, which are supplied on certain conditions with suitable mercury barometers.

The instruments supplied to the ships of the Royal Navy include mercury barometers, aneroid barometers, wet and dry bulb thermometers, maximum and minimum thermometers, thermometer screens and hydrometers.

The outfit of instruments lent to captains of merchant ships consists of one mercury barometer ; six thermometers, with a screen ; four hydrometers.

The supply of instruments to His Majesty's ships is conducted through the Admiralty. For this purpose stocks of instruments, in accordance with a fixed scale of establishment, are maintained at H.M. Dockyards at home and abroad. The officers of the Mercantile Marine are supplied either directly from the Office or through the following agents :—

Cardiff—Mr. T. L. Ainsley, Bute Dock.

Dundee—Mr. C. H. Brown, 33, Dock Street.

Glasgow—Messrs. D. McGregor & Co., 37 & 38, Clyde Place.

Greenock—Messrs. D. McGregor & Co., 32, Brymner Street.

Hull—Messrs. Castle & Co., 56, Lister Street.

Liverpool—Messrs. D. McGregor & Co., 39, South Castle Street.

Southampton—Captain D. Forbes, 169, High Street.

Sunderland—Messrs. J. J. Wilson & Son, 18, Hudson Road.

Sets of instruments are kept in working order at the Office in London, and at each agency, for the purpose of instructing observers in the method of observation.

The Council have been in the habit of supplying Barometers for the use of fishing communities, after due inquiry into the requirements and the resources of the localities applying for them, where it is shown that the instrument will be of material Fishery barometers.

service. As a condition for the loan the community is required to provide for the housing of the instrument and to keep and forward to the Office a record of daily readings. A copy of a manual specially compiled for the purpose accompanies the instrument, and is intended to point out in simple language the practical use of the Barometer, with a view to anticipating important changes in the weather in the neighbourhood of the fishing stations. The following is a list of stations that have been supplied with Fishery Barometers :—

LIST of STATIONS supplied with FISHERY BAROMETERS.

Shetland Isles.—Balta Sound, Uya Sound, Burravoe, Nesting, Lerwick, Sandwick, Scalloway, Symbister, Hamnavoe.

Orkney Isles.—Westray, Papa Westray, Burray, Kirkwall.

Scotland, East coast.—Duncansbay, Freswick, Auchengill, Keiss, Ackergill, Staxigoe, Wick, Lybster, Dunbeath, Inver, Portmahomack, Ballintore, Cromarty, Avoch, Nairn, Burghead, Portessie, Port Knockie, Portsoy, Whitehills, Gardenstown, Rosehearty, Pitullie, Fraserburgh, Inverallochy, Pointlaw, Portlethen, Skateraw, Stonehaven, Arbroath, East Haven, Broughty Ferry, St. Andrews, Crail, Cellardyke, St. Monance, Burntisland, Newhaven.

England, East coast.—Berwick, North Shields, South Shields, Sunderland, West Hartlepool, Staithes, Scarborough, Filey, Flamborough, Bridlington Quay, Withernsea, Hull, Lynn (2), Wells, Gorleston, Lowestoft, Orford Haven, Felixstowe, Harwich, Brightlingsea, West Mersea, Maldon, Leigh, Margate, Deal, Kingsdown, Dover.

England, South coast.—Bognor, Ryde, Bembridge, Brixton, Atherfield, Ventnor, Yarmouth (Isle of Wight), Gorey (Jersey), Haslar Hospital, Poole, Weymouth, Portland, Budleigh Salterton, Exmouth, Cawsand, Mevagissey, Gorranhaven, Devoran, Portscatho, Penryn, Durgan, Porthallow, Falmouth, Coverack, Newlyn (2), Mousehole, Penberth Cove, Porth Guarra.

England, South-West coast.—St. Ives, Hayle, Port Isaac, Boscastle, Bideford, Burnham, Highbridge, Weston-super-Mare.

Wales.—Briton Ferry, Swansea, Angle, Milford, Aberystwyth, Nevin, Carnarvon.

England, North-West coast.—Fleetwood, Morecambe, Maryport.

Isle of Man.—Douglas, Port St. Mary, Peel (2).

Scotland, South-West coast.—Port Patrick, Stranraer.

Ireland, East coast.—Cushendall, Belfast, Bangor, Groomsport, Donaghadee, Ardglass, Warren Point, Carlingford, Glenarm, Greenore, Dundalk, Malahide, Howth, Kingstown (2), Bray, Wicklow.

Ireland, South coast.—Dunmore East, Dungarvan, Crosshaven, Kinsale, Union Hall, Castletownshend, Baltimore, Schull (2), Crookhaven, Castletown (Berehaven), Lawrence Cove, Ballydonegan, Ballycrovane.

Ireland, West coast.—Valencia, Dingle, Tralee, Ballyheigue, Tarbert, Kilcredane, Kilronan, Galway, Spiddal, Cleggan, Elly Bay, Ballyglass, Ballycastle (Co. Mayo), Donegal, Tribane, Killybegs, Teelin, Malinmore, Port Noo, Burton Port, Kincashla, Bunbeg, Inniscoo Island.

Ireland, North coast.—Dunfanaghy, Rathmullen, Buncrana, Malin Head, Moville, Greencastle, Port Stewart, Portrush, Port Ballintrae, Ballycastle (Co. Antrim).

Scotland, West coast.—Lamlash, Tarbert (Loch Fyne), Loch Ranza, Campbeltown, Carradale; Portnahaven, Port Wemyss, and Bowmore (Islay); Mallaig; Portree and Armadale (Isle of Skye); Isle of Soay, Kyle of Lochalsh, Plockton, Ardneaskan, Shieldaig, Gruinard, Badachro, Ullapool, East Mey, Gills, Stroma (2).

Hebrides.—Ness, Carloway, Marvaig, Crossbost, Stornoway, Portnaguran, Valtos, Obb, Bernera, Boreray.

Supply of instruments on commission for observers at Land Stations.

The Council are prepared to supply, at a cost of 5 per cent. in addition to their contract prices and the cost of carriage, trustworthy instruments for standard meteorological observations to those who are willing to send copies of their observations to the Office. The risk of breakage in transit must be undertaken by the consignee. The Council will also supply, free of cost, blank registers for the returns of the observations and forms for anemographs and sunshine recorders, and will, if desired, give advice about the site and exposure of the instruments.

For further information as to the supply of instruments, application should be made to the Office.

H.—List of Stations in the British Isles and on the Continent from which Information has been received at the Meteorological Office during the Year ended March 31st, 1904.

The returns from Stations marked "§" are supplied by the Scottish Meteorological Society, and those from Stations marked "𝔐" by the Royal Meteorological Society.

Where necessary, the name of the nearest well-known village or town has been inserted within brackets, following the name of the station.

The nature of the information received from each station is indicated by letters in the fifth column, as follows:—

A. Observatories.—Continuous records or hourly readings of pressure, temperature, wind, sunshine, and rain, with eye observations of the amount, form, and motion of the clouds, and notes on the weather. The indication (A.) in the fifth column denotes that the station is included in Group A. of p. 71, although the information regularly received by the Office is confined to that denoted by the other letters in the column.

B. Additional Anemograph Stations.—Continuous record of the direction and velocity (or force) of the wind.

C. Additional Barograph Stations.—Continuous record of pressure.

C¹. Additional Thermograph Stations.—Continuous record of temperature.

C². Additional Stations with automatic rainfall recorders.—Continuous record of rainfall.

D. Normal Climatological Stations: Second Order Stations of the International Classification.—Monthly sheets, containing regular observations at 9 a.m. and 9 p.m. each day, local time, of pressure, temperature (dry bulb and wet bulb), wind, cloud, and weather, with the daily maximum and minimum of temperature, the daily rainfall, and remarks on the weather. Those marked ⊙ contribute records of sunshine in addition.

E. Normal Climatological Stations: Second Order Stations of the International Classification.—Monthly means and summaries of observations taken at 9 a.m. and 9 p.m. each day as above.

F. Climatological Returns.—Weekly reports of maximum and minimum temperature, and the rainfall for each day, with remarks on the weather. This information is received in the Meteorological Office each week for use in the "Weekly Weather Report," and for the Tables compiled in the Meteorological Office for the Registrar General's Weekly Returns. Returns of sunshine are included in many cases.

G. Auxiliary Climatological Stations: Third Order Stations of the International Classification.—Observations of the same kind as at Stations under D and E, but either—(*a*) less full, (*b*) taken only once daily, (*c*) taken at hours other than 9 a.m. and 9 p.m.

H. Fishery Barometer Stations:—Monthly Charts of daily readings of the Fishery Barometer and attached Thermometer.

R. Additional Rainfall Stations.—Monthly sheets containing the daily observations of the amount of rainfall, with remarks on the weather.

S. Additional Sunshine Stations.—Continuous record of bright sunshine.

T. Telegraphic Stations.—Regular observations at 8 a.m. and 6 p.m. G.M.T. (and from some stations at 2 p.m. in addition), of pressure, temperature, wind and weather, with the daily maximum and minimum of temperature, the daily rainfall, and, where possible, the sea disturbance at 8 a.m. each day, and the daily amount of bright sunshine. This information is received each day by telegraph, for use in the "Daily Weather Report" and in the "Weekly Weather Report."

W. Sea Temperature Stations.—Daily observations of the temperature of the air and of the sea water.

List of Stations arranged according to Districts and Counties.

The Districts are numbered as follows :—

0. Scotland, N.
1. Scotland, E.
2. England, N.E. (including part of Scotland).
3. England, E.
4. Midland Counties.
5. England, S., and English Channel.
6. Scotland, W. (including part of Cumberland), and the Isle of Man.
7. England, N.W., and North Wales.
8. South Wales, and England, S.W.
9. Ireland, N.
10. Ireland, S.

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection
0. Scotland, North.						
Caithness :—	Wick	58° 27′	3° 6′ W.	80	T.	03
	„	58 27	3 6 W.	—	W.	—
Cromarty :—	Cromarty	57 41	4 0 W.	—	W.	—
	Strathpeffer Spa...	57 37	4 28 W.	253	D.F.S.	03
Inverness :—	§Ben Nevis ...	56 48	5 0 W.	4,405	A.E.	03
	§Fort Augustus ...	57 8	4 40 W.	68	E.F.S.	03
	Fort William ...	56 49	5 7 W.	31	A.F.	03
Orkney :—	Deerness	58 56	2 45 W.	160	B.D.S.	03
	Kirkwall	58 59	2 57 W.	—	W.	—
Perth :— (*See* also District 1.)	No station.					
Ross :—	Ardross Castle ...	57 45	4 21 W.	449	R.	—
	§Glenearron ...	57 30	5 14 W.	489	E.F.	03
	Kinlochewe ...	57 36	5 24 W.	—	R.	—
	Stornoway ...	58 11	6 22 W.	29	C.S.T.	03
	„ ...	58 11	6 22 W.	—	H.W.	—
Shetlands :—	Lerwick	60 9	1 8 W.	—	H.W.	—
	Sumburgh Head...	59 51	1 17 W.	126	C.T.	03
	Symbister ...	60 14	1 25 W.	—	H.	—
Sutherland :—	§Dunrobin Castle..	57 59	3 56 W.	12	D.	03
	§Lairg	58 1	4 22 W.	335	E.F.	03
1. Scotland, East.						
Aberdeen :—	Aberdeen Observatory.	57 10	2 6 W.	46	A. T.	03
	§Braemar	57 0	3 24 W.	1,111	D.F.	03
	Pennan Bay ...	57 40	2 16 W.	—	W.	—

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
1. Scotland, East—*continued.*						
Banff :—	*Gordon Castle.	57° 37′	3° 5′ W.	101	E.	03
Berwick :—	Burnmouth ...	55 51	2 4 W.	—	W.	—
	*Marchmont ...	55 44	2 25 W.	498	E.F.S.	02
Clackmannan :—	No station.					
Edinburgh :—	Edinburgh ...	55 57	3 12 W.	253	S.	—
	Leith	55 58	3 10 W.	19	T.	03
Elgin :—	No station.					
Fife :—	Burntisland ...	56 4	3 14 W.	—	W.	—
Forfar :—	*Dundee ...	56 23	2 56 W.	160	D.	03
	*Lednathie ...	56 45	3 7 W.	719	E.	03
	Uzon	56 40	2 28 W.	—	W.	—
Haddington :—	No station.					
Kincardine :—	Cove Bay ...	57 9	2 5 W.	—	W.	—
Kinross :—	No station.					
Linlithgow :—	No station.					
Nairn :—	Nairn	57 36	3 52 W.	82	T.	03
Peebles :—	No station.					
Perth :—	Forgandenny...	56 21	3 29 W.	175	C.	—
	*Ochtertyre ...	56 23	3 53 W.	329	E.F.	02
Selkirk :—	No station.					
Stirling :—	No station.					
2. England, North East (including part of Scotland).						
Durham :—	Durham ...	54 46	1 35 W.	336	D.F.S.	03
	Seaham Harbour.	54 50	1 19 W.	148	D.	02
	Sunderland ...	54 54	1 23 W.	—	W.	—
Lincolnshire :—	Caistor ...	53 30	0 20 W.	99?	R.	01
	Fulbeck ...	53 3	0 37 W.	185	C.D.F.	03
	Lincoln ...	53 14	0 33 W.	—	D.	03
	Mareham-le-Fen.	53 8	0 5 W.	33	R.	01
	Rauceby Hall..	53 0	0 29 W.	125	G.S.	03
	Skegness ...	53 9	0 21 E.	12	G.S.	03
	Tealby ...	53 24	0 16 W.	251	D.	03
	Temple Bruer..	53 4	0 30 W.	—	R.	03

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
2. England, North East (including part of Scotland)—*cont.*					
Northumberland:— Alnwick Castle ...	55 25	1 43 W.	210	B.F.	03
Chertners	55 16	2 0 W.	1,000	R.	—
Cockle Park, Morpeth	55 13	1 41 W.	324	D.S.	03
Dam Site	55 14	1 54 W.	620	R.	—
Fallowlees	55 15	1 57 W.	850	R.	—
Newcastle-on-Tyne ...	54 59	1 36 W.	152	G.S.	03
North Shields ...	55 0	1 27 W.	99	T.	03
N. Shields High Light-house.	55 0	1 27 W.	—	B.	03
Red Path	55 13	2 0 W.	850	R.	—
Tod Crag	55 15	2 1 W.	1,000	R.	—
Roxburgh:— §Wolfelee	55 23	2 39 W.	587	E.	02
Yorkshire:— Ampleforth	54 12	1 5 W.	349	D.	03
Hull	53 45	0 16 W.	2	D.F.S.	03
Northallerton ...	54 20	1 26 W.	129	R.	95
Rounton	54 24	1 18 W.	242	E.	02
⚓Scarborough	54 18	0 24 W.	62	D.F.S.	03
,, ...	54 17	0 23 W.	—	W.	02
Spurn Head	53 34	0 7 E.	26	T.	03
Spurn Lightship ...	53 31	0 13 E.	—	W.	—
Whitby, The Museum	54 29	0 37 W.	88	D.S.	—
York, Deighton Grove	53 54	1 3 W.	38	R.	—
,, The Museum ...	53 57	1 5 W.	56	D.	03
,, Bootham ...	53 57	1 5 W.	105	S.	03
,, The Mount ...	—	—	—	S.	—
(*See* also Districts 4 and 7).					
3. England, East.					
Bedford:— No station. (*See* also District 4.)					
Cambridge:—Cambridge	52 13	0 6 E.	83	C².D.F.S.	03
Essex:— Clacton-on-Sea ...	51 48	1 9 E.	—	D.S.T.	03
Dunmow	51 53	0 23 E.	297	D.S.	02
Shoeburyness ...	51 32	0 47 E.	—	B.F.	03
West Mersea	51 47	0 54 E.	—	H.	—
Hertford:— Buntingford	51 56	0 0 W.	314	G.S.	—
⚓Bennington	51 54	0 5 W.	407	E.	03
Rothamsted	51 48	0 22 W.	368	F.G.S.	02
(*See* also District 4.)					
Huntingdon:— No station.					
Middlesex:—Barnet ... ... (*See* also Districts 4 and 5.)	51 39	0 10 W.	212	G.	03

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
2. England, North East (including part of Scotland)—*cont.*					
Northumberland :— Alnwick Castle ...	55 25	1 43 W.	210	B.F.	03
Chertners	55 16	2 0 W.	1,000	R.	—
Cockle Park, Morpeth	55 13	1 41 W.	324	D.S.	03
Dam Site	55 14	1 54 W.	620	R.	—
Fallowlees	55 15	1 57 W.	850	R.	—
Newcastle-on-Tyne ...	54 59	1 36 W.	152	G.S.	03
North Shields ...	55 0	1 27 W.	99	T.	03
N. Shields High Lighthouse.	55 0	1 27 W.	—	B.	03
Red Path	55 13	2 0 W.	850	R.	—
Tod Crag	55 15	2 1 W.	1,000	R.	—
Roxburgh :—Wolfelee	55 23	2 39 W.	587	E.	02
Yorkshire :—Ampleforth	54 12	1 5 W.	349	D.	03
Hull	53 45	0 16 W.	2	D.F.S.	03
Northallerton ...	54 20	1 26 W.	129	R.	95
Rounton	54 24	1 18 W.	242	E.	02
Scarborough	54 18	0 24 W.	62	D.F.S.	03
"	54 17	0 23 W.	—	W.	02
Spurn Head	53 34	0 7 E.	26	T.	03
Spurn Lightship ...	53 31	0 13 E.	—	W.	—
Whitby, The Museum	54 29	0 37 W.	88	D.S.	—
York, Deighton Grove	53 54	1 3 W.	38	R.	—
" The Museum ...	53 57	1 5 W.	56	D.	03
" Bootham ...	53 57	1 5 W.	105	S.	03
" The Mount ...	—	—	—	S.	—
(*See* also Districts 4 and 7).					
3. England, East.					
Bedford :— No station. (*See* also District 4.)					
Cambridge :—Cambridge	52 13	0 6 E.	83	C².D.F.S.	03
Essex :— Clacton-on-Sea ...	51 48	1 9 E.	—	D.S.T.	03
Dunmow	51 53	0 23 E.	297	D.S.	02
Shoeburyness ...	51 32	0 47 E.	—	B.F.	03
West Mersea	51 47	0 54 E.	—	H.	—
Hertford :— Buntingford	51 56	0 0 W.	314	G.S.	—
Bennington	51 54	0 5 W.	407	E.	03
Rothamsted	51 48	0 22 W.	368	F.G.S.	02
(*See* also District 4.)					
Huntingdon :— No station.					
Middlesex :—Barnet ... ... (*See* also Districts 4 and 5.)	51 39	0 10 W.	212	G.	03

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
3. England, East—*continued.*						
Norfolk:—	Cromer	52° 56′	1° 17′ E.	139	D.S.	02
	East Dereham ...	52 41	0 57 E.	158	R.	—
	Geldeston ...	52 28	1 31 E.	37	D.F.S.	99
	⁂Hillington ...	52 48	0 33 E.	88	D.F.S.	02
	Norwich (Brundall).	52 38	1 23 E.	—	F.	03
	Thetford ...	52 25	0 45 E.	169	R.	—
	Yarmouth ...	52 37	1 43 E.	10	B.C.T.	03
Suffolk:—	Brandon ...	52 27	0 37 E.	48	R.	—
	Felixstowe ...	51 58	1 22 E.	10	F.S.	03
	Gorleston ...	52 35	1 43 E.	—	H.	—
	Hollesley Bay ...	52 3	1 27 E.	38	D.S.	02
	⁂Lowestoft ...	52 29	1 44 E.	84	E.S.	02
	,, ...	52 29	1 44 E.	—	H.	—
4. Midland Counties.						
Bedford:—	Aspley Guise ...	52 1	0 38 W.	410	S.	—
	Ridgmont ...	52 1	0 36 W.	291	D.	02
(*See* also District 3.)						
Buckingham:—	No station.					
Derby:—	⁂Buxton	53 14	1 54 W.	987	E.	02
	Chatsworth ...	53 14	1 37 W.	—	C.C'.G.	02
Gloucester:—	⁂Cheltenham ...	51 54	2 3 W.	184	E.	03
	Cirencester ...	51 43	1 57 W.	446	F.S.	03
	Dursley	51 41	2 21 W.	250	R.	96
	Hidcote	52 5	1 46 W.	524	R.	97
(*See* also District 8.)						
Hereford:—	⁂Hereford ...	52 5	2 45 W.	291	D.F.	01
	Wessington Court	52 1	2 35 W.	439	D.	03
Hertford:—	⁂Berkhamsted ...	51 46	0 34 W.	400	E.	03
(*See* also District 3.)						
Leicester:—	Belvoir Castle ...	52 54	0 47 W.	259	D.	02
	Syston	52 43	1 5 W.	178	R.	96
	Thurcaston ...	52 42	1 10 W.	253	S.	96
Middlesex:—	Harefield ...	51 36	0 29 W.	247	R.	—
(*See* also Districts 3 and 5.)						
Northampton:—	Colly Weston ...	52 37	0 31 W.	280	F.	03
	Great Billing ...	52 16	0 50 W.	273	R.	—
	Oundle (The School).	52 29	0 28 W.	144	G.	03
	,, ...	52 29	0 28 W.	—	R.	—
Montgomery:—	⁂Churchstoke ...	52 31	3 5 W.	538	D.F.S.	01
	Llandinam ...	52 29	3 26 W.	500	R.	—

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
4. Midland Counties—*continued.*					
Nottingham :—Bawtry, Hesley Hall	53 27	1 4 W.	65	F.	02
Nottingham, The Castle.	52 57	1 9 W.	192	F.G.	03
" The Pumping Station.	52 56	1 9 W.	82	T.S.	03
Worksop	53 22	1 5 W.	56	S.	96
Oxford :— Oxford	51 46	1 16 W.	208	(A.)T.	03
Rutland :— Ridlington... ...	52 37	0 45 W.	522	R.	—
Shropshire :— Shrewsbury ...	52 43	2 45 W.	191	D.	—
Stokesay	52 26	2 52 W.	370	D.	01
Stafford :— ⚓Cheadle ...	52 58	1 57 W.	646	E.F.	02
Hoar Cross... ...	52 48	1 49 W.	396	R.	—
Warwick :— Birmingham, Edgbaston.	52 28	1 56 W.	534	D.F.S.	02
Coventry	52 25	1 30 W.	269	G.S.	02
Rugby School ...	52 22	1 15 W.	379	G.	98
Worcester :— Rochford	52 18	2 36 W.	316	C.R.	01
Yorkshire :— Ackworth	53 39	1 20 W.	—	D.	03
Bradford	53 48	1 45 W.	—	F.S.	03
Garforth	53 48	1 22 W.	195	D.S.	03
Harrogate	54 0	1 33 W.	480	F.S.	02
Huddersfield ..	53 39	1 47 W.	—	F.	02
Leeds	53 48	1 33 W.	132	F.G.	02
Sheffield	53 23	1 29 W.	429	D.S.	02
.. Attercliffe	53 24	1 25 W.	—	S.	02
⚓Wakefield	53 41	1 30 W.	96	F.	02
(*See* also Districts 2 and 7.)					
5. England, South, and English Channel.					
Berkshire :— Maidenhead ...	51 30	0 43 W.	99	G.	99
Reading	51 26	0 57 W.	261	G.	—
Wokingham, Pinewood.	51 23	0 48 W.	219	C.G.	03
Dorset :— Parkstone	50 43	1 56 W.	197	D.	00
Portland Bill ...	50 32	2 27 W.	177	T.	03
⚓Shaftesbury ...	51 1	2 12 W.	722	F.	03
Hampshire :— Bournemouth ...	50 43	1 53 W.	—	S.	02
Haslar	50 47	1 7 W.	—	H.	—
Osborne	50 46	1 15 W.	171	G.	—
Portsmouth ...	50 48	1 6 W.	11	F.G.S.	03
Southampton ...	50 55	1 24 W.	78	D.F.S.	02
⚓Swarraton	51 8	1 11 W.	310	F.	03
Totland Bay ...	50 41	1 33 W.	84	G.	00
Ventnor	50 36	1 13 W.	80	G.S.	97
Yarmouth, I. of Wight.	50 42	1 29 W.	—	H.	—

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
5. England, South, and English Channel—*continued.*					
Kent:— Broadstairs	51° 21′	1° 26′ E.	—	S.	—
Canterbury	51 16	1 5 E.	39	D.	03
Chatham	51 23	0 32 E.	136	G.	03
Dover	51 7	1 18 E.	198	R.	96
Dungeness	50 55	0 58 E.	26	T.	03
Greenwich	51 28	0 0 E.	155	(A.)E.F.	—
Kearsney Abbey	51 8	1 17 E.	100?	R.	96
„ Chilton Farm	51 8	1 17 E.	135	R.	—
Littlestone-on-Sea	50 59	0 59 E.	—	G.S.	03
℔Margate	51 24	1 24 E.	83	S.	03
Plumstead	51 29	0 6 E.	85?	S.	01
Ramsgate	51 20	1 25 E.	—	S.	03
Sandgate	51 4	1 9 E.	56	R.	99
Sandwich	51 17	1 20 E.	6	R.	03
Tunbridge Wells	51 8	0 16 E.	419	G.S.	—
Middlesex:—					
Isleworth	51 29	0 20 W.	—	R.	—
Lalebam	51 25	0 29 W.	—	R.	—
London, Camden Square	51 33	0 8 W.	110	D.	—
„ Chelsea	51 29	0 10 W.	—	R.	—
„ City	51 31	0 5 W.	80	S.	—
„ Hampstead	51 34	0 10 W.	—	C.	—
„ Pall Mall	51 30	0 7 W.	—	C.	—
„ Westminster	51 30	0 8 W.	76	C.C.G.	—
„ „ Training College.	51 30	0 8 W.	—	S	—
Surrey:— Bramley	51 11	0 33 W.	148	D.	03
Caterham	51 17	0 5 W.	600?	G.	03
Kew	51 28	0 19 W.	18	A.	03
London, Brixton	51 27	0 8 W.	77	T.	02
„ Camberwell Green	51 28	0 5 W.	—	C².	03
„ Camberwell Cemetery.	51 26	0 4 W.	—	C².	03
„ Leyton Square, Camberwell.	51 29	0 4 W.	—	C².	03
„ Peckham Road	51 28	0 5 W.	—	C².	03
℔Norwood	51 26	0 6 W.	220	E.	03
Wisley, Royal Hort. Soc.	51 17	0 26 W.	150	G.S.	03
Sussex:— Bognor	50 47	0 40 W.	20	G.S.	—
Brighton	50 49	0 8 W.	65	F.S.	03
Cuckfield	51 1	0 9 W.	389	R.	97
Eastbourne	50 46	0 17 E.	39	D.S.	03
„	50 44	0 19 E.	12	G.	—
Forest Row	51 7	0 2 E.	619	R.	—
Hastings	50 51	0 34 E.	149?	R.	99
„ Waterworks	50 51	0 34 E.	—	S.	03
St. Leonards	50 51	0 33 E.	178	D.F.S.	03
„ West Marina	50 51	0 32 E.	—	G.	03
Watergate Park	50 56	0 55 W.	236	S.	99
Westbourne	50 52	0 55 W.	30	S.	99
Worthing	50 49	0 22 W.	38	S.	99

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
5. England, South, and English Channel—*continued.*					
Kent:—					
Broadstairs	51° 21′	1° 26′ E.	—	S.	—
Canterbury	51 16	1 5 E.	39	D.	03
Chatham	51 23	0 32 E.	136	G.	03
Dover	51 7	1 18 E.	198	R.	96
Dungeness	50 55	0 58 E.	26	T.	03
Greenwich	51 28	0 0 E.	155	(A.)E.F.	—
Kearsney Abbey ...	51 8	1 17 E.	100?	R.	96
,, Chilton Farm	51 8	1 17 E.	135	R.	—
Littlestone-on-Sea ...	50 59	0 59 E.	—	G.S.	03
ℳMargate	51 24	1 24 E.	83	S.	03
Plumstead	51 29	0 6 E.	85?	S.	01
Ramsgate	51 20	1 25 E.	—	S.	03
Sandgate	51 4	1 9 E.	56	R.	99
Sandwich	51 17	1 20 E.	6	R.	03
Tunbridge Wells .	51 8	0 16 E.	419	G.S.	—
Middlesex:—					
Isleworth	51 29	0 20 W.	—	R.	—
Laleham...	51 25	0 29 W.	—	R.	—
London, Camden Square	51 33	0 8 W.	110	D.	—
,, Chelsea ...	51 29	0 10 W.	—	R.	—
,, City	51 31	0 5 W.	80	S.	—
,, Hampstead ...	51 34	0 10 W.	—	C.	—
,, Pall Mall ...	51 30	0 7 W.	—	C.	—
,, Westminster ...	51 30	0 8 W.	76	C.C.¹G.	—
,, ,, Training College.	51 30	0 8 W.	—	S	—
Surrey:—					
Bramley...	51 11	0 33 W.	148	D.	03
Caterham	51 17	0 5 W.	609?	G.	03
Kew	51 28	0 19 W.	18	A.	03
London, Brixton ...	51 27	0 8 W.	77	T.	02
,, Camberwell Green	51 28	0 5 W.	—	C².	03
,, Camberwell Cemetery.	51 26	0 4 W.	—	C².	03
,, Leyton Square, Camberwell.	51 29	0 4 W.	—	C².	03
,, Peckham Road...	51 28	0 5 W.	—	C².	03
ℳNorwood	51 26	0 6 W.	220	E.	03
Wisley, Royal Hort. Soc.	51 17	0 26 W.	150	G.S.	03
Sussex:—					
Bognor	50 47	0 40 W.	20	G.S.	—
Brighton	50 49	0 8 W.	65	F.S.	03
Cuckfield	51 1	0 9 W.	389	R.	97
Eastbourne	50 46	0 17 E.	39	D.S.	03
,, ...	50 44	0 19 E.	12	G.	—
Forest Row	51 7	0 2 E.	619	R.	—
Hastings	50 51	0 34 E.	149?	R.	00
,, Waterworks ...	50 51	0 34 E.	—	S.	03
St. Leonards	50 51	0 33 E.	178	D.F.S.	03
,, West Marina	50 51	0 32 E.	—	G.	03
Watergate Park ...	50 56	0 55 W.	236	S.	99
Westbourne	50 52	0 55 W.	30	S.	99
Worthing	50 49	0 22 W.	38	S.	99

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
5. England, South, and English Channel—*continued.*					
Wilts:— Marlborough ...	51° 25′	1° 44′ W.	424	S.	—
Salisbury	51 4	1 51 W.	186	D.	02
Channel Islands:—					
Guernsey, St. Peter Port ...	49 27	2 32 W.	180	S	00
,, ,, Fort Road	49 27	2 31 W.	297	D.S.	—
Jersey, St. Aubin's	49 12	2 11 W.	25	T.	02
,, St. Helier's	49 11	2 6 W.	—	S.	02
6. Scotland, West (including Part of Cumberland), and Isle of Man.					
Argyleshire:—Crinan Harbour ...	56 6	5 33 W.	20	C.G.	—
Gruline, Isle of Mull	—	—	100	R.	—
Laudale	56 41	5 41 W.	14	D.F.	01
§Poltalloch	56 8	5 30 W.	132	E	02
Ayr:— Ballantrae	55 6	5 0 W.	—	W.	—
Bute:— Lamlash	55 32	5 8 W.	—	H.W.	—
§Rothesay	55 50	5 4 W.	115	E.	02
Cumberland:—					
Aspatria	54 46	3 21 W.	250	D.S.	01
(*See* also District 7.)					
Dumbarton:—No station.					
Dumfries:— No station.					
Kirkcudbright:—					
§Cally...	54 52	4 12 W.	120	E.F	02
§Cargen	55 2	3 37 W.	72	E.	02
Lanark:— Glasgow	55 53	4 18 W.	180	A.D F	03
Peebles:— No station.					
Renfrew:— No station.					
Stirling:— No station.					
Wigton:— Stranraer	54 54	5 2 W.	—	H.	—
Isle of Man:—Cronkbourne ...	54 10	4 29 W.	137	D.F.S.	01
7. England, North West, and North Wales.					
Cheshire:— Bidston	53 24	3 4 W.	188	(A.) D.T.	01
Chester (Haward-en Bridge).	53 12	3 1 W.	22	F.	03
Hoylake	53 23	3 12 W.	30?	S.	02

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of *Information received.* *See* p. 57.	Year of last Inspection.
7. England, North West, and North Wales—*continued.*					
Cumberland:—					
Carlisle	54° 53′	2° 57′ W.	111	D.	03
Newton Rigg ...	54 40	2 49 W.	559	D.S.	03
(*See* also District 6.)					
Lancashire:—Blackpool	53 48	3 3 W.	62	C.F.S.	03
Bolton	53 35	2 27 W.	389	G.	—
Darwen	53 41	2 28 W.	710	G.S	02
Fleetwood	53 56	3 1 W.	—	B.	03
Rossall	53 55	3 2 W.	—	C.	—
Lytham	53 44	2 58 W.	21	G.S	02
Manchester (Oldham Road).	53 29	2 13 W.	190	D.S.	03
,, (Whitworth Park).	53 28	2 14 W.	125	D.S.	03
,, (Prestwich)	53 32	2 17 W.	320	D.F.S.	02
Preston	53 46	2 42 W.	148	F.	02
Southport	53 39	2 59 W.	37	(A.) G.S.	03
Stonyhurst	53 51	2 28 W.	375	A.D.F.	03
Westmorland:—					
Kirkby Lonsdale (Norwood).	54 12	2 36 W.	304	R.	—
Yorkshire:— Aysgarth	54 18	1 58 W.	646	D.	99
Halifax (Bermerside).	53 43	1 52 W.	500	G.	03
,, (Pub. Lib.).	53 43	1 52 W.	624	G.	
(*See* also Districts 2 and 4.)					
Anglesey:— Holyhead (Harbour Office).	53 18	4 39 W.	57	B.W.	03
,, (Sailor's Home).	53 18	4 39 W.	48	T.	03
Carnarvon:—					
Llandudno	53 21	3 50 W.	72	E.F.S.	01
Penrhyn Quarry ...	53 10	4 6 W.	—	R.	01
Denbigh:— Bettws-y-Coed ...	53 7	3 53 W.	101	D.S.	—
Flint:— Penbedw	53 12	3 11 W.	650	C.	—
Rhyl	53 19	3 29 W.	30	S.	03
Merioneth:— Aberdovey	52 33	4 4 W.	—	S.	03
Llanbedr Hall ...	53 8	3 17 W.	—	R.	—
Montgomery:—					
No station.					
(*See* also District 4.)					

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
7. England, North West, and North Wales—*continued.*					
Cumberland:—					
Carlisle	54 53	2 57 W.	111	D.	03
Newton Rigg ...	54 40	2 49 W.	559	D.S.	03
(*See* also District 6.)					
Lancashire:—Blackpool	53 48	3 3 W.	62	C.F.S.	03
Bolton	53 35	2 27 W.	389	G.	—
Darwen	53 41	2 28 W.	710	G.S	02
Fleetwood	53 56	3 1 W.	—	B.	03
Rossall	53 55	3 2 W.	—	C.	—
Lytham	53 44	2 58 W.	21	G.S	02
Manchester (Oldham Road).	53 29	2 13 W.	190	D.S.	03
„ (Whitworth Park).	53 28	2 14 W.	125	D.S.	03
„ (Prestwich)	53 32	2 17 W.	320	D.F.S.	02
Preston	53 46	2 42 W.	148	F.	02
Southport	53 39	2 59 W.	37	(A.)G.S.	03
Stonyhurst	53 51	2 28 W.	375	A.D.F.	03
Westmorland:—					
Kirkby Lonsdale (Norwood).	54 12	2 36 W.	304	R.	—
Yorkshire:— Aysgarth	54 18	1 58 W.	646	D.	99
Halifax (Bermerside).	53 43	1 52 W.	500	G.	03
„ (Pub. Lib.).	53 43	1 52 W.	624	G.	
(*See* also Districts 2 and 4.)					
Anglesey:— Holyhead (Harbour Office).	53 18	4 39 W.	57	B.W.	03
„ (Sailor's Home).	53 18	4 39 W.	48	T.	03
Carnarvon:—					
Llandudno	53 21	3 50 W.	72	E.F.S.	01
Penrhyn Quarry ...	53 10	4 6 W.	—	R.	01
Denbigh:— Bettws-y-Coed ...	53 7	3 53 W.	101	D.S.	—
Flint:— Penbedw	53 12	3 11 W.	650	C.	—
Rhyl	53 19	3 29 W.	30	S.	03
Merioneth:— Aberdovey	52 33	4 4 W.	—	S.	03
Llanbedr Hall ...	53 8	3 17 W.	—	R.	—
Montgomery:— No station. (*See* also District 4.)					

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
8. South Wales and England, South West.					
Brecknock:—Llangammarch Wells	52° 7′	3° 34′ W.	550	G.S.	03
Cardigan:— Aberystwyth ...	52 25	4 4 W.	—	G.	03
Carmarthen:— No station.					
Glamorgan:—Port Talbot ...	51 34	3 45 W.	179	R.S.	03
Pembroke:— Haverfordwest ...	51 48	4 58 W.	—	S.	01
St. Ann's Head ...	51 41	5 30 W.	150	S.T.W.	03
Tenby	51 41	4 42 W.	79	S.	03
Radnor:— Disserth	52 13	3 24 W.	711	R.	00
Rhayader, Nantgwillt, Old	?52 18	?3 29 W.	—	R.	—
„ „ New	—	—	—	R.	—
Abergwngy	—	—	—	R.	—
Bwlchyrhendre ...	—	—	—	R.	—
Claerwen	—	—	—	R.	—
Nant-y-car	—	—	—	R.	—
Pryddellau	—	—	—	R.	—
Tremynydd	—	—	—	R.	—
Cornwall:— Falmouth	50 9	5 4 W.	167	A.F.	03
„ (Pendennis Castle).	50 8	5 3 W.	—	B.	03
Newquay	50 25	5 4 W.	250?	S.	02
„	50 25	5 5 W.	—	W.	—
Scilly	49 56	6 18 W.	65	B.C.S. T.W.	03
Truro	50 17	5 4 W.	83	G.	02
Devonshire:—Arlington Court ...	51 8	3 58 W.	613	F.	01
Barnstaple	51 5	4 4 W.	24	G.	02
M'Cullompton	50 51	3 23 W.	202	F.S.	01
Plymouth	50 22	4 8 W.	116	D.F.S.	02
M'Rousdon	50 43	3 0 W.	515	E.	03
Salcombe	50 14	3 46 W.	—	S.	—
„	50 14	3 46 W.	—	W.	—
Torquay	50 28	3 31 W.	286	S.	00
M'Whitchurch	50 32	4 6 W.	593	E.	01
M'Woolacomb	51 10	4 12 W.	59	D.	01
Gloucester:— Bristol, Over Court Park.	51 32	2 35 W.	147	F.	02
„ Clifton College	51 27	2 37 W.	230	F.	03

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
8. South Wales and England, South West—*continued.*						
Gloucester—*continued.*						
Forest of Dean :—						
	Blakeney Hill ...	51° 46′	2° 30′ W.	700	R.	—
	Braceland ...	51 49	2 38 W.	500	R.	—
	Edgehills Lodge...	51 50	2 29 W.	700	R.	—
	Ruardean Hill ...	51 51	2 33 W.	900	R.	—
	Whitemead Park ..	51 46	2 34 W.	200	R.	—
	Worcester Lodge ..	—	—	550	R.	—
(*See* also District 4.)						
Monmouth :—	Abersychan ...	51 44	3 5 W.	688	R.	—
	Newchurch ...	51 41	2 48 W.	—	R.	—
	Newport	51 35	3 0 W.	—	G.R.	00
	Pant-y-reos ...	51 38	3 4 W.	449	R.	00
	Ynis-y-bro ...	51 38	3 3 W.	115	R.	00
Somerset :—	Bath	51 23	2 21 W.	66	G.T.S.	03
	Simonsbath ...	51 8	3 45 W.	1,099	R.	—
	Clevedon	51 26	2 52 W.	—	H.	—
9. Ireland, North.						
Antrim :—	Belfast	54 35	5 56 W.	61	D.	03
	Glenarm	54 58	5 56 W.	44	R.	—
	,, ...	54 55	5 56 W.	—	H.	03
	Portrush	55 13	6 40 W.	—	W.	03
Armagh :—	Armagh	54 21	6 39 W.	196	(A.)D.F.	03
Cavan :—	No station.					
Donegal :—	Dunfanaghy ...	55 11	7 58 W.	39	G.	—
	Malin Head ...	55 23	7 24 W.	230	C.T.	03
	Sheephaven ...	55 11	7 58 W.	—	W.	—
	Teelin	54 38	8 39 W.	—	W.	—
Down :—	Donaghadee ...	54 38	5 32 W.	40	T.	03
Fermanagh :—	No station.					
Galway :—	Cleggan	53 33	10 8 W.	—	W.	—
	Recess	53 28	9 44 W.	90	R.	—
	Spiddal	53 15	9 17 W.	—	H.	90
Leitrim :—	Carrigallen ...	53 58	7 38 W.	350?	R.	—
Londonderry :—	No station.					
Longford :—	No station.					
Louth :—	No station.					
Mayo :—	Ballyglass ...	54 17	9 52 W.	—	W.	—
	Blacksod Point ...	54 6	10 4 W.	37	T.W.	02
	Mallaranny ...	53 55	9 40 W.	119	R.	02

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See* p. 57.	Year of last Inspection.
9. Ireland, North—*continued.*						
Meath :—	No station.					
Monaghan :—	No station.					
Sligo :—	Markree Castle ...	54° 11′	8° 27′ W.	122	D.F.S.	03
Tyrone :—	Edenfel, Omagh ...	54 36	7 19 W.	300	F.	03
Westmeath :—	No station.					
10. Ireland, South.						
Carlow :—	No station.					
Clare :—	Ennis	52 51	8 59 W.	38	R.	—
	Ennistymon ...	52 57	9 17 W.	131	R.	—
	Hurdlestown ...	52 48	8 38 W.	157	R.	—
	Kilcredane ...	52 35	9 47 W.	—	W.	—
	Lahinch	52 55	9 21 W.	52	R.	99
	Liscannor	52 56	9 23 W.	—	W.	—
	Mount Callan ...	52 53	9 16 W.	479	R.	98
	Newmarket-on-Fergus.	52 46	8 53 W.	—	R.	98
	Seafield	52 48	9 30 W.	—	W.	—
Cork :—	Ballinacurra ...	51 52	8 10 W.	—	S.	—
	Baltimore	51 28	9 22 W.	—	H.	90
	Crookhaven ...	51 28	9 43 W.	—	H.	90
	Crosshaven ...	51 48	8 18 W.	—	H.	01
	Doneraile	52 13	8 34 W.	266	R.	—
	Lawrence Cove ...	51 17	9 49 W.	—	H.	—
	Roche's Point ...	51 47	8 15 W.	42	T.	02
	Schull	51 32	9 32 W.	—	H.	90
	Union Hall... ...	51 33	9 8 W.	—	H.	90
Dublin :—	Dublin City ...	53 20	6 15 W.	47	D.F.	03
	„ Phœnix Park ...	53 22	6 21 W.	155	B.D.S.	03
	„ Botanic Gardens	53 23	6 16 W.	67	D.	02
	„ Trinity College	53 21	6 16 W.	—	D.S.	—
	Dundrum	53 16	6 14 W.	—	G.	—
	Kingstown... ...	53 17	6 8 W.	—	G.S.	03
	„ Harbour ...	53 17	6 8 W.	—	B.	03
	„ Sandy Cove	53 17	6 8 W.	—	W.	—
Galway :—	Arran	53 6	9 40 W.	—	H.W.	—
Kerry :—	Killarney	52 4	9 30 W.	174	F.	03
	Minard	52 7	10 8 W.	—	W.	—
	Valencia	51 56	10 15 W.	30	A.C.T.	03
	„ Glanleam ...	51 56	10 20 W.	—	R.	01
	„ Knightstown	51 55	10 20 W.	—	H.	01
Kildare :—	No station.					

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES—*continued.*

County and Station.		Lat.	Long.	Height in feet above M.S.L.	Nature of Information received. *See p. 57.*	Year of last Inspection.
10. Ireland, South—*continued.*						
Kilkenny :—	Kilkenny	52° 39′	7° 14′ W.	212	C.F.	02
King's Co. :—	Birr Castle... ...	53 6	7 55 W.	175	D.S.T.	03
Limerick :—	Corbally	52 39	8 36 W.	59	R.	02
	Foynes	52 37	9 7 W.	108	F.	02
	Roxborough ...	52 35	8 36 W.	111	R.	02
Queen's Co. :—	No station.					
Roscommon :—	No station.					
Tipperary :—	No station.					
Waterford :—	Waterford	52 16	7 7 W.	—	C.	02
	„	52 16	7 7 W.	—	F.	—
Wexford :—	No station.					
Wicklow :—	Bray	53 12	6 6 W.	—	H.	—
	Newcastle	53 5	6 6 W.	256	D.	02
	Wicklow	52 58	6 2 W.	—	H.	—

List of Observers at the Stations of the several Orders.

Name of Station.	Observer.
Group A.—Observatories.	
Aberdeen	Professor C. Niven, F.R.S., for the Meteorological Council.
[1]Armagh	J. L. E. Dreyer, Ph.D., for the Meteorological Council.
[2]Ben Nevis	A. Rankin, for Directors of Ben Nevis Observatory.
[2]Bidston	W. E. Plummer, F.R.A.S., for the Mersey Docks and Harbour Board.
Falmouth	E. Kitto, for the Meteorological Council.
[3]Fort William	A. Rankin, for the Meteorological Council.
Glasgow	Professor L. Becker, Ph.D., for the Meteorological Council.
Greenwich	The Royal Observatory.
Kew	C. Chree, Sc.D., F.R.S., Superintendent of the Observatory Department, National Physical Laboratory, for the Meteorological Council.
Oxford	The Radcliffe Observatory.
Southport	J. Baxendell, for the Corporation.
Stonyhurst College	Rev. W. Sidgreaves, S.J., for the Meteorological Council.
Valencia	J. E. Cullum, for the Meteorological Council.
Group B.—Additional Anemograph Stations.	
Alnwick Castle...	Robert Kyle, for the Duke of Northumberland K.G.
Deerness, Orkney Islands ...	M. Spence, for the Meteorological Council.
Dublin, Phœnix Park... ...	Colonel Sim, R.E., Ordnance Survey Office.
Falmouth (Pendennis Castle)	Coast Guard, for the Meteorological Council.
Fleetwood	The Urban District Council, for the Meteorological Council.
Holyhead (Harbour Office) ...	F. M. Cotton, C.E., for the Meteorological Council.
Kingstown	H.M. Office of Works.
Scilly Islands, St. Mary's ...	A. Hicks, for the Meteorological Council.
Shields, North	T. Robson, for the Meteorological Council.
Shoeburyness	The Superintendent of Experiments.
Yarmouth	G. T. Watson, for the Meteorological Council.
Group C.—Additional Barograph Stations.	
[4]*Blackpool	F. J. H. Coutts, M.D., for the Corporation.
Chatsworth	The Duke of Devonshire, K.G.
Forgandenny	C. L. Wood.
Fulbeck	Rev. Vere F. Willson, M.A.
Kilkenny	H. Carlton, for the Marquis of Ormonde, K.P.
London, Hampstead	H. R. Beeton.
,, Pall Mall	Athenæum Club.
,, Westminster	The Staff of the Meteorological Office.
Malin Head	A. C. Hailstone and J. Putt, for the Meteorological Council.

[1] Automatic Records of Wind, Sunshine, and Rainfall.
[2] Automatic Records of Pressure, Hygrometry, Wind, and Rain
[3] There is no Anemograph at this Observatory.
[4] Station added to the list since last Report.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.
Group C.—Additional Barograph Stations—*continued.*	
†Newton Reigny	T. G. Benn.
Penbedw, Mold...	H. W. Buddicom.
Rochford, Tenbury	Rev. John Tomson.
*Rossall	T. G. Benn.
Scilly Islands, St. Mary's ...	A. Hicks, for the Meteorological Council.
Stornoway	J. Mackenzie, for the Meteorological Council.
Sumburgh Head	Rev. W. Brand, for the Meteorological Council.
Waterford	Harbour Authorities.
*Wokingham, Pinewood ...	C. C. Chidell, M.D.
Yarmouth	G. T. Watson, for the Meteorological Council.
Group C[1].—Additional Thermograph Stations.	
Chatsworth	The Duke of Devonshire, K.G.
London, Westminster ...	The Meteorological Council.
Group C[2].—Additional Pluviograph Stations.	
Cambridge, Botanic Gardens	R. Irwin Lynch.
London, Camberwell Green...	W. Oxtoby, M.I.C.E., for the Borough Council.
„ „ Cemetery ...	„ „ „
„ „ Leyton Square	„ „ „
„ „ Peckham Road	„ „ „
Group S.—Sunshine Stations in addition to the Observatories in Group A, and the Stations marked ⊙ in Groups D, E, G, and T.	
‡Aberdovey	John Edwards.
Aspley Guise...	*The late* E. E. Dymond, J.P.
*Ballinacurra	John H. Bennett.
‡Bournemouth	C. Dales, for Town Council.
‡Broadstairs	W. H. White, for the District Council.
‡Edinburgh	Prof. I. B. Balfour, F.R.S.
Guernsey. *See* St. Peter Port.	
‡Hastings, Waterworks ...	—. Farnham, for the Corporation.
Haverfordwest	J. W. Phillips.
‡Hoylake	Tom Robinson, for the Urban District Council.
‡London, City	Messrs. De La Rue.
‡ „ Westminster ...	H. A. Reatchlous, M.A.
‡Margate	J. Stokes, J.P.
‡Marlborough	J. C. Alsop.
‡Newquay, Cornwall... ...	C. C. Vigurs, B.A., M.D., for the Urban District Council.
*Plumstead	J. G. Waller.
Port Talbot, Margam Park	R. Milner, for Miss Talbot.
‡*Ramsgate	T. J. Taylor, C.E., for the Corporation.
‡Rhyl	A. A. Goodall, for District Council.
St. Helier's, Jersey	Signal Officer, Fort Regent.
‡St. Peter Port, Guernsey ...	F. E. Carey, M.D.

[1] There is a Dines Anemograph and a self-recording Rain-gauge at this Station.
* Station added to the list since last Report.
† Station now discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.

LIST OF OBSERVERS AT THE STATIONS OF THE SEVERAL ORDERS—*continued.*

Name of Station.	Observer.
GROUP S.—ADDITIONAL SUNSHINE STATIONS—*continued.*	
Salcombe	W. Barrington Prowse, M.D.
Sheffield (Attercliffe) ...	J. Robertson, M.D., B.Sc., for the Corporation.
‡Tenby	R. J. Truscott, for the Corporation.
‡Thurcaston, Leicester ...	Rev. T. A. Preston, M.A.
‡Torquay	F. March, for the Corporation.
‡Watergate (Emsworth) ...	W. M. Christy.
‡Westbourne, Sussex ...	Rev. L. B. Birkett.
‡Worksop	H. Mellish, J.P.
‡Worthing	*The late* C. Kelly, M.D., for the Corporation.
‡York (Bootham)	Hugh Richardson, M.A.
„ (The Mount)	R. Thompson.
GROUP D. AND GROUP E.—NORMAL CLIMATOLOGICAL STATIONS.(1)	
Ackworth	E. B. Ludlam, M.Sc.
Ampleforth	Rev. J. B. McLaughlin, B.A., O.S.B.
⊙‡Aspatria	J. Smith Hill, B.Sc.
Aysgarth	*The late* Rev. F. W. Stow, M.A.
Belfast, Queen's College ...	John Wylie, B.A.
⊙ Belvoir Castle	W. H. Divers, for the Duke of Rutland, K.G.
ℳBennington	Rev. J. D. Parker, LL.D.
ℳBerkhamsted	E. Mawley, F.R. Met. Soc.
⊙*‡Bettws-y-coed	D. Macdonogh, L.R.C.P., L.R.C.S.I.
⊙‡Birmingham	Alfred Cresswell, for the Midland Institute.
⊙†‡Birr Castle...	G. A. Roe and W. J. Roe, for the Earl of Rosse, K.P.
ℌ‡Braemar	J. Aitken, J.P.
Bramley	J. Bartlett, M.A.
ℳBuxton	W. Pilkington.
ℌ‡Cally	W. Thomson, for H. G. Murray Stewart.
⊙†‡Cambridge	Miss A. Walker, for Sir Robert Ball, F.R.S.
⊙*‡ „ Botanic Gardens.	R. Irwin Lynch.
Canterbury	A. Lander.
ℌCargen	A. Peacock.
Carlisle	Studholme Cartmell, for the Corporation.
ℳ‡Cheadle	J. C. Philips.
ℳCheltenham	F. O. Bell and A. C. Saxby, for the Corporation.
ℳ⊙‡Churchstoke	P. Wright, F.C.S.
⊙‡*Clacton-on-Sea	A. W. Shadick, for Urban District Council.
⊙‡Cockle Park, Morpeth ...	J. H. J. Farquhar, B.Sc., for the Northumberland County Council.
⊙†Cromer	W. H. Archer, for Urban District Council.
⊙‡Cronkbourne	A. W. Moore, M.A., J.P., C.V.O.
⊙‡Deerness, Orkney	M. Spence.
Dublin, Botanic Gardens...	F. W. Moore, M.R.I.A.
‡ „ City	Sir John W. Moore, M.D., D.Sc.
⊙‡ „ Phœnix Park ...	Colonel Sim, R.E., Ordnance Survey Office.
⊙* „ Trinity College ...	Arthur R. Moore.
ℌDundee	J. Carnochan.
⊙‡Dunmow	Thos. Hacking, for the Countess of Warwick's Agricultural School.

(1) Second Order Stations of the International Classification.
* Station added to the list since last Report.
† Station now discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.
Group D and Group E.—Normal Climatological Stations—*continued.*	
§Dunrobin Castle	D. Melville, for the Duke of Sutherland, K.G.
⊙‡Durham	Professor R. A. Sampson, M.A., F.R.S.
⊙‡Eastbourne	R. Sheward, for the Corporation.
§⊙‡Fort Augustus	Rev. C. von Dieckhoff.
‡Fulbeck	Rev. Vere F. Willson, M.A.
⊙ Garforth	Prof. Seton, for the Yorkshire College, Leeds.
⊙‡Geldeston	E. T. Dowson.
§‡Glencarron...	D. D. Munro, for Lord Maclaren.
§Gordon Castle	C. Webster, for the Duke of Richmond and Gordon, K.G.
⊙ Guernsey (St. Peter Port)	Adolphus Collenette.
ℳ‡Hereford (Belmont) ...	Rev. F. B. Harrington, O.S.B.
ℳ⊙‡Hillington	Rev. H. E. B. Ffolkes, M.A.
⊙†Hollesley Bay	Prof. C. G. Freer Thonger, F.C.S.
⊙‡Hull	H. B. Witty, for the Corporation.
§‡Lairg	Rev. John K. Maclean.
‡Laudale	A. Fletcher (*the late*) and J. A. Fletcher, for T. H. G. Newton, M.A.
§Lednathie	W. Morrison, for P. Stormonth Darling.
‡Lincoln	W. H. Curtin, for the Corporation.
ℳ⊙‡Llandudno...	William Little, for the Town Council.
London (Camden Square)	H. Robert Mill, D.Sc., LL.D.
ℳ⊙‡Lowestoft	C. W. Edwards, for the Corporation.
⊙ Manchester, Oldham Road	J. Niven, M.A., M.B., for the Corporation.
⊙ ,, Whitworth Park.	Prof. Schuster, Ph.D., F.R.S.
⊙‡ ,, Prestwich ...	T. R. H. Clunn, M.D.
§⊙‡Marchmont	J. A. Wood, for Sir H. P. Campbell, Bart.
⊙‡Markree Castle	J. R. Armstrong, for the Trustees of *the late* Colonel Cooper.
Newcastle, Co. Wicklow...	B. H. Steede, M.A., M.D.
⊙*‡Newton Rigg	W. T. Lawrence, for the Cumberland County Council.
ℳNorwood	W. Marriott (*Sec.*, Royal Met. Soc.).
§‡Ochtertyre...	G. Croucher, for Sir P. K. Murray, Bart.
†Parkstone	*The late* R. Hawkesworth Barnes, B.A.
⊙‡Plymouth	H. Victor Prigg, A.M.I.C.E., for the Corporation.
§Poltalloch	D. S. Melville, for Rt. Honble. Lord Malcolm.
Ridgmont	H. M. Freear, F.C.S., for the Royal Agricultural Society.
§Rothesay	J. Kay.
ℳRounton	Sir I. Lothian Bell, Bart., F.R.S.
ℳRousdon	The Hon. Lady Peek.
‡St. Leonard's	H. Colborne, M.R.C.S., for the Corporation.
Salisbury	Thos. Challis, for the Earl of Pembroke, G.C.V.O.
ℳ⊙‡Scarborough	W. W. Larkin, for the Corporation.
Seaham Harbour	G. H. Aird.
⊙‡Sheffield, Weston Park Museum.	E. Howarth, F.R.A.S.
*‡Shrewsbury	Capt. C. St. B. Sladen, R.E.
⊙‡Southampton	A. Vanghan, for Director-General of Ordnance Survey.

* Station added to the list since last Report.
† Station now discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.

Group D and Group E.—Normal Climatological Stations—*continued.*

Stokesay	Rev. W. La Touche, M.A., and Miss Tonkin.
‡Strathpeffer Spa	J. McLean, for R. Fortescue Fox, M.D.
Tealby	Rev. S. Lewin, B.A.
ℳWakefield	A. Clyde.
Wessington Court ...	S. Lomas, for Miss L. Grafton.
⊙Whitby	Thos. Newbitt.
ℳWhitchurch, Devon ...	E. E. Glyde.
ℒWolfelee	W. Gordon, for Major Elliot.
ℳWoolacombe, Devon ...	B. Fanshawe.
York, The Museum ...	H. M. Platnauer, B.Sc.

Monthly returns are also furnished for the Registrar-General's report, or for the publications of the Office, by the Royal Observatory, Greenwich, the Radcliffe Observatory (Oxford), Bidston Observatory, the Observatory of Stonyhurst College, Glasgow Observatory, and the Armagh Observatory.

Group G.—Auxiliary Climatological Stations. (²)

Aberystwyth	R. Kenrick.
‡Alnwick Castle	Robert Kyle, for the Duke of Northumberland, K.G.
‡Arlington Court, Devon ...	Lady Chichester.
Barnet	T. H. Martin, A.M.I.C.E.
Barnstaple...	Thos. Wainwright, for the North Devon Athenæum.
‡Bath	W. H. Symons, M.D., for the Corporation.
‡Bawtry (Hesley Hall) ...	B. I. Whitaker, J.P.
⊙‡Blackpool	F. J. H. Coutts, M.D., for the Corporation.
⊙ Bognor	H. C. L. Morris, M.B., and A. G. Thompson.
Bolton	W. W. Midgley, for the Corporation.
⊙‡Bradford	H. A. Johnson, M.Inst.C.E.
⊙‡Brighton	A. Newsholme, M.D., for the Corporation.
‡Bristol (Over Court Park)	R. C. Cann Lippincott, F.R. Met. Soc.
Buntingford	Dr. G. M. Smith.
Caterham	P. E. Campbell, M.B.
†Chatham	The Instructor in Surveying.
‡Chatsworth	The Duke of Devonshire, K.G.
‡Chester (Hawarden Bridge).	F. B. Summers.
⊙‡Cirencester	Prof. G. T. Locke, M.A., for the R.A. College
‡Clifton College	D. Rintoul, M.A.
‡Colly Weston	Miss A. Tasker.
⊙ Coventry	E. Hugh Snell, M.D., for the Corporation.
⊙‡Cullompton	T. Turner, J.P.
⊙ Darwen	G. Mainland, for the Corporation.
Dundrum	Arthur S. Goff.
Dunfanaghy	J. J. Macgrath.
Eastbourne	Miss Brodie Hall.
‡Edenfel (Omagh)... ...	Col. Buchanan, C.B.
⊙†‡Felixstowe...	Rev. J. G. Munday, M.A.
*† ,, ...	J. Mills, for the Corporation, and S. Alexander.
‡Foynes	W. H. Ward, for Lord Monteagle, K.P.
†Halifax (Bermerside Oby.)	J. Gledhill, F.R.A.S.

(²) Third Order Stations of the International Classification.
* Station added to the list since last Report.
† Station now discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.
Group G.—Auxiliary Climatological Stations—*continued.*	
Halifax (Public Library)	J. Whiteley.
⊙‡Harrogate	G. Paul, for the Corporation.
ℳ‡Hereford (Belmont) ...	Rev. F. B. Harrington, O.S.B.
Huddersfield	J. Firth.
‡Kilkenny	H. Carlton, for the Marquess of Ormonde, K.P.
‡Killarney	E. W. Griffin, M.D.
⊙ Kingstown...	Dr. J. B. Power, for the Corporation.
Leeds	H. Crowther.
⊙‡Littlestone-on-Sea ...	H. T. Tubbs.
⊙ Llangammarch Wells ...	W. Black Jones, M.D.
‡London, Westminster ...	The Staff of the Meteorological Office.
⊙†Lytham	J. C. Fisher, M.A., M.B., for the Corporation.
Maidenhead	G. H. Palmer.
⊙‡Newcastle-on-Tyne ...	N. H. Martin, F.R.S.E., F.C.S.
Newport, Monmouth ...	C. Cullum, for the Corporation.
‡Norwich (Brundall) ...	A. W. Preston.
⊙‡Nottingham	Arthur Brown, M. Inst. C.E., and Philip Boobbyer, M.D., for the Corporation.
†Osborne	Robert Scott.
*Oundle School	J. O. Morris, for Headmaster.
⊙‡Portsmouth	A. Mearns Fraser, M.B., for the Corporation.
‡Preston	Thomas Jackson.
⊙‡Rauceby Hall	J. Hope, for General Sir M. Willson, K.C.B.
Reading	Edward Little.
⊙‡Rothamsted	The Lawes Agricultural Trust.
Rugby School	Denys E. Shorto, M.A.
St. Leonard's, West Marina	T. Eldridge, for the Corporation.
ℳ‡Shaftesbury	Miss L. H. Harris.
‡Shoeburyness	The Superintendent of Experiments.
⊙*Skegness	S. Coetmore Jones, for the District Council.
ℳ‡Swarraton	Rev. W. L. W. Eyre, M.A.
Totland Bay, Isle of Wight	J. Dover, M.A.
Truro	G. Penrose, for the Royal Institution of Cornwall.
⊙*‡Tunbridge Wells	F. G. Smart, M.B.
⊙ Ventnor	Miss M. Gibson, for Royal National Hospital for Consumption.
‡Waterford	J. N. White.
⊙*‡Wisley R. Hort. Gardens	The Superintendent, for the Royal Horticultural Society.
*Wokingham, Pinewood ...	C. C. Chidell, M.D.
Group R.—Additional Rainfall Stations.	
Abersychan	W. P. James.
Ardross Castle	W. Minty.
Brandon	Lt.-Col. B. E. Spragge, D.S.O.
Caistor, Lincolnshire ...	Thos. Ford.
Carrigallen	Mrs. J. Godley and Miss Morrow.
Chertners, Northumberland...	Francis R. Hull, C.E.
Corbally, Limerick	Poole Gabbett.

* Station added to the list since last Report.
† Station now discontinued.
‡ Information received weekly for use in the Weekly Weather Reports.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.
Group R.—Additional Rainfall Stations—*continued*	
Cuckfield	John Howe.
Dam Site, Northumberland ...	Francis R. Hull, C.E.
Disserth, Llandrindod... ...	Rev. J. Le Herbert.
Doneraile	Capt. J. W. Evans, J.P.
Dover	H. E. Stilgoe, C.E.
Dursley	R. W. Pinney, and J. Richards.
East Dereham	G. H. Cooper.
Ennis (Roslevan), Co. Clare ...	Miss A. L. Scott.
Ennistymon	Rev. C. W. McDowell, M.A.
Fallowlees, Northumberland...	Francis R. Hull, C.E.
Forest of Dean :—	
*Blakeney Hill	Edward Allford, for Philip Baylis, Esq.
*Braceland	E. A. Popert, " "
*Edgehills Lodge	Campbell Anderson, " "
*Ruardean Hill	John Morris, " "
*Whitemead Park	Kate Roberts, " "
*Worcester Lodge	Fred Morris, " "
Forest Row, Sussex	Rt. Hon. J. Bryce, D.C.L., M.P.
Glenarm...	The Earl of Antrim.
Great Billing	Rev. G. H. Mullins, M.A.
Gruline, Isle of Mull	J. W. Melles.
Harefield	G. Eland.
Hastings, St. Helen's Crescent	Rev. H. H. Breton, M.A.
Hidcote, Campden	Major W. Wright, R.A.
*Hoar Cross	F. W. Lycett.
Hurdlestown	Lt.-Col. W. O. Bentley, R.A.
*Isleworth	A. Worsley.
Kearsney Abbey (Dover) ...	C. W. Curtis.
" Chilton Farm ...	H. E. Stilgoe, C.E.
Kinlochewe	A. McLennan, for Hon. W. Peel, M.P.
Kirkby Lonsdale (Casterton)	R. A. Clarke.
Lahinch, Co. Clare	Miss I. F. K. Bowes.
*Laleham (Middlesex)	W. Trusler, for J. Thornton.
*Llanbedr	George A. Crace-Calvert.
Llandinam	John Owens.
London, Chelsea	T. W. E. Higgens, C.E.
" Camberwell Cemetery	W. Oxtoby, M.I.C.E., for the Borough Council.
" " Green ...	
" Leyton Square ...	
" Peckham Road ...	
Mallaranny	Miss M. Kilsby.
Mareham-le-Fen	Mrs. G. L. Kime.
Mount Callan, Inagh	Lt.-Col. Tottenham.
Newchurch	C. Cullum.
Newmarket-on-Fergus ...	W. W. A. Fitzgerald.
Newport, Monmouth	C. Cullum.
Northallerton	W. Stead, C.E.
Oundle	N. E. Dixon.
Pant-y-reos, Monmouth ...	C. Cullum.
Penrhyn Quarry	H. P. Meares, C.E.
Port Talbot, Margam Park ...	G. Lipscombe, for Miss Talbot.
Recess, Co. Galway	A. A. Smith.
Redpath, Northumberland ...	Francis R. Hull, C.E.

* Station added to the list since last Report.

List of Observers at the Stations of the several Orders—*continued.*

Name of Station.	Observer.
Group R.—Additional Rainfall Stations—*continued.*	
*Rhayader Watershed :—	
*Rhayader, Nantgwillt, Old...	The Engineer-in-Charge, for the Corporation of Birmingham.
* " " New...	
*Abergwngy	
*Bwlchyrhendre	
*Claerwen	
*Nant-y-car	
*Pryddallau	
*Tremynydd	
Ridlington	N. W. Wortley.
Rochford, Tenbury	Rev. John Tomson.
Roxborough	A. W. Shaw.
Sandgate	A. Robert Bowles, C.E.
Sandwich	Royal St. George's Golf Club.
Simonsbath	Rev. John S. Martin.
Syston	S. K. Daniels.
Temple Bruer (Lincolnshire) ...	Miss Alice S. Morley.
*Thetford, Norfolk	H. T. Killick, J.P.
Tod Craig	Francis R. Hull, C.E.
Valencia Island, Glanleam ...	Miss E. Fitzgerald.
Watergate (Emsworth) ...	W. M. Christy.
Ynis-y-bro, Newport	C. Cullum.
York, Deighton Grove ...	M. L. Whitehead.
Group T.—Telegraphic Reporting Stations	
⊙Aberdeen Observatory ...	G. A. Clarke.
⊙[1]Bath	W. H. Symons, M.D., for the Corporation.
Bidston Obsty., Liverpool ...	W. E. Plummer, F.R.A.S., for the Mersey Docks and Harbour Board.
⊙Birr Castle, Parsonstown ...	J. L. Roe.
Blacksod Point, Co. Mayo ...	A. Marshall, Coastguard.
⊙Clacton-on-Sea	A. W. Shadick, for the Town Council.
Donaghadee	W. Keown, Coastguard.
Dungeness	J. G. Williams, Lightkeeper.
Holyhead	T. Chope, Sailors' Home.
Leith	T. Richardson and A. J. Bottrill, Post Office.
London, Brixton	F. Gaster.
Malin Head, Co. Donegal ...	A. C. Hailstone and J. Putt, Lloyd's Signal Station.
Nairn	Miss Penny.
⊙Nottingham	Arthur Brown, A.M. Inst. C.E., for the Corporation.
⊙Oxford	W. Wickham, Radcliffe Observatory.
Portland Bill	W. J. Batton, Lightkeeper.
Roche's Point, Co. Cork ...	James Mountjoy, Post Office.
⊙St. Ann's Head, Pembroke...	G. H. Dunsford, Lightkeeper.
St. Aubin's, Jersey	J. Fisher.
⊙Scilly Islands, St. Mary's ...	A. Hicks, The Parade, St. Mary's.
Shields, North	W. B. Clark, Post Office.
Spurn Head	A. S. Badcock, Lightkeeper.
⊙Stornoway	J. Mackenzie, Lloyd's Agent.
Sumburgh Head	Rev. W. Brand.
⊙Valencia Observatory ...	J. E. Cullum, Valencia Observatory.
Wick	J. Sinclair.
Yarmouth, Norfolk	G. T. Watson, Sailors' Home.

* Station added to the list since last Report.
[1] There is an automatic record of Wind by a Dines' Anemometer at this Station.

List of Foreign Stations from which Reports are received daily by Telegraph. *See* page 44.

Name of Station.	Authority.
Haparanda	Meteorological Office, Stockholm.
Hernösand	
[2]Stockholm	
Wisby	
Karlstad...	
Bodö	Meteorological Institute, Christiania.
[2]Christiansund	
[1 2]Skudesnaes	
Færder	
[2]The Scaw	Meteorological Institute, Copenhagen.
Fanö	
Cuxhaven	Deutsche Seewarte, Hamburg.
Berlin	
Frankfürt	
Munich	
[2]The Helder	Bureau Central Météorologique, Paris.
Brussels	
Cape Gris Nez	
[2]Brest (St. Mathieu)	
Lorient (Ile de Groix) ...	
[1 2]Rochefort (Ile d'Aix)... ...	
[2]Biarritz	
[2]Paris	
Belfort	
Lyons	
Nice	
Perpignan	
Corunna	Observatory, Lisbon.
Lisbon	
[2]Azores (P. Delgada)	Meteorological Service of the Azores.
„ (Horta)	

Note.—The stations marked (1) report also at 2h. p.m., and those marked (2) at 6h. p.m. Lisbon reports at 4h. p.m. instead of 6h. p.m.

The Helder does not send reports at 6 p.m. on Sundays.

Hay Harvest "Record of Weather," Form A, No. 60, received from :—

H. G. Burkitt, Grange Hill, Bishop Auckland.

M. R. Pryor, Weston Hall, Stevenage, Herts.

W. A. Sandeman, Guilden Morden, Royston.

T. Courteney Warner, Brettenham Park, Brettenham.

T. G. Binney, Guisnes Court, Tolleshunt D'Arcy, Essex.

R. H. Hollins, 25, Austin Friars, E.C. (Ketton, Stamford).

G. Cadbury, Bournville, near Birmingham.

W. A. Procter, Holgate Head, Kirkby Malham, Leeds.

A. C. Humphreys-Owen, Glansevern, Berriew, Montgomery.

W. E. Anslow, Wombourne, Wolverhampton.

C. Tickell, Royal Indian Engineering College, Coopers Hill, Englefield Green, Surrey.

J. Cross, Sturminster Marshall, near Wimborne.

Jesse Norris, Staplehurst.

G. C. Swindells, Monks Horton Park, near Hythe, Kent.

T. M. Guest, J.P., D.L., Inwood, Henstridge.

G. V. Webb & Co., Tunstall, Sittingbourne. [Observers at Minster and at Rayham Farm.]

C. F. C. Hobart, Shipley Place, Horsham.

W. A. Bewes, The Tile House, Denham.

W. Little, Llandudno.

R. M. Greaves, Portmadoc, North Wales.

Vivian Stenhouse, Bishops Lydeard, near Taunton, Somerset.

R. C. Cann Lippincott, Over Court, Almondsbury, Bristol.

C. D. Phillips, The Gaer, Newport, Mon.

D. A. Thomas, Llanwern, near Newport, Mon.

R. Evans, Brynog, Talsarn, Cardiganshire.

Captain W. P. Pryse, Noyadd Trefawr, Boncath, R.S.O., South Wales.

Sir Thomas Dyke Acland, Killerton, Exeter.

H. W. Potterton, Balatalion, Athboy.

Richard M. Barrington, Fassaroe, Bray, Co. Wicklow.

Jonathan Darby, Leap Castle, Roscrea.

LIST OF OBSERVERS AT THE STATIONS OF THE SEVERAL ORDERS—*continued.*

Name of Station.	Observer.
GROUP W.—SEA TEMPERATURE STATIONS.	
Aberdeen, Cove Bay	Coastguard.
Arran, North, Galway ...	"
Bahama Bank lightship ...	Lightkeepers.
Ballantrae, Ayrshire	Coastguard.
Ballydonegan, Co. Cork ...	"
Ballyglass, Co. Mayo	"
Blacksod Point, Co. Mayo ...	"
Burnmouth, Ayton, Berwick...	"
Burntisland	"
Caernarvon Bay Lightship ...	Lightkeepers.
Cardigan Bay Lightship ...	"
Cleggan, Co. Galway	Coastguard.
Coningbeg Lightship	Lightkeepers.
Cromarty	Coastguard.
East Goodwin Lightship ...	Lightkeepers.
English and Welsh Grounds Lightship.	"
Holyhead Harbour Office ...	F. M. Cotton C.E.
Kilcredane, Co. Clare	Coastguard.
Kingstown, Sandy Cove ...	"
Kirkwall	"
Kish Bank Lightship	Lightkeepers.
Lamlash, Isle of Arran ...	Coastguard.
Leman and Ower Lightship ...	Lightkeepers.
Lerwick	Coastguard.
Liscannor, Co. Clare	"
Minard, Co. Kerry	"
Newarp Lightship	Lightkeepers.
Newquay, Cornwall	Coastguard.
North-West Lightship ...	Lightkeepers.
Outer Dowsing Lightship ...	"
Owers Lightship	Lightkeepers.
Pennant Bay, Aberdour ...	Coastguard.
Portrush	"
Royal Sovereign Lightship ...	Lightkeepers.
St. Ann's Head, Pembroke ...	"
Salcombe, Devon	Coastguard.
Scarborough	"
Scilly Islands, St. Mary's ...	A. Hicks.
Seafield, Co. Clare	Coastguard.
Seven Stones Lightship ...	Lightkeepers.
Shambles Lightship	"
Sheephaven, Dunfanaghy ...	Coastguard.
Shipwash Lightship	Lightkeepers.
Solway Lightship	"
South Rock Lightship ...	"
Spurn Lightship	"
Stornoway	Coastguard.
Sunderland	"
Teelin, Co. Donegal	"
Uzon, Montrose	"
Wick	"

I.—List of Stations in the Colonies and Dependencies and in Foreign Countries from which Returns are received in Manuscript.

Note.—Returns received in printed form are included in the list of additions to the Library. Appendix X., p. 137.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Nature of Information Received. (*See* p. 57.)	Year of Commencement of Observations.	Observer.
Mediterranean.	° ′	° ′				
Cyprus, Famagusta	35 7 N.	33 57 E.	34	D.	1881	L. Berand, for Dr. Heidenstam, C.M.O.
,, Kyrenia	35 21 N.	33 19 E.	51	D.	1881	P. Michaelides ,, ,, ,,
,, Larnaca	34 55 N.	33 37 E.	19	D.	1881	P. Nicopoulles ,, ,, ,,
,, Limassol	34 40 N.	33 1 E.	26	D.	1881	M. Theodorides ,, ,, ,,
,, Nicosia	35 11 N.	33 22 E.	493	D.	1881	J. Josif ,, ,, ,,
,, Papho	34 46 N.	32 25 E.	202	D.	1881	M. Enotiades ,, ,, ,,
Gibraltar	30 6 N.	5 21 W.	48	D.	1883	Staff-Sergt. Tuson and Sergt. Davis, for Col. J. McNamara, M.D., C.M.O.
Morocco, Casablanca	—	—	—	R.	1896	G. H. Lerman.
,, Mogador	31 30 N.	9 42 W.	—	R.	1903	A. M. Maddan, H.B.M. Vice-Consul.
Syria, Beyrout	33 54 N.	35 28 E.	172	D.	1883	Robt. West, M.A., and George Maier, M.S.
Tangier, Cape Spartel	35 47 N.	5 55 W.	191	D.	1893	Edwin C. Hathaway.
Africa.						
East :—						
Upper Sheikh	9 56 N.	45 11 E.	4,595	G.	1903	Lt.-Col. J. W. Rodgers, I.M.S.
Central :—						
Eastern Soudan, Wadelai ...	†2 40 N.	31 35 E.	2,200	G.	1901	F. A. Knowles.
Uganda, Butiaba	—	—	—	R.	1904	R. K. Miller.
,, Entebbe	0 3 S.	32 30 E.	3,902	D.	1896	John Mahon.

I.—List of Stations in the Colonies and Dependencies and in Foreign Countries from which Returns are received in Manuscript.

Note.—Returns received in printed form are included in the list of additions to the Library. Appendix X., p. 137.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Nature of Information Received. (*See* p. 57.)	Year of Commencement of Observations.	Observer.
Mediterranean.	° ′	° ′				
Cyprus, Famagusta	35 7 N.	33 57 E.	34	D.	1881	L. Berand, for Dr. Heidenstam, C.M.O.
,, Kyrenia	35 21 N.	33 19 E.	54	D.	1881	P. Michaelides ,, ,, ,,
,, Larnaca	34 55 N.	33 37 E.	19	D.	1881	P. Nicopoulles ,, ,, ,,
,, Limassol	34 40 N.	33 1 E.	26	D.	1881	M. Theodorides ,, ,, ,,
,, Nicosia	35 11 N.	33 22 E.	493	D.	1881	J. Josif ,, ,, ,,
,, Papho	34 46 N.	32 25 E.	202	D.	1881	M. Enotiades ,, ,, ,,
Gibraltar	30 6 N.	5 21 W.	48	D.	1883	Staff-Sergt. Tuson and Sergt. Davis, for Col. J. McNamara, M.D., C.M.O.
Morocco, Casablanca	—	—	—	R.	1896	G. H. Lerman.
,, Mogador	31 30 N.	9 42 W.	—	R.	1903	A. M. Maddan, H.B.M. Vice-Consul.
Syria, Beyrout	33 54 N.	35 28 E.	172	D.	1883	Robt. West, M.A., and George Maier, M.S.
Tangier, Cape Spartel	35 47 N.	5 55 W.	191	D.	1893	Edwin C. Hathaway.
Africa.						
East :—						
Upper Sheikh	9 56 N.	45 11 E.	4,595	G.	1903	Lt.-Col. J. W. Rodgers, I.M.S.
Central :—						
Eastern Soudan, Wadelai ...	†2 40 N.	31 35 E.	2,200	G.	1901	F. A. Knowles.
Uganda, Butiaba	—	—	—	R.	1904	R. K. Miller.
,, Entebbe	0 3 S.	32 30 E.	3,902	D.	1896	John Mahon.

„ Fort Portal	†0 40 N.	30 20 E.	4,770	R.	1901	L. Ormsby.
„ Gondokoro	†4 52 N.	31 44 E.	1,500	G.	1901	Fred. Spire.
„ Jinja	†0 27 N.	33 12 E.	3,800	G.	1901	A. D. P. Hodges, M.D.
„ Masaba (Mount Elgon)	†1 0 N.	34 15 E.	4,500	G.	1902	Rev. W. A. Crabtree and Rev. John B. Purvis.
„ Masaka	†0 20 S.	31 50 E.	—	D.	1902	G. C. Ishmael.
„ Mbarara	†0 39 S.	30 49 E.	4,500	D.	1901	R. Stoney.
„ Nimule	3 38 N.	32 11 E.	—	G.	1903	C. W. Guy Eden.
West :—						
Gold Coast, Aburi	—	—	—	G.	1893	A. E. Evans.
„ Accra	†5 35 N.	0 6 W.	—	G.	1893	Dr. R. H. Kennan and Dr. G. J. Rutherford.
„ Axim	†4 50 N.	2 12 W.	—	G.	1895	Dr. W. M. Graham and Dr. M. J. Loughney.
„ Cape Coast Castle	†5 15 N.	0 30 W.	—	G.	1895	Dr. G. L. Barker.
„ Gambaga	†10 31 N.	0 26 W.	—	G.	1899	Dr. P. J. Garland and Dr. H. B. S. Montgomery.
„ Kumasi	†6 50 N.	2 16 W.	—	G.	1899	Dr. E. H. Tweedy and Dr. P. J. Garland.
„ Kwitta	†5 59 N.	0 59 E.	—	G.	1895	Dr. M. S. Webb and Dr. H. A. Chaplin.
Sierra Leone	8 30 N.	13 9 W.	179	D.	1895	Dr. C. G. Thomson, Lieut. R.A.M.C., and Dr. E. F. L'Estrange, Capt. R.A.M.C.
WEST INDIES.						
Bahamas, Abaco	25 52 N.	77 11 W.	70	D.*	1859	J. W. Roberts.
„ Cay Lobos	22 33 N.	77 36 W.	15	D.*	1877	Lightkeepers.
„ Cay Sal	23 42 N.	80 25 W.	30	D.*	1859	F. W. Lunn and B. N. Jones.
„ Inagua	21 21 N.	73 1 W.	21	D.*	1871	T. A. Williams.
„ Nassau	†25 2 N.	77 25 W.	—	G.	1895	R. W. D. Albury.
„ Watling's Island ...	23 57 N.	74 28 W.	60	D.*	1889	T. R. Thompson, senr.
Barbados	†13 12 N.	59 35 W.	181	E.	1895	John R. Bovill.
Sombrero	18 36 N.	63 28 W.	30	D.*	1867	J. A. Richardson.

* Lighthouse Register containing observations every 4 hours.

† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

LIST OF STATIONS in the COLONIES, &c., from which RETURNS are received in MANUSCRIPT—*continued.*

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Nature of Information Received. (*See* p. 57.)	Year of Commencement of Observations.	Observer.
AMERICA.						
Central :—	° ′	° ′				
Panama, Colon	†9 23 N.	79 23 W.	—	D.	1897	The Ven. Archdeacon S. P. Hendrick.
South :—						
British Guiana, Georgetown...	6 49 N.	56 10 W.	0	D.S.	1887	E. G. Christian.
ATLANTIC.						
North :—						
Canary Islands, Tenerife ...	28 25 N.	16 30 W.	454	D.C.C.*	1888	Alfred F. Perry.
South :—						
Falkland Islands (Cape Pembroke).	51 41 S.	57 42 W.	70	D.S.*	1859	J. Pearce.
St. Helena, St. Matthew's Vicarage.	16 0 S.	5 40 W.	1,887	B.D.	1885	A. L. C. Hands.
,, Central, Oak Bank	—	—	1,696	R.	1902	J. Homagee.
,, Mount Pleasant ...	—	—	1,997	R.	1896	T. C. Barker.
INDIAN AND PACIFIC OCEANS, &C.						
Madagascar, Mojunga	15 45 S.	46 19 E.	134	G.D.	1892	Stratton C. Knott (*the late*), H.B.M. Vice-Consul.
Mauritius, Royal Alfred Observatory.	20 6 S.	57 31 E.	181	E.	1901	T. F. Claxton.
Malden Island	†4 3 S.	154 55 W.	14	D.	1888	W. H. Evans.

* Lighthouse Register containing observations every 4 hours.
† The positions and heights of the stations are those given by the observers, except in cases marked †, for which the information given has been obtained from other sources.

I.—LIST OF PUBLICATIONS ISSUED UNDER THE AUTHORITY OF THE METEOROLOGICAL COUNCIL.*

The list is arranged under the following headings :—

1. Periodical Publications.
2. Occasional Publications and Reports.
3. Instructions in the use of Instruments, &c.
4. Marine Meteorology.
5. Miscellaneous Publications.

1. Periodical Publications.

Daily Weather Report. Subscription, £1 per annum.

Weekly Weather Report. With Appendices and Monthly Supplements priced separately :—

†1888. Vol. V. (Official, No. 85.) 4*d*. per week. Annual subscription, including Supplements and Appendices, 21*s*. 2*d*.

1889-1904. Vols. VI.–XXI. (Official, Nos. 86, 87, 96, 100, 107, 111, 116, 121, 128, 133, 138, 144, 150, 155, 161, 167.) 6*d*. per week. Annual subscription, including Supplements and Appendices, 30*s*.

Monthly Pilot Charts of the North Atlantic and Mediterranean. *See* Marine Meteorology.

‡*Monthly* Weather Reports :—

1884 (Official, No. 62), Jan.–March, May–Nov., 1*s*. 6*d*. each ; April (with two Appendices). 2*s*. 6*d*. ; Dec., 1*s*. 9*d*. 1885 (No. 65) ; 1886 (No. 68), Jan. to Dec., 1*s*. 6*d*. each. 1887 (No. 77), Jan. to April, 1*s*. 6*d*. each ; May to Dec., in wrapper, 12*s*.

Quarterly Weather Reports :—

1869 (Official, No. 7), 1870 (No. 9), 1871 (No. 14), 1872 (No. 16), 1873 (No. 19), Parts I. to IV. of each year, 5*s*. each. 1874 (No. 25), Parts I., II., and IV., 5*s*. each ; Part III., 5*s*. 9*d*. 1875 (No. 30), Parts I. to IV., 5*s*. each. 1876 (No. 33), Part I., 6*s*. ; Parts II., III., and IV., 5*s*. each. 1877 (No. 52), Part I., 10*s*. ; Part II., 5*s*. ; Part III., 4*s*. 6*d*. ; Part IV., 6*s*. ; Appendices and Plates, 27*s*. 1878 (No. 55), Parts I. to IV., 6*s*. each ; Appendices and Plates, 28*s*. 1879 (No. 49), Parts I. to III., 6*s*. each; Part IV., 5*s*. 6*d*. ; Appendices and Plates, 27*s*. 1880 (No. 50), Parts I. and II., 6*s*. each ; Part III., 4*s*. ; Part IV., 6*s*. ; Appendices and Plates, 28*s*.

ANNUAL Volumes :—

Reports of the *Meteorological Committee* :—

1867 (Official, No. 1), 1*s*. 1868 (No. 5), 5*d*. 1869 (No. 6), 10*d*. 1870 (No. 10), 10*d*. 1871 (No. 15), 10*d*. 1872 (No. 17), 1*s*. 1873 (No. 22), 4*d*. 1874 (No. 26), 6*d*. 1875 (No. 29), 4*d*. 1876–77 (No. 31), 3*s*. 5*d*.

Reports of the *Meteorological Council* :—

1877–78 (Official, No. 35), 1*s*. 1878–79 (No. 38), 5*d*. 1879–80 (No. 41), 1*s*. 1880–81 (No. 42), 1*s*. 2*d*. 1881–82 (No. 48), 1*s*. 1882–83 (No. 58), 10½*d*. 1883–84 (No. 64), 1*s*. 2*d*. 1884–85 (No. 67), 4*s*. 4*d*. 1885–86 (No. 72), 8*d*. 1886–87 (No. 75), 8*d*. 1887–88 (No. 79), 1*s*. 1888–89 (No. 84), 5½*d*.

---

* Sold by Messrs. Eyre and Spottiswoode and other agents for the sale of the publications of H.M. Stationery Office ; Annual Reports by Parliamentary Booksellers ; Pilot Charts and Charts published by the Admiralty, by Messrs. J. D. Potter & Co.

† The publication of the Weekly Weather Report began in February 1878. Annual subscription, including Supplements and Appendices, post paid, 1878-1883, 12*s*. 6*d*. ; 1884–1887, 21*s*. 2*d*.

‡ The publication of the Monthly Weather Report was continued after 1887 as a Supplement to the Weekly Weather Report.

1. Periodical Publications—*continued.*

Reports of the *Meteorological Council*—continued.

1889–90 (No. 91), 7½*d.* 1890–91 (No. 99), 5½*d.* 1891–92 (No. 104), 6*d.* 1892–93 (No. 109), 8*d.* 1893–94 (No. 112), 7½*d.* 1894–95 (No. 119), 8½*d.* 1895–96 (No. 122), 8½*d.* 1896–97 (No. 130), 8*d.* 1897–98 (No. 136), 11*d.* 1898–99 (No. 140), 7½*d.* 1899–1900 (No. 147), 11½*d.* 1900–01 (No. 153), 1*s.* 1½*d.* 1901–02 (No. 158), 1*s.* 2*d.* 1902–03 (No. 166), 11*d.* 1903–04 (No. 171). (In the Press.)

Observatories and Stations.

*Hourly Readings from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council :—

1881. (Official, No. 51.) Part I., 10*s.* 6*d.*; Parts II., III., and IV., 21*s.* each
1882. (No. 54.) Parts I. and II., 20*s.* each; III., 22*s.* 6*d.*; IV., 26*s.*
1883. (No. 63.) Parts I., II., and III., 21*s.* each; IV., 30*s.*
1884. (No. 70.) Part I., 12*s*; II., 10*s.*; III., 10*s.* 6*d.*; IV., 15*s.*
1885 (No. 74.) Parts I. and II., 11*s.* each; III., 10*s.* 6*d.*; IV., 12*s.*
1886. (No. 81.) Parts I., II., and III., 10*s.* 6*d.* each; IV., 12*s.* 6*d.*

Hourly Means of the Readings obtained from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council :—

1887 (Official, No. 94), 16*s.* 1888 (No. 97), 20*s.* 1889 (No. 103), 15*s.* 1890 (No. 105), 20*s.* 1891 (No. 113), 32*s.* 6*d.* 1892 (No. 118), 21*s.* 1893 (No. 126), 24*s.* 1894 (No. 131), 24*s.* 1895 (No. 135), 38*s.* 1896 (No. 141), 37*s.* 6*d.* 1897 (No. 145), 37*s.* 6*d.* 1898 (No. 151), 37*s.* 6*d.* 1899 (No. 157), 37*s.* 6*d.* 1900 (No. 163). 1901 (No. 170), 25*s.* each.

Meteorological Observations at Stations of the Second Order :—

†1876 (Official, No. 33*a*). 1877 (No. 33*b*). 1878 (No. 39), 20*s.* 1879 (No. 45), 20*s.* 1880 (No. 57), 34*s.* 6*d.* 1881 (No. 66), 35*s.* 1882 (No. 69), 35*s.* 1883 (No. 73), 30*s.* 1884 (No. 78), 32*s.* 1885 (No. 82), 31*s.* 1886 (No. 88), 25*s.* 1887 (No. 95), 24*s.* 1888 (No. 101), 22*s.* 1889 (No. 108), 34*s.* 1890 (No. 110), 34*s.* 1891 (No. 117), 30*s.* 1892 (No. 120), 27*s.* 1893 (No. 125), 27*s.* 1894 (No. 129), 27*s.* 1895 (No. 137), 22*s.* 6*d.* 1896 (No. 139), 21*s.* 1897 (No. 146), 22*s.* 1898 (No. 152), 22*s.* 6*d.* 1899 (No. 156), 22*s.* 6*d.* 1900 (No. 169). (In the Press.)

2. Occasional Publications and Reports.

ATLAS :—

Meteorological Atlas of the British Isles. (Official, No. 53. 1883.) 5*s.* 6*d.*

CONGRESSES, CONFERENCES, &c., Reports of Proceedings :—

Leipzig. 1872. (Non-Official, No. 6.) 1*s.*
Vienna. 1873. (Official, No. 21.) 1*s.*
Vienna and Utrecht. 1873 and 1874. (Non-Official, No. 9.) 1*s.* 6*d.*
London. 1874. Maritime Meteorology. (Official, No. 23.) 2*s.*
London. 1876. With Supplement. (Non-Official, No. 11.) 2*s.*
Utrecht. 1878. (Non-Official, No. 13.) 6*d.*
Rome. 1879. (Official, No. 36.) 1*s.* 6*d.*
Berne. 1880. (Non-Official, No. 14.) 1*s.*
Copenhagen. 1882. (Non-Official, No. 15.) 2*s.* 6*d.*
Paris. 1885. (Non-Official, No. 16.) 1*s.*
Zürich. 1888. (Non-Official, No. 17.) 4*d.*
Munich. 1891. (Official, No. 102.) 1*s.* 6*d.*
Upsala. 1894. (Official, No. 115.) 1*s.*
Paris. 1896. (Official, No. 127.) 1*s.*
St. Petersburg. 1899. (Official, No. 148.) 2*s.*
Southport. 1903. (Official, No. 164.) (In the Press.)

---

* For the years 1874–1880 the Hourly Readings were issued in lithographed form. Price 20*s.* per annum.

† The Observations at Stations of the Second Order for 1873–75 will be found in the Quarterly Weather Report for the respective years.

2. Occasional Publications and Reports—*continued.*

CONGRESSES, CONFERENCES, &c., Reports of Proceedings—*continued.*

Report on Weather Telegraphy and Storm Warnings. 1873. (Non-Official, No. 8.) 6*d.*

Reports . . . on Atmospheric Electricity, Maritime Meteorology, and Weather Telegraphy. 1878. (Non-Official, No. 12.) 2*s.*

FOG :—

London Fog Inquiry, 1901–03. (Official, No. 160, 1904) :—
Report of the Council, with Report by R. G. K. Lempfert, M.A. (1904).
Report by Captain Alfred Carpenter, R.N., D.S.O. (1903). 2*s.*

FOREIGN AND COLONIAL STATIONS :—

Contribution to the Meteorology of Japan.—By Staff-Com. Thomas H. Tizard, H.M.S. "Challenger." (Official, No. 28. 1876.) [Out of Print.]

Report on the Meteorology of Kerguelen Island.—By Rev. S. J. Perry, S. J., F.R.S. (Official, No. 37. 1879.) 3*s.*

Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers, and the Army Medical Department, 1852 - 1886. (Official, No. 83. 1890.) 23*s.*

Meteorological Observations made at Sanchez, Samaná Bay, St. Domingo, 1886–1888.—By the late W. Reid, M.D. (Official, No. 89. 1890.) 8*s.* 6*d.*

Climatological Observations in Tropical Africa, 1900–1902, with Summaries and Map.—By E. G. Ravenstein, F.R.G.S. (Official, No. 165. 1904.) 6*s.*

RAINFALL :—

Rainfall Tables of the British Isles for 1866-80. Compiled by G. J. Symons, F.R.S. (Official, No. 47. 1883.) 7*s.* 6*d.*

Rainfall Tables of the British Islands, 1866–90. (Official, No. 114. 1897.) 6*s.*

Diurnal Range of Rain at the Seven Observatories in connection with the Meteorological Office, 1871–1890. (Official, No. 143. 1900.) 2*s.* 6*d.*

SUNSHINE :—

Sunshine Records of the United Kingdom for 1881. (Official, No. 56. 1883.) 4*s.*

Ten Years' Sunshine in the British Isles, 1881–90. (Official, No. 98. 1891.) 2*s.*

TEMPERATURE :—

Temperature Tables for the British Islands. 10*s.* 6*d.* Supplement :—Difference Tables for each Five Years for the Extrapolation of Mean Values. 3*s.* (Official, No. 154. 1902.)

Barometer Manual. (Official No. 8, 1871.) [Out of print.]

3. Instructions in the use of Instruments, &c.

Instructions for Meteorological Telegraphy. New Edition. 1891. (Official, No. 2.) Prepared for the use of observers exclusively.

Fishery Barometer Manual. New Edition. 1887. (Official, No. 3.) 6*d.*

Instructions in the use of Meteorological Instruments. Reprinted 1892. (Official, No. 24.) [Out of print.]

Barometer Manual for the use of Seamen. With an Appendix on the Thermometer, Hygrometer, and Hydrometer. Fourth Edition, extensively revised. 1902. (Official, No. 61.) 3*d.*

Hints to Meteorological Observers in Tropical Africa, with Instructions for taking Observations, and Notes on Methods of Recording Lake Levels. 1902. (Official, No. 162.) 9*d.*

FORECASTING :—

Aids to the Study and Forecast of Weather.—By W. Clement Ley, M.A. (Official, No. 40. 1880.) 1*s.*

Principles of Forecasting by means of Weather Charts.—By the Hon. Ralph Abercromby, F.R.Met.Soc. Second Edition, Revised. 1885. (Official, No. 60.) [Out of print.]

4. Marine Meteorology.

CHARTS :—

Arabian Sea :—

Daily Weather Charts for the period of six weeks ending June 25, 1885, to illustrate the tracks of two cyclones in the Arabian Sea. (Official, No. 80. 1891.) 10*s.*

Atlantic :—

Charts of Meteorological Data for the Nine 10° Squares of the Atlantic, which lie between 20° N. and 10° S., and extend from 10° to 40° W., with accompanying Remarks, ending with the Best Routes across the Equator. (Official, No. 27. 1876.) 24*s.*

Monthly Current Charts for the Atlantic Ocean. From information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 132. 1897.) 7*s.*

Atlantic (North) :—

Currents and Surface Temperature of the North Atlantic Ocean, from the Equator to Latitude 40° N., for each Month of the Year. With a General Current Chart. (Official, No. 12. 1872.) 2*s.* 6*d.*

Discussion of the Meteorology of that Part of the Atlantic lying North of 30° N., for the eleven days ending 8th February, 1870. With Charts. (Official, No. 13. 1872.) 5*s.*

Charts of Meteorological Data for Square 3. Lat. 0°–10° N., Long. 20°–30° W., and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (Official, No. 20. 1874.) 20*s.*

Meteorology of the North Atlantic during August, 1873, with 31 Synoptic Charts. (Official, No. 32. 1878.) With Book of Charts. 15*s.*

Synchronous Weather Charts of the North Atlantic and the Adjacent Continents, 1st August, 1882, to 3rd September, 1883. Parts I. to IV. (33 sheets each). (Official, No. 71. 1886.) 17*s.* each part.

Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898-99. (Official, No. 142. 1901.) 6*s.* 6*d.*

Atlantic (South) :—

Charts showing the Surface Temperature of the South Atlantic Ocean in each month of the Year. (Official, No. 4. 1869.) 2*s.* 6*d.*

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 159. 1902.) 7*s.*

Atlantic, Indian, and Pacific Oceans :—

Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (Official, No. 59. 1884.) 21*s.*

Charts showing the Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans. (Official, No. 76. 1887.) 10*s.* 6*d.* Supplementary Chart. 6*d.*

Atlantic (North) and Mediterranean :—

Monthly Pilot Charts, commencing April, 1901. (Official, No. 149.) 6*d.* each. Subscription for one year, 5*s.* (exclusive of postage).

Indian Ocean :—

Monthly Current Charts for the Indian Ocean. From Information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 124. 1896.) 7*s.*

Indian Ocean (North) :—

Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ras-Hafún. (Official, No. 92. 1891.) 6*s.*

Monthly Wind Chart of the South Atlantic. Published by the Admiralty. (Official No. 168, 1903.) 6*d.* each.

4. Marine Meteorology—*continued.*

CHARTS—*continued.*

Indian Ocean (South) :—

Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope, with accompanying Remarks. (Official, No. 43. 1882.) Charts, 25*s.*; Remarks, 7*s.*

Cyclone Tracks in the South Indian Ocean. From information compiled by Dr. Meldrum, C.M.G., F.R.S. (Official, No. 90. 1891.) 7*s.*

Pacific Ocean :—

Quarterly Current Charts for the Pacific Ocean. From Information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 134. 1897.) 5*s.*

Wind Charts for the Coastal Regions of South America from information collated and prepared in the Meteorological Office. Published by the Admiralty. (Official, No. 159. 1902.) 7*s.*

Red Sea :—

Meteorological Charts of the Red Sea. (Official, No. 106. 1895.) 21*s.*

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (Official, No. 123. 1899.) 12*s.*

OTHER PUBLICATIONS ON MARINE METEOROLOGY :—

Report to the Committee of the Meteorological Office on the Meteorology of the North Atlantic.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 2. 1869.) 1*s.*

Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of South America. (Official, No. 11. 1871.) 2*s.* 6*d.*

Routes for Steamers from Aden to the Straits of Sunda and back. Translated from a Paper issued by the R. Meteor. Inst. of the Netherlands. (Non Official, No. 4. 1872.) [Out of print.]

On the Winds, &c. of the North Atlantic along the Tracks of Steamers from the Channel to New York. Translated from a Paper issued by the Deutsche Seewarte, Hamburg. (Non-Official, No. 5. 1872.) 6*d.*

Notes on the Form of Cyclones in the Southern Indian Ocean.—By C. Meldrum, M.A., F.R.S. (Non-Official, No. 7. 1873.) [Out of print.]

Contributions to our Knowledge of the Meteorology of the Antarctic Regions. (Official, No. 18. 1873.) 2*s.*

On the Physical Geography of the part of the Atlantic which lies between 20° N. and 10° S. and extends from 10° to 40° W. A Paper read before the British Association at Bristol, in August, 1875.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 10. 1876.) [Out of print.]

Contributions to our Knowledge of the Meteorology of the Arctic Regions. (Official, No. 34. 1885.) Vol. I.: Part I., 2*s.*; II., 10*s.*; III. and V., 6*s.* each; IV., 5*s.*

Report on the Gales experienced in the Ocean District adjacent to the Cape of Good Hope between Lat. 30° and 50° S., and Long. 10° and 40° E.—By Capt. H. Toynbee, F.R.A.S. (Official, No. 44. 1882.) 7*s.* 6*d.*

5. Miscellaneous Publications.

Report of an Inquiry into the Connexion between Strong Winds and Barometrical Differences.—By Robert H. Scott. (Non-Official, No. 1. 1868.) 6*d.*

Report to the Committee of the Meteorological Office on the use of Isobaric Curves.—By Capt. H. Toynbee, F.R.A.S. (Non-Official, No. 3. 1869.) [Out of print.]

Report on the Storm of October 13-14, 1881.—By Robert H. Scott, F.R.S (Official, No. 46. 1882.) 1*s.* 6*d.*

Harmonic Analysis of Hourly Observations of Air Temperature and of Pressure at British Observatories. (Official, No. 93. 1891.) 12*s.*

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Excellent" during the year ending March 31, 1904. Figures are attached to the name of each observer to show the number of "Excellent" logs which he has supplied during the whole time of his co-operation with the Office.

Name of Captain.	Number of "Excellent" Logs.	Ship.
Alexander, D.	2	S.S. Clan Grant.
Alsop, J. J.	6	Hermione.
Andersen, O. E.	21	S.S. Olivemoor.
Angus, T. S.	30	S.S. China.
Bailey, J. J.	1	S.S. Brooklyn City.
Belding, R.	6	Harold.
Blight, F.	1	S.S. Assyria.
Caie, G.	2	S.S. Hibernian.
Clarke, W. H.	7	S.S. Cevic.
Corner, F. W., R.N.R.	1	Macquarie.
De Carteret, W. G. Squares ...	21	S.S. Minia.
Eagleton, H.	1	S.S. Trojan Prince.
Edmonds, T. D....	1	S.S. Courtfield.
Hurford, R.	4	S.S. Romney.
Lyon, F. C. A., R.N.R. ...	4	S.S. Arcadia.
Millican, J. W.	24	S.S Greta Holme.
Mullan, F. C., F.R.G.S. ...	14	S.S. Ramsay.
Pattman, R.	2	Loch Torridon.
Phillips, J. D. S.	2	S.S. Aorangi.
Robinson, J. C....	4	S.S. Walmer Castle.
Simmons, S. H.	1	S.S. Port Maria.
Simpson, A.	38	S.S. Moravian.
Webster, G. S., R.N.R.... ...	1	S.S. Mount Royal.
Young, W. G., ...	1	S.S. Clan Gordon.

APPENDIX IV.

METEOROLOGICAL REGISTERS received during the Year 1903–04.

(1)—*From the* ROYAL NAVY.—*Meteorological Logs* (5).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Dart," H.M.S. ...	F. C. O. Pasco, Commander.	Surgeon Forrester; Lieutenants R. Aylen, Stainer, McKenzie Grieve.	1	7 5	Surveying in Australian Waters.
"Egeria," H.M.S.	C. H. Simpson ... ... J. F. Parry	Lieutenant J. H. Knight; Sub-Lieutenant V. Brandon; Petty Officers Bates, Bowen, Brassington, Cook, Crome, Elby, and Walsh.	2	12 15	At Esquimalt.
"Goldfinch," H.M.S.	F. C. Learmonth ...	Assistant-Paymaster R. Sydney Smith	2	11 4	From Malta to W. Coast of Africa and Newfoundland.

METEOROLOGICAL REGISTERS received during the Year 1903-04—*continued.*

(2.)—*From the Mercantile Marine.—Meteorological Logs* (172).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Active," S.S. ...	Alex. Murray	— Kinness	1	1 20	To Hudson's Straits.
"Alabama," S.S. ...	R. Götsche	H. Petersen	2	5 6	To United States.
"Albertville," S.S. ...	G. B. Sparrow	A. Hayes; S Shepard; G. Richards; W. Horth.	2	5 18	To the Congo.
"Alcinous"	R. C. MacCormaig ...	... ...	1	7 4	To San Francisco and Melbourne.
"Alliance"	R. Harley Potter ...	A. P. Horridge; Owen Williams ...	1	6 27	To Adelaide, returning to $\frac{38^\circ N.}{39^\circ W.}$
"Alnwick Castle," S.S.	Bernard Burt, R.N.R. ...	C. M. Roberts	2	3 18	To Natal.
"Aorangi," S.S. ...	J. D. Sydney Phillips ...	S. Mortimer; E. C. Mason; A. Shipwright; G. M. Clayton.	2	8 17	Between Australia and British Columbia.
"Arcadia," S.S. ...	F. C. A. Lyon, R.N.R. ...	H. N. Rivers, R.N.R.; A. Thompson, R.N.R.; C. G. Smith, R.N.R.; W. H. F. Warren, R.N.R.; R. T. Fallon, R.N.R.; E. B. Drake; H. M. N. Hood, R.N.R.; E. J. Stuart, R.N.R.	2	5 13	To Sydney, *viâ* Suez.
"Argyle," S.S. ...	E. Barron, R.N.R. ...	... ...	1	3 28	To Baltic Ports.
"Assyria," S.S. ...	F. S. Blight	Edwin H. Hill	3	6 21	To Calcutta, *viâ* Suez.
"Astoria," S.S. ...	J. Wilson, R.N.R. ...	R. A. Lewis	2	5 17	To New York.
"Atrato," S.S. ...	H. Rudge	F. Bateman; T. Buret	1	2 29	To West Indies.
"Australia," S.S. (P. & O.).	F. Cole	E. M. Hussey-Cooper, R.N.R.; D. Scratton; L. C. Bedwell; E. Robinson; R. J. Pearce; R. C. Hulme-Gorden.	3	8 18	To Sydney, *viâ* Suez.

"Ava," S.S.	D. MacAlister	... ...	2	3	6	From Liverpool to $\frac{8°\ N.}{85°\ E.}$.
"Britannia," S.S. (P. & O.).	F. H. Seymour	C. W. Cartwright; L. R. Gardiner; E. C. Gardner; N. B. Northcote; T. Willshire; R. S. Ward; H. Hillcoat.	3	6	17	To Rangoon, *viâ* Suez. To Sydney, *viâ* Suez. To Bombay, *viâ* Suez.
"Britannia," S.S. ...	A. C. Turner, R.N.R. ...	T. A. Stirling; D. S. McQueen ...	1	1	26	To Bombay, *viâ* Suez.
"Brooklyn City," S.S.	J. J. Bailey	N. D. Kellock; A. H. Davies ...	1	3	7	To New York.
"Caithness," S.S. ...	W. T. Atkinson ...	J. R. Jones; D. McGillwray ...	1	2	13	To Buenos Aires.
"Campania," S.S. ...	J. B. Watt	— Manley; — Webb	1	2	29	To New York.
"Carisbrook Castle," S.S.	J. Rose ... ... J. Tyson...	F. Tunbridge; H. Linklater; E. A. Comley; S. Symons; J. MacMahon.	3	10	14	To Cape Town.
"Cevic," S.S.	W. H. Clarke	L. Vaughan Davies; P. J. Doyle; W. Molley.	2	7	15	To New York.
"Chicago City," S.S.	W. Hunter	N. D. Kellock; G. C. Knott	1	3	12	" "
"Chickahominy," S.S.	E. H. Jones	P. Brond	1	2	17	To the West Indies.
"China," S.S. ...	T. S. Angus	A. V. Worthington; J. McGregor; C. H. Cochrane.	1	3	4	To Australia, *viâ* Suez.
"Clan Ferguson," S.S.	W. McAllister	S. P. Elliott; W. Crichton; A. H. MacColl.	1	3	8	To New York, South Africa, India, and home *viâ* Suez.
"Clan Gordon," S.S.	— Young	J. Wilson; S. Kersey; W. Haines ...	1	2	13	To Calcutta, *viâ* Suez.
"Clan Grant," S.S. ...	David Alexander ...	A. Thomson; C. Duggan; E. Lawson; G. Shearer; E. Nosworthy.	2	6	9	To India, *viâ* Cape of Good Hope, returning *viâ* Suez.
"Clan Maclachlan," S.S.	F. W. Barber	... ...	1	3	5	To South Africa, India, *viâ* Suez.
"Clan Shaw," S.S. ...	C. Sommerfelt	G. Scott; C. Laird; D. Macfarlane...	1	2	15	To Bombay and Madras, *viâ* Suez.
"Clan Urquhart," S.S.	J. A. MacPherson ...	H. J. Wilson; C. Stewart; W. Smith; J. Taylor.	1	2	19	To Cape Town, Bombay, and home, *viâ* Suez.
"Conway" ...	A. T. Miller, R.N. ... H. W. Broadbent, R.N.R.	Cadets	2	3	20	Off Birkenhead.
"Courtfield," S.S.	W. Sheldrake ... ... W. Attree ... ... T. D. Edmonds	J. W. Anderson; T. P. Hunter; W. Rand; W. Ebbitt; E. H. Hogue.	3	7	0	To Bombay *viâ* Cape of Good Hope, and back, *viâ* Suez. To Galveston, Texas, U.S.
"Danube," S.S. ...	L. R. Dickinson ...	L. H. J. Tinney; F. K. Sanders, R.N.R; A. Etheridge, R.N.R.	1	3	20	To Monte Video.

METEOROLOGICAL REGISTERS received during the Year 1903-04—*continued.*

(2.)—*From the Mercantile Marine.—Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Den of Seaton," S.S.	P. R. Singer	J. Aitken	1	5 –	To Calcutta, *vid* Suez.
"Diana," S.S. ...	Wm. Adams	... ...	1	6 4	To Arctic Regions (B.N. America).
"Don," Barque ...	W. Chamberlin... ...	... ...	1	3 17	From New Zealand, *vid* Cape Horn.
"Dorothy," S.S. ...	J. N. Wilson	J. C. Naylor ; P. Barraclough ; H. H. Henson.	1	3 9	To the Black Sea.
"Earl Derby," Barque	W. C. Jackson	J. Kane ; D. MacDonald	1	4 2	From Savannah to Buenos Aires and Sydney.
"East Point," S.S. ...	L. R. W. Beavis... ...	H. A. Dawes	2	6 7	To Philadelphia.
"Eclipse," S.S. ...	Wm. Milne	... ...	1	6 18	To Arctic Regions (B.N America).
"Egypt," S.S. ...	G. L. Langborne ... J. R. Lendon	J. B. Browning ; A. Warren ; F. M. Moore ; C. Desborough ; G. W. Taylor ; G. Budgen ; K. A. Yates.	3	5 13	To Bombay, *via* Suez.
"Empress of China," S.S.	R. Archibald, R.N.R. ...	C. J. White ; A. W. McKenny, R.N.R.; F. W. Wilsden ; W. H. Bramwell ; G. E. Bridge.	2	7 7	Between Columbia, Japan, China.
"Empress of India," S.S.	O. P. Marshall, R.N.R....	J. C. Davison	3	11 25	Between British Columbia, Japan and China.
"Empress of Japan," S.S.	H. Pybus, R.N.R. ...	G. E. Bridge ; R. M. Pope ; W. D. Hopcraft ; W. Jones ; A. H. Reed ; A. Hailey.	1	4 –	Between China and British Columbia.
"Erne"	G. T. Dann	Jas. McCalmont	1	4 4	Calcutta to Demerara and homeward to $\frac{32^\circ\ N.}{48^\circ\ W.}$, *vid* Cape of Good Hope.

"European," S.S. ...	D. Edwards	... ...	1	1	7	To New Orleans.
"Glanton," S.S. ...	Wm. Leisk	B. T. Morris and D. Jones	1	8	26	To Madeira, Sapelo (U.S.A.), Sydney (C.B.). To Pensacola (Flor.), thence to and from Tampico (Mexico), to Newport News (U.S.) and Bremen.
"Goorkha," S.S. (B.I.S. Nav. Co.)	T. Kerr, R.N.R.... ... G. H. Armstrong ...	J. Ross; A. Darling; A. Pitt; — Vincent; J. Black; H. Jackson.	2	5	10	To Calcutta, *via* Suez. To Cape Town.
"Goorkha," S.S. (U.C.S.S. Co.) ...	F. J. Moseley, R.N.R. ...	A. Barron; W. Watson Black; J. V. Black; H. L. Scholefield; H. E. Jackson.	2	4	20	" "
"Greta Holme," S.S.	J. W. Millican	Jas. Roberts; J. Tweedie; T. Stark; W. E. Parkes.	2	10	3	Between Argentina and South Africa.
"Harmony," S.S. ...	J. C. Jackson	— Farmer; — Murphy	2	3	21	To Labrador.
"Harold," Barque ...	R. Belding	— Guillie; — Kirk	1	12	–	To Australia, Chili, British Columbia, to $\frac{17^\circ\ N.}{38^\circ\ W.}$
"Hermione"	J. J. Alsop	E. Penny	1	7	9	To New Zealand.
"Hibernian," S.S. ...	Geo. Caie	J. Gallacher; D. Hutton; W. G. Edwards.	1	1	15	To River Plate.
"Hilarius," S.S. ...	C. K. Sergent	C. A. Boulton; W. P. Evans; J. Johnstone; L. V. Morsch.	2	5	24	To Bombay, *viâ* Cape of Good Hope, returning *viâ* Suez. From Durban (S. Africa) to Buenos Ayres and New York.
"India," S.S.... ...	F. W. Vibert, R.N.R. ...	W. R. Le Mare; H. W. A. Clarke; C. M. Redhead; C. D. Forbes; J. Hallam; R. H. Hignett; E. H. Maas; H. E. Taylor; F. E. French; R. C. Dine.	4	10	4	To Sydney. To Bombay.
"Jason," S.S. ...	T. G. Steeves	S. T. Phillips; T. W. Phillips ...	1	3	19	To China, Japan, and Australia, *viâ* Suez.
"Knight of St. George," S.S.	John E. Hicks	Thos. Wilson	1	6	23	To and in Indian Seas, *viâ* Cape of Good Hope, and home, *viâ* Suez.

METEOROLOGICAL REGISTERS received during the Year 1903-04—*continued.*

(2.)—*From the Mercantile Marine.—Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"La Plata," S.S. ...	F. S. Newton	*J. Gair*; F. A. Bilton; W. Walker; E. Bridges; W. H. Macey.	1	3 29	To Colon and Panama.
"Loch Tay," S.S. ...	J. Stephens	... ...	1	2 29	To Ceylon, *viâ* Suez.
"Loch Tay," Barque..	T. C. Martin	R. H. Swanney...	1	6 23	To India, *viâ* Cape of Good Hope, and back, *viâ* Suez. To Melbourne, *viâ* Cape of Good Hope, returning *viâ* Cape Horn.
"Loch Torridon," Barque.	R. Pattman	*H. R.* Bowers, *R.N.R.*	1	7 24	To Adelaide, Newcastle (N.S.W.), From San Francisco to $\frac{12^\circ N.}{34^\circ W.}$
"Lord Roberts," S.S.	Jas. Davie	W. Mahood; W. E. Bowack; W. L. Clibborn; R. L. Hatton.	2	5 22	To Baltimore.
"Lutterworth," Barque.	G. H. B. Wood	... ...	1	1 24	To New Zealand, *viâ* Cape of Good Hope.
"Macduff," S.S. ...	R. Glegg	— Muir; — Steel; — Wylie ...	1	4 4	To Shanghai and New York, *viâ* Suez.
"Macquarie" ...	F. W. Corner, R.N.R. ...	— Marshall; — *Gaunt*; — Leech ..	1	3 6	To Sydney (outward).
"Maine," S.S. ...	F. J. Languedoc ...	H. A. Lloyd	1	4 3	To the Mediterranean.
"Manchester Shipper," S.S.	*L. Morton*	J. Payne; H. H. Herand; J. Bannerman-Watt.	1	3 22	To Montreal (1). To New Orleans (2).
"Merionethshire," S.S.	C. H. Burch	— Gibb; — Horne; — Nunn ...	1	3 24	To China, Japan, and Christmas Island, *viâ* Suez.
"Metis," S.S. ...	D. B. Marshall	R. S. Walton; J. N. Purvis	1	2 27	To South Africa, Mauritius, Bombay, and home, *viâ* Suez.
"Minia," S.S. ...	W. G. S. De Carteret ...	Jas. Adams; A. Cocks; J. Bowman; G. Hawes.	1	13 23	To British North America and on the Coasts.

"Moravian," S.S. ...	A. Simpson	G. A. Elrick; A. Corbett; R. R. Harrison.	2	6	5	To Australia, *viâ* Cape of Good Hope.
"Mount Royal," S.S.	G. S. Webster, R.N.R....	Jas. Gillies	1	1	14	To Galveston, U.S.
"Olivemoor," S.S. ...	O. E. Anderson... ...	G. Heatley; J. Mikkelsen	1	3	13	To Mediterranean Ports, Rotterdam, Mobile.
"Omrah," S.S.	F. S. Symons ... ... Colin Nicholson, R.N.R.	R. de V. Williams, R.N.R.; W. D. Seagar; Thos. Taylor; T. Withers, R.N.R.; R. McD. Suter, R.N.R.; R. J. Reeves; M. Brooke-Smith; H. Bird.	3	8	11	To Sydney, *viâ* Suez.
"Ophir," S.S. ...	F. W. Kershaw, R.N.R.	R. de V. Williams, R.N.R.; H. T. Jones; W. T. Cox, R.N.R.; R. McD. Suter, R.N.R.; R. J. Reeves; C. D. Pickering.	3	5	26	To Adelaide, *viâ* Suez. To Spitzbergen.
"Orient," S.S.	A. J. Coad, R.N.R. ... Colin Nicholson, R.N.R.	W. G. Cullimore; E. A. Seager; A. V. Cowell, R.N.R.; J. Avern; D. Dowdy; T. Taylor; A. H. Fraser.	2	4	18	To Sydney. To West Indies.
"Orinoco," S.S. ...	H. Davies	... ...	1	–	23	To Barbados.
"Ormuz," S.S.	W. S. Shelford, R.N.R. A. J. Coad, R.N.R.	R. de V. Williams, R.N.R.; P. N. Layton; W. de M. Baynham; J. Usborne; H. S. Seale; C. M. Graves; H. Rowe.	3	8	7	To Sydney, *viâ* Suez.
"Orontes," S.S. ...	J. F. Ruthven	J. H. Healey, R.N.R.; F. E. B. Owen; J. Burn, R.N.R.; D. Dowdy, R.N.R.; J. Hills; A. V. Cowell, R.N.R.; H. G Stenton; G. A. Leech.	3	8	21	" "
"Persia," S.S.... ...	G. Mitchell	G. K. Wilson; G. Watson; A. Shewan	2	5	17	To Calcutta *viâ* Suez.
"Port Antonio," S.S.	H. F. Bartlett	R. B. Skellon	2	7	21	To West Indies.
"Port Maria," S.S. ...	J. G. Parsons	B. G. Drake; W. G. Palmer; F. H. Swain; A. C. Threlfall; N. J. Sterner.	3	4	28	To "
"Port Royal," S.S. ...	J. G. Parsons	L. H. Sumnor; B. G. Drake; W. G. Palmer; J. Sternor.	2	1	26	To "
"Ramsay," S.S. ...	F. C. Mullan	C. MacCarthy; A. Callaghan; T. Glover; H. Houchen.	4	10	8	To Black Sea, Bombay, and United States, *viâ* Suez.

METEOROLOGICAL REGISTERS received during the Year 1903-04—*continued.*

(2.)—*From the Mercantile Marine.—Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Rangoon," S.S. ...	W. Duguid	— Reed; — McLeish; — Tarson ...	2	4 13	To Rangoon, *viâ* Suez.
"Reynolds," S.S. ...	J. A. F. de Vine ...	Thos. Harrison; S. E. Stubbs; H. A. L. Bond.	2	4 12	To Cochin China, *viâ* Suez, returning to Port Said.
"Rodney," S.S. ...	A. C. Aikman	C. Jenkins; L. J. Clare	1	2 5	To Mediterranean.
"Romney," S.S. ... (Bolton S.S. Co., Ltd.)	R. Hurford	G. L. Burnley; M. Weeks; F. C. P. Harris; F. W. Kelly.	4	5 23	To the Bosphorus.
"Romney," S.S. ... (L.B. and R.P.S.N. Co.)	R. Trenaman	J. Stone; J. M. Clubb; J. Taylor; J. Jones.	2	7 1	To Monte Video.
"Saba," S.S.	G. F. Golden, H. Dewar	A. A. Thomson; A. J. Davis; L. Holt; C. W. Maisey; E. E. Burt.	3	5 7	To West Indies and U.S.A.
"Sarmatian," S.S. ...	Edward Pitts, R.N.R. ...	T. Lewis; J. Williamson; D. J. Groves.	2	6 17	To and from Portland (Maine), Montreal, Boston (Mass.).
"Sekondi," S.S. ...	H. G. Harrison	T. Davies; H. Bennett; H. Honey; T. Search.	2	5 29	To S.W. Africa.
"Sophocles," S.S. ...	H. A. Schleman ...	A. Thompson; — Clark; H. C. Allingham; — Laird.	2	5 23	To Melbourne, *viâ* Cape of Good Hope.
"Soudan," S.S. ...	G. C. Henning, R.N.R....	A. P. Parmeter; E. G. Bentler; H. C. Davies; C. H. Allen; S. S. Marsden.	1	1 25	To Bombay, *viâ* Suez Canal.
"Tagus," S.S. ...	R. H. Stranger	C. Cleaner; R. Krules; F. Bateman; — Chasmar.	2	5 18	To Colon. / To Panama.
"Trojan Prince," S.S.	H. Eagleton	A. H. McKegg; T. Barnes; H. Elledge; H. Barnes; R. W. Porter.	1	3 5	From New York to Genoa.
"Victoria," S.S. ...	R. L. Haddock, R.N.R.	S. Finch, R.N.R.: E. C. Miller, R.N.R. C. W Clift, R.N.R.; L. MacIntosh; B. Elliot, R.N.R.; R. G. Axford; G. L. Kennedy; A. H. Harris; E. R. Lyndon.	3	8 7	To Sydney, *viâ* Suez.

"Walmer Castle," S.S.	J. C. Robinson	Wm. Graham; — Mumford; Maxwell; — Dowson.	1	3	10	To Cape Town.
"Weardale," S.S. ...	T. McDonald	... ...	1	3	12	To Stockholm and Alexandria.
"Wells City," S.S. ...	J. J. Carey	— Newton; — Owen	1	3	6	To New York.
"Wooda," S.S. ...	T. A. Tait	D. Blaikie; T. McGladdery; W. E. Jenkins.	4	12	26	To and at Odessa. From Teneriffe to U.S.A. and Hamburg.
"Worcester," Training Ship.	D. Wilson Barker, R.N.R.	Cadets	1	4	3	Off Greenhithe.
"Yucatan," S.S. ...	W. H. Harrocks ...	S. J. Holmes	2	4	3	To Central America.
		(3.)—Abbreviated Meteorological Registers.—From the Royal Navy (3).				
"Aboukir," H.M.S. ...	Sir C. J. G. Sawle, Bart., M.V.O., R.N.	Lieutenant Hon. F. G. P. Butler, R.N.	3	5	25	On the Mediterranean Station.
		From the Mercantile Marine (28).				
"Arana," S.S. ...	R. Walton	J. H. Scanes; W. Kershaw	5	7	2	To Mediterranean.
"China," S.S. ...	G. K. Wright, R.N.R. ...	A. V. Worthington	2	2	27	To Sydney, *viâ* Suez.
"Dora," S.S.	J. Goulding	J. S. Smith; B. Maughan	3	4	14	To Archangel. To U.S.A.
"Foylemore," S.S. ...	E. Ellis	J. Sallery	4	4	14	To Black Sea.
"Lily," S.S.	J. S. Smith	... ...	1	—	29	To Mediterranean Ports.
"Mount Royal," S.S.	G. S. Webster, R.N.R. ...	J. Gillies	4	2	20	To Montreal.
"Orient," S.S. ...	A. J. Coad, R.N.R. ...	W. J. Cullimon; E. A. Seager; J. Burn, R.N.R.; J. Avern.	1	—	29	To Mediterranean Ports and Lisbon.
"Oro," S.S.	W. Ransom Coleman ...	... ...	2	4	7	To China, returning to Aden. To East Siberia and Japan.
"Powhatan," S.S. ...	E. Irinich	O. V. Melchebeke	1	1	29	To Newport News, Virginia.
"Tambo," S.S. ...	F. J. Bayldon, R.N.R. ...	... ...	1	1	17	Pacific Islands, from Sydney.
"Virginian," S.S. ...	Franklin Prentice ...	Frank Baylis; W. Lloyd-Jones; W. A. Willett.	4	3	12	To Portland, Maine.

METEOROLOGICAL REGISTERS received during the year 1903-04 —*continued.*

(4.)—NORTH ATLANTIC REGISTERS :—FORM NO. 51 (1886).

Line	Ship.	Captain.	No. of Registers.
Aberdeen ...	Damascus	R. McKilliam	3
Allan	Bavarian	A. Macnicol	17
	Buenos Ayrean...	B. T Eastaway... ...	13
		G. Caie	
	Carthaginian	H. Gunson	16
	Corean	T. Pickering	11
	Corinthian	J. W. Nunan	5
	Damara	J. E. Gorst	16
	Hungarian	W. Wallace	16
	Ionian	J. Brown	16
	Laurentian	A. G. Stewart	15
	Livonian	J. Hamilton	5
	Monte Videan ...	B. Henry	10
		G. Caie	
	Norwegian	W. White	2
	Numidian	W. S. Main	14
	Orcadian	H. Imrie...	13
	Peruvian	J. Harrison	11
	Pomeranian ...	B. Henry	17
		W. White	
		T. Pickering	
	Pretorian	J. M. Johnston... ...	20
	Sardinian	T. Moar	15
	Sarmatian	E. Pitts, R.N.R... ...	10
	Siberian	E. Outram	8
	Sicilian	J. A. Fairfull	17
	Tunisian...	A. H. Vipond	16
American ...	Belgenland ...	J. B. Hill	9
		S. Anfindsen	
	Friesland	G. C. Apfeld	18
	Haverford ...	C. Lucas...	16
		H. O. Nielsen	
	New York	F. M. Passow	13
	Noordland	E. V. Roberts	18
	Philadelphia ...	A. R. Mills	22
		W. J. Roberts	
	St. Louis	J. C. Jamison	7
	St. Paul	J. C. Jamison	12
		W. J. Roberts	
	Westernland ...	W. H. Morle	10
		C. Lucas...	
		J. B. Hill	
Anchor	Astoria	J. Wilson, R.N.R. ...	11
	Ethiopia...	J. Lumsdane	18
"Arana" S.S. Co.	Arana	R. Walton	11
Atlantic Transport.	America...	J. T. J. Wylie	4
	Asian	J. E. Bartlett	7
	Mackinaw	A. T. Musselwhite ...	11
	Manhattan	G. T. Goudie	4
	Manitou... ...	E. G. Cannons	8
		T. F. Gates	

METEOROLOGICAL REGISTERS received during the year 1903–04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Atlantic Transport—*cont.*	Marquette ...	P. G. Lowe	6
		E. G. Cannons	
	Maryland ...	O. P. Clarke	16
		S. W. Watkins	
	Massachusetts	F. W. Richardson ...	5
	Menominee	L. T. Lucas	8
	Mesaba	F. W. Tubbs	1
	Michigan	S. W. Watkins	2
	Minneapolis	T. F. Gates	20
	Minnehaha	J. Robinson	11
	Minnesota	F. C. Pike	13
	Minnetonka	S. Layland	21
	Mississippi	J. B. Findley	4
	Montana...	P. Laverock	13
Austin Friars S.S. Co.	Shrewsbury	G. H. Sheppard ...	1
Bailey & Leetham	Argyle	C. Barron, R.N.R. ...	5
"Bellailsa" S.S. Co.	Bellailsa...	O. O. Aagaard	7
"Bellona" S.S. Co.	Bellona	F. Rolls	4
Booth S.S. Co. ...	Amazonense	W. J. Hughes	1
	Dominic...	G. C. Westray	8
Brightman C.E....	Zero	J. Hutchison	1
	Zuleika	J. Hutchison	1
Bristol "City"...	Boston City ...	J. Winscombe	4
		S. Watkins	
	Llandaff City	A. Andrews	6
British and Burmese.	Mandalay	R. Leslie...	6
	Rangoon...	W. Duguid	4
Bucknall ...	Bloemfontein	G. E. Roberts, R.N.R. ...	4
Canadian-Pacific Railway Co.	Lake Erie	F. Carey	18
	Monmouth	C. E. Birchman... ...	7
	Monteagle	H. Parry...	12
	Montreal	J. A. Murray	2
Chesapeake and Ohio S.S. Co.	Powhatan	E. Trinick	5
City	City of Khios	D. Cruickshank... ...	7
	City of Madrid... ...	W. Greenhorn	2
Clan	Clan Gordon	W. G. Young	1
	Clan Macniel	S. Beer	2
	Clan Mathison	G. Haywood	1

METEOROLOGICAL REGISTERS received during the year 1903-04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Clan—*cont.*	Clan Murray	S. Beer	1
	Clan Ogilvy	W. J. Lennox	8
	Clan Stuart	W. J. Lennox	5
"Crown" S.S. Co.	Yanariva	G. Grindlay	6
Cunard	Aurania	T. Potter	4
	Campania	J. B. Watt	10
	Carpathia	J. C. Barr	4
	Cherbourg	J. S. Carbines	3
	Cypria	J. Barlow	16
	Ivernia	T. Stephens	9
		G. F. Jeffries	
	Lucania	A. McKay	13
		J. B. Watt	
	Pavia	D. P. Thomson, R.N.R.	4
	Saragossa ...	W. Williams	6
		H. Letson	
	Saxonia	W. B. Cresser, R.N.R. ...	2
	Tyria	W. H. Bacon	10
		J. S. Carbines	
	Ultonia	G. F. Jeffries	15
		W. B. Cresser, R.N.R. ...	
		D. Dow, R.N.R.... ...	
	Umbria	T. C. Dutton	12
		T. Stephens	
	Veria	T. Hewitson	8
Dixon Sir Daniel	Belfast	J. B. Boal	8
	Larne	C. W. S. Fausset ...	2
Dominion ...	Canada	R. O. Jones	15
	Columbus	J. McAuley	2
	Commonwealth...	J. McAuley	10
		E. Maddox	
	Cornishman	J. H. A. Thornton ...	4
	Dominion	W. L. Mendus	1
	Irishman	J. O. Williams	13
	Kensington	J. A. Broomhead ...	12
	Merion	J. Dann	3
	New England	J. James...	12
	Norseman	J. Evans...	12
	Ottoman...	T. Howell	2
	Southwark	J. Dann	8
	Vancouver ...	D. McDonald	7
		W. Japha	
Elder Dompster...	Albertville	G. B. Sparrow	4
	Fantee	H. A. Yardley	5
	Lake Erie	F. Carey	2
	Montcalm	A. E. Evans	14
	Montenegro	J. Clare	8
	Montezuma	W. D. Jones	2
	Montreal	J. A. Murray	8
	Port Antonio ...	H. F. Bartlett	8
		J. G. Parsons	
		W. R. Rowe	

METEOROLOGICAL REGISTERS received during the year 1903–04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Elder Dempster —*cont.*	Port Maria	?	1
	Port Morant	W. R. Rowe	5
	Port Royal ...	J. G. Parsons	7
		W. R. Rowe	
	Roquelle	W. E. Potter	2
	Sekondi	H. G. Harrison	2
	Yoruba	G. A. Cotterell	1
Elders & Fyffes Shipping (Ltd.)	Appomattox	H. Neale...	2
English & American Shipping Co.	Bona	W. J. Beavan, R.N.R. ...	1
	Inca	G. Muir	5
"Ethel Radcliffe" S.S. Co.	Ethel Radcliffe... ...	J. Wood	1
"Forest" S.S. Co.	Forest	W. Wood	1
Forwood Bros. ...	Orotava	H. C. Bennett, R.N.R....	23
General Steam Navigation Co.	Vesuvio	F. J. Carter	1
Gulf Transport...	Ikbal	A. Jennings	4
	Imani	T. B. Peabody	9
	Indore	C. Mytton	18
	Inkum	E. S. Pearse	3
	Irada	A. W. Roberts, R.N.R....	9
	Irak	A. Delargy	6
	Iran	C. M. M. Jacob	7
	Istrar	G. J. Perks	7
Harrison ...	Capella	— Boulton	3
	Colonial	C. S. Rhodes	8
	Cuban	T. W. Lofthouse ...	8
	Historian	J. Valiant	8
	Logician...	R. Owen...	2
	Musician	H. McKee	4
	Orion	J. Marshall	6
Holman, F. A. ...	Archtor	W. Sturgeon	4
Horsley	Montgomery	C. L. A. Lecoustre ...	2
Houston	Heraclides	H. C. Lockyer	1
	Hilarius	C. K. Sargent	1
	Hyanthes	W. Bywater	4
"Hurona" S.S. Co.	Hurona	J. Dorward	12
Irish Shipowners' Co.	Lord Downshire ...	H. Magill	4

METEOROLOGICAL REGISTERS received during the year 1903-04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
"Jacob Bright" S.S. Co.	Jacob Bright	L. Anderson	5
"Jacona" S.S. Co.	Jacona	W. Lindsay	5
Johnston ...	Foylemore	E. Ellis	7
	Rowanmore	W. Thomas	2
	Vedamore	W. Henry	15
Lamport & Holt	Phidias	A. Allen	3
Leyland	American	W. H. Howell	3
	Asian	J. E. Bartlett	5
	Darien	C. E. Shacklock ...	3
	Devonian	A. S. McConkey ...	16
	Jamaican	A. H. Highton	7
	Mayflower	G. W. Muir	12
	Nicaraguan	W. Japha	2
	Philadelphian	W. Dickinson	7
	Virginian	F. Prentice	4
	William Cliff	T. Chadwick	7
	Winifredian	F. Shepherd	8
	Yucatan	W. Harrocks	2
"Lobelia" S.S. Co.	Lobelia	F. H. Watson	4
Lund	Yarrawonga	W. G. Gilchrist	1
MacIver, D. ...	Tartary	T. Emery	1
Manchester ...	Manchester Commerce	J. G. Baxter	13
	Manchester Engineer	L. Morton	8
		— Ackraman	
	Manchester Market ...	M. Hikings	1
	Manchester Shipper ...	L. Morton	1
	Manchester Trader	F. Mann	8
		M. J. Swords	
Mediterranean & New York.	Pawnee	J. G. Cartwright ...	8
New Zealand Shipping Co.	Rimutaka	H. E. Greenstreet ...	2
"North Atlantic" S.S. Co.	Mineola	J. W. E. Dickens ...	2
Orient	Orient	A. J. Coad, R.N.R. ...	1
	Ophir	F. W. Kershaw, R.N.R.	1
Peninsular and Oriental.	Arabia	T. Leigh	1
	Banca	E. P. Martin, R.N.R. ...	1
	Britannia	F. H. Seymour	6
	Caledonia	E. H. Gordon	1
	China	T. S. Angus	2

METEOROLOGICAL REGISTERS received during the year 1903-04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain	No. of Registers.
Peninsular and Oriental—*cont.*	Egypt	G. L. Langbourne ...	13
		J. R. Lendon	
	Himalaya	W. L. Brown, R.N.R. ...	6
	Japan	E. P. Martin, R.N.R. ...	4
	Syria	W. H. Haughton, R.N.R.	3
Philadelphia Transatlantic.	North Point	W. E. Robertson ...	16
"Pinta" S.S. Co.	Pinta	J. E. Dothie	5
Prince	Egyptian Prince ...	H. M. Walker	2
	Grecian Prince... ...	A. McMillan	1
	Italian Prince	C. B. Andersson ...	5
	Moorish Prince... ...	W. Barrett	9
	Napolitan Prince ...	H. Eagleton, R.N.R. ...	1
	Norman Prince... ..	W. Gill	2
	Ocean Prince	R. Kirkwood	6
	Royal Prince	A. B. W. Sheppard, R.N.R.	9
	Sicilian Prince	W. Hanks	6
	Trojan Prince	H. Eagleton, R.N.R. ...	4
Pyman, Bell & Co.	Eveline	B. Burgess	6
	Mab	W. Rasmussen	7
Red Star... ...	Vaderland	R. C. Ehoff	13
Ropner	Kirkby	O. N. Pettersson ...	12
Rover Shipping Co.	Inchkeith	F. G. Major	6
Royal Mail Steam Packet Co.	Atrato	H. E. Rudge	8
	Clyde	C. S. Tindall	6
	Danube	L. R. Dickinson ...	11
	Magdalena	J. Pope	16
	Orinoco	H. Davies	2
	Severn	J. Thomas	2
	Tagus	R. H. Stranger	10
	Thames	F. W. Powles	6
	Trent	A. C. Farmer	8
	Tyne	W. H. B. Trigge, R.N.R.	2
"Saxoleine" S.S. Co.	Saxoleine	J. R. Waters	2
Talbot S.S. Co. ...	Cabral	J. R. Grant	2
Telegraph Construction and Maintenance Co.	Colonia	H. Woodcock	1
Trechmann ...	Emma	T. Martin	1
	Marian	T. Martin	3

METEOROLOGICAL REGISTERS received during the year 1903-04 —*continued.*

(4.)—North Atlantic Registers (Form No. 51)—*continued.*

Line.	Ship.	Captain.	No. of Registers.
Ulster S.S. Co. ...	Carrigan Head	S. Orr	11
Union-Castle ...	Arundel Castle...	T. Chope, R.N.R. ...	9
		R. Walls	
	Braemar Castle... ...	D. Wallace	10
	Briton	J. W. Creaghe	13
		J. Rose	
	Carisbrook Castle	J. Tyson...	9
		J. Rose	
	Galeka	J. H. Wilford, R.N.R....	9
	German	E. A. Sylvester... ...	1
	Guelph	J. W. Hague	7
	Pembroke Castle ...	R. Walls...	7
United S.S. Co....	Alabama	R. Götsche	7
"Ursula Bright" S.S. Co.	Ursula Bright	F. Coode...	5
Warren	Kansas	W. Waters	2
White Star ...	Afric	J. O. Carter, R.N.R. ...	5
	Arabic	B. F. Hayes, R.N.R. ...	8
	Bovic	D. Kerr	16
	Cedric	H. J. Haddock, C.B., R.N.R.	18
	Cevic	W. H. Clarke	20
	Cymric	T. P. Thompson ...	23
	Georgic	R. Nicol	11
		S. A. Anning, R.N.R. ...	
		F. R. Clarke, R.N.R. ...	
	Germanic	A. Hambelton. R.N.R....	12
	Majestic	E. J. Smith, R.N.R. ...	13
	Nomadic...	J. H. A. Thornton ...	11
	Oceanic	J. G. Cameron, R.N.R....	12
	Republic	J. McAuley	4
	Runic	D. Thomas, R.N.R. ...	2
		H. David, R.N.R. ...	
	Teutonic...	E. R. McKinstry, R.N.R.	22
	Victorian	G. J. Caven, R.N.R. ...	9
Wilson & Furness-Leyland.	Cambrian	E. B. Lee	16
	Columbian	R. F. Masters	9

APPENDIX V.

INSTRUMENTS supplied to the Royal Navy.

Per Account.	Barometers.	Aneroids.	Thermometers.			Screens.	Hydrometers.
			Ordinary.	Max.	Min.		
April 1st, 1903, afloat ...	253	766	1,692	478	460	301	66
Issued since	122	270	551	117	124	52	4
	375	1036	2,243	595	584	353	70
Returned since	107	227	355	104	105	24	—
April 1st, 1904, afloat ...	268	809	1,888	491	479	329	70

INSTRUMENTS supplied for use at Naval Stations.

April 1st, 1903, in use ...	80	95	275	44	64	10	14
Issued since	11	7	43	4	7	5	3
	91	102	318	48	71	15	17
Returned since	3	2	44	2	2	—	—
April 1st, 1904, in use ...	88	100	274	46	69	15	17

DISPOSITION of ADMIRALTY INSTRUMENTS on April 1st, 1904.

Afloat in Royal Navy ...	268	809	1,888	491	476	329	70
In use at stations	88	100	274	46	69	15	17
In store at M.O.	72	106	93	130	117	16	20
,, Portsmouth ...	14	36	95	49	57	13	—
,, Devonport ...	18	53	128	48	49	22	2
,, Chatham	29	52	150	51	53	26	12
,, Sheerness ...	5	11	21	7	7	11	6
,, Queenstown ...	4	8	15	7	7	2	—
,, Gibraltar	3	1	8	3	3	—	4
,, Malta	7	19	50	9	7	2	6
,, Bombay	2	2	13	2	5	2	4
,, Halifax	3	4	24	4	4	—	4
,, Bermuda ...	2	3	22	4	3	1	—
,, Jamaica	1	4	9	2	2	1	5
,, Cape of Good Hope	4	8	25	7	6	2	4
,, Trincomali ...	2	2	9	5	4	1	4
,, Hong Kong ...	15	32	57	16	15	11	5
,, Sydney	7	8	16	9	11	1	13
,, Esquimalt ...	4	12	20	3	4	2	4
Total April 1st, 1904 ...	548	1,270	2,917	893	899	457	178
Lost, &c., since April 1st, 1903	1	—	211	17	15	—	—
Under repair, April 1st, 1904	10	14	—	—	—	—	—

APPENDIX VI.

INSTRUMENTS supplied to the Mercantile Marine.

Per Account.	Barometers.	Thermometers.			Screens.	Hydrometers.
		Ordinary.	Max.	Min.		
April 1st, 1903, afloat	136	829	—	—	147	491
Issued since	74	460	—	—	59	271
	210	1,289	—	—	206	762
Returned since	64	306	—	—	34	181
April 1st, 1904, afloat	146	983	—	—	172	581

INSTRUMENTS at Stations: Telegraphic Reporting Stations, Observatories, Fishing Villages, &c.

April 1st, 1903, in use	327	373	69	81	106	7
Issued since	7	26	9	8	9	—
	334	399	78	89	115	7
Returned since	1	5	4	8	2	—
April 1st, 1904, in use	333*	394	74	81	113	7

DISPOSITION of INSTRUMENTS on April 1st, 1904.

In merchant ships	146	983	—	—	172	581
„ use at stations	333	394	74	81	113	7
„ store at M.O.	12	27	9	11	5	22
At Liverpool Agency	9	21	—	—	4	15
„ Glasgow „	11	43	—	—	10	36
„ Dundee „	4	11	—	—	—	17
„ Hull „	4	21	—	—	4	14
„ Cardiff „	2	20	—	—	6	10
„ Southampton „	6	25	—	—	7	10
„ Sunderland „	3	24	—	—	4	16
Total April 1st, 1904	539	1,569	83	92	325	728
Lost since April 1st, 1903	1	65	—	—	3	21
Under repair, April 1st, 1904 ...	—	—	—	—	—	—

* Of these barometers, 229 are lent for the use of seafaring communities at fishing villages and ports.

APPENDIX VII.

Report of Inspections of Stations in connexion with the Office, 1903.

The Telegraphic Reporting Stations, a number of Climatologica Stations, and the self-recording instruments at the Observatories and other stations were inspected during the summer of 1903.

The Inspectors were as follows :—

Observatories and Anemograph Stations.	Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory.
Districts 0, 1, and part of 6 ...	Dr. A. Buchan.
„ 2, and part of 4 ...	Mr. J. A. Curtis.
„ 3	Mr. R. G. K. Lempfert and Mr. W. Marriott.
„ 5	Mr. H. Harries and Mr. W. Marriott.
„ 7 and part of 6 ...	Mr. R. H. Curtis.
„ 8 „ „ 4 ...	Mr. F. J. Brodie.
„ 9, 10, and part of 8...	Capt. C. Hepworth.

The following notes, taken from the Inspectors' reports, refer to new stations or call attention to changes in the observing staff or other points of importance.

General Remarks by Dr. Buchan, Inspector of Scottish Stations.

Barometers :—The barometers at the stations were compared with inspector's standard No. 690, which continued to be in good order during the inspection, as shown by a comparison with the Standard barometer in Edinburgh at the beginning and at the end of the inspections. The Standard had been recently repaired and compared at Kew, and provided with a new box with india-rubber fittings adapted for greater safety in carriage. This arrangement has proved to be an eminently successful one. The barometer at Lairg, which was known to be out of order before inspection, was examined and put right.

Thermometers :—Those instruments were, as usual, read twice, first by the observer as they hang in the screen, and then by the inspector after they had been in water for the time specified in the table. The thermometers were found to be in good order. The inspector's new thermometer, No. 6,297, which is virtually free from instrumental error throughout the scale, proved to be a convenient and satisfactory instrument.

Hygrometers :—In all cases the dry and wet bulb thermometers were read as they hang in the screen, and immediately on its

being opened, with the gratifying result that these thermometers are well attended to. In many cases new dry and wet bulb thermometers had been sent to the stations in the beginning of last winter, the uncorrected readings of which closely agreed together.

GROUP A.—OBSERVATORIES.

Aberdeen, August 29th and September 1st.—It was found that the pointer attached to the free ends of the zinc rods for the temperature adjustment of the barograph, was loose, and the knife-edge dirty. The knife-edge and bearings were cleaned and re-polished, the glass pointer cemented in its bed, and all left in good working order again. To correct the change in the residuals due to the repair, &c., the mercury was raised an amount equivalent to a measurement of 0·06 inch on the curves, and the residuals now average about 0·005 inch.

There is considerable back-lash with the direction fan-spindle of the anemometer, and the endless worm on the spindle is much worn.

Armagh, September 18th–19th.—Everything at this station was in good order.

Since the last inspection a good many of the trees surrounding the sunshine recorder have been topped, and the work is still being continued.

As regards earth temperatures, Dr. Dreyer informed me that there are no thermometers at the observatory suitable for this purpose, but that he would be willing to take daily observations if the Council supplied the necessary instruments.

A suitable site could be obtained on the grass plot near to the Stevenson screen. The sub-soil is a uniform and very compact clay, and extends to a considerable depth. It is quite dry as far as 6 feet down, as shown by the space around the pillar which supports the equatorial instrument, and which is about 20 feet distant.

Ben Nevis (Report by Dr. Buchan), August 18th.—The work is well understood by all the observers and is carefully and accurately done.

Mr. Watt reports that the extensive repairs and renovations which were recently ordered by the Directors are well in hand, and when completed will add greatly to the comfort of the observers.

Falmouth, September 9th–16th.—Here the instruments were all in good order, and the photography was up to the usual standard of excellence of this observatory.

Fort William, August 21st–23rd (Mr. Constable).—The clocks of both barograph and thermograph decidedly required attention and cleaning.

The beat of the thermograph clock was bad, and the crutch bent. This was put right, and its performance is now much improved.

Endeavours were made to improve the dry-bulb zero line.

The diaphragm on barometer-tube was shifted lower down.

New burners for the six lamps are wanted.

The photography seems to have improved of late ; I left written particulars fully describing the best procedure, and if these instructions are carefully carried out the improvement noted should prove permanent.

It was found that the Beckley rain-gauge emptied at about 0·195 inch instead of 0·200 inch. This was rectified as far as the thread would allow, and the emptying may now be considered as practically correct.

August 21st–22nd (Dr. Buchan).—The instruments were all in excellent order, and the observations are made punctually, carefully, and correctly.

Glasgow, August 17th–19th.—The "temperature-bar" of the barograph required taking down, and the diaphragm was removed and tube cleaned.

I found that the wet-bulb dots of the thermograph were out of focus, but I had to take off the rack of the lens to correct this ; the subsequent curve showed an improvement.

Kew, October 28th.—Instruments all in good order. The wet-bulb standard thermometer was broken in March. Another Kew standard, No. 788, was fitted up on April 24th, a spare thermometer being used temporarily. The shade maximum, No. 19,081, in use in the thermograph screen for many years, was removed in May as its action had become uncertain, the column persisting in joining-up. It was replaced by maximum Hicks, No. 872,334.

Oxford, August 10th.—The self-recording meteorological instruments were all in very good order, and the curves satisfactory.

Stonyhurst, September 16th and 17th.—At this observatory all the instruments were going well, and the photography was good.

The standard wet-bulb thermometer for eye observations was accidentally broken on September 3rd, and the fact was duly reported to the Meteorological Office by the Rev. W. Sidgreaves. Another thermometer having a small spherical bulb was fitted up pending the arrival of a new standard. I entirely dismounted the exterior portions of the anemometer and found that all the bearings were well lubricated. As reported on my last visit, the direction fans are rapidly wearing away and one or two of the blades are now badly corroded, so that new fans should be supplied as soon as practicable.* After oiling the clock and recording apparatus, the orientation was examined and found correct.

---

* New fans have now been supplied.

Valencia, September 26th–29th.—The instruments were in good order.

The anemograph required painting externally, which was arranged to be done after the inspection, and at the same time Mr. Cullum promised to get one of the ties, which had just given way, mended.

Group B.—Additional Anemograph Stations.

Alnwick Castle, August 14th-15th and September 2nd.—The Velocity traces appear to have been irregular since last winter, when the cups, &c., were damaged in a heavy gale, the curve gradually becoming worse, the spiral slipping about 10 miles very frequently, and the instrument has been out of action for some time past.

This anemometer is a very awkward one to do much with, owing to the long and complicated system of shafting in use between the exterior part on the tower and the recording part in the library, most of it being under the roof.

When the weather permitted, I dismounted, cleaned, and oiled the exterior portion—which appeared to be well looked after—and also examined the shafting under roofs. A pin was found to have worked out of the velocity rod, and it was only holding friction-tight. This was put right and reduced the slipping fault somewhat.

On my way South I paid another visit on September 2, and went carefully and thoroughly over the shafting and the various wheels and connexions, and we finally found that the bottom ball bearing of the upright steel rod, gearing direct into the spiral pencil, was faulty and apparently worn, and the rod had dropped, causing the wheels to grind.

It was not possible, under the circumstances, to dismount the rod and bottom bearing from the slate slab on the floor, as it would have taken considerable time, and free access to the library was not obtainable for several days, but as a temporary measure the rod was slightly lifted and a washer fitted, but the marking is still not quite satisfactory.* The orientation could be taken as fairly good.

Deerness, August 26th–27th.—The weather at the time of my visit was stormy and wet, and the examination of the anemograph was carried out under difficulties. One of the copper blades of the direction fan had broken off close up to the stem and this was repaired. Endeavours were made to correct the loop at the end of the direction spiral. The orientation was satisfactory. At Mr. Spence's request a new pin was fitted to the cylinder as the old one was much worn and would not hold the sheets. The

---

* The Council have been in correspondence with the Duke of Northumberland upon the steps necessary to restore the anemometer to its former condition of efficiency.

faulty posts of the hut have been removed and three new ones fixed, as well as two new posts to the wire fence round the enclosure. Arrangements were made to complete the cementing of the stonework and about the new supports.

Dublin (*Phœnix Park*), September 21st–22nd.—I found the small Robinson anemometer working satisfactorily, excepting that the direction vane was oscillating too freely.

Falmouth (*Pendennis Castle*), October 14th–15th.—The Dines' pressure-tube anemometer erected on the old Castle is now under the care of Mr. Venson, Chief Officer of the Coastguard at Falmouth.

I inspected the instrument in company with Mr. Kitto. At the time of our visit the wind was blowing very strongly, and it was noticed that the hut in which the recording apparatus is placed was vibrating considerably, and as the stand on which the container rests is fixed to the side of the hut it receives the full force of the shaking.

I first carefully examined the float and found that it was just a trifle low, about the thickness of the line on the pen rod. The water level was satisfactory, and so also was the adjustment of the pen to the paper. The gearing at the bottom of the clock spindle was found to be slightly loose, which would reasonably account for any difference previously shown between the curve and clock times. I corrected this.

On dismounting the instrument a small quantity of water was found in the pressure tube and there was a slight whitish sediment at the bottom of the container. As regards the float, there was an appreciable deposit of oil on the top, this having found its way down the pen rod which had evidently been freely oiled from time to time.

The float was cleaned and replaced in the container, which was then refilled with clean water. The lid was replaced and the apparatus fixed in position. The zero of the float was adjusted and the water brought to accurate gauge level and the instrument re-started. The vane worked very freely. Owing to the high wind at the time of inspection I was unable to dismount it, but I asked the observer to take it off and wipe it on the first calm day.

Mr. Venson was present during the greater part of these operations. He had not seen the instrument dismounted before, and was not aware of the screw valve for drawing off any condensed water that might accumulate in the pressure tube. I gave strict instructions that on no account was oil to be applied to the pen rod. The anemometer sheets are sent by messenger every afternoon to the Custom House for exhibition.

Fleetwood, July 21st.—The entire instrument was dismounted and cleaned, and the velocity spindle was strengthened by an additional rivet before being replaced. Some re-adjustments of parts were made in "assembling" the instrument after cleaning, and the working of the instrument was very satisfactory when

left. Mr. Gaulter is assisted in changing the sheets by Miss Hall, daughter of the caretaker of the Kiosk. Mr. Gaulter promised to ascertain whether the vane of this instrument points accurately with the wind ; I had reason to suspect that it does not, but I was not able to ascertain definitely whether my suspicion was correct.

Holyhead, July 14th–17th.—*Robinson Cup Anemometer.*—A spindle forming part of the reducing gear had become badly grooved and worn, and required to be repolished before being replaced ; a slight re-adjustment of the plate carrying this portion of the instrument was made to prevent a recurrence of the undue friction.

General.—All the instruments were in good order and appear to have been carefully attended to.

Pressure-plate Anemometer.—A square plate of one square foot area was substituted for the circular plate hitherto used, and the spring was readjusted.

Bridled Anemometer.—This instrument was dismounted and cleaned, and the wheel-pen examined and improved.

Pressure-tube Anemometer.—The water in the container was again free from deposit and the instrument was working satisfactorily. The crippled mast had been well strengthened and is now apparently quite secure.

Kingstown, September 23rd.—The anemometer here was going satisfactorily, the external parts being regularly attended to and oiled by the mechanic employed in the Harbour Yard, under the direction of Mr. R. D. Gray, C.E. I examined the exposed parts of the instrument and found that all the bearings were well lubricated. The orientation was tested, but was found a point or two in error. This, however, was corrected before starting the instrument again.

By appointment, I met Mr. F. Dick, C.E., the chief engineer to the Board of Works, Dublin, to discuss details as to the raising of the instrument as suggested by Mr. Curtis. After due consideration, Mr. Dick was of opinion that there would be no difficulty in carrying out the proposed alteration, and decided to recommend the Board to erect an iron lattice column, about ten feet high, on the roof of the existing hut, to carry the anemometer, which would then bring the cups about 15 or 16 feet above the ridge of the roof. When this is carried out, there is no doubt that the value of the records obtained will be considerably increased.

Scilly, October 3rd–6th.—At this station the instruments were in good order and appeared to be working satisfactorily, but I dismounted the Robinson anemometer and found that all the bearings were well lubricated, but the brake-box was not full, and the oil was a good deal discoloured. All parts were cleaned and fresh sperm oil put in, and the instrument left in good order. The clock was also cleaned and the pendulum adjusted, after which the orientation was tested and found correct.

Before disturbing the Dines pressure-tube anemometer, I noted the position of the zero of the float and pen, as well as the water-level, all of which were quite satisfactory. The clock, however, showed a tendency to gain, and this I endeavoured to regulate. On taking down the container, the water proved to be clean and with but a very slight sediment. The float, as well as the container, were cleaned, the latter being re-filled with fresh water. The lid was replaced and the zero of the float adjusted, whilst the water was brought to accurate gauge-level, and the instrument re-started. The palings round the hut are in a very shaky condition, and the whole of the anemometer requires painting. Mr. Hicks promised to have these things seen to before the winter sets in.

Shields, North, August 12th.—The anemometer at this station decidedly required attention. It was dismounted, and all parts thoroughly cleaned and freshly lubricated.

The oil for the direction-roller bearings was fairly liquid, but very dirty. There was but little sperm in the cup bearing on velocity shaft, and hardly any on the step-bearing; and the direction fan-spindle was working stiffly.

The recording portion and clock were very dirty. The steel spindle, on which the recording-frames turn, had rusted, and the pencils moved very badly. I burnished the rod and oiled it, and left it in good order again.

The spiral on the direction-roller is short, and marks too heavily about N—NNW.

The clock was out of beat, and the lines had broken and been roughly repaired. I fitted new and stouter cords.

The flat brass spring for clamping the sheets on the drum had perished and broken off at one end, and the observer was using rubber bands; so I fitted a brass spiral spring to the clamp.

The trouble with the damp seems mainly due to condensation, and it is hard to see what more can be done to overcome it.

Since my last visit, six ventilators have been fitted round the chamber, and also a gas stove, with a long pipe for drying and outside outlet; but as long as the instrument remains in its present position the trouble with damp and dirt will always be more or less present.

Even under the best conditions the velocity trace is none too pronounced, and I had the counterpoise weight cut through, and instructed Mr. Robson to vary the weights and leverage during the damper months of the year.

Shoeburyness, December 4th.—*Pressure-tube Anemometer.*—The instrument had only recently been opened and refilled with the anti-freezing mixture recommended by Munro. The external portion of the instrument was clean, and is kept in excellent order.

The float was insufficiently weighted and did not descend to zero. This I corrected, and I then showed the sergeant-in-charge how to proceed with the daily adjustment of the instrument; I also changed the pen, and by altering its position with respect to the paper got a much better trace.

The tower vibrates readily, and in strong winds it no doubt shakes very much; and this may account for a good deal of the shake shown at times in the traces. But since these shakes are sometimes absent with strong winds, whilst they are very evident with much lighter winds, it does not appear that the movement of the tower is a full explanation of the phenomenon. I took with me two or three Meteorological Office sheets for trial upon the instrument, and I think these, with the readjustment of the pen, will probably together give better results.

For various reasons I think the use of the anti-freezing mixture undesirable, and I understood that a trial will be made of water, using a lamp to prevent it from freezing in times of frost.

At the request of Captain Haines I suggested a plan for recording the direction of the wind upon paper, in substitution for the dial now in use.

Yarmouth, November 4th.—The anemometer had recently been to London for repair. It appeared to be in good working order, and in consequence it was not now dismounted.

Group S.—Additional Sunshine Stations.

Aberdovey, August 26th.—The recorder here is a Jordan (single lens pattern), and is placed in an enclosure at the back of the Aberdovey Institute, and quite close to the sea. The observer has hitherto changed the papers at 8 a.m., and has entered the whole amount of sunshine to the previous day. In future he will change them each evening, after sunset.

Ramsgate, July 23rd.—The sunshine recorder is on the roof of the building on the East Cliff occupied by the various municipal officials. A slight rise in the ground to the westward is probably not sufficient to materially affect the record at sundown. At about 4 feet from the recorder, on its eastern side, and on the same level, there is a row of six chimney pots, but the attendant states that only the one from the kitchen sends out smoke, other rooms having gas stoves and no coal fires.

Rhyl, July 18th.—The thermometers and rain-gauge are now properly fitted up at the pumping station where they are very satisfactorily exposed, and are read by Mr. Hughes, one of the staff employed at the station. The barometer is exposed in High Street, where it can be seen by the public, and the observations, as also those of sunshine, are made by Mr. Polkinghorne. The borough surveyor, Mr. Goodall, has general charge of all the observations. The sunshine recorder had not been erected at the

time of my visit, some difficulty having arisen with the Pier Company as to the site; it will, however, be erected forthwith. If desired, a suitable site for it can be had at the pumping station. This ought to become a very useful station.

Skegness, September 7th.—The recorder is exposed on the roof of the pavilion at the end of the pier, which is 600 yards long. The height of the ball above the deck of the pier is 30 feet, and above M. S. L. 45 feet. The record was slightly interfered with by the roof, and I therefore raised the instrument about a foot. I corrected defects and securely clamped the instrument in its new position, where its exposure is practically perfect. The instrument is in charge of Mr. Cash, the pier master, under the direction of Mr. S. Coetmore Jones, Lord Scarbrough's agent at Skegness.

York, September 12th.—The summer cards had been kept in use beyond the proper date, and to meet the difficulty thus created Mr. Stevenson had raised the recorder at the back two or three days before my visit. To prevent a similar mistake in future I wrote out a list of the proper dates for changing the kind of card, and affixed the paper where the stock of cards is kept.

I found that the differences between the amounts sent up weekly and those supplied on the Monthly Form 19, were due to re-measurements made at the museum.

The adjustment for meridian was not quite exact, but I deemed it unwise to make any change.

GROUPS D. AND E.—NORMAL CLIMATOLOGICAL STATIONS* (SECOND ORDER STATIONS of the INTERNATIONAL CLASSIFICATION).

Ackworth (The Friends' School), September 17th.—I found all in good order at this station except that the thermometer screen needed repainting.

The observations are under the superintendence of the science master, Mr. H. B. Ludlam, M.Sc.

I was asked as to whether the exposure was suitable for a sunshine recorder. As far as I could judge from the ground it would be easy to find an excellent position.

Ampleforth, September 12th.—The rain-gauge was not quite circular, and it was simply resting on the ground. I asked that the dent might be removed, and that the instrument might be properly fixed at 1 foot above the ground.

---

* A Normal Climatological Station is one at which readings are taken each day at 9 a.m. and at 9 p.m., local time, and which is provided with the following instruments properly verified and exposed:—barometer, dry-bulb, wet-bulb, maximum and minimum thermometers, and rain-gauge.

The thermometer screen is not of the standard pattern, but is quite satisfactory. I asked that it might be raised by 6 inches.

The other instruments were in good order. Much interest is manifested in the work at this station, and the observations appear to be taken with great care.

Belfast, August 11th.—The Robinson anemometer (erected in 1849), unreliable for many years, had broken down badly. The observer promised to record in future the force and direction of the wind by estimation, whether the anemometer was found to be working or not. The maximum thermometer in use was out of order, the continuity of the mercury being broken in four places. Another maximum will be used. Instrumental observations at this station appear to be made accurately, and recorded faithfully. I spent a considerable time explaining to the observer the requirements of the Office as regards non-instrumental observations.

Bramley, July 15th.—The observations at this station are, so far as they go, of the best quality, but the great age of the observer, the fact that the instruments are the property of some one living elsewhere, and the difficulty experienced in finding anyone in the neighbourhood willing to give even temporary assistance in looking after the records, render it probable that the observations cannot be continued much longer unless the local authorities can be induced to make the station a permanent one to be looked after by one of their officials.

Canterbury, July 21st.—Mr. Lander is the Secretary of the East Kent Scientific Society and takes great interest in the meteorological records for the district. The Annual Report of the Society contains photographic reproductions of the automatic registrations of various elements as recorded at Canterbury by Mr. Lander. He is willing to undertake the registration of ground temperatures at depths of 1 foot and 4 feet, and the Medical Officer of Health is prepared to submit to the Town Council a proposal that that body should defray the cost of the thermometers required.

Cheltenham, July 8th.—The instruments had been removed from the late Mr. Tyrer's residence to the Montpellier Gardens, and were placed in an enclosure 15 feet square. I recommended that the rain-gauge be moved to the position of the grass minimum thermometer, and that the rim be only 1 foot above the ground. The minimum and grass minimum thermometers had some spirit up the tube. On comparing the thermometers it was found that the wet bulb had gone up 0°·3, and that both the minimum and the grass minimum had gone down 0°·7. The barometer was placed in the pay office of the Montpellier Spa, which was a very confined and close room. The instrument was not hanging quite perpendicularly. I recommended that it be removed, if possible, to the observer's house. I found that the observer had been reading and setting the minimum and the grass minimum thermometers at 9 a.m. instead of at 9 p.m.

Dublin, Phœnix Park, September 21st–23rd.—All the instruments here were in good order, excepting that the screen minimum thermometer had about two degrees of spirit lodged in

the upper part of the stem, whilst the grass minimum had one degree. The observer's attention was directed to this and I showed him how to re-unite the column in case of any further separation.

As to earth temperature observations, Colonel Sim informed me that he would not object to observations being taken provided the necessary thermometers were supplied by the Council. Colonel Sim thought that the water level would be about 6 feet below the surface of the ground, but if the Council desire it, he would have a hole dug on the site of the Stevenson screen and rain-gauge in order to see whether the depth of 6 feet would be quite free from water.

Durham, September 16th.—Mr. Carpenter, the observer, was absent on the day of my visit, but I saw Prof. Sampson, M.A., F.R.S., under whose direction the observations are carried on. I came to the conclusion that the abnormal temperatures occasionally observed are due to the shaking of the screen by the wind. At present the screen is supported by a central post. Prof. Sampson promised that this should be replaced by four legs in the ordinary way. I asked that when this alteration is made the maximum thermometer might be hung quite horizontally; it is now a little low at the bulb end. I pointed out the desirability of having earth temperatures, and Prof. Sampson promised to consider if this information could be supplied. The rain-gauge remains at its old height of over 3 feet above the ground. A good exposure is now available at the regulation height, and I think it would be advantageous to have it lowered to 1 foot and placed on the grass.

Garforth, September 17th.—The observations at this station are now under the superintendence of Dr. Crowther, Mr. Ingles having left the College Staff for an appointment in Africa. The observations are taken by Mr. Edwards, the Farm Manager, and by Mr. Smith, one of the assistants. The station was in good order, but the maximum thermometer is not satisfactory, the column being divided and the mercury being very apt to run up the scale. The grass minimum read 1°·5 lower than my standard. The grass around the rain-gauge was too long, and I asked that it should be cut.

Glencarron, August 18th.—All the instruments were in remarkably good order and are well observed. Further reports of clouds and weather generally are promised.

Gordon Castle, August 3rd.—The observations continue to be carefully and intelligently recorded, and the instruments were in admirable order. Eye observations of a fuller character are promised for the future. A sunshine recorder has not yet been added, but there is a prospect of this being done.

Hull, September 9th.—The thermometer screen and rain-gauge were somewhat sheltered by trees and shrubs, and I approved a suggestion by Mr. Witty that the instruments should be removed to another site on the same level, about 100 yards distant, where the exposure would be much better. This change has since been carried out.

The sunshine recorder was not fixed in its position, but it was promised that this should be done at once.

The grass minimum thermometer reads 2°·9 too low, and should be superseded.

Lairg, August 6th.—Since last inspection, August 11th, 1902, a new rain-gauge and a new minimum thermometer were sent.

At first reading the station barometer read 0·030 inch lower than inspector's standard. On examination a small portion of air had got into the tube from an accident which was reported to us last spring. With a little trouble the air was expelled, and after hanging beside the standard for some time, it was found to read 0·016 inch lower, which was the error of this barometer in the past.

The instruments were all in very good order, and the observations were made carefully and correctly.

Lincoln, September 8th.—I called on the city surveyor, Mr. McBrear, and ascertained that the City had recently purchased a set of instruments, which were exposed in the grounds attached to the Sessions House. I was shown the instruments and found that the outfit comprised barometer, dry bulb, wet bulb, maximum and minimum thermometers in Stevenson screen, earth thermometers at 2 feet and 4 feet below the surface, and a 5-inch rain-gauge.

The instruments are of excellent quality, with Kew certificates, and observations are taken at 9 a.m. and 9 p.m. each day by Mr. Curtin, F.R.Met.Soc., the Chief Sanitary Inspector, and a junior assistant.

Copies of the observations are supplied to the local press, and a Negretti's Combined Chart is exhibited outside the Corporation Offices. The barometer is in a bad light, but the exposure of the other instruments is satisfactory, and in my opinion the readings may be taken as representing fairly the meteorological conditions of the City.

I recommend that the Office ask to be supplied with a monthly return on Form 19, from, at any rate, the beginning of 1904.

Manchester, Oldham Road, July 24th.—The observer at this station has changed a few months since, the former observer having died. I found the station in very good order, and I think a great deal of care is taken to obtain good observations. The station admirably represents the City of Manchester, and is an important one on that account. A Campbell-Stokes sunshine recorder is now to be added to the equipment.

Markree Castle, August 18th.—All the instruments were clean and well cared for. The barometer is now quite reliable; the screw for making the cistern adjustment has been repaired. The mountings of the dry and wet bulb thermometers were in bad order, but while they are held intact by the screws the thermometers should still be efficient. The other instruments were in good order. The base of the sunshine recorder has been

cemented in position ; the instrument is in adjustment, level, and firmly fixed. For the rain-gauge on the ground a suitable receptacle for receiving moisture has been provided. A second rain-gauge, secured against the inside edge of the observatory wall, $16\frac{1}{2}$ feet from the ground, is neither level nor firmly fixed, but is in fairly good order.

Norwood, July 25th.—Owing to the growth of trees in a neighbouring garden a 5-inch rain-gauge was obtained some time ago and placed 17 feet north-west of the 8-inch gauge. For the first year there was no difference in the amounts collected by the two gauges, but in the second year the old gauge showed a slight falling off. The rainfall is now reported from the 5-inch gauge.

Rousdon, August 13th.—This station was in good order. The sunshine recorder was placed in the Meteorological enclosure for the summer months. I recommended that it be removed to the anemometer tower, as the trees on the east-north-east and west-north-west were likely to cut off some of the early morning and late evening sunshine. The various self-recording instruments were in good working order. The "head" of the Dines anemometer had recently been cleaned, and a new spindle had been put in the Robinson anemometer. On comparing the thermometers it was found that the wet bulb had gone up 0°·2, and both the 2- and 4-ft. earth thermometers 0°·1.

Scarborough, September 23rd.—A large dish of water was placed under the wet bulb thermometer. I recommended that this be removed and a small glass vessel with a cover be used instead. The spot of light on the sunshine card was exactly on the central line, and on the hour line at 12 o'clock noon this day.

I saw the chairman of the Meteorological Committee, who was very desirous of having the instruments removed from the Peasholme allotments. The new site recommended is the lawn in front of the Town Hall. The reasons for this are that the instruments will be on Corporation ground, and that they will be much more accessible for the observer. Also, being at the Town Hall, they will be more under supervision. The site is close to the cliff, but it is within a few yards of the spot where the instruments were placed some years ago. The instruments at the Manor Road Nursery are to be continued for at least a year, so it will be possible to see whether there is any difference between the various places. The sunshine recorder is to be placed on the tower of the Fire Station, where the exposure will be very good.

Strathpeffer Spa, August 18th.—Was visited on the 4th, 14th, and 18th, Dr. F. Fox's absence on professional duty and the want of sunshine deferring the full inspection till August 18th.

Height of barometer.—The position of a Bench mark was ascertained from Ordnance Survey map, the height given being 149 feet. Two aneroids gave each a difference of 0·060 inch of a fall to the cistern of Dr. Fox's barometer, the temperature of the air being at the time 57°·3, and the reading of the barometer 29·567 at 32°. A height of 210 feet may be accepted as not more than 2 feet wrong.

Considering the hilly character of the situation the position of the various instruments is good. The instruments were all in remarkably good order, and were intelligently and well observed by Mr. McLean. Dr. F. Fox takes a general supervision of the work.

GROUP G.—AUXILIARY CLIMATOLOGICAL STATIONS.

Aberystwyth, August 27th.—This station supplies observations which are despatched on post cards at 6 p.m. for insertion in the Daily Weather Report of the following day. The instruments are well exposed. The observations are made under the superintendence of Dr. Abram Thomas, the Medical Officer of Health, by one of the Inspectors of Nuisances.

Alnwick Castle, August 14th.—The instruments are in good order, but the Stevenson screen is not over grass, but it was promised that turf should be laid under and around it.

An 8-inch copper rain-gauge has been fitted up since my last visit, and is a decided improvement.

Barnet, November 11th.—This station was started more than 20 years ago. Mr. Martin, who is in charge, was out when I arrived, but the clerk who looks after the office, and takes the observations, showed me the instruments, &c. Observations are taken carefully and systematically.

Temperature and rainfall observations are satisfactory. The index correction of the barometer amounted to ·019 in., and that of the minimum thermometer to + 1°·7.

Blackpool, September 12th.—The sunshine recorder was temporarily placed on the roof of the Sanatorium. The instrument was not quite level. There was a little spirit at the top of the tube of the minimum thermometer. The Negretti and Zambra self-recording rain-gauge needed overhauling and cleaning. A new site has been obtained for the instruments about half-a-mile to the north-east of the Sanatorium. An enclosure about 24 feet square has been railed off in a field, and about 60 feet to the north of it has been erected a brick building, on the top of which the sunshine recorder and the Dines anemometer are to be placed. The field belongs to the Corporation, and the exposure is very open. The instruments were to be removed to the new site very shortly.

Bradford, July 22nd.—The station has some drawbacks, owing to its being in the centre of Bradford, where it is probably impossible to find an entirely satisfactory site for the instruments. A rain-gauge near the thermometer screen might afford a useful comparison with the record from the gauge now used.

Brundall, near Norwich, November 5th.—The station has been in existence for 20 years, and is in connexion with the Royal Meteorological Society. Mr. Marriott had inspected it last year.

Observer has had long experience in taking observations, and is alive to the importance of punctuality and accuracy. The wind observations are rather unsatisfactory, as the station is hedged in by tall trees. Observer has, therefore, been in the habit of

recording the wind at Norwich by observing the direction of the vanes on the Cathedral. On Sundays, &c., observations are taken at Brundall by watching motion of smoke, &c.

Caterham, July 25th.—As there has been no previous inspection of this station, and there has been no attempt to instruct the officials who see to the instruments, the observations are naturally of a rough character. It is, however, desirable that this Metropolitan "High Level" Station—at an elevation of about 600 feet, within less than 15 miles of the Meteorological Office—should be improved and rendered perfect. The situation is an ideal one, and as the institution is public and permanent, an endeavour should be made to substitute a complete set of new instruments —barometer, thermometers, rain-gauge, screen, and sunshine recorder—so as to obtain a better knowledge of the atmospheric conditions at a spot where they seem to be very different from those prevailing in the neighbouring metropolis. The officials take a lively interest in the explanations of the phenomena which they are asked to record, so that with little trouble they could be trained to make very good returns. Dr. Campbell, the medical superintendent, had to be away in London on the day of the inspection, and it was, consequently, not possible to arrange for shifting the instruments to better positions.

Chatham, July 24th.—The thermometers and rain-gauge have been moved from their former position, the ground being required for the erection of an astronomical and magnetical observatory. Advantage should be taken of the opportunity to improve the meteorological observations and place them on a more satisfactory footing. The screen now in use has the dry and wet bulb thermometers at 28 inches, instead of 48 inches, above the ground; the rain-gauge is wearing out, and the anemometrical records are misleading, as the cups are stationary when a perceptible breeze is blowing, and when they do revolve the friction is so great that the "grinding" can be heard in the rooms of the surveying officers, about 100 yards distant.

Cirencester, August 17th.—A new thermometer screen (a Stevenson) has been set up since the last inspection in 1901. The legs upon which it stands are not firmly fixed, and with a high wind there is great risk of the thermometers being shaken.

The minimum thermometer reads 1° too low.

With these exceptions the station appeared to be in good order.

Clifton, August 19th.—The exposure of the instruments at this station leaves much to be desired. The thermometer screen is over bare stony ground, and is only 8 feet from the trunk of a large hawthorn tree. In the early morning the screen is quite shaded by the branches. A Richard thermograph has been placed in the screen, and in order to make room for this the dry and wet bulb thermometers have been placed quite close to the louvres on the right hand side. A better and more open site for the instrument is very desirable.

Mr. Rintoul was away at the time of my visit. I urged the desirability of obtaining earth thermometers. This suggestion will be brought to Mr. Rintoul's notice on his return.

Hawarden Bridge, July 20th.—The instruments are in good order, and appear to be carefully read by Mr. Rooney, the new observer, chemist at the adjoining iron works. The station is a considerable distance from Chester, and it is doubtful to what extent it represents the climate of the city.

Killarney, September 30th.—The screen has not yet been changed and I found it in rather a shaky condition. It is quite different in pattern from the ordinary Stevenson screen. It has a solid bottom about 2 feet above the grass, whilst the roof is without a ventilator. I suggested that a ventilator be fitted in the roof, and that fresh supports or wooden stakes should be driven in the ground in order to steady the screen in high winds.

Dr. Griffin said that as soon as the resident carpenter had time a new screen would be constructed in accordance with the drawings sent him by the Meteorological Office.

Llandovery, August 24th.—Dr. Rosser, who took over the instruments from the late Mr. J. Watkins, has hitherto been too busy to take observations, but has now expressed his willingness to resume the work. The position of the thermometer screen (about 5 feet from a garden wall) is not very good. Observer intends, however, to have the garden entirely re-arranged, and will endeavour to provide a better site.

Llangammarch Wells, August 25th.—The observer applies no corrections, even to the barometer readings.

Several defects were noticed in the methods of observing.

Newton Rigg, July 22nd.—Mr. Lawrence, the Principal of the Agricultural School, is very anxious to make this station as good as possible. A few points in which the methods adopted were not quite in accordance with the Office rules were mentioned, and the recommendations will be at once adopted. The position of the station leaves nothing to be desired, and I think it will prove to be a very useful and important one.

Nottingham Castle, September 18th.—The instruments were in good order, and the observations are carefully and intelligently taken by a member of the City Engineer's Staff.

I compared the barometer and found it to read 0·032 lower than my standard. I requested that a further comparison might be made, the check barometer at the newly established telegraphic station being used for the purpose.

Oundle School, September 19th.—This is a new station now being established. The outfit of instruments is good, and the exposure is excellent. The barometer is a "Fortin," and is hung in the physical laboratory. The outdoor instruments were not properly placed and I promised that directions for setting out the station should be sent, together with correction tables for the barometer readings.

I saw Mr. Sanderson, the head master, who is much interested in the work, and who gave directions for a sunshine recorder to be added to the equipment. There is a good exposure available for the recorder.

The usual difficulty as to the observations during the vacations could, I was informed, be satisfactorily met in this case. If this is so I think the station will be a very good one.

Portsmouth, July 14th.—This being the first visit paid to this station the observations generally are not so satisfactory as those at inspected stations, but the observer takes a most intelligent interest in the work, and gives promise of supplying very good reports in future. Greater attention will be given to the fitting of the wet bulb, the position of the sunshine recorder, and other matters.

Port Talbot, August 20th.—The sunshine recorder was found some months ago to be out of adjustment and was returned to the Office for examination. It has since been sent back to the station and is now working satisfactorily. Owing to a shifting of the wooden post upon which it is fixed the level was not true. It would be an advantage if the records could be measured daily. At present no measurement is made before the cards reach the Office.

A rain-gauge has recently been started at this station, and the records are now sent to the Office. The gauge is fairly, but not exceptionally, well exposed.

Sandwich, July 22nd.—The exposure of the gauge at this station would be very good were it not for a few trees eight feet to ten feet high, at a distance of about five yards, on the western side of the lawn. As, however, the trees will be lopped and kept down as much as possible, the records will not be materially affected. Everything is clean and in good order, and the observations are carefully taken.

Shaftesbury, August 21st.—The rain-gauge, I learned, had been occasionally moved.

Temple Bruer, September 4th.—This is a rainfall station, which had not been visited since 1899.

I found the gauge clean and firmly fixed, but somewhat out of level. I levelled it and left it in good order.

The present observer is Miss Alice S. Morley.

Wokingham, Pinewood, December 16th.—This is a new station, from which returns have not yet been received. The instrumental outfit is at present limited to the requirements of temperature and rainfall observations; there is a small aneroidograph, and also a Jordan sunshine recorder, but the last-named instrument is not at present in use, owing chiefly to the absence of a satisfactory exposure for it. The situation of the instruments is excellent; and I think the observations—limited at present to 9 a.m.—will be carefully made, and that the station will be a permanent one. The thermometers and rain-gauge are very good instruments.

Group H.—Fishery Barometer Stations.

Malin Head, August 13th.—The barometer is in charge of the Chief Officer of Coast Guard, and is in excellent order. The instrument is set daily at 8 a.m. and 8 p.m., the readings being recorded in a log book which is returned to the Admiralty. It read ·06 too high when my standard was at 28·91. I gathered from what the Chief Officer told me that the fishermen of the district find the barometer serviceable to them.

Port Rush, August 15th.—The barometer here is in good order. It read ·08 too low when the reading of my standard was 29·71. It is in charge of the Chief Officer of Coast Guard, and is said to be frequently consulted by the fishermen and seamen—through the watchman at the station. Telegrams from the Meteorological Office are shown in a frame on the wall enclosing the station house. The flagstaff had recently been broken, and the cone to give the storm warning of the 14th (yesterday) could not be exhibited. One of the two M. O. thermometers at this station was in bad order.

South Shields, September 15th.—I went to South Shields and made careful inquiry for the fishery barometer said to be exposed there, but could find no trace of it.

I visited all the barometers exposed for public use of which I could get information, but none of them answered to the M. O. instrument.

I recommend that inquiry be made as to the person to whom the barometer was originally issued, and as to what has become of the instrument.

Group T.—Telegraphic Reporting Stations.

Aberdeen, July 29th.—This being the first inspection after the appointment of the new observer, the various instruments were carefully inspected, Mr. Clarke's handling of the same, and the records of the observations made. The instruments were all in good order, and Mr. Clarke gave evidence of being an accurate and expert observer. The estimated and the instrumental observations of wind force were examined. It is possible that the higher velocities recorded by the anemometer are due to its greater height as compared with the position where the wind-force is estimated. The unnecessary repetition of words in the Telegraphic Reports was gone into.

Bath, August 18th.—This is a voluntary station, but owing to the liberality of the Corporation a complete 8 a.m. report is sent by wire each morning, and also a sunshine telegram in the evening.

The station is excellently exposed and the instruments were all in good condition. The sunshine recorder was not fixed in any way, and might easily be put out of position. I was, however, assured that a metal clamping arrangement had been ordered and was expected daily. I suggested that before securing the instrument a more perfect adjustment for meridian should be obtained.

Birr Castle, August 19th.—The observers are now G. A. Roe for the Telegraphic Reporting section, and W. J. Roe for the Normal Climatological, both under the direct supervision of Dr. Otto Boeddicker. G. A. Roe, a novice at the work this time last year, is now a good observer; his brother is a beginner at present and is anxious to become efficient.

All the instruments were clean and in first-rate order. The barometer at 29·63 inches read ·018 inch lower than my standard (corrected); the necessary correction will be applied in

future. A small observatory has been erected 4 feet distant from the thermometer screen; Dr. Bœddicker will have the screen moved to a position selected as suitable.

Brighton, July 16th.—The observations at this station seem to be carefully taken, and the 6 p.m. reports of other phenomena, in addition to the duration of bright sunshine, will probably be of considerable value in the preparation of forecasts, as they (the observations) will fall between the distantly situated Dungeness and Portland Bill, and afford some clue to the more local conditions in a district in which the public are greatly interested. The barometer should be removed to a position where the light would enable the readings to be taken with greater ease.

Clacton-on-Sea, November 3rd.—The instruments were in excellent order.

The barometer readings are of little value for incorporation with other observations on synoptic charts, as the instrument is not one of standard type. No cloud observations are taken. With these exceptions, a complete set of observations of a second order station are taken, but at present the Meteorological Office only receives maximum and minimum temperatures, sun, rain, present weather, and weather for past 24 hours, by telegraph every morning.

Observations appear to be taken punctually and accurately.

Margate, July 23rd.—Mr. Stokes has been a meteorological observer for over a quarter of a century, and his evening reports consequently should form a valuable addition to the information on which the forecasts are based. The station being situated at the mouth of the Thames and close to the most frequented shipping route, the observations will be of more than local interest.

Nottingham, September 18th.—This is a newly established station. The barometer hangs in a small wooden house, on a brick pier specially built to carry it without vibration. The outdoor instruments are placed in an enclosure 27 feet by 18 feet, neatly turfed and surrounded by an open iron fencing. The thermometer screen was not quite firmly fixed, and I asked that the legs might be strengthened.

The sunshine recorder is exposed on a wooden post, approached by an iron ladder. It would be better if a small platform could be constructed independent of the post so as to allow the observer to change the cards. At present, ascending the ladder tends to shake the instrument. To lessen risk of damage I asked that the ball should be cemented to the pillar. The adjustment of the recorder was not quite right, but I made the requisite corrections, and left it in good order.

Scilly, October 3rd–6th.—All the instruments were satisfactory, excepting that about one degree of spirit had become separated from the main column in the minimum thermometer. This I put right, and showed the observer how to re-unite the column in the event of its getting out of order again.

At the end of August Mr. Hicks removed the two barometers and self-recording aneroid from the signal station, and fitted them up in the anemometer hut.

On inspecting the instruments I found that the space inside the hut was so confined that in the summer time the barometers would be a good deal affected by temperature. In consequence I thought it best to remove the recording aneroid and the observing barometer to Mr. Hicks' private house, where I had them fitted up.

The height of the barometer is about 6 feet above the roadway, the latter being approximately 14 feet above sea level.

Sumburgh Head, August 12th.—Shortly after last inspection a complete change of thermometers and screen was carried out at this station. These and all the other instruments were found to be in excellent order and the observations continue to be correctly and carefully made. As Mr. Brand has some difficulty in understanding the kind of cases shown by his Richard barograph desired by the Office, it might assist him if the Office selected from the cards recently received from Dunrossness several such cases, with remarks thereon; the end in view would be more readily apprehended than by any merely verbal descriptions.

Mr. Brand promises to supply the Office regularly with readings of his mercurial barometer at 10 p.m. or 11 p.m.

Comparison of Barometers.

The following tables give the corrections required to be applied to the readings of the various instruments to make them agree with the Inspector's standards:—

Observatories.

Station.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	Remarks.
England and Wales.	Inches.	Inches.	Inches.	
Falmouth	—	—	—	Not tested.
Kew	—	—	—	Not tested.
Oxford	—	—	—	Not tested.
Stonyhurst	—	—	—	Not tested.
Scotland.				
Aberdeen	29·489	— ·003	— ·006	
Ben Nevis	—	—	—	Not tested.
Fort William	29·715	+ ·005	—	
Glasgow	29·698	+ ·004	—	
Ireland.				
Armagh	29·975	+ ·001	—	
Valencia	29·416	+ ·012	+ ·006	

TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.				
Bath	Inches. 29·653	Inches + ·001	Inches. —	
Brighton	29·777	·000	—	
Dungeness	30·103	+ ·003	+ ·011	
Holyhead	29·677	— ·001	+ ·004	
Jersey	—	—	—	Not visited this year.
London (Brixton) ..	—	—	—	Not visited this year.
Margate	29·771	— ·002	—	
Nottingham	30·293	— ·001	— ·023 ?	
Pembroke	29·664	+ ·012	+ ·007	
Portland Bill	29·910	— ·004	— ·003	
Scilly	29·638	+ ·004	— ·004	
Shields, North	29·889	+ ·009	+ ·004	
Spurn Head	29·784	+ ·010	+ ·009	
Yarmouth	30·471	— ·001	+ ·007	
SCOTLAND.				
Leith	29·862	·000	·000	
Nairn	29·394	+ ·004	+ ·014	
Stornoway	29·670	— ·002	+ ·008	
Sumburgh Head ..	29·688	— ·004	— ·006	
Wick	29·502	— ·004	— ·006	
IRELAND.				
Birr Castle	29·647	+ ·017	—	
Blacksod Point	—	—	—	Not visited this year.
Donaghadee	29·907	+ ·007	— ·005	
Malin Head	28·813	— ·007	+ ·011	
Roche's Point	—	—	—	Not visited this year.

BAROMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Ackworth	30·189	− ·009	—	
Ampleforth	29·267	− ·009	—	
Bramley	29·822	+ ·005	—	
Canterbury	30·201	− ·008	—	
Carlisle	29·692	+ ·036	—	
Chester	—	—	—	
Cockle Park	30·255	− ·005	—	
Durham	29·901	− ·002	—	
Eastbourne .. .	29·698	·000	—	
Fulbeck	29·791	− ·003	—	
Garforth	30·095	+ ·046	—	
Hull	29·751	− ·004	—	
Manchester, Oldham Rd.	29·770	+ ·010	—	
Manchester, Whitworth Park.	29·889	+ ·012	—	
St. Leonard's	29·558	·000	—	
Tealby	29·646	+ ·016	—	
Wessington Court ..	29·588	·000	—	
York	29·448	+ ·004	—	
SCOTLAND.				
Braemar	28·714	·000	—	
Dundee	29·651	+ ·001	—	
Dunrobin	30·030	+ ·002	—	
Fort Augustus	29·371	+ ·001	—	
Glencarron	29·122	+ ·014	—	
Gordon Castle	29·356	+ ·004	—	
Laing	29·540	+ ·015	—	
Lednathie	28·914	+ ·002	—	
Strathpeffer Spa ..	29·436	·000	—	
IRELAND.				
Belfast	29·831	+ ·003	—	
Birr Castle	29·648	+ ·022	—	
Dublin, City	29·963	+ ·004	—	Mean of 4 comparisons.
„ Phœnix Park ..	29·699	− ·005	—	
Markree Castle	29·547	− ·001	—	

OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
ENGLAND AND WALES.	Inches.	Inches.	Inches.	
Barnet	30·186	− ·019	—	
Bradford	—	—	—	
Brundall, near Norwich	30·611	+ ·050	—	
Caterham	29·452	+ ·107	—	
Chatham	29·839	− ·002	—	
Halifax, Bermerside ..	—	—	—	
„ Public Library	—	—	—	
Littlestone	30·125	·000	—	
Llangammarch Wells..	29·482	− ·009	—	
Newcastle-on-Tyne ..	30·371	− ·002	—	
Newton Rigg	29·241	+ ·003	—	
Nottingham Castle ..	30·116	+ ·032	—	Doubtful; time not sufficient.
Oundle School	—	—	—	No comparison made.
Portsmouth	30·069	+ ·007	—	
Truro	30·155	+ ·025	—	
SCOTLAND.—None.				
IRELAND.				
Kingstown	30·185	+ ·002	—	

APPENDIX VIII.

STORM WARNING CHECKING.

COMPARISON between the WARNINGS and the subsequent WEATHER in 1903.

Coasts.	Total No. of Warnings.	Warnings justified by subsequent Gales. Force 8 and upwards.	Warnings justified by subsequent strong Winds. Forces 6 & 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two Stations before issue.	Warnings partially late. Force 9 reached at one Station before issue.	Warnings issued in consequence of telegraphic errors.	Storms for which no Warning was issued.
Scotland, N.E. ...	52	35	15	1	1	—	—	Oct. 5.
,, E. ...	43	16	23	4	—	—	—	
,, N.W. ...	59	37	14	5	—	3	—	
,, W. ...	58	31	19	7	—	1	—	
Ireland, S.W. ...	72	42	17	11	—	2	—	Aug. 14–15.
,, N.W. ...	70	46	14	4	1	5	—	Oct. 30.
Irish Sea	69	51	13	1	1	3	—	April 7; Oct. 30.
St. George's Channel	59	40	15	2	—	2	—	Jan. 10–11; Nov. 13.
Bristol Channel ...	58	42	13	2	—	1	—	Jan. 3–4 Aug. 14–15
England, S.W. ...	57	33	18	6	—	—	—	
,, S. ...	44	27	13	4	—	—	—	
,, S.E. ...	40	29	8	2	—	1	—	
,, E. ...	34	17	13	4	—	—	—	
,, N.E. ...	42	28	12	2	—	—	—	
Totals ...	757	474	207	55	3	18	—	
Percentages...	—	62·6	27·3	7·3	0·4	2·4	—	

GALES EXPERIENCED in 1903 for which no WARNINGS were issued.

These were few in number, and were confined to limited portions of our coasts. They occurred on the following dates, and in the following districts :—

January 3rd and 4th, in the Bristol Channel.—A westerly gale, caused by a depression, the centre of which moved

eastwards along the north of Scotland. All the Irish and north-western coasts were duly warned, but the gale extended somewhat further south than was anticipated.

January 10th and 11th, in the St. George's Channel.—A N.E. gale in the rear of a depression which advanced originally in a north-easterly direction over Ireland. On reaching the Irish Sea, the centre completely changed its course and moved southwards to France. The information available at 2 p.m. on the 10th was insufficient to give any definite indication of such a change, and the warnings which had been issued on the afternoon of the 8th were therefore allowed to expire. The gale sprang up on the evening of the 10th.

April 7th, in the Irish Sea.—Warnings for a westerly gale were issued to the north of Scotland on the afternoon of the 6th, and were fully justified. During the ensuing night the depression which occasioned this increase of wind moved eastwards, but also extended laterally in a southerly direction, so that the gale spread to many other parts of our north and north-west coasts.

August 14th and 15th, over Ireland, S.W., and the Bristol Channel.—A gale from S.W., veering to W. and N.W., caused by a depression, the centre of which advanced north-eastwards across Ireland to the north of England, and then travelled northwards across Scotland. At 6 p.m. on the 14th, when the warnings, to be effective, should have been issued, the gradients were not steep, and were not expected to increase. The gale commenced during the ensuing night.

October 5th, in Scotland, N.E. (northern part only).—A depression which was approaching our western coasts on the evening of the 4th, proved to be deeper than was anticipated, and caused a gale from S.E. in Caithness and the Orkneys. The western and southern coasts had all been warned on the 3rd.

October 30th, in Ireland, N.W., and the Irish Sea.—A depression which appeared suddenly off the north-west of Ireland on the morning of the 30th, was expected to move away again over the Atlantic. The disturbance, however, continued to advance in a north-easterly direction and caused a southerly to westerly gale in the Irish Sea, and a W. to N.W. gale in the north-west of Ireland.

November 13th, in the St. George's Channel.—Owing to the appearance of a rather deep depression in the West, the signals were hoisted in Ireland and the west of Scotland on the afternoon of the 13th, and, later in the day, the warnings were extended to the Irish Sea and the north and east of Scotland. A serious increase of wind was not anticipated as far south as the St. George's Channel, but in the course of the ensuing night, a strong gale from the southward sprang up.

APPENDIX IX.

REPORT ON THE COMPARISON OF THE FORECASTS ISSUED AT 8h. 30m. p.m., WITH THE WEATHER SUBSEQUENTLY EXPERIENCED, for the 12 months April, 1903, to March, 1904. The results are for the United Kingdom as a whole.

The letters used have the following signification :—

a=complete success. | **c**= partial failure.
b=partial (more than half) success. | **d**= total failure.

The checking has been conducted on the same system as that employed in previous years, *i.e.*, each forecast has been considered under the separate headings of "Wind" and "Weather." The results for the 8.30 p.m. Forecasts only.

The first column gives the percentage of success in "Wind," the second in "Weather," and the third the average of the two.

The Summary for the various districts is given at page 26.

Months.		Percentages. Wind.	Weather.	Average.	a + b.
April	a	51	63	57	89
	b	35	29	32	
	c	11	6	9	
	d	3	2	2	
May	a	58	68	63	87
	b	24	24	24	
	c	13	5	9	
	d	5	3	4	
June	a	52	59	56	88
	b	31	33	32	
	c	13	6	9	
	d	4	2	3	
July	a	51	71	61	88
	b	31	22	27	
	c	12	5	8	
	d	6	2	4	
August	a	35	59	47	83
	b	37	35	36	
	c	21	6	14	
	d	7	0	3	
September	a	49	63	56	86
	b	31	28	30	
	c	16	7	11	
	d	4	2	3	
October	a	52	64	48	83
	b	38	32	35	
	c	23	4	14	
	d	7	0	3	
November	a	40	76	58	85
	b	34	20	27	
	c	17	3	10	
	d	9	1	5	
December	a	50	64	57	83
	b	26	26	26	
	c	16	7	12	
	d	8	3	5	
January	a	51	72	62	91
	b	35	23	29	
	c	12	4	8	
	d	2	1	1	
February	a	41	70	56	86
	b	35	25	30	
	c	19	3	11	
	d	5	2	3	
March	a	43	62	53	87
	b	37	31	34	
	c	17	5	11	
	d	3	2	2	
The entire year	a	46	66	56	86
	b	33	27	30	
	c	16	5	11	
	d	5	2	3	

APPENDIX X.

ACCESSIONS TO THE LIBRARY DURING THE YEAR ENDING 31ST MARCH, 1904, ARRANGED ON THE LINES OF THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

I.—*METEOROLOGY; p.* 136.

II.—*REPORTS . . . . OF SCIENTIFIC SOCIETIES WHICH INCLUDE METEOROLOGICAL TABLES OR PAPERS; p.* 177.

III.—*ASTRONOMY; p.* 179.

IV.—*GEOGRAPHY; p.* 180.

V.—*MISCELLANEOUS; p.* 183.

NOTE.—To avoid reduplication of entries the following rules have been adhered to as far as possible :—

(*a*) A publication has only been included under the sub-heading "**General**" when it could not be classed under any one [or more] of the other sub-headings of the same general heading.

(*b*) The heading "**Meteorological Registers**" has been held to include tabular summaries of meteorological observations as well as transcripts of observations.

(*c*) Official reports, which are not exclusively or primarily meteorological, but contain meteorological summaries or tables, have been classed in geographical order under the sub-headings **1710-1730 (Climatology: Agricultural, Phenological,** or **Hygienic)** or under **1800 (Meteorological Registers—General)**, according to the nature of the Report.

(*d*) Periodical issues have been classed under **0020 (Periodicals)** if they contain miscellaneous articles on meteorological subjects, and under **0020 (Reports of Meteorological Institutions)** if they contain administrative reports, but year books and other publications consisting of tables of meteorological data chronologically arranged with or without explanatory notes, have been classed under **1800-1820 (Meteorological Registers).**

Tables of data of meteorological elements, arranged to give a synoptical review of the weather for consecutive days, weeks, months, &c., have been classed under **1830-1840 (Weather Reports).**

General Discussions of data not classed as Weather Reports are included under **1700-1730 (Climatology).**

Cross references have been used when a publication is made up of distinct sections belonging to different headings.

(*e*) Publications consisting of meteorological data, whether dealing with a single meteorological element or with more than one, have been classed under **1800-1820 (Meteorological Registers)**; those containing *discussions* of data for a single element, *e.g.*, rainfall, under the separate heading, with a cross reference, if necessary, under **1800-1820 (Meteorological Registers).**

I.—*METEOROLOGY* (F),

INCLUDING TERRESTRIAL MAGNETISM

0010 HISTORY, BIOGRAPHY.

Glaisher, James. *See* MARRIOTT, WILLIAM.

Hepites, Stefan C.—Mijloce de investigatiune ale meteorologiei. *See* 0040.

‖ **Marriott,** William.—Some account of the meteorological work of the late James Glaisher, F.R.S. 1a. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 30, 1904, *p.* 1.)

——— James Glaisher, F.R.S. 1809-1903. 1a. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 29, 1903, *p.* 115.)

‖ ——— The earliest telegraphic daily meteorological reports and weather maps. 1a. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 29, 1903, p. 123.)

Rotch, A[bbott] Lawrence.—The first use of the word "barometer." 1a. 8°. (*Science, New York, N.Y., n.s.*, 17, 1903, *p.* 708.)

0020 PERIODICALS, REPORTS OF METEOROLOGICAL INSTITUTIONS, SOCIETIES, CONGRESSES, &c. (*See* Note *d*.)

Aachen, Meteorologisches Observatorium.—Ergebnisse der Beobachtungen am Observatorium und dessen Nebenstationen. Jahrg. 8, 1902. 1a. 4°. Karlsruhe, 1903.

[**Allahabad,** Meteorological Office.]—Administration report of the Meteorological Reporter to Government, United Provinces of Agra and Oudh. 1902-3. sm. f°. Allahabad, 1903.

Berlin, Königlich Preussisches Meteorologisches Institut.—Bericht über die Tätigkeit . . . im Jahre 1902 von W. von Bezold. 1a. 8°. Berlin, 1903.

Bombay, Government Observatory.—Report on the condition and proceedings of the Government Observatory, Colába, 1902. sm. f°. s.l.e.a.

Brussels, Observatoire Royal de Belgique. Annuaire météorologique, 1903. 18°. Bruxelles, 1903.

Bucharest, Institutul Meteorologic al Romaniei.—Anulele . . . publicate de S. C. Hepites. Tom. 16, 1900. 1a. 4°. Bucuresci, 1903.

In the French language also.

Budapest, K. Ung. Reichsanstalt für Meteorologie u. Erdmagnetismus.—Bericht über die Thätigkeit der Kgl. Ung. Reichsanstalt für Meteorologie u. Erdmagnetismus und des Central-Observatoriums in O-Gyalla im Jahre 1902. 1a. 8°. Budapest, 1903.

NOTE.—Books marked * have been acquired by purchase; the others are donations from institutions, societies, or authors. Those marked ‖ are excerpt papers, extra copies of which have been separately printed.

In some cases additional publications have been received besides those specified, but only completed volumes or years are given here.

[**Calcutta,** Meteorological Office, India.]—Report on the administration of the Meteorological Department of the Government of India in 1902-3. f°. s.l.e.a.

—— —— —— Indian meteorological memoirs. Vol. 14. sm. f°. Calcutta, 1902.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Jahresbericht . . . mit den Ergebnissen der meteorologischen Beobachtungen und der Wasserstandsaufzeichnungen am Rhein und an seinen grössern Nebenflüssen. 1902. la. 4°. Karlsruhe, 1903.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Jahrbuch . . für das Jahr 1899. Jahrg. 17 der neuen Reihe. Zugleich Deutsches meteorologisches Jahrbuch für 1899. Beobachtungssystem des Königreiches Sachsen. la. 4°. Chemnitz, 1902.

* **Ciel et Terre.**—Revue populaire d'astronomie, de météorologie, et de physique du globe. 24e année ; 1903-4. 8°. Bruxelles, s.a.

Durban, Natal Observatory.—Report of the Government Astronomer for the year 1902. sm. f°. Pietermaritzburg, 1903.

Edinburgh, Scottish Meteorological Society.—Journal. Third series. Vol. 12. la. 8°. Edinburgh and London, 1903.

Greenwich, Royal Observatory.—Report of the Astronomer Royal to the Board of Visitors . . . read . . . 1903, June 6. la. 4°. s.l.e.a.

***Grenoble.**—Congrès international d'hydrologie, de climatologie et de géologie. Compte rendu de la sixième session. Grenoble, 1902. la. 8°. Grenoble, 1903.

Hamburg, Deutsche Seewarte.—Annalen der Hydrographie und maritimen Meteorologie. 31. Jahrg., 1903. la. 8°. Berlin, s.a.

—— —— Ausführliches Sach- und Namen-Register der Jahrgänge 1889-1902 der Annalen der Hydrographie und Maritimen Meteorologie. la. 8°. Hamburg, 1903.

***Himmel und Erde.**—Illustrirte naturwissenschaftliche Monatsschrift. Herausgegeben von der Gesellschaft Urania zu Berlin. Redakteur: Dr. P. Schwahn. 15. Jahrg. la. 8°. Berlin, 1903.

International Meteorological Committee.—Rapport du Comité Météorologique International. Réunion de Southport, 1903. [Publié par le] Bureau Central Météorologique de France. la. 8°. Paris, 1904.

—— Bericht des Internationalen Meteorologischen Komitees. Versammlung zu St. Petersburg, 1899. Königl. Preuss. Meteor. Inst. la. 8°. Berlin, 1903.

Kew Observatory, Richmond, National Physical Laboratory.—Report. 1902. la. 8°. London, 1903.

* **Klein,** H. J.—Jahrbuch der Astronomie und Geophysik. 13. Jahrg., 1902. 8°. Leipzig, 1903.

Kodaikánal Observatory.—Report on the Kodaikánal and Madras Observatories for 1902. sm. f°. s.l.e.a.

London, Meteorological Office.—Report of the Meteorological Council for the year ending 31st of March, 1902 . . . la. 8°. London, 1902.

—— Royal Meteorological Society.—Quarterly Journal. Vol. 29, 1903. la. 8°. London, 1903.

Lowe, Edward Joseph.—The Magazine of Natural Philosophy. Edited by E. J. Lowe. Vol. 1. la. 8°. London, 1856. [Incomplete.]

Manila, Department of the Interior, Philippine Weather Bureau.—Report of the Director of the Philippine Weather Bureau, 1902. Part 2, Meteorological service of the Philippine Islands. Report of its establishment and development under the Spanish Government, and its reorganization under the Government of the United States. 1865–1902. By Fr. Marcial Solá. la. 4°. Manila, 1902.

—— —— —— Part 3. *See* **1810** *e.g.*

Meteorologische Zeitschrift.—Herausgegeben im Auftrage der Oesterreichischen Gesellschaft für Meteorologie und der Deutschen Meteorologischen Gesellschaft. 20. Jahrg. (38. Bd. d. Zeitschr. oesterr. Gesellsch. Meteor.) 1903. la. 8°. Wien, s.a.

Ottawa, Department of Marine and Fisheries.—Report of the Meteorological Service of Canada, by R. F. Stupart. 1901. 4°. Ottawa, 1903.

Paris, Société Météorologique de France.—Annuaire. Tome 51, 1903. la. 8°. Paris, s.a.

Rotch, A[bbott] Lawrence.—Meteorology at the British Association, [Southport. 1903]. la. 8°. (*Reprinted from Science, New York, N.Y., n.s.*, 18, 1903, *p.* 657.)

[**St. Petersburg,** Nicolas Central Physical Observatory.—Report of the Nicolas Central Physical Observatory for 1901. Presented to the Imp. Acad. Sc. by M. Rikatcheff.] la. 4°. St. Pétersbourg. (*St. Pétersb., Mém. Acad. Imp. Sc., 8e sér., Cl. phys.-math.*, xiii., No. 4.)

In the Russian language.

—— —— Monthly meteorological bulletin. 11, 1903. la. 4°. St. Petersburg, 1904.

In the Russian language.

Symons's Meteorological Magazine.—Edited by H. R. Mill. Vol. 38, 1903. 8°. London, 1904.

Tebbutt, John.—Report of Mr. Tebbutt's Observatory The Peninsula, Windsor, New South Wales, for the year 1902. 8°. Sydney, 1903.

Vienna, K. K Central-Anstalt für Meteorologie und Erdmagnetismus.—Jahrbücher. 1901 und Anhang. Neue Folge 38. Bd. 2 vols. la. 4°. Wien, 1902–3.

Washington, Department of Agriculture, Weather Bureau.—Monthly Weather Review and Annual Summary. Vol. xxxi., 1903. 4°. Washington, 1903–1904.

—— —— —— Report of the Chief of the Weather Bureau for 1903. By Willis L. Moore. la. 8°. Washington, 1903. (*Washington, D.C., Ann. Rep. Dep. Agric.*, 1903.)

—— —— —— Report of the Chief of the Weather Bureau. 1900–01. Vol. 2. la. 4°. Washington, 1902. Comprises "Report on the barometry of the United States, Canada, and the West Indies. Prepared . . . by Frank H. Bigelow."

***Wetter,** Das.—Monatsschrift für Witterungskunde. Herausgegeben von R. Assmann. 20. Jahrg., 1903. la. 8°. Berlin, 1903.

Zi-ka-wei, Observatoire [Magnétique et Météorologique].—Calendrier-annuaire pour 1904. sm. 8°. Chang-hai, 1903.

0030 GENERAL TREATISES, TEXT BOOKS, DICTIONARIES, BIBLIOGRAPHIES, TABLES.

***Arrhenius,** Svante August.—Lehrbuch der kosmischen Physik. Teil. 1 u. 2. 1 vol. 8°. Leipzig, 1903.

* **Berget,** Alphonse.—Physique du globe et météorologie. la. 8°. Paris, 1904.

‖ **Bucharest,** Institut Météorologique de Roumanie.—Index des publications de l'Institut Météorologique de Roumanie sous la direction de Mr. St. C. Hepites, 1885–1903. la. 8°. Bucuresci, 1903. (*Ann. Inst. Météor. Roumanie*, 16, 1900.)

Hamburg, Deutsche Seewarte.—IV. Nachtrag zum Katalog der Bibliothek der Deutschen Seewarte zu Hamburg. 1901 und 1902. la. 8°. Hamburg, 1903.

***Hann,** Julius.—Handbook of climatology. Part 1. General climatology. Translated . . . with additional references and notes, by Robert de Courcy Ward. la. 8°. New York, 1903.

Mohn, H.—Les phénomènes de l'atmosphère: traité illustré de météorologie pratique. Par H. Mohn, traduit par Decaudin-Labesse, précédé d'une introduction par Henri de Parville. 2e éd. Paris, 1884.

O'Gyalla, Königl. Ung. Meteorologisches-Magnetisches Observatorium. Namen- und Sachregister der Bibliothek. la. 8°. Budapest, 1903.

0040 ADDRESSES, LECTURES, AND MAGAZINE ARTICLES.

Eliot, Sir John. *See* **1150.**

Hepites, Stefan C.—Mijlóce de investigatiune ale meteorologieĭ. Discurs rostit la 30 Martie (12 Aprilie) 1903 in sedintă solemnă de Stefan C. Hepites cu rĕspuns de I. Felix. Acad. Română. Discursurĭ de receptiune, xxv. 4°. Bucuresci, 1903.

M[iller], W.—The meteorology of the Bible. sm. 8°. Cork, 1903.

Pernter, J. M. *See* **1750.**

Polis, P[eter Hermann Johann.]—Witterungskunde. 6 Vorträge. Leitfaden. 8°. s.l.e.a.

0060 INSTITUTIONS, MUSEUMS, COLLECTIONS, ECONOMICS.

Merecki, R., and **Gorczynski,** W.—Sprawozdanie stacyi centralnej meteorologicznej przy Muzeum przemysłu i rolnictwa w Warszawie za r. 1902. la.8°. Warszawa, 1903. (*Wiad. mat., Warszawa*, 7.)

0070 NOMENCLATURE.

[**Hamburg,** Deutsche Seewarte.]—Erklärung der von der Deutschen Seewarte in den Witterungsberichten und Wettervorhersagen angewandten Ausdrücke. la. 8°. (Berlin, s.a.)

METHODS OF OBSERVATION AND COMPUTATION.

0110 INSTRUCTIONS FOR OBSERVERS.

***Angot,** Alfred.—Instructions météorologiques. 4e éd., entièrement refondue. la. 8°. Paris, 1903.

London, Meteorological Office.—Hints to meteorological observers in tropical Africa, with instructions for taking observations, and notes on methods of recording lake levels. Official, No. 162. la. 8°. London. 1902 [1903].

Mawley, Edward.—A simple method of taking phenological observations. *See* 1720.

Mill, Hugh Robert.—Rules for rainfall observers. Revised by Hugh Robert Mill. 8°. London, 1904.

0140 HARMONIC ANALYSIS AND COMPUTATION OF PERIODICITY.

Sutton, J[ohn] R[ichard].—Some results derived from the constant values in the periodic formulæ. Read, May 28, 1902. 1a. 8°. (*Cape Town, Trans. S. Afric. Phil. Soc.*, 14, 1903, *p.* 113.)

——— An elementary synopsis of the diurnal meteorological conditions at Kimberley. Read, October 29, 1902. 1a. 8°. (*Cape Town, Trans. S. Afric. Phil. Soc.*, 14, 1903, *p.* [133].)

OBSERVATORIES AND INSTRUMENTS.

0200 GENERAL.

Southport, British Association [for the advancement of Science].—Southport meeting, 1903. Meteorology and terrestrial magnetism. Catalogue of the exhibition of instruments, &c., in connexion with the meeting of the International Meteorological Committee. sm. 8°. Southport, [1903].

Strachan, Richard.—Instruments devised at the Kew Observatory. Parts 1–6. 1a. 8°. (*Horol. Journ., London*, 45–46, 1902–3.)

0210 OBSERVATORIES—CONSTRUCTION AND EQUIPMENT.

Mosso, A.—Laboratoire international de physiologie sur le Mont Rosa (alt. 4560 m.). 1a. 8°. (*Arch. ital. biol., Torino*, 37, *fasc.* 2, 1902.)

Palazzo, [Luigi].—Die Einrichtung des neuen Observatoriums für die Physik der Atmosphäre auf dem Monte Rosa. 1a. 8°. (*Protokoll dritte Versamml. internat. Komm. wissensch. Luftschiffahrt, Berlin, Mai* 1902, *p.* 79.)

Readville, Blue Hill Meteorological Observatory. [Notice of.] sm. 8°. (*Journ. Education, Boston, Mass.*, 1903.)

0220 SELF-RECORDING APPARATUS.

Redier, A[ntoine]. Nouveau baromètre enregistreur à mercure. 1a. 8° Paris, 1886.

0230 BAROMETERS.

* **Brander,** Georg Friederich.—Kurze Beschreibung zweyer besonderer und neuer Barometer, welche sich nicht nur verschliessen und sicher von einem Orte zu dem andern bringen lassen, sondern auch zu Höhenbeobachtungen vorzüglich zu gebrauchen sind, als ein Zusatz zu des Herrn [Michael] du Crest Sammlung kleiner Schriften von Thermometern und Barometern. sm. 8°. Augsburg, 1772.

See also THENN, JOHANN CHRISTOPH.

Crest, Michael du. *See* BRANDER, GEORG FRIEDERICH; THENN, JOHANN CHRISTOPH.

Strachan, Richard.—On verniers. 1a. 8°. (*Horol. Journ., London*, 44, 1902 *p.* 109.)

***Thenn,** Johann Christoph.—Michael du Crest kleine Schriften von den Thermometern und Barometern. Dritte und mit einer neuen Abhandlung des Autoris einige Versuche mit Thermometern betreffend sowohl als mit einer neuen Abhandlung von den Barometern, vermehrte Auflage mit Kupfern. Aus dem Franz. uebersetzt und mit einigen Anmerkungen begleitet von J. C. Thenn. sm. 8°. Augsburg, 1770.

See also BRANDER, GEORG FRIEDERICH.

0250 THERMOMETERS.

Cambridge Scientific Instrument Company.—The measurement of temperature by electrical means. 8°. (Cambridge, 1902.)

0330 SUNSHINE RECORDERS.

Strachan, Richard.—On sunshine recorders. la. 8°. (*Horol. Journ., London,* 45, 1903, *p.* 159; 46, 1903, *pp.* 2 *and* 18.)

0350 ELECTROMETERS AND OTHER ELECTRICAL APPARATUS.

Palazzo, [Luigi].—Ueber ein registrirendes Elektrometer, welches auch für die Ballonfahrten oder Drachenaufstiege benutzt werden kann. la. 8°. (*Protokoll dritte Versamml. internat. Komm. wissensch. Luftschiffahrt, Berlin, Mai* 1902, *p.* 135.)

0360 KITES.

Clayton, H[enry] H[elm].—Professor Alexander Graham Bell on kite construction. 4°. (*Science, New York, N.Y., n.s.,* 18, 1903, *p.* 204.)

——— Professor Alexander Graham Bell on kite construction. f°. (*Scient. Amer., New York, N.Y., Suppl.,* 1903, *June* 27, *p.* 22975.)

PHYSICS OF ATMOSPHERE.

0400 GENERAL.

Fassig, Oliver L.—Kite flying in the Tropics. la. 8°. (*Reprinted from Washington, U.S. Month. Weather Rev.,* 1903, *Dec.*)

Palazzo, [Luigi].—Die Theilnahme Italiens an der internationalen wissenschaftlichen Erforschung der hohen Atmosphäre. la. 8°. (*Protokoll dritte Versamml. internat. Komm. wissensch. Luftschiffahrt, Berlin, Mai* 1902, *p.* 78.)

Rotch, A[bbott] Lawrence.—Meteorological observations with kites at sea. 4°. (*Science, New York, N.Y., n.s.,* 18, 1903, *p.* 113.)

——— Die Erforschung der Atmosphäre über dem Ozean. la. 8°. [*Protokoll Komm. für Luftschiffahrt, Strassburg,* 1902.]

Shaw, W. N., and **Dines,** W. H.—Meteorological observations by the use of kites off the West Coast of Scotland, 1902. la. 4°. (*London, Phil. Trans., A,* 202, 1903, *p.* 123.)

Strassburg, International Kommission für wissenschaftliche Luftschiffahrt.—Beobachtungen mit bemannten, unbemannten Ballons und Drachen sowie auf Berg- und Wolkenstationen. 1901, Bd. 1-2; 1902, Jan.-Dez.; 1903, 9. Jan.; 5. Feb.; 5. März; 2. April; 7. Mai. 8 vols. 4°. Strassburg, [1903]-1904.

In the French language also.

0410 GASEOUS CONSTITUENTS.

Cook, S. R.—The permanency of planetary atmospheres, according to the kinetic theory of gases. 1a. 8°. (*Washington, Dep. Agric., U.S. Mon. Weather Rev.,* 1902, *Aug.*)

Hann, J[ulius].—Die Zusammensetzung der Atmosphäre. sm. f°. (*Meteor. Zeitschr., Wien,* 1903, *März, p.* 122.)

0420 IMPURITIES AND DUST.

Berlin, Königlich Preussisches Meteorologisches Institut.—Abhandlungen. Bd. 2, No. 1. Der grosse Staubfall vom 9. bis. 12. März 1901 in Nordafrika, Süd- und Mitteleuropa. Von **G. Hellmann** und **W. Meinardus.** 1a. 4°. Berlin, 1901.

[Hermann, E.]—Die Staubfälle vom 19. bis 23. Februar 1903 über dem Nordatlantischen Ozean, Grossbritannien und Mitteleuropa. 1a. 8°. (*Ann. Hydr. mar. Meteor., Berlin,* 1903, *Okt.*)

Liversidge, A[rchibald].—Meteoric dusts, New South Wales. 8°. (*Journ. Proc. R. Soc. N.S.W.,* 36, 1902, *p.* 241.)

Meinardus, Wilh[elm Siegfried].—Ueber einige bemerkenswerte Staubfälle der letzten Zeit. 1a. 8°. (*Das Wetter, Berlin,* 1903, *Heft* 12.)

Russell, W. J.—On the formation of definite figures by the deposition of dust. 1a. 4°. (*London, Phil. Trans., A,* 201, 1903, *p.* 185.)

0440 DYNAMICAL AND THERMO-DYNAMICAL THEORIES.

Thévenet, A.—Recherches de thermodynamique sur la distribution des éléments météorologiques à l'intérieur des masses d'air en mouvement. 4°. Alger, 1903.

COSMICAL RELATIONS.

0450 GENERAL.

Bigelow, Frank H[agar].—The new cosmical meteorology. 4°. (*Science, New York, N.Y., n.s.,* 19, 1904, *p.* 30.)

0460 SOLAR INFLUENCES.

Bigelow, Frank H[agar].—Studies on the meteorological effects in the United States of the solar and terrestrial physical processes. W.B. No. 290. 1a. 4°. Washington, 1903. (*Washington, U.S. Dep. Agric., Mon. Weather Rev., Dec.,* 1902 *Jan., Feb.* 1903.)

——— Studies on the circulation of the atmospheres of the sun and of the earth. 1. The circulation of the sun's atmosphere. 1a. 4°. (*Washington, U.S. Dep. Agric., Mon. Weather Rev.,* 31, 1903, *p.* 459.]

——— [Studies on the circulation of the atmospheres of the sun and of the earth.] ii. Synchronism of the variations of the solar prominences with the terrestrial barometric pressures and the temperatures.] 1a. 4°. [*Washington, U.S. Dep. Agric., Mon. Weather Rev.,* 31, 1903, *p.* 509.]

0470 RELATIONS TO SUN-SPOT PERIOD.

Zenger, K. W.—Die Meteorologie der Sonne und das Wetter im Jahre 1889, zugleich Wetterprognose für das Jahr 1899. 1a, 8°. Prag, 1899.

0480 LUNAR INFLUENCES.

Borredon, Giuseppe.—La luna é la calamita del mondo la. 8°. Dated, Napoli, 1903.

McClounie, J[ohn].—Rainfall forecasts and estimates. *See* 1750 *ff.*

OPTICAL PHENOMENA.

0540 HALOS, CORONÆ, PARHELIA.

Schück, [Karl Wilhelm] A[lbert].—Seltenes Kreuz durch den Mond, beobachtet im nördlichen Eismeer, zwischen Spitzbergen und Grönland. la. 8°. Kiel, 1904. (*Kiel, Schr. Naturw. Ver. Schleswig-Holstein*, 13, *Heft* 1.)

ATMOSPHERIC PRESSURE.

0700 GENERAL.

Bigelow, Frank H[agar].—Report on the barometry of the United States, Canada and the West Indies. *See* 0020. WASHINGTON, DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

Clayton, H[enry] Helm.—The eclipse cyclone of 1900. *See* 1550.

Schreiber, Paul.—Kritische Bearbeitung der Luftdruckmessungen im Königreich Sachsen während der Jahre 1866-1900. la 4°. Chemnitz, 1903. (*Chemnitz, Jahrb. K. Sächs. meteor. Inst.*, 1900.)

0710 PRESSURE.—DISTRIBUTION AT THE EARTH'S SURFACE.—ISOBARS.

Eliot, *Sir* John.—Monthly normals [actual means] of air pressure [at stations in India] reduced to 32° F. and constant gravity, Lat. 45°. la. 4°. [*Ind. Met. Mem., Calcutta*, 16, *Part* 1.]

0750 PRESSURE.—VARIATIONS AND OSCILLATIONS.—PERIODICAL.

Krebs, Wilhelm.—Die Gezeitenbewegungen der Atmosphäre. sm. f°. (*Das Weltall, Berlin*, 4, *Heft* 4 *u.* 5, *p.* 91.)

Pfund, J.—Essai météorologique. Publications de l'État-Major Général Égyptien. 8°. Le Caire, 1877.

TEMPERATURE AND RADIATION.

0810 DISTRIBUTION AT EARTH'S SURFACE.—ISOTHERMS.

dm **Mediterranean and Islands.**

Hann, J[ulius].—Vierzigjährige Temperaturmittel für Malta. sm. f°. (*Meteor. Zeitschr., Wien*, 1903, *Feb., p.* 69.)

0830 TEMPERATURE VARIATIONS, PERIODICAL.

Lancaster, A[lbert].—Un intéressant phénomène. Les refroidissements du milieu de Juin depuis vingt ans. la. 8°. (*Ciel et terre, Bruxelles*, 23, 1902, *Juillet* 16 *et Sept.* 1.)

Berlin, Königlich Preussisches Meteorologisches Institut.—Abhandlungen. Bd. 2, No 3. Ueber die Kälterückfälle im Juni. Von. **W. Marten.** la. 4°. Berlin, 1902.

Gautier, Raoul et **Duaime,** Henri.—Quelques chiffres relatifs aux saints de glace. 8°. (*Arch. sc. phys. nat., Genève, 4e période*, 15, 1903, *p.* 545.)

Lancaster, A[lbert].—Le mois de mai. 1. Mai, 1902. 2. Le mois de mai à Bruxelles. 3. Les refroidissements périodiques de mai. la. 8°. Bruxelles, 1902.

0850 EARTH TEMPERATURE.

Zomba, Scientific Department. *See* 1800 *ff.*

0880 SEA TEMPERATURE.—SURFACE.

Åkerblom, Filip.—Expédition de M. A.-G. Nathorst en 1899. Recherches océanographiques par Filip Åkerblom. la. 8°. Uppsala, 1904. (*Uppsala Univ. Årsskr.*, 1903. *Mat. Naturv.* 2.)

Copenhagen, Dansk Meteorologisk Institut.—Nautisk-meteorologisk Aarbog. *See* 1820 *da.*

Copenhagen, Conseil Permanent International pour l'Exploration de la Mer. —Bulletin des résultats acquis pendant les courses périodiques publié par le Bureau du Conseil avec l'assistance de M. Knudsen. Année 1902–1903. la. 4°. Copenhague, 1903.

London, Admiralty, Hydrographic Department.—List of oceanic depths and serial temperature observations received at the Admiralty during the year 1902, from H.M. Surveying Ships, Indian Marine Survey, and British Submarine Telegraph Companies. sm. f°. London, 1903.

0890 SEA TEMPERATURE.—VERTICAL VARIATION.

‖ **Dickson,** H. N.—The hydrography of the Færoe-Shetland Channel. la. 8°. (*Geogr. Journ.*, 21, 1903, *p.* 418.)

0900 FROZEN SEA.

Copenhagen, Dansk Meteorologisk Institut.—Nautisk-meteorologisk Aarbog. *See* 1820 *da.*

‖ ——— ——— Isforholdene i de arktiske Have. 1903. la. 4°. (*Danske Meteor. Inst. naut.-meteor. Aarbog.*)

In the English language also.

0910 RIVER AND LAKE TEMPERATURE.

Calderwood, W. L.—Water temperature in relation to the early annual migration of salmon from the sea to rivers in Scotland. 2nd and 3rd papers. la. 8°. (*Edinburgh, Ann. Rep. Fish. Board*, 20th, *p.* 101 ; 21st, *p.* 71.)

——— The temperature of the River Tay and its tributaries in relation to the ascent of salmon. la. 8°. (*Edinburgh, Ann. Rep. Fish. Board*, 21st, *p.* 77.)

* **Müllner,** Johann.—Die Vereisung der österreichischen Alpenseen in den Wintern 1894–5 bis 1900–1. Geogr. Abhandl. herausg. von A. Penck in Wien Bd. 7, Heft 2. la. 8°. Leipzig, 1903.

0930 SOLAR RADIATION.

Exner, Felix M.—Messungen der Sonnenstrahlung und der nächtlichen Ausstrahlung auf dem Sonnblick. sm. f°. (*Meteor. Zeitschr., Wien,* 1903, *p.* 409.)

0950 SUNSHINE.

‖ **Collenette,** A[dolphus].—Guernsey sunshine for 1902. 8°. (*Guernsey, Trans. Soc. Nat. Sc.,* 1902.)

0970 TERRESTRIAL RADIATION.

Exner, Felix M. *See* 0930.

AQUEOUS VAPOUR AND RAIN.

1050 EVAPORATION AND PERCOLATION.

Mawley, Edward.—The percolation of rain through comparatively light and through comparatively heavy soil. 8°. (*Hertford, Trans. Herts. Nat. Hist. Soc.,* 6, 1891, *p.* 175.)

Sydney, Department of Public Instruction.—Results of rain, river, and evaporation observations made in New South Wales. *See* 1180 *ie.*

Sutton, J[ohn] R[ichard].—Results of some experiments upon the rate of evaporation. la. 8°. (*Cape Town, Trans. S. Afric. Phil. Soc.,* 14, *Part* 1, 1903.)

1090 CLOUD VARIETIES OF FORM.

* **Barber,** Samuel.—The cloud world: its features and significance; being a popular account of forms and phenomena. la. 8°. London, 1903.

1100 CLOUD ALTITUDES.

Berlin, Königlich Preussisches Meteorologisches Institut.—Ergebnisse der Wolkenbeobachtungen in Potsdam und an einigen Hülfsstationen in Deutschland in den Jahren 1896 und 1897. Von. **A. Sprung** und **R. Süring.** sm. f°. Berlin, 1903.

1150 RAIN.—GENERAL.

* **Eliot,** Sir John.—The meteorology of the Empire during the unique period 1892-1902. la. 8°. (*Broad Views,* 1, 1904, *Meh., p.* 191.)

Krebs, Wilhelm.—Das Hochwasser des verflossenen Jahrgangs in meteorologischer Beziehung. la. 4°. (*Globus, Braunschweig,* 85, 1904, *p.* 27.)

Russell, H[enry] C[hamberlaine].—The fallacy of assuming that a wet year in England will be followed by a wet year in Australia. 8°. (*Sydney, N.S.W., Journ. Proc. R. Soc.,* 36, 1902, *p.* 314.)

1170 CONDENSATION—EFFICIENT CAUSES OF.

Bell, Arthur H[ope].—The romance of a raindrop. la. 8°. (*Chambers's Journ., ser.* 6, 6, 1903, *p.* 251.)

1180 RAIN DISTRIBUTION.—GEOGRAPHICAL.

c **Ocean as a Whole.**

Black, W[illiam] G[alt].—Ocean rainfalls. Monthly tables. [1864-80.] la. 8°. s.l.e.a.

d **Europe and Mediterranean Islands.**

* **Ule,** Willi.—Niederschlag und Abfluss in Mitteleuropa. la. 8°. Stuttgart, 1903. (*Forsch. deutsch. Landes- u. Volksk., Stuttgart*, 14, 5, *p.* 435.)

da **Scandinavia.**

Christiania, Norsk Meteorologisk Institut.—Nedbøriagttagelser i Norge. Aarg. 8, 1902. f°. Kristiania, 1903.

db **Russia in Europe.**

Odessa, Observatoire Magnétique et Météorologique.—Revue météorologique. *See* 1800 *db*.

Sresnewsky, B.—Synoptische Tabellen der täglichen Niederschläge an allen meteorologischen Stationen der Ostseeprovinzen im Jahre 1900. la. 8°. Jurjew, 1903.

dc **German Empire.**

[**Berlin,** Königlich Preussisches Meteorologisches Institut].—Handzeichnungen der 6 forstlichen Regenmessfelder in Preussen nebst Nachbarstationen des Berliner Meteorologischen Instituts. sm f°. s.l.e.a

——— ——— Ergebnisse der Niederschlags-Beobachtungen in den Jahren 1899 und 1900. la. 4°. Berlin, 1903.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogtum Baden. 1903. 1. u. 2. Halb. 2 vols. la. 4°. Karlsruhe, 1903–1904.

——— ——— Uebersicht der Ergebnisse der an den badischen meteorologischen Stationen angestellten Beobachtungen. *See* 1840 *dc*.

Hellmann, [J. G.] G[ustav].—Regenkarte der Provinzen Hessen-Nassau und Rheinland sowie von Hohenzollern und Oberhessen. la. 8°. Berlin, 1903.

de **British Islands.**

British Rainfall. *See* WALLIS, H. SOWERBY, and MILL, H. R.

Croydon Microscopical and Natural History Club.—[Daily rainfall at stations in Kent and Surrey.] 1903, Jan.–Dec. 4°. Sheets.

——— Natural History and Scientific Society.—Report of the Meteorological Committee for 1902. 8°. (*Trans. Croydon Nat. Hist. Sc. Soc.*, 1902–1903, *p.* 63.)

Continuation of "Croydon Microscopical and Natural History Club."

Dorset.—Returns of rainfall, &c., in Dorset, by Henry Storks **Eaton,** 1901, 1902. 2 parts, 8°. Dorchester, 1902–1903. (*Proc. Dorset Nat. Hist. Antiq. Field Club*, 23, 1902; 24, 1903.)

Great Central Railway.—Monthly statement of rain fallen in the year ending 31st December, 1903. sm. f°. Sheet.

Guernsey, The rainfall of, for the year 1902, by A[dolphus] **Collenette.** 8°. (*Guernsey, Trans. Soc. Nat. Sc.*, 1902.)

Hertfordshire, Report on the rainfall in, in the year 1901, by John **Hopkinson.** 8°. (*Hertford, Trans. Herts. Nat. Hist. Soc.*, 11, *part* 5, 1902, *p.* 155.)

London.—Rainfall at Camden Square, London, for the 45 years 1858 to 1902, by H[erbert] Sowerby **Wallis.** 8°. (*Brit. Rainfall*, 1902.)

London County Council.—Shrinkage of the Thames and Lea. Report by Maurice Fitzmaurice. sm. f°. [London, 1903.]

Nottingham. *See* 1800 *de.*

Wallis, H[erbert] Sowerby and **Mill,** Hugh Robert.—British rainfall, 1902. On the distribution of rain over the British Isles during the year 1902. 8°. London, 1903.

df **France.**

Bordeaux, Commission Météorologique de la Gironde.—Observations pluviométriques et thermométriques . . . *See* 1800 *df.*

‖ **Fines,** —. La pluie dans le Département des Pyrénées-Orientales, 1851–1900. 4°. Perpignan, 1902. [*Bull. Météor. Ann. Dép. Pyrénées Orient., Perpignan*, 1900, 1901.]

Launay, F. et **Maillet,** E[dmond].—Sur le débit probable des sources pendant la saison chaude de 1903 (1er Mai, 1er Novembre). la. 8°. [*Paris, Ann. Soc. Météor. Fr.*, 51, 1903, *p.* 97.]

Lyons, Commission Départementale de Météorologie du Rhône. *See* 1800 *df.*

Maillet, Edmond.—Sur la prévision des crues à Pommeuse et à Coulommiers (Bassin du Grand-Morin) à l' aide des hauteurs de pluie. la. 8°. (*Paris, Ann. Soc. Météor. Fr.*, 1901.)

——— Sur la prévision des débits minima des sources de la Vanne. la. 8°. (*Ann. ponts et chauss., mém., Paris*, 1902, *p.* 208.)

——— Résumé des observations centralisées par le Service Hydrométrique du Bassin de la Seine pendant l'année 1901. la. 8°. (*Paris, Ann. Soc. Météor. Fr.*)

——— Résumé des observations météorologiques et hydrométriques de 1891 à 1900. (Service hydrométrique central du bassin de la Seine.) la. 8°. (*Paris, Ann. Soc. Météor. Fr.*)

——— *See* LAUNAY, F. ET MAILLET, E.

Paris, Service Hydrométrique du Bassin de la Seine.—Observations sur les cours d'eau et la pluie centralisées pendant l'année 1901 . . . 7 plates. f°. s.l.e.a.

di **Switzerland.** *See* 1800 *di.*

dl **Balkan Peninsula.**

Hepites, St[efan] C.—Materiale pentru climatologia României. *See* 1700 *dl.*

dm **Mediterranean and Islands.**

Bellamy, C. V. *See* 1700 *dm.*

Cyprus. Nicosia, Public Works Department.—Statement of rainfall recorded at six stations in Cyprus from October to March, inclusive, during the years 1882–83 to 1902–3, 1881–82 to 1902–3, Apl.-Sept., 1882–1903. sm. f°. 3 sheets. (*Cyprus Gazette*, 1903, *Apl.* 9, *p.* 5013; *July* 3, *p.* 5121; *Nov.* 6, *p.* 5200.)

——— ——— Return of rainfall for the month. 1902, Apl.–Sept., Oct.–Dec. and year; 1903, Jan., Feb., Apl.–Dec. and year. sm. f°. Sheets. (*Cyprus Gazette*, 1902–1904.)

Hann, J[ulius].—Ergebnisse 43 jähriger Regenmessungen auf der Insel Malta. sm. f°. (*Meteor. Zeitschr., Wien*, 1903, *Apl.*, *p.* 180.)

ef **British India.** *See also* 1460 and 1840 *ef.*

(Allahabad, Meteorological Office.)—Annual statement of rainfall in the United Provinces of Agra and Oudh, 1902. sm. f°. s.l.e.a.

Bangalore, Mysore Government Meteorological Department.—Report on rainfall registration in Mysore for 1902. By J. Cook. la. 4°. Bangalore, 1903.

(Calcutta, Meteorological Office, India).—Rainfall of India. 12th year, 1902. sm. f°. Calcutta, 1903.

Rangoon. *See* 1710 *ef.*

eg **Malay Peninsula.** *See also* 1800 *eg.*

Batavia, Kon. Magnetisch en Meteorologisch Observatorium.—Uitkomsten van regenwaarnemingen in Deli 1890–1899. la. 8°. (*Natuurk. Tijdschr. Nederl. Ind.*, 62, 1902, *p.* 36.)

fd **West Africa.** *See also* 1800 *fd.*

Sierra Leone, Observatory, [Freetown].—Rainfall—Sierra Leone. Observatory, Tower Hill Hospital, [Freetown]. 1882–1903. Oblong sm. f°. Sheet.

ff **East Africa.** *See also* 1800 *ff.*

[Zomba, Scientific Department].—Rainfall, 1902-1903, British Central Africa Protectorate, showing amount for the year 1902 and up to 31st March, 1903. la. 8°. Sheet.

fg **South Africa.**

Durban, Natal Observatory. *See* 0020.

Rhodesia.—Rainfall registered at various stations in Southern Rhodesia during the months of November and December, 1903. 4°. (*Rhodesian Agric. Journ., Salisbury*, 1, 1904, *p.* 101.)

hc **West Indian Islands.** *See* 1800 *hc.*

Barbados. *See* 1710 *hc.*

Kingston, Government Laboratory.—Jamaica weather report. *See* 1840 *hc.*

hd **Trinidad.** *See* 1800 *hd.*

hi **Argentina; Uruguay and Paraguay.** *See* 1800 *hi.*

Monte Video, Dirección General del Servicio Meteorológico Nacional.—Resumen de las observaciones del agua caida en el mes. 1902, 1903, Jan.–Dec. la. f°. Sheets.

ie **New South Wales.** *See also* 1800 *ie.*

Sydney, Department of Public Instruction.—Results of rain, river, and evaporation observations made in New South Wales during 1900 . . . by H. C. Russell. la. 8°. Sydney, 1903.

ig **South Australia.** *See also* 1800 *ig.*

Adelaide, Post Office and Telegraph Department, General Post Office.—Rainfall—Pinnaroo and other places. [1888–1903.] sm. f°. s.l.e.a.

ih **West Australia.** *See also* 1800 *ih.*

Perth, Observatory.—Rainfall. 1903, Jan.–Dec. and year. f°.

ik **New Zealand.** *See also* 1800 *ik.*

Wellington, Meteorological Office.—Rainfall. 1899, 1900, 1901; 1902, 1903 Jan.-Dec. sm. f°. Sheets.

——— ——— Annual rainfall (of New Zealand) from 1865 to 1901. sm. f°. (Wellington, 1902.)

1220 DROUGHTS.

Australian droughts, the prediction of.—Newspaper cutting. (*Mining Journ.*, 1903, *May* 30, *pp.* 640 *and* 653.)

***Cyprus.**—Correspondence respecting the drought in Cyprus. [1901-1902.] sm. f°. London, 1903.

1240 SHOWERS OF MISCELLANEOUS MATTER.

See also 0420.

Black, W[illiam] G[alt].—Rain and dustfall in Edinburgh, 1902. 8°. Dated, Edinburgh, March, 1903. (*Sanitary Record.*)

Krebs, Wilhelm.—Staubfälle, Blutregen, Blutschnee. 1a. 4°. (*Globus, Braunschweig*, 84, 1903, *p.* 181.)

HAIL, SNOW AND FROST.

1260 HAIL.

Waehner, C.—Historische-kritische Uebersicht ueber die Hageltheorien, und eine Zusammenfassung des Status-quo der letzten Theorien mit Beruecksichtigung wissenschaftlich festgestellter Thatsachen. Nieuwe Verhand. Bataaf. genootschproef. wijsbeg. Rotterdam, 2. Reeks; 2. deel, 2. stuk. 4°. Rotterdam, 1876.

1270 SNOW.

‖ **Bentley,** Wilson A.—Studies among the snow crystals during the winter of 1901-2, with additional data collected during previous winters and twenty-two half-tone plates. 1a. 4°. (*Washington, U.S. Dep. Agric., Mon. Weather Rev.*, 30, 1902, *p.* 607.)

Vienna, K. K. Hydrographischen Dienst in Oesterreich. *See* 1840 *dk.*

WIND.

1300 GENERAL.

Charrol, Marcel.—L'état anémométrique du bassin occidental de la Méditerranée. 1a. 8°. Paris, 1903. (*Géographie, Paris*, 1903, *p.* 199.)

La Coudraye, [François Célestin de Loynes, Chevalier] de.—Théories des vents et des ondes. 2 éd. 8°. Paris, [1802].

1310 CIRCULATION OF THE ATMOSPHERE.

[**Bigelow,** Frank Hagar]. *See* 0450 and 0460.

1350 UPPER CURRENTS.

‖ **Vanderlinden,** E.—Etude sur la marche des cirrus. *See* 1550.

1360 PRESSURE EXERTED BY WIND.

‖ **Lancaster,** A[lbert].—La force du vent en Belgique. sm. 8°. Bruxelles, 1903. (*Bruxelles, Ann. météor.*, 1903.)

London, Royal Agricultural Society of England.—The trials of wind pumping engines carried out by the Royal Agricultural Society of England, at Park Royal, 1903. Report of the judge, **W. N. Shaw,** with notes by . . . **F. S. Courtney.** 8°. London, 1903.

Nielsen, Theodor.—Effect of wind on roofs, on the basis of J. O. V. Irminger's experiments. f°. (*Engineering*, 1903, Oct. 9, *p.* 508.)

Stanton, T. E.—The effect of wind pressures on roofs. f°. (*Engineering*, 1903, *Oct.* 16, *p.* 540.)

1400 CONSTANT AND LOCAL WINDS.

Scarpellini, Caterina.—Colpo d' occhio su' i grandi fenomeni atmosferici notati alla privata stazione meteorologica in Roma negli anni 1865, 1866, 1867, in relazione alle burrasche. 8°. Roma, 1868. (*Bull. ozonomet. meteor. Roma*, 11, 1868.)

PERIODICAL WINDS.

1460 MONSOONS.

Calcutta, Meteorological Office, Bengal.—Meteorological summary for the monsoon period of 1903. sm. f°. s.l.e.a.

[—— —— India.]—Memorandum on the meteorological conditions prevailing in the Indian monsoon region before the advance of the south-west monsoon of 1903, with an estimate of the probable distribution of the monsoon rainfall in 1903. sm. f°. Simla, 1903.

[—— —— ——.]—Memorandum on the meteorological conditions prevailing in the Indian monsoon region during the first half of the south-west monsoon period of 1903, with an estimate of the probable distribution of the monsoon rainfall during August and September, 1903. sm. f°. Simla, 1903.

[—— —— ——.]—Memorandum on the meteorological conditions prevailing in the Indian monsoon region during the south-west monsoon of 1903, with an estimate of the probable distribution of the cold weather rainfall in 1903-1904. By Sir John Eliot. sm. f°. Simla, 1903.

1480 MOUNTAIN AND VALLEY WINDS.

Hann, J[ulius.]—Ueber die tägliche Drehung der mittleren Windrichtung und über eine Oscillation der Luftmassen von halbtägiger Periode auf Berggipfeln von 2 bis 4 km Seehöhe. la. 8°. (*Sitzungsb. K. Akad. Wiss. Wien, math.-naturw. Kl.*, 111, *Abth.* 2*a*, 1902, *p.* 1615.)

—— Ueber die tägliche Drehung der mittleren Windrichtung auf Berggipfeln von 2–4 km Seehöhe. Auszug aus dem I. Teil einer Abhandl. in den Sitzungsb. k. Akad. Wiss. Wien., math.-naturw. Kl., 111., Abt. 2a, Dez. 1902. sm. f°. (*Meteor. Zeitschr., Wien*, 20, 1903, *p.* 433.)

—— Ueber eine doppelte tägliche Periode der Windkomponenten auf den Berggipfeln. sm. f°. (*Meteor. Zeitschr., Wien*, 20, 1903, *p.* 501.)

—— Die Luftströmungen auf dem Gipfel des Säntis (2504 m.) und ihre jährliche Periode. la. 8°. (*Sitzungsb. K. Akad. Wiss. Wien, math.-naturw. Kl.*, 112, *Abth.* 2*a*, 1903, *p.* 371.)

—— Die Luftströmungen auf dem Gipfel des Säntis, 2504 m. und ihre jährliche Periode. la. 8°. (*K. Akad. Wiss. Wien, Sitz. math.-naturw. Kl.*, 1903, *Apl.* 2.)

STORMS.

1500 GENERAL.

‖ **Brodie,** Frederick J[ohn].—The prevalence of gales on the coasts of the British Islands during the 30 years, 1871–1900. Second paper. la. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 29, 1903, *p.* 151.)

CYCLONES AND ANTICYCLONES.

1550 GENERAL.

‖ **Clayton,** H[enry] Helm.—The eclipse cyclone of 1900. la. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 29, 1903, *p.* 47.)

Colin, [E].—Étude sur les deux derniers cyclones ressentis à Madagascar, 10, 11, 12 décembre 1902 et 22, 23, 24 Mars 1903. 4°. Tananarive, [1903]. (*Journ. Officiel*, 16 *Mai*, 1903.)

Joly, C. J.—Irish barograms of the recent storm. [Feb. 26–27, 1903.] Slip.

Meinardus, Wilh[elm Siegfried].—Über die absolute Bewegung der Luft in fortschreitenden Zyklonen. sm f°. (*Meteor. Zeitschr., Wien*, 1903, *p.* 529.)

Shaw, William Napier.—The meteorological aspects of the storm of February 26–27, 1903. la. 8°. (*London, Quart. Journ. R. Meteor. Soc.*, 29, 1903, *p.* 233.)

Vanderlinden, E.—Etude sur la marche des cirrus dans les cyclones et les anticyclones d'après les observations faites à Uccle. sm. 8°. Bruxelles, 1903. (*Bruxelles, Ann. météor.*, 1903.)

ATMOSPHERIC ELECTRICITY.

1610 POTENTIAL.—VARIATIONS DUE TO LOCAL ATMOSPHERIC CONDITIONS.

Conrad, Victor und **Exner,** Felix M.—Beiträge zur Kenntnis der atmosphärischen Elektrizität. xii. Registrierungen des luftelektrischen Potentials auf dem Sonnblick. la. 8°. (*Wien, Sitzungsb. k. Akad. Wissensch., math.-naturw. Kl.*, 112, *Abth. 2a*, 1903, *p.* 413.)

1630 LIGHTNING AND OTHER DISCHARGES.

* **Walter,** B.—Ueber die Entstehungsweise des Blitzes. la. 8°. Hamburg, 1903. (*Hamburg, Jahrb. Wiss. Anst.*, 20.)

1640 THUNDERSTORMS.

Berlin, Königlich Preussisches Meteorologisches Institut.—Ergebnisse der Gewitter-Beobachtungen in den Jahren 1898, 1899, und 1900. la. 4°. Berlin, 1903.

Budapest, Institut Royal Météorologique et Magnétique.—Rapport sur les orages en Hongrie. 1903, Nos. 1–31, 1 juin–31 Dec. f°. Budapest, s.a.

In the Hungarian language also.

Lyons, Commission Départementale de Météorologie du Rhône.—*See* **1800** *df.*

Odessa, Observatoire Magnétique et Météorologique de l'Université.—Revue météorologique. *See* **1800** *db.*

‖ **Polis,** P[eter Hermann Johann].—Der Gewittersturm vom 26. Juli 1902 in der Rheinprovinz. 1a. 8°. (*Das Wetter*, 1903, *Heft* 6-7.)

Zürich, Schweizerische . . . Central-Anstalt. *See* **1800** *di.*

CLIMATOLOGY AND WEATHER.

1700 GENERAL.

Berlin, Königlich Preussisches Meteorologisches Institut.—Abhandlungen. Bd. 2, No. 4. Katalog bemerkenswerter Witterungsereignisse von den ältesten Zeiten bis zum Jahre 1800. Von **R. Hennig.** 1a. 4°. Berlin, 1904.

Hann, Julius.—Handbook of climatology. *See* **0030.**

Polis, P. *See* **0040.**

Tyler, W[illiam] F[erdinand].—A scheme for the comparison of climates. 1a. 8°. London, 1904. (*Journ. Balu. Clim.*, 1904, *Feb.*)

da **Scandinavia.**

Hann, J[ulius].—Die Anomalien der Witterung auf Island in dem Zeitraume 1851 bis 1900 und deren Beziehungen zu den gleichzeitigen Witterungsanomalien in Nordwesteuropa. 1a. 8°. (*Wien, K. Akad. Wiss., akad. Anzeiger, Nr.* 1, 1904.)

dd **Holland, Belgium, Luxemburg.**

Lancaster, A[lbert].—Données météorologiques. 2me série. Ephémérides météorologiques et naturelles. sm. 8°. Bruxelles, 1902.

——— Constantes et éphémérides météorologiques et naturelles de Bruxelles-Uccle. sm. 8°. Bruxelles, 1903. (*Bruxelles, Ann. météor.*, 1903.)

——— Le climat de la Belgique. 1900, 1901. 15e, 16e années. 2 vols. sm. 8°. Bruxelles, 1902, 1903. (*Bruxelles, Ann. météor.*, 1902, 1903.)

Quetelet, A.—Variations annuelles et horaires des instruments météorologiques à Bruxelles. 8°. (*Bruxelles, Bull. acad. roy. Belgique*, 2 *sér.*, 2, *Nos.* 6 *et* 7.)

de **British Islands.**

‖ **Bayard,** Francis Campbell.—English climatology, 1881–1900. 3 papers in one vol. 1a. 8°. Edinburgh, 1903. (*Quart. Journ. R. Meteor. Soc.*, 18, 1892, *p.* 213; 28, 1902, *p.* 253; 29, 1903, *p.* 1.)

‖ **Baxendell,** Joseph.—The meteorology of Southport. sm. 8°. Southport, 1903. (*Brit. Assoc. Handbook*, 1903.)

‖ **Devon.**—Report of the Committee on the climate of Devon. Edited by A. Chandler. 21st, 3rd series, 1902. 8°. (*Plymouth, Trans. Devon. Ass.*, 35, 1903, *p.* 66.)

* **Howard,** Luke.—The climate of London, deduced from meteorological observations, made at different places in the neighbourhood of the metropolis. Vols. 1, 2. 2 vols. 8°. London, 1818, 1820.

Mossman, R[obert] C[ockburn].—Report on the meteorology of Scotland for the years ending 30th September, 1896, 1897. 2 papers. 8°. (*Edinburgh, Trans. R. Scott. Arbor. Soc.*, 1897 (2), *p.* 61; 1898 (1), *p.* 186.)

dl **Balkan Peninsula.**

Hepites, Stefan C.—Climatologia Bucurescianã. 1895–1897. Nos. 1–3. 3 vols., 1a. 8°. Bucuresci, 1897–99. (*Ann. Statist. Capitalei*, 1895, 1897, 1898.)

Hepites, St[efan] C.—Materiale pentru climatologia României. XII. Clima Brăilei. XIII. Regimul pluviometric al României. XVII. Repartitiunea ploiĭ pe districte si pe basenurĭ ĭn România ĭn anul 1901 st. n. si ĭn lustrul 1896–1900. 3 papers. 4°. Bucuresci, 1900, 1903. (*Bucuresci, Anal. Acad. Române, Ser.* 2, 22, 25, *Mem. Sect. Sc.*)

dm **Mediterranean and Islands.**

Bellamy, C[harles] V[incent].—The incidence of rainfall in regard to irrigation [in Cyprus]. Printed for the use of the Colonial Office, October, 1903. sm. f°. s.l.e.a.

eb **China.**

Wei-hai-wei. *See* STARR, W. H. 1800 *eb.*

Zi-ka-wei, Observatoire Magnétique et Météorologique.—Calendrier annuaire. *See* 0020.

fg **South Africa.**

Sutton J[ohn] R[ichard]. *See* 0140.

fi **Red Sea.**

Hann, J[ulius].—Die meteorologischen Ergebnisse der Expedition Sr. M. Schiff "Pola" in das Rote Meer 1895–6 und 1897–8. Bearbeitet von Cäsar Arbesser v. Rastburg. Denkschr. math.-naturw. Kl. der k. Akad. Wiss., 65, 1898, und 74, 1902. sm. f°. (*Meteor. Zeitschr., Wien*, 20, 1903, *p.* 317.)

gi **Western United States.**

California.—Climatology of California. Prepared . . . by Alexander G. McAdie. Washington, Department of Agriculture, Weather Bureau, Bulletin L., W.B. No. 292. la. 4°. Washington, 1903.

1710 AGRICULTURAL.

Gilbert, J[oseph] H[enry].—Remarques sur la relation qui existe entre le sommes de température et la production agricole. 8°. Genève, 1886. (*Arch. sc. phys. nat. Genève* 3me *periode*, 16, 1886, *p.* 421.) Reprinted by Spottiswoode & Co., London, 1893.

London, Board of Agriculture.—Agricultural statistics, 1902. Report on the agricultural returns relating to acreage and produce of crops and number of live stock in Great Britain . . . la. 8°. London, 1903.

Müttrich, [A.].—Bericht über die Untersuchung der Einwirkung des Waldes auf die Menge der Niederschläge . . . la. 8°. Neudamm, 1903.

Remington, John Stewart.—Meteorological science in relation to agriculture. 8°. (*Ann. Journ. Cartmel Agric. Soc.*, 1903, *p.* 23.)

db **Russia in Europe.**

[**Kieff,** Meteorological Observatory.—Meteorological and rural-economical bulletin.] 1894–95, Nos. 1–12; 1896, Nos. 5–12; vols. 3–5, 1897–1899. 5 vols. la. 8°. [Kieff], 1894–1900.

In Russian.

dh **Italy, Sicily, Sardinia.**

Rome, Ufficio Centrale di Meteorologia e di Geodinamica.—Rivista Meteorico-Agraria. Anno 24, 1903, N. 1–36. sm. f°. Roma, 1903–1904.

ef **British India.**

Rangoon, Land Records Department.—Season and crop report of Burma for the year ending 30th June, 1903. sm. f°. Rangoon, 1903.

hc **West Indian Islands.**

Barbados, Imperial Department of Agriculture for the West Indies.—Report on the botanic station, agricultural school plots, and cacao experiment plots, Dominica. 1901-1902. sm. f°. Barbados, 1902.

Contains rainfall observations, 1901.

1720 PHENOLOGICAL.

Mawley, Edward.—A simple method of taking phenological observations. 8°. (*Hertford, Trans. Herts. Nat. Hist. Soc.*, 6, 1891, *p.* 117.)

——— Report on phenological phenomena observed in Hertfordshire. 1891-1901. 11 parts. 8°. (*Hertford, Trans. Herts. Nat. Hist. Soc.*, 7-11, 1893-1902.)

1730 HYGIENIC.

Gordon, W.—Remarks on the influence of wind on phthisis. 8°. London, 1903. (*Brit. Med. Journ., London*, 1903, *May* 23.)

——— Wind exposure and phthisis. 8°. London, 1902. (*London, Med.-Chir. Trans.*, 84, 1900.)

de **British Islands.**

Bath, Medical Officer of Health.—Annual report to the Bath Urban Sanitary Authority, by the Medical Officer of Health. 37th. 1902. 1a. 8°. Bath, 1903.

Blackpool, Public Health Office.—Annual report of the Medical Officer of Health. 1902. 1a. 8°. Blackpool, 1903.

Brighton, Medical Officer of Health.—Annual report on the health, sanitary condition, etc., of the County Borough of Brighton. By A. Newsholme. 1902, 1a. 8°. Brighton, 1903.

Coventry, Medical Officer of Health.—Annual report on the health of the City, by E. H. Snell, 1902. 1a. 8°. Coventry, [1903.]

Dublin, General Register Office.—Weekly returns of births and deaths in the Dublin registration area and in twenty-one of the principal urban districts in Ireland. 1903. 1a. 8°. Dublin, 1904.

——— ——— Quarterly returns of the marriages, births and deaths registered in . . . Ireland; . . . 1903. 1st—4th quarters, Nos. 157-160. 1a. 8°. Dublin, 1903-1904.

——— ——— Detailed annual report of the Registrar-General (Ireland), containing a general abstract of the numbers of marriages, births and deaths registered in Ireland during the year 1902. 39th. sm. f°. Dublin, 1903.

Edinburgh, Registrar General.—Weekly return of births, deaths and marriages in eight principal towns of Scotland. 1903. 1a. 8°. Edinburgh, 1903-1904.

——— ——— Monthly return of the births, deaths and marriages registered in eight of the principal towns of Scotland; . . . 1903, Jan.-Dec. 1a. 8°. Edinburgh, 1903-1904.

——— ——— Quarterly return of the births, deaths and marriages registered in the divisions, counties and districts of Scotland. 1903. 1a. 8°. Edinburgh, 1903.

The undersigned has received from the Meteorological Office :—

OFFICIAL No. 171.

REPORT of the METEOROLOGICAL COUNCIL

for the year ending 31st of MARCH 1904.

Signature or Stamp } _____

Institution or Society _____

Place _____

Date _____

$\frac{1}{2}d.$

THE SECRETARY,

METEOROLOGICAL OFFICE,

63, VICTORIA STREET,

LONDON, S.W.

in the divisions, counties and districts of Scotland. 1903. 1a. 8°. Edinburgh, 1903.

Cairo, Ministry of Interior, Sanitary Department.—Weekly return. [1]
903, Nos. 1–52. la. 4°.

No. 30.

METEOROLOGICAL OFFICE,

63, Victoria Street,

London, S.W.

Sir,

I have the honour to inform you that the work specified on the opposite side has been sent to your address, and to request that the attached receipt may be signed and returned immediately, as an *unsealed* prepaid letter.

Your obedient Servant,

W. N. SHAW,

Secretary.

W. & A. L. (2163)—3087—2000-1-5

in the divisions, counties and districts of Scotland. 1903. [s. d.] Edinburgh: 1903.

* **Fox,** Fortescue.—Strathpeffer Spa; its climate and waters. sm. 8°. London, 1889.

Hoskins, S. Elliott.—Home resorts for invalids. The climate of Guernsey. Read before the Brit. Meteor. Soc., May 25, 1852. 8°. (*London, Journ. Med.*)

London, General Register Office.—Weekly return of births and deaths in London and . . . other great towns. Vol. 64, 1903. la. 8°. London, 1903.

——— ——— Quarterly returns of marriages, births and deaths registered in . . . England. Nos. 217-220, 1903. la. 8°. London, 1903-1904.

——— ——— Annual summary of births, deaths and causes of death in London and other large towns. 1902. la. 8°. London, 1903.

——— ——— Annual report of the Registrar General of births, deaths and marriages in England. 64th. 1901. la. 8°. London, 1903.

——— Great Western Railway.—The Cornish Riviera as an ideal winter, health and pleasure resort. 8°. [London, 1904.]

Lowestoft, Medical Officer of Health.—Annual report. 1902, 1903. 2 vols. la. 8°. Lowestoft, s.a.

Manchester, Public Health Office.—Weekly returns of the Medical Officer of Health. 1903. la. 8°. Manchester, s.a.

——— ——— Quarterly returns of the Medical Officer of Health. 1903. la. 8°. Manchester, s.a.

Nottingham, Rural District Council of Basford.—Annual report. 1902. By G. B. Wray, Medical Officer of Health. la. 8°. Nottingham, 1903.

Truro, Cornwall County Council. Sanitary Committee.—Monthly report. 1903, Jan.-Dec. sm. f°.

——— ——— ——— Annual report, vital statistics and annual meteorological summary for 1902. 4°. Truro, 1903.

dh **Italy, Sicily and Sardinia.**

Burgess, T. H.—Climate of Italy in relation to pulmonary consumption: with remarks on the influence of foreign climates upon invalids. 8°. London, 1852.

dk **Austria-Hungary.**

Körösy, Joseph v.—Die Sterblichkeit der Haupt- und Residenzstadt Budapest in den Jahren 1901-1905 und deren Ursachen. ii^ter (tabellarischer) Theil, 1^tes Heft. 1901. Publ. statist. Bureaus der Haupt- und Residenzstadt Budapest, No. 36. la. 8°. Budapest und Berlin, 1902.

In the Hungarian language also.

dm **Mediterranean and Islands.**

Cyprus, Sanitary Commissioner.—Second annual report of the Sanitary Commissioner with the Government of Cyprus for the year 1881. [London, 1883.]

Contains abstract of meteorological registers for 1881.

eb **China.**

Peking, Inspectorate General of Customs.—Medical reports for the half-year ended 30th September, 1901, and for the year ended 30th September, 1902. 61st and 62nd, and 63rd and 64th issues. 2 vols. 4°. Shanghai, 1903.

fb **N.E. Africa; Egypt and Nile Valley.**

Cairo, Ministry of Interior, Sanitary Department.—Weekly return. Vol. 18, 1903, Nos. 1-52. la. 4°.

fd **West Africa.**

Attasi Mines, Limited.—Reports and balance sheet, 1903. [Contains: Extracts from the report of the Medical Officer at Princisu, West Africa, for the year ending June 30th, 1903, with meteorological diagram.] 4°. [London, 1903.]

gf **United States.**

Forry, Samuel.—The climate of the United States and its endemic influences. 1a. 8°. New York, 1842.

lb **Azores.**

Ponta Delgada, Society for spreading information about St. Michael's.—The Azores. St. Michael's as a health resort; St. Michael's as a station for tourists; St. Michael's as a coal station. sm. 8°. s.l.e.a.

WEATHER FORECASTING.

1750 GENERAL.

Bell, Arthur H[ope].—Wireless telegraphy and weather forecasting. 1a. 4°. (*Knowledge, London*, 1903, *Aug., p.* 172.)

* **Doneux,** A.—Les lois de Brück. Des prévisions possibles en météorologie. Les évènements de la Martinique. Calendriers du système Brück. 1a. 8°. Péruwelz, 1902.

Klossovsky, A.—Examen de la méthode de la prédiction du temps de M. N. Demtschinsky. 1a. 8°. (Odessa), 1903.

Pernter, J[osef] M[aria].—Allerlei Methoden, das Wetter zu prophezeien. sm. 8°. Wien, 1903. (*Wien, Vortr. Ver. Verbr. naturw. Kenntn.*, 43, *Heft* 14.)

dc **German Empire.**

Hamburg, Deutsche Seewarte.—Dienstanweisung für die Sturmwarnungsstellen der Deutschen Seewarte (4. Ausgabe), die Windsemaphorstationen und die Windmeldestellen. 4°. Hamburg, 1902.

[—— ——]—Erklärung . . . *See* 0070.

eh **China.**

Zi-ka-wei, Observatoire [Magnétique et Météorologique].—Codes des signaux, annonce des typhons et coups de vent. With explanatory sheet. 2 sheets. f°. s.l. 1903.

ff **East Africa.**

McClounie, J[ohn].—Rainfall forecasts and estimates from 1st June, 1903 to 31st May, 1904. British Central Africa. sm. 4°. Zomba, 1903.

1760 WEATHER PROGNOSTICS.

Garriott, Edward B.—Weather folk-lore and local weather signs. Prepared . . . by Ed. B. Garriott. Washington, Department of Agriculture, Weather Bureau. Bulletin No. 33, W. B. No. 294. 1a. 8°. Washington, 1903.

1770 SYNOPTICAL CHARTS.

* **Copenhagen** und **Hamburg,** Dänisches meteorologisches Institut und Deutsche Seewarte.—Tägliche synoptische Wetterkarten für den nordatlantischen Ozean und die anliegenden Theile der Kontinente. 16. Jahrg., 1.-4. Quart., Dez. 1896-Nov. 1897. 4 vols. f°. Copenhague et Hambourg, 1903.

In the French language also.

METEOROLOGICAL REGISTERS.

(*See* Note, p. 135.)

1800 GENERAL.

* **London,** Board of Trade, Commercial, Labour and Statistical Department.—Statistical tables relating to the Colonial and other possessions of the United Kingdom. Part 26, 1901. sm. f°. London, 1903.

da **Scandinavia.** *See also* 1180 *da.*

Christiania, Norwegisches Meteorologisches Institut.—Jahrbuch . . . für 1902. Herausgegeben von H. Mohn. sm. f°. Christiania, 1903.

db **Russia in Europe.**

Kieff. *See* 1710 *db.*

Odessa Observatoire Magnétique et Météorologique de l'Université.—Revue météorologique. Travaux du réseau météorologique du sud-ouest de la Russie. Par A. Klossovsky. 2e série, vols. 6-7, 1901, 1902. One vol., la. 4°. Odessa, 1903.

In the Russian language also.

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* 1820 *db.*

[——— Meteorological Section of the Central Hydrographical Department.—Summary of hydro-meteorological observations. Part 4, 1900. Suppl. to Part 25 of Mem. of Hydr.] la. 8°. [St. Petersburg], 1903.

In the Russian language.

dc **German Empire.** *See also* 1180 *dc.*

DEUTSCHES METEOROLOGISCHES JAHRBUCH.

Aachen, Meteorologisches Observatorium. *See* 0020.

Berlin, Königlich Preussisches meteorologisches Institut.—Ergebnisse der Beobachtungen an den Stationen II. und III. Ordnung . . . zugleich Deutsches meteorologisches Jahrbuch. Beobachtungssystem des Königreichs Preussen und benachbarten Staaten. 1892-1898. 7 vols. la. 4°. Berlin, 1896-1903.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Jahresbericht. *See* 0020.

——— ——— Deutsches meteorologisches Jahrbuch für 1902. Baden. 2. Theil des Jahresb. Centralbureau für Meteor. u. Hydr. 1902. la. 4°. Karlsruhe, 1903. Sonderabdruck des Jahresbericht. *See* 0020.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Jahrbuch. *See* 0020.

Hamburg, Deutsche Seewarte.—Deutsches meteorologisches Jahrbuch für 1902. Beobachtungs- System der Deutschen Seewarte. Ergebnisse der meteorologischen Beobachtungen . . . Jahrg. 25. sm. f°. Hamburg, 1903.

Magdeburg.—Jahrbuch der meteorologischen Beobachtungen der Wetterwarte der Magdeburgischen Zeitung. Herausgegeben von R. Weidenhagen. Jahrg. 20, 1900. la. 4°. Magdeburg, 1903.

Strassburg, Meteorologischer Landesdienst.—Ergebnisse der meteorologischen Beobachtungen in Reichsland Elsass-Lothringen im Jahre 1899. Herausgegeben von . . . H. Hergesell. la. 4°. Strassburg, 1903.

dd **Holland, Belgium, and Luxemburg.** *See also* 1700 *dd.*

‖ **Lancaster,** A[lbert].—Résumé des observations météorologiques faites à l'observatoire royal de Belgique, à Uccle, pendant l'année 1902. sm. 8°. Bruxelles, 1903. (*Bruxelles, ann. météor.*, 1903.)

de **British Islands.** (For other Rainfall data, *see* 1180 *de.*)

Bognor Climatological Society.—Annual report and results of the observations made during the year 1902 at the Bognor climatological station. 8°. Bognor s.a.

Bolton.—Annual Report of the Museums and Meteorological Observatory for 1903. 8°. Bolton, 1904.

Brundall.—Meteorological notes, 1902. From observations taken at Bradestone House, Brundall, Norfolk, by Arthur W[aters] **Preston.** 8°. [*Norwich, Trans. Norfolk and Norwich Nat. Soc.*, 1903, *p.* 528.]

Chester.—Results of meteorological observations taken in Chester during 1902, by Rev. J. Cairns **Mitchell.** 8°. (*Chester, Proc. Chester Soc. Nat. Sc. Lit.*, 1902–1903.)

——— Table shewing the pressure, temperature, &c., during the year 1902, compiled from observations taken at Rutland Cottage, Parkgate Road, Chester, by Rev. J. Cairns **Mitchell.** la. 8°. Sheet.

Croydon. *See* 1180 *de.*

Dorset. *See* 1180 *de.*

Dublin.—Abstract of meteorological observations taken at 40, Fitzwilliam Square, West, Dublin, by J[ohn] W[illiam] **Moore.** 1883. [With monthly means for 1865–1883.] 8°. [*Ann. Rep. Fever Hosp., Dublin*, 1883–84, *p.* 46.]

Eastbourne, [Borough Meteorologist].—Annual report of the meteorological observations. 1902. la. 8°. [Eastbourne, 1903.]

‖ **Falmouth** Observatory.—Meteorological and magnetical tables and reports for the year 1902, by W. L. Fox and E. Kitto. 8°. Falmouth, 1903. (*Falmouth, Ann. Rep. R. Cornw. Polyt. Soc.*, 1902.)

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations made at the Royal Observatory, Greenwich, in the year 1900; under the direction of W. H. M. Christie. la. 4°. Edinburgh, 1902.

Hertfordshire, Meteorological observations taken in, in the year 1901, by John **Hopkinson.** 8°. (*Hertford, Trans. Herts. Nat. Hist. Soc.*, 11, 1902, *p.* 145.)

——— *See* 1180 *de.*

Hoylake and West Kirby Urban District Council, Meteorological Department.—Report and results of observations, for year 1903, by Tom Robinson. Oblong 18°. Hoylake, 1904.

Margate, Borough Meteorologist.—Annual report on the meteorology of Margate, by [**John Stokes**], the Borough Meteorologist. 1902, 1903. 2 vols. la. 8°. Margate, [1903], 1904.

Marlborough.—Results of meteorological observations at Marlborough for the year 1888 [and monthly means for 1865–1888]. 8°. s.l.e.a.

Northampton, Natural History Society.—Meteorological report. 1903, Jan.–Dec. 8°. [*Northampton, Journ. Nat. Hist. Soc.*]

Nottingham.—The meteorology of Nottingham for the past 22 years (1867 to 1888 inclusive), from diurnal observations by M. Ogle Tarbotton (1867 to 1887), and Arthur Brown and Arthur Whitelegge (1887 onwards), to which are added rainfall tables from several localities on the Trent watershed. la 8°. [Nottingham, 1889.]

——— The meteorology of Nottingham. (By Arthur Brown and Philip Boobbyer.) 1889–1903. 15 vols. sm. f°. s.l.e.a.

Nottingham, Rural District Council of Basford. Annual Report. *See* **1730** *de.*

Rousdon Observatory.—Meteorological observations for the year 1902, continued under the superintendence of the Hon. Lady Peek. 4°. London, 1903.

Rugby School Natural History Society.—Report. 1902, 1903. 2 vols. 8°. Rugby, 1903–1904.

Sheffield.—Meteorological observations at the Central Radical Club, 84, West Street, Sheffield, by **C. J. Barker.** 1903, Jan.–Dec. Slips.

[Shropshire], Meteorology of, [1902], by **W. M. De La Touche.** 8°. [*Shrewsbury, Rec. Caradoc and Severn Valley Field Club.*]

Southport, Fernley Observatory.—Report and results of observations for the year 1902. By **J. Baxendell.** 4°. Southport, 1903.

Throcking.—Meteorological observations, Throcking Rectory, by C. Wigan **Harvey.** 1903. Slip.

Totland Bay, Isle of Wight.—Report of meteorological observations for the year 1902, with extremes and averages for preceding years, by **John Dover.** la. 8°. Newport, 1903.

Truro, Cornwall County Council, Sanitary Committee.—Monthly Report. *See* **1730** *de.*

Waterford.—Waterford weather report, by C. Percival **Bolton.** 1903. sm. 8°. Slip.

Wellington College Natural Science Society.—Annual Report. 33rd, 1902. 8°. Wellington, 1903. Contains daily meteor. obsns. for 1902.

Whitby Literary and Philosophical Society.—Report. 81st, 1903. 8°. Whitby, s.a.

Whitchurch.—Meteorological observations at Statsford, Whitchurch, Tavistock, by E[dwin] E[dsall] **Glyde.** 1903. Slip.

Worksop.—The weather of 1903, at Hodsock Priory, Worksop, by **H. Mellish.** 8°. s.l.e.a.

Worthing Observatory.—Weather report. 1903, Jan.–Dec. 4°.

df **France.**

Bordeaux, Commission Météorologique de la Gironde.—Observations pluviométriques et thermométriques faites dans le Département de la Gironde de Juin, 1901, à Mai, 1902; Juin, 1902, à Mai, 1903. Note de M. G. Rayet. 2 vols. la. 8°. Bordeaux, 1902–1903.

Lyons, Commission Départementale de Météorologie du Rhône. 1890-91—1898-99. 5 vols. la. 8°. Lyon, 1894-1901.

Marseilles, Commission de Météorologie du Département des **Bouches-du-Rhone.**—Bulletin annuel. Année 1902, 21me année. 4°. Marseille, 1903.

dg **Spain and Portugal.**

Llinás (Barcelona), Observatorio Belloch.—Hojas meteorológicas. 1902. Oblong f°. Llinás, 1902-1903. [Monthly diagrams.]

Oporto, Villa Nova de Gaya, Observatorio Meteorologico da Princeza D Amelia.—Resumo das observaçõcs. 1903, Jan.-Dec. Oblong sm. 8°. Sheets.

dh **Italy, Sicily, and Sardinia.** *See also* 1710 *dh.*

Naples, R. Specola di Capodimonte.—Riassunto delle osservazioni meteorologiche fatte nella R. Specola di Capodimonte. Nota del Vittorio Alberti. 1901, 1902. 2 vols. la. 8°. (*Napoli, Rend. R. Acc. Sc. Fis. Mat.*, 1902, 1903.)

Ricco, A. e **Mendola,** L.—Risultati delle osservazioni meteorologiche fatte nel R. Osservatorio di **Catania.** 1901. sm. f°. (*Catania, Atti Acc. Gioenia, ser.* 4°, 15.)

Rome, Ufficio Centrale Meteorologico e Geodinamico Italiano.—Annali. Serie ii. Vol. 13, 1891, Parte 1; 18, 1896, Parte 1. 2 vols. sm. f°. Roma, 1901-1902.

Venice, Osservatorio Meteorologico del Seminario Patriarcale.—Prospetto generale delle osservazioni . . . nell' anno meteorico Novembre 1902-Ottobre, 1903. f°. Sheet.

di **Switzerland.**

Berne, Eidgenössisches Oberbauinspectorat, Hydrometrisches Abteilung.—Graphische Darstellung der schweizerischen hydrometrischen Beobachtungen und der Lufttemperaturen und Niederschlagshöhen für das Jahr 1902. la. f° Bern, 1903.

In the French language also.

Zürich, Schweizerische Meteorologische Central-Anstalt.—Annalen. 1901. "Der Schweiz. meteor. Beob." 38. Jahrg. 4°. Zürich, s.a.

dk **Austria-Hungary.**

Pola, Hydrographisches Amt der K. K. Kriegs-Marine.—Veröffentlichungen. Gruppe ii. Jahrbuch der meteorologischen, erdmagnetischen und seismischen Beobachtungen. Neue Folge, 7. Bd. 31. Jahrg. der ganzen Reihe. Beobachtungen des Jahres 1902. la. 4°. Pola, 1903.

Sarajevo, Bosnisch-Hercegovinische Landesregierung.—Ergebnisse der meteorologischen Beobachtungen an den Landesstationen in Bosnien-Hercegovina im Jahre 1899. la. 4°. Wien, 1902.

Vienna, K. K. Central Anstalt . . . Jahrbücher. *See* 0020.

dl **Balkan Peninsula.**

Bucharest, Institutul Meteorologic al Romaniei.—Analele. *See* 0020.

Hepites, Stephan C. *See* 1700 *dl.*

dm **Mediterranean and Islands.** *See* 1730 *dm.*

Cyprus.—Meteorological observations. 1898-1902. 5 parts. sm. f°. [*Cyprus Blue Book.*]

——— Sanitary Commissioner.—Second annual report. *See* 1730 *dm.*

ea **Asiatic Russia.**

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* 1820 *db.*

eb **China.**

Starr, W. H.—Climate and meteorological returns for 1899 to 1902. [Wei-hai-wei.] 1a. 8°. (*Colonial Rep., Annual, Wei-hai-wei,* 1902, *p.* 26.)

ec **Japan and Formosa.**

Formosa, Taihoku Meteorological Observatory.—Meteorological observations in Formosa during the years 1896-1901. sm. f°. s.l.e.a.

In the Japanese language also.

Tokio, Central Meteorological Observatory.—Monthly report. Meteorological observations in Japan. 1901, 1902, Jan.-Dec. 1a. 8°. s.l.e.a.

In the Japanese language also.

——— ——— Annual report. 1896-1898. Parts 1 and 2. 6 vols., 1a. 8°. Tokio, s.a.

In the Japanese language also.

ef **British India.** *See* 1180 *ef*, 1710 *ef*, 1840 *ef.*

eg **Malay Peninsula.** *See also* 1180 *eg.*

Batavia, Kon. Magnetisch en Meteorologisch Observatorium.—Meteorologische waarnemingen verricht op eenige plaatsen in Nederlandsch-Oost-Indië. [1891-1900.] 1a. 8°. (*Batavia, Natuurk. Tijdschr. Nederl. Ind.*, 62, 1902, *p.* 53.)

——— ——— Uitkomsten van meteorologische waarnemingen in Nederlandsch-Indië. 1900. 1a. 8°. (*Batavia, Natuurk. Tijdschr. Nederl. Ind.*, 62, 1902, *p.* 89.) (Rainfall data.)

British North Borneo.—Meteorological return for the year 1902. sm. f°. (*Brit. N. Borneo Official Gazette*, 14, 1903, *Sept.* 1, *p.* 139.)

Pasoeroean, Java.—Uitkomsten van meteorologische waarnemingen verricht aan het proefstation Oost-Java te Pasoeroean gedurende het jaar 1901. 1a. 8°. (*Batavia, Natuurk. Tijdschr. Nederl. Ind.*, 62, 1902, *p.* 267.)

Taiping, Trigonometrical Survey Office.—Return of meteorological observations taken at the Trig. Survey Office, Taiping. 1903, Jan.-Mch., May-Sept., Nov., Dec. sm. f°. Sheets. (*Perak Gov. Gazette*, 1903-1904.)

——— State Surgeon's Office.—Abstract of meteorological readings in the various districts of the State. 1903, Jan.-Dec. sm. f°. Sheets. (*Perak Gov. Gazette*, 1903-1904.)

fd **West Africa.** *See also* 1180 *fd.*

Lagos, Government Gazette.—Containing meteorological observations at various stations for Jan.-Dec., 1903. sm. f°. Sheets.

ff **East Africa.** *See also* 1180 *ff* and 1820 *ff.*

Zanzibar.—Meteorological observations. 1902. sm. f°. (*The Shamba, Journ. of Agric. for Zanzibar, No.* 24, 1903, *June, p.* 5.)

[**Zomba,** Scientific Department].—Meteorology for the year 1902. Table of monthly mean values. Zomba and Fort Johnston. oblong sm. 8°. Sheet.

[——— ———] Temperature and rainfall of climatological stations. British Central Africa Protectorate. 1902. Oblong slip.

[——— ———] Monthly means for earth temperatures and monthly totals of sunshine. 1901, 1902. 4°. Sheet.

fy **South Africa.** *See* 1180 *fg.*

gb **Canada.**

Ottawa, Department of Marine and Fisheries.—Toronto general meteorological register. 1903. 8°. s.l.e.a. *See also*, TORONTO, MAGNETICAL OBSERVATORY.

——— ——— Report of the Meteorological Service. *See* 0020.

Toronto, Magnetical Observatory.—General meteorological register for the year 1902. 8°. s.l.e.a. For continuation, *see* OTTAWA, DEPARTMENT OF MARINE AND FISHERIES.

gf **United States.**

Washington, Department of Agriculture, Weather Bureau.—Monthly Weather Review. *See* 0020.

ho **West Indian Islands.**

Jamaica.—Meteorological observations. [1901.] sm. f°. [*Jamaica Blue Book*, 1902–1903, *p. DD.* 1.]

hd **Trinidad.**

Trinidad, Royal Botanic Gardens.—Meteorological returns. 1902, Jan.–Dec. sm f°. Sheets.

hh **Brazil.**

Pelotas, Lyceu Rio Grandense de Agronomia.—Contribuição para o estudo da climatologia do Rio Grande do Sul. Observações meteorologicas . . . 1893–1902, por **G. Minssen.** 4°. Pelotas, s.a.

hi **Argentina, Uruguay, and Paraguay.** *See also* 1180 *hi.*

Buenos Aires, Observatorio Mons-Lasagna.—Boletin meteorológico. Años 1–5, 1897–1901, Nos. 1–8. la. 8°. Buenos Aires, 1898–1902.

ia **New Guinea.**

British New Guinea Government Gazette.—Vols. 16–17, 1903-1904, containing meteorological observations at Port Moresby (1903, Jan.–Dec.); Sogeri (1903, Jan.–Nov.); Daru (1903, July–Dec.); St. Andrew's Station (1903, Jan.–Oct.). sm. f°.

ie **New South Wales.** *See also* 1180 *ie.*

Sydney, Department of Public Instruction.—Results of meteorological observations in New South Wales during 1899. By H. C. Russell. la. 8°. Sydney, 1903.

ig **South Australia.** *See also* 1180 *ig.*

Adelaide Observatory.—Meteorological observations made at the Adelaide observatory, and other places in South Australia and the northern territory, during the year 1899, under the direction of C. Todd. sm. f°. Adelaide, 1902.

ih **West Australia.** *See also* 1180 *ih.*

Perth, Government Statistician's Office.—Statistical register for the year 1901 and previous years. Part 12. Miscellaneous. sm. f°. Perth, 1903.

—— Observatory.—Meteorological observations made at the Perth Observatory and other places in Western Australia, during the year 1901. sm. f°. Perth, 1902.

ii **Tasmania.** *See also* 1840 *ii.*

Hobart, Meteorological Department.—Report. 1887-1894, 1898-1900. 11 vols. sm. f°. s.l.e.a.

ih **New Zealand.** *See also* 1180 *ih.*

Wellington, Meteorological Department.—[Meteorological observations in New Zealand.] 1902. sm. f°. (*Statistics of New Zealand*, 1902.)

lb **Azores.**

Ponta Delgada, Service Météorologique des Açores. Observatoire de Ponta Delgada.—Résumé des observations. 1903, Jan.-Dec. and year. Oblong 8°. Sheets.

—— —— Observatoire de Horta.—Résumé des observations. 1903, Jan.-Dec. and year. Oblong 8°. Sheets.

nf **Fiji Islands.**

Fiji.—Abstract of meteorological observations taken at Delanasau, Bua, Fiji, [1871-1883, by R. L. Holmes, and at various stations for 1883]. sm. f°. 2 sheets.

1810 REGISTERS GIVING HOURLY VALUES OR CONTINUOUS RECORDS.

da **Scandinavia.**

Christiania, Norwegisches Meteorologisches Institut.—Jahrbuch. *See* 1800 *da.*

Upsala, Observatoire Météorologique de l' Université.—Bulletin mensuel. Par H. H. Hildebrandsson. Vol. 34. 1902. la. 4°. Upsal, 1902-1903.

db **Russia in Europe.**

Dorpat, Meteorologisches Observatorium.—Meteorologische Beobachtungen angestellt in Jurjew. 1902, 37. Jahrg. la. 8°. [Jurjew], 1903.

In Russian language also.

Moscow, Observatoire Météorologique de l'Université Impériale.—Observations. 1901, Jan.-Dec. la. 8°.

In Russian language also.

Odessa. *See* 1800 *db.*

St. Petersburg, Observatoire Physique Central Nicolas.—Annales *See* 1820 *db.*

dc **German Empire.**

Aachen, Meteorologisches Observatorium. *See* 0020.

Berlin, K. Preuss. Meteor. Institut. *See* 1800 *dc.*

[**Bremen,** Meteorologische Station I. Ordnung.]—Deutsches meteorologisches Jahrbuch für 1902. Freie Hansestadt Bremen. Herausgegeben von P. Bergholz. Jahrg. 13. la. 4°. Bremen, 1903.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Jahrbuch. *See* **0020.**

Hamburg, Deutsche Seewarte. *See* **1800** *dc.*

Magdeburg.—Jahrbuch . . . *See* **1800** *dc.*

Strassburg, Meteorologischer Landesdienst. *See* **1800** *dc.*

de **British Islands.**

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations. *See* **1800** *de.*

Jersey, Observatoire St. Louis.—Bulletin des observations magnétiques et météorologiques. 10e année, 1903. 4°. St. Hélier, 1903–1904.

df **France.**

Paris, Observatoire Municipal, Service Physique et Météorologique.—Atlas météorologique. Observations faites à Paris: de 1887 à 1891 à Montsouris et de 1882 à 1898 à la Tour St. Jacques. la. 4°. [Paris], 1902.

dg **Spain and Portugal.**

San Fernando, Instituto y Observatorio de Marina.—Anales. Sección 2ª. Observaciones meteorológicas, magnéticas y sísmicas. 1900–1902. 3 vols. f°. San Fernando, 1901–1903.

di **Switzerland.**

Zürich, Schweizerische Meteorologische Central-Anstalt. *See* **1800** *di.*

dk **Austria-Hungary.**

Kremsmünster, Sternwarte.—Resultate aus den im Jahre 1902 auf der Sternwarte zu Kremsmünster angestellten meteorologischen Beobachtungen. Von Prof. P. T. Schwarz. la. 8°. Wels, 1903.

Pola, Hydrographisches Amt der K. K. Kriegs-Marine.—Veröffentlichungen. Gruppe ii. *See* **1800** *dk.*

Sarajevo, Bosnisch Hercegovinische Landesregierung. *See* **1800** *dk.*

Trieste, [I.R.] Osservatorio Astronomico-Meteorologico.—Rapporto annuale . . . contenente le osservazioni meteorologiche di Trieste e di alcune altre stazioni Adriatiche per l' anno 1900. Vol. 17. la. 4°. Trieste, 1903.

Vienna, K. K. Central Anstalt . . .—Jahrbücher. *See* **0020.**

dl **Balkan Peninsula.**

Bucharest, Institutul Meteorologic al Romaniei.—Analele. *See* **0020.**

ea **Asiatic Russia.**

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* **1820** *db.*

eb **China.**

Hong-Kong Observatory.—Observations, 1902. f°. Hong-Kong, 1903.

Zi-ka-wei, Observatoire Magnétique et Météorologique.—Bulletin mensuel. Tome 27, année 1901. sm. f°. Chang-hai, 1903.

ec **Japan, and Formosa.**

Formosa, Taihoku Meteorological Observatory. *See* 1800 *ec.*

Tokio, Central Meteorological Observatory.—Monthly report. *See* 1800 *ec.*

eg **Malay Peninsula, and Philippines.**

Batavia, Royal Magnetical and Meteorological Observatory.—Observations. Vol. 24, 1901. f°. Batavia, 1903.

Manila, Observatorio.—Boletin mensual. *See* 1840 *eg.*

—— Department of the Interior, Philippine Weather Bureau.—Report of the Director of the Philippine Weather Bureau, 1902. Part 3.—Hourly observations of atmospheric phenomena at the Manila Central Observatory, 1902. la. 4°. Manila, 1903.

fb **N.E. Africa; Egypt and Nile Valley.**

Cairo, Survey Department, Public Works Ministry.—The meteorological report for the year 1901. oblong sm. 8°. Cairo, 1903.

—— —— —— A report on the meteorological observations made at the Abbassia Observatory, Cairo, during the year 1900, together with the Alexandria mean values derived from the observations of the previous 10 years, and climatological stations, also some magnetic and seismological observations. oblong sm. 8°. Cairo, 1902.

gb **Canada.**

Ottawa, Department of Marine and Fisheries.—Report of the Meteorological Service. *See* 0020.

gf **United States.**

Washington, Dep. Agric., Weather Bureau. Monthly Weather Review. *See* 0020.

gg **N.E. United States.**

New York Meteorological Observatory.—Report. 1902, 1903. 2 vols. 4°. New York, 1902-1903.

hb **Central America.**

San José de Costa Rica, Instituto Fisico-Geografico.—Boletin. Vol. 2, 1902. sm. f°. San José de Costa Rica, s.a.

k **Arctic.**

* **Abruzzi,** Luigi Amedeo di Savoia, *Duke of the.*—Osservazioni scientifiche eseguite durante la spedizione polare. 1899-1900. sm. f°. Milano, 1903.

1820 REGISTERS—DAILY VALUES.

da **Scandinavia.**

Christiania, Norwegisches Meteorologisches Institut. *See* 1180 *da* and 1800 *da.*

Copenhagen, Dansk Meteorologisk Institut.—Bulletin météorologique du Nord, publié par les Instituts météorologiques de Norvége, de Danemark et de Suède. Année 1903. oblong 8°. Copenhague, s.a.

—— —— Nautisk-meteorologisk Aarbog. 1902. la. 4°. Kjøbenhavn, 1903.

In the English language also.

Stockholm, Kongl. Svenska Vetenskaps-Akademie.—Meteorologiska iakttagelser i Sverige utgifna af Kongl. Svenska Vetenskaps-Akademien, anställda och utarbetade under inseende af Meteorologiska Central-Anstalten, Bd. 42, 2. dra. ser., Bd. 28. 1900. la. 4°. Stockholm, 1903.

In the French language also.

Upsala, Observatoire Météorologique de l'Université. — Bulletin mensuel. *See* 1810 *da.*

db **Russia in Europe.**

[**Dorpat,** Meteorologisches Observatorium.]—Meteorologische Beobachtungen. *See* 1810 *db.*

Kazan Université, Observatoire Météorologique.—Bulletin. 1899-1901, Jan.-Dec. f°.

In Russian also.

Moscow, Observatoire Météorologique de l'Université Impériale. — Observations. *See* 1810 *db.*

Odessa. *See* 1800 *db.*

St. Petersburg, Observatoire Physique Central Nicolas.—Annales . . . publiées par M. Rykatchew. 1901, Partie i. Observations . . . extraordinaires des stations de 2 ordre et observations des stations de 3 ordre. Partie ii. Observations météorologiques faites, d'après le système international dans les stations de 2 ordre en Russie. 2 vols. sm. f°. St. Pétersbourg, 1903.

dc **German Empire.**

Aachen, Meteorologisches Observatorium. *See* 0020.

Berlin, Königlich Preussisches Meteorologisches Institut. *See* 1800 *dc.*

Carlsruhe, Centralbureau für Meteorologie und Hydrographie. *See* 0020, and 1800 *dc.*

Chemnitz, K. Sächsisches Meteorologisches Institut.—Jahrbuch. *See* 0020.

Hamburg, Deutsche Seewarte. *See* 1800 *dc.*

Magdeburg.—Jahrbuch. *See* 1800 *dc.*

Strassburg, Meteorologischer Landesdienst. *See* 1800 *dc.*

de **British Islands.**

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations. *See* 1800 *dc.*

Jersey, Observatoire St. Louis. *See* 1810

London, Royal Botanic Society.—Quarterly Record. Vols. 7–8, 1898-1903. 2 vols. 8°. London, 1901, 1904.

Southport Meteorological Observatory. Abstract of observations and results for the months of Jan.-Dec., 1903. Slips.

Stonyhurst College Observatory.—Results of meteorological and magnetical observations, 1902. sm. 8°. Clitheroe, 1903. The appendix contains "Results of meteor. obsns. taken at St. Ignatius' College, Malta, by Rev. J. F. Dobson, 1903."

df **France.**

Lyons, Observatoire.—Météorologie Lyonnaise, 1891-2—1896-7, 1898-9, 1899-1900. Par Charles André. 8 vols. 4°. Lyon, 1893-1902.

Marseilles, Commission de Météorologie. *See* 1800 *df.*

(Perpignan, Commission Météorologique Départementale des Pyrénées Orientales.)—Bulletin météorologique annuel . . . par le Dr. Fines. 1875, 1887, 1891, 1892, 1896, 1897, 1901. 7 vols. 4°. Perpignan, 1880-1902.

dg **Spain and Portugal.**

Oña, Observatorio.—Observaciones meteorológicas hechas en el Colegio Máximo de la Compañia de Jesus en Oña, Provincia de Burgos. 1903. la. 8°. Oña, 1904.

dh **Italy, Sicily, and Sardinia.**

Milan, R. Osservatorio Astronomico di Brera in Milano.—Osservazioni meteorologiche eseguite nell'anno, 1902, col riassunto composto sulle medesime da E. Pini. sm. f°. (Milano, 1902.)

Naples, R. Osservatorio di Capodimonte.—Osservazioni meteoriche. 1902, 1903. 2 vols. la. 8°. s.l.e.a.

Riposto, Osservatorio Meteorologico del R. Istituto Nautico.—Bollettino mensile. Anno 30, 1903. Fasc. 1-12. sm. f°. Riposto, 1903.

Venice, Osservatorio Meteorologico del Seminario Patriarcale. Bollettino mensile. 1903, Jan.-Dec. sm. f°. Sheets.

di **Switzerland.**

Davos Traffic Association.—[Daily observations at the] official meteorological station in Davos. 1902, Dec. 31—1903, Dec. 30. la. 4°. (*The Courier*, 18-19, 1903.)

‖ **Gautier,** R[aoul].—Résumé météorologique . . . pour Genève et le Grand Saint-Bernard. 1902. 8°. Genève, 1903. (*Arch. sc. phys. nat., Genève*, 1903.)

——— et **Duaime,** H[enri].—Observations météorologiques faites aux fortifications de Saint-Maurice. 1902. 8°. Genève, 1903. (*Arch. sc. phys. nat. Genève*, 4ᵉ *période*, 1902-3.)

Lausanne, Institut Agricole.—Observations météorologiques faites à la station météorologique du Champ-de-l'Air. 16ᵉ année, 1902. la. 8°. Lausanne, 1902. [1903.]

Zürich, Schweizerische Meteorologische Central-Anstalt. *See* 1800 *di.*

dk **Austria-Hungary.**

Cracow, K. K. Sternwarte.—Meteorologische Beobachtungen. 1903, Jan.-Dec. and Results. la. 8°. Krakau, 1903-4.

Fiume, K. K. Marine Akademie.—Meteorologische Beobachtungen. 1903, Jan.-Dec., and Results. la. 8°. Sheets.

Jaeger, Franz.—Magnetische und meteorologische Beobachtungen zu Klagenfurt. Dec. 1902—Nov. 1903 and year. 8°. s.l.e.a.

Pola, Hydrographisches Amt der K. K. Kriegsmarine. — Meteorologische Termin-Beobachtungen in Pola, Sebenico und Teodo. Mitteilungen über Erdbeben-Beobachtungen in Pola. 1903, Jan.-Dec. and year. oblong la. 8°.

Prague, K. K. Sternwarte.—Magnetische und meteorologische Beobachtungen. 63. Jahrg., 1902. la. 4°. Prag, 1903.

Sarajevo, Bosnisch-Hercegovinische Landesregierung. *See* 1800 *dk.*

Trieste, I. R. Osservatorio Astronomico-Meteorologico.—Osservazioni meteorologiche. 1901, Jan. Dec. and Results. oblong la. 8°. Sheets.

——— ——— Rapporto annuale. *See* 1810 *dk.*

Vienna, K. K. Central Anstalt. . . .—Jahrbücher. *See* 0020.

——— [K. K.] Hydrographischer Dienst in Oesterreich.—Jahrbuch des K. K. hydrographischen Central Bureaus. 8. u. 9. Jahrg., 1900, 1901. 2 vols. f°. Wien, 1902, 1903. [Daily rainfall and temperature data.]

dl **Balkan Peninsula.**

Bucharest, Institutul Meteorologic al Romaniei.—Analele. *See* 0020.

ea **Asiatic Russia.**

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* 1820 *db.*

eb **China.**

Hong-Kong Observatory.—Extract of meteorological observations made at the Hong-Kong Observatory. 1903, Jan.-Dec. sm. f°. Sheets.

——— ——— China Coast meteorological register.—1902, 1903. 2 vols. sm. f°. s.l.e.a.

——— ——— *See also* 1810 *eb.*

ec **Japan and Formosa.**

Tokio, Central Meteorological Observatory. *See* 1800 *ec.*

ef **British India.**

Calcutta, Meteorological Office, India.—Results of the meteorological observations taken at the Alipore Observatory, from 4th Jan., 1903, to 2nd Jan., 1904. sm. f°. Sheets.

Bombay, Government Observatory.—Magnetical, meteorological and seismological observations made at the Government Observatory, Bombay, in the years 1900 and 1901, under the direction of N. A. F. Moos. f°. Bombay, 1903.

eg **Malay Peninsula, and Philippines.**

Manila, Observatorio.—Boletín mensual. *See* 1840 *eg.*

Singapore, Principal Civil Medical Officer, Straits Settlements.—Annual meteorological report, Straits Settlements, for the year 1902. sm. f°. Singapore, 1903.

fb **N.E. Africa; Egypt and Nile Valley.**

Cairo, Ministry of Interior, Sanitary Department.—Weekly return. *See* 1730 *fb.*

——— Survey Department, Public Works Department.—Meteorological observations at Abbassia, Alexandria, Assiut, Assuan (Aswan), Berber, Duem, Giza, Khartum, Port Said, Suakin, Wadi Halfa, Wad Medani. 1903, Jan.-Dec. Oblong la. 8°. Sheets.

ff **East Africa.**

Zomba, Scientific Department.—Meteorological observations. 1903, Jan.–Dec. sm. f°. Sheets.

fg **South Africa.**

Durban, Natal Observatory.—Report of the Government Astronomer. *See* 0020.

gg **N.E. United States.**

Washington, United States Naval Observatory.—Meteorological observations and results. United States Naval Observatory. 1891–1892. la. 4°. Washington, 1902. (*Washington obsns.*, 1891 *and* 1892.)

hh **Central America.**

Belize, Public Hospital.—Meteorological observations. 1903, Jan.–Dec. sm. f°. Sheets.

Guatemala, Laboratorio Químico Central.—Observaciones meteorológicas. 1902. la. 8°. Guatemala, 1903.

hc **West Indian Islands.**

Antigua, Government Laboratory.—Meteorological register kept at the Government Laboratory, St. John's, Antigua. 1903, Jan. 6 to 1904, Jan. 4. sm. f°. Sheets.

[**Grenada,** Richmond Hill Observatory.]—Meteorological report for 1903. By Richard Heels. sm. f°. s.l.e.a.

——— ——— Meteorological report. 1903, Jan.–Dec. sm. f°. Sheets.

Havana, Observatorio del Colegio de Belen de la Compañia de Jesus.—Observaciones meteorológicas. 1902. f°. Habana, 1903.

‖ **Port-au-Prince, Haiti.**—[Tägliche meteorologische Beobachtungen.] 1898–1900. 3 parts, la. 4°. (*Wien, Jahrb. K. K. Central-Anst. Meteor.*, 1898, 1900.)

St. Lucia, Botanic Garden.—Meteorological observations. 1902, 1903. sm. f°. Sheets.

hh **Brazil.**

Rio Janeiro, Ministerio da Marinha, Directoria de Meteorologia.—Boletim das observações meteorologicas e dos rezultados magneticos . . . Anno 7, 1902, Jan.–Dec. sm. f°. Rio de Janeiro, 1902–1903.

——— ——— ——— Boletim semestral dos rezultados obtidos na estaçao central no morro de Santo Antonio (Rio de Janeiro) e nas estações meteorologicas e pluviometricas. No. 11, Apl.–Sept., 1902. la. 8°. Rio de Janeiro, 1903.

hk **Chili.**

Valparaiso, Servicio Meteorolojico de la Direccion del Territorio Maritimo.—Anuario. Tomo 1–3. 1899–1901. 3 vols. la. 8°. Valparaiso, 1902–3.

ih **West Australia.**

Perth Observatory. *See* 1800 *ih*.

ii **Tasmania.**

Hobart, Meteorological Observer.—Monthly record of results of meteorological observations at Hobart, and various localities in Tasmania. 1891. Jan.–Dec. 8°. Hobart, 1891-2.

nd **Sandwich Islands.**

Lyons, C. J.—Weather record for Honolulu and the Hawaiian Islands. 1899–1902. 4 vols. 8°. [Honolulu], 1903.

1830 WEATHER REPORTS.—DAILY.

da **Scandinavia.**

Copenhagen, [Dansk] Meteorologisk Institut.—Vejrkaart. 1903, Jan. 1–Dec. 31. 4°. Sheets.

db **Russia in Europe.**

St. Petersburg, Observatoire Physique Central Nicolas.—Bulletin météorologique. 1903, Jan. 1–Dec. 31. f°. Sheets.

In the Russian language also.

dc **German Empire.**

Aachen, Meteorologisches Observatorium.—Wetterkarte und Wetterbericht. Jahrg. 2, 1903, Jan. 1–Dec. 31. f°. Aachen, 1903.

Chemnitz, K. Sächsisches meteorologisches Institut.—Wetterbericht. 19 3, Jan. 1–Dec. 31. Oblong 8°.

Hamburg, Deutsche Seewarte. Wetterbericht. 28. Jahrg., 1903, Jan. 1—Dec. 31. f°. Sheets.

Munich, K. b. meteorologische Central-Station.—Wetterkarte und Wetterbericht. 1903, Jan. 1–Dec. 31. f°. Sheets.

dd **Holland, Belgium, Luxemburg.**

Brussels, Observatoire Royal, Uccle.—Bulletin quotidien. 1903, Jan. 1–Dec. 31. f°. Sheets.

Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.—Weerbericht. 1903, Jan. 1–Dec. 31. sm. f°. Sheets.

de **British Islands.**

London, Meteorological Office.—Daily weather report. 1903, Jan. 1–Dec. 31. 2 vols. la. 4°. s.l.e.a.

df **France.**

Paris, Bureau Central Météorologique de France.—Bulletin international. 47e année, 1903, Jan. 1—Dec. 31. 4°.

dg **Spain and Portugal.**

Madrid, Instituto Central Meteorológico. Boletin. 1903, Jan. 1–Dec. 31. sm. f°. Sheets.

Lisbon, Observatorio Do Infante D. Luiz.—Boletim meteorologico. 1903, Jan. 1–Dec. 31. f°. Sheets.

dh **Italy, Sicily and Sardinia.**

Rome, Ufficio Centrale di Meteorologia e di Geodinamica.—Bollettino meteorico giornaliero. Anno 25, 1903, Jan. 1–Dec. 31. la. 4°. Sheets.

di **Switzerland.**

Zürich, Schweizerische Meteorologische Central-Anstalt. — Wetterbericht. 1903, Jan. 1–Dec. 31. sm. f°. Sheets.

In the French language also.

dk **Austria-Hungary.**

Vienna, K. K. Central-Anstalt für Meteorologie und Erdmagnetismus.—Telegrafischer Wetterbericht. Jahrg. 27, 1903. Jan. 1–Dec. 31. la. 4°. Sheets.

dl **Balkan Peninsula.**

Bucharest, Institutul Meteorologic al Romaniei.—Buletin meteorologic. Anul 9, 1903, Jan. 1–Dec. 31. la. 4°. Sheets.

ec **Japan and Formosa.**

Tokio, Central Meteorological Observatory.—Weather chart. 1903. Jan. 1-Dec. 31. 4°. Sheets.

ef **British India.**

Calcutta, Meteorological Office, India.—India daily weather report. 1903, Jan. 1–Dec. 31. 2 vols. f°. Simla, 1903.

[———, Meteorological Office, Bengal].—Bay of Bengal weather chart. 1903. sm. f°. Sheets. From May to October this is combined with the "Bay of Bengal and Bengal daily weather report."

———, Meteorological Office, Bengal.—Bay of Bengal and Bengal daily weather report. 1903. sm. f°. Sheets. These reports are only published during the rainy season.

fa **Mediterranean States.**

[**Algiers,** Service Météorologique du Gouvernement Général de l'Algérie].—Bulletin météorologique de l'Algérie. 1903, Jan. 1–Dec. 31. sm. f°. Sheets.

fb **N.E. Africa; Egypt and Nile Valley.**

Cairo, Survey Department, Public Works Department.—Daily weather report. 1903, Jan. 1–Dec. 31. la. 4°. Sheets.

gb **Canada.**

Toronto, Meteorological Service, Dominion of Canada.—Weather map. 1903, Jan. 2–Dec. 31. f°. Sheets.

gf **United States.**

Washington, Department of Agriculture. Weather Bureau. Weather map. 1903, Jan. 1–Dec. 31. la. f°. Sheets.

ha **Mexico.**

Mexico, Dirección General de Telégrafos Federales. Secretaria de Communicaciones y Obras Públicas.—Carta del tiempo. 1903, Jan. 1–Dec. 31. sm. f°. Sheets.

hi **Argentina, Uruguay, and Paraguay.**

Buenos Aires, Ministerio de Agricultura, Oficina Meteorológica Argentina.—Carta del tiempo. 1903, Jan. 1–Dec. 31. la. f°. Sheets.

1840 WEATHER REPORTS FOR LONGER PERIODS.

da Scandinavia.

Copenhagen, Dansk Meteorologisk Institut.—Maanedsoversigt over Vejrforholdene. 1903, Jan.-Dec. f°.

Stockholm, Meteorologiska Central-Anstalt.—Månadsöfversigt af väderleken i Sverige till landtbrukets tjenst utgifven under meteorologiska Central-Anstaltens inseende af H. E. Hamberg. Årgång 23, 1903. f°. Stockholm, 1903.

db Russia in Europe.

[**St. Petersburg,** Nicolas Central Physical Observatory.—Monthly meteorological bulletin.] *See* 0020.

dc German Empire.

‖ **Berlin,** Königlich Preussisches meteorologisches Institut.—Witterung nach den Beobachtungen des königlichen meteorologischen Instituts. 1903, Jan.-Dec. la. 4°. (*Statist. Korresp.*)

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Uebersicht der Ergebnisse der an den badischen meteorologischen Stationen angestellten Beobachtungen, nebst Wasserstandsaufzeichnungen an den wichtigsten Hauptpegeln des Rheins. 1903, Jan.-Dez. und Jahr. f°. Sheets.

Chemnitz. K. Sächsisches Meteorologisches Institut.—Decaden-Monatsberichte. 1902, Jahrg. 5. sm. f°. Chemnitz, 1903.

Hamburg, Deutsche Seewarte.—Zehntägiger Witterungsbericht für die Landwirthschaft. Jahrg. 1-2. Apl., 1902-März, 1904. f°.

——— ——— Internationaler Dekadenbericht. Beilage zum Wetterbericht. 1. Dez., 1902—31. Dez., 1903. f°. Sheets.

Stuttgart. Königl. Statistisches Landesamt.—Mitteilungen, 1903. Beilage des Staats-Anzeigers für Württemberg. la. 8°. Stuttgart. 1903. Contains "Witterungsübersicht . . . nach den Beob. der Württemb. meteor. Stationen."

Strassburg, Meteorologischer Landesdienst.—Uebersicht über die Witterungs-Verhältnisse Elsass-Lothringens. 1903, Jan.-Dec. and year. Beilage der Strassburger Correspondenz, 1903-1904. 4°.

de British Islands.

London, Meteorological Office.—The weekly weather report of the Meteorological Office for the year 1903 (vol. 20, 3rd series), containing synoptic charts, and descriptive summaries of the weather for each day; also tabular summaries of temperature, rainfall, and bright sunshine, for each week, with monthly and annual supplements, [quarterly] appendices, and frontispiece map. la. 4°. London, 1904.

——— Royal Meteorological Society.—The meteorological record. Monthly results of observations made at the stations of the R. Meteor. Soc., with remarks on the weather. By W. Marriott. Vol. 22, 1902. la. 8°. London, 1903.

Issued quarterly.

df France.

Paris, Bureau Central Météorologique de France.—Bulletin mensuel. 1903, Jan.-Dec. 4°. Paris, 1903.

di **Switzerland.**

Davos.—Davoser Wetterkarte. Nach dem Schema von Herrn C. Wetzel, Ingenieur, herausgegeben im Auftrag des Curvereins Davos-Platz vom Amtl. Beobachter der Schweiz. meteor. Station Davos. 1903, Jan.–Dec., and Suppl. la. f°. Sheets.

In the French and English languages also.

dk **Austria-Hungary.**

Vienna, K. K. hydrographischer Dienst in Österreich.—Wochenberichte über die Schneebeobachtungen im österreichischen Elbegebiete und im böhmischen Donau- und Odergebiete für den Winter 1902–3. Herausgegeben von der k. k. hydrographischen Landesabtheilung der böhmischen Statthalterei. f°. Prag, 1903.

——— ——— Wochenberichte über die Schneebeobachtungen im österreichischen Weichsel-, Dniestr-, Styr-, Pruth- und Serethgebiete für die Zeit vom 31. Nov., 1902, bis 28. Feb., 1903. Herausgegeben von der k. k. hydrographischen Landesabtheilung in Lemberg. f°. (Lemberg, s.a.)

——— ——— Wochenberichte über die Schneebeobachtungen im österreich. ischen Rhein-, Donau-, Oder- und Adriagebiete für den Winter 1902–3. Herausgegeben vom k. k. hydrographischen Centralbureau. f°. Wien, 1903.

dl **Balkan Peninsula.**

Belgrade, Observatoire Central.—Bulletin mensuel. Vol. 1. 1902. sm. f°. Belgrade, 1902–3.

Bucharest, Institutul Meteorologic al Romaniei.—Buletinul lunar al observatiunilor meteorologice din Romania publicat de S. C. Hepites Anul 11, 12, 1902, 1903. sm. f°. Bucuresci, 1903–4.

ef **British India and Ceylon.**

[**Allahabad,** Meteorological Office.]—Brief sketch of the meteorology of the United Provinces [of Agra and Oudh] and adjacent parts of Rajputana and the Panjab. 1902. sm. f°. Allahabad, 1903.

[**Calcutta,** Meteorological Office, Bengal.]—Summary of the meteorology of Bengal for the year 1902. sm. f°. s.l.e.a.

(——— ——— ———) Meteorological and rainfall table of the province of Bengal for the months of January to December, 1903, with annual tables. sm. f°. Sheets.

[——— ——— India].—The India weather review for the year 1902. f°. Calcutta, 1903.

——— ——— ——— Abstract of the results of meteorological observations taken at the Alipore Observatory in the months of Jan.–Dec. 1903. sm. f°. Sheets.

‖ **Colombo,** Surveyor General's Office.—Report on the meteorology of Ceylon for 1902. sm. f°. (*Ceylon Administr Rep.*, 1902, *Part ii.*)

‖ ——— ——— Results of meteorological observations in Ceylon during the months of January to December, 1902. f°. Sheets. (*Suppl. Ceylon Gov. Gazette*, 1902–3.)

Lahore, Meteorological Reporter to Government, Punjab.—Summary of meteorological conditions prevailing over the Punjab, Kashmir, and Frontier Province. 1903, Jan.–Dec. f°.

cj **Malay Peninsula and Philippines.**

Manila, Observatorio.—Boletín mensual. Años 33-37, 1897-1901. 5 vols. sm. f°. Manila, 1897-1902.

fb **N.E. Africa; Egypt and Nile Valley.**

Cairo, Survey Department, Public Works Department.—Summary of the weather. 1903, Jan.-Dec. sm. f°.

gb **Canada.**

Toronto, Meteorological Service, Dominion of Canada.—Weather Map. 1903, Jan. to Dec. Chart shewing the mean temperature and the difference from mean average temperature, also total rain and snowfall for the month, and depth of snow on the ground on the last day of the month. f°. Sheets.

—— —— —— Monthly weather review. 1903, Jan.-Dec. la. 4°. s.l.e.a.

gf **United States.**

Washington, Department of Agriculture, Weather Bureau.—Monthly Weather Review and Annual Summary. *See* 0020.

ha **Mexico.**

Leon, Observatorio Meteorológico.—Boletin mensual. 1903, Jan. Dec. f°. Leon, 1903-1904.

he **West Indian Islands.**

Kingston, Government Laboratory.—Jamaica weather report. 1903, Jan.-Dec. sm. f°.

ih **Western Australia.**

Perth, Observatory.—The climate of Western Australia. 1903, Jan.-Dec. f°. Sheets.

ii **Tasmania.**

Hobart, Meteorological Observer.—Monthly record. *See* 1820 *ii*.

1870 METEOROLOGICAL CHARTS.

See also 1770.

df **France.**

Paris, Observatoire Municipal, Service Physique et Météorologique.—Atlas météorologique. *See* 1810 *df*.

dk **Austria-Hungary.**

Vienna, K. K. Hydrographischer Dienst in Österreich.—Wochenberichte über die Schneebeobachtungen. *See* 1840 *dk*.

ge **North America.—The Laurentian Lakes.**

Washington, Department of Agriculture, Weather Bureau.—Meteorological chart of the great Lakes. 1903, Nos. 1, 2. W.B. Nos. 286, 298. 2 vols. la. 4°. Washington, 1903, 1904.

l **Atlantic.**

Hamburg, Deutsche Seewarte.—Atlantischer Ozean. Ein Atlas von 37 Karten die physikalischen Verhältnisse und die Verkehrs-Strassen darstellend, mit einer erläuternden Einleitung und als Beilage zum Segelhandbuch für den Atlantischen Ozean. Zweite Auflage. f°. Hamburg, 1902.

—— —— —— Internationaler Dekadenbericht. *See* 1840 *dc.*

la **North Atlantic.**

Hamburg, Deutsche Seewarte.—Vierteljahrskarte für die Nordsee und Ostsee. Winter (Dez., Jan., Feb.), 1903-4. la. f°. Chart.

—— —— Monatskarte des nordantl. Oceans. Neue Folge der nordatlantischen Wetterausschau. Jahrg. 3, 1903, Nos. 1-12. la. f°. Sheets.

London, Meteorological Office.—Monthly pilot Charts of the North Atlantic and Mediterranean. 1903, Jan.-Dec. la. f°. Sheets.

Washington, Hydrographic Office.—Pilot chart of the North Atlantic Ocean. 1903, Jan.-Dec. la. f°. Sheets.

mc **Indian Ocean, N. of Equator.**

[**Calcutta,** Meteorological Office, India].—Normal weather chart of the Indian monsoon area. 1903, Jan.-Dec. f°. Sheets.

na **North Pacific.**

Washington, Hydrographic Office.—Pilot chart of the North Pacific. 1903, Jan.-Dec. la. f°. Sheets.

TERRESTRIAL MAGNETISM.—THE COMPASS. EARTH CURRENTS.

3020 MAGNETIC STATE OF THE SURFACE OF THE EARTH; SURVEYS; ISOMAGNETICS AND GAUSSIAN COEFFICIENTS.

Fritsche, H.—Atlas des Erdmagnetismus für die Epochen 1600, 1700, 1780, 1842 und 1915. f°. Riga, 1903.

da **Scandinavia.**

Copenhagen, Institut Météorologique de Danemark.—Annales de l'Observatoire Magnétique de Copenhague publiées par A. Paulsen. Années 1899-1900. sm. f°. Copenhagen, 1903.

db **Russia in Europe.**

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* 1820 *db.*

dc **German Empire.**

Stuttgart, Königl. Statistisches Landesamt.—Die erdmagnetischen Elemente von Württemberg und Hohenzollern. Gemessen und berechnet für 1. Januar 1901 im Auftrage und unter Mitwirkung der K. Württemberg. meteor. Zentralstation. Von Karl **Haussmann.** Herausgegeben von dem K. Statist. Landesamt 1903. la. 4°. Stuttgart, 1903.

de **British Islands.**

‖ **Chree,** C[harles].—An analysis of the results from the Kew magnetographs on "quiet" days during the eleven years 1890 to 1900, with a discussion of certain phenomena in the absolute observations. 1a. 4°. (*London, Phil. Trans., A*, 202, 1903, *p.* 335.)

——— An analysis of the results from the Kew magnetographs on *quiet* days during the eleven years 1890–1900, with a discussion of certain phenomena in the absolute observations. [Abstract.] 8°. (*London, Proc. R. Soc.*, 72, 1903, *p.* 22.)

Falmouth Observatory.—Meteorological and magnetical tables. *See* 1800 *de.*

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations. *See* 1800 *de.*

Jersey. Observatoire St. Louis.—Bulletin des observations magnétiques et météorologiques. *See* 1810 *de.*

Kew Observatory, Richmond, National Physical Laboratory.—Report. *See* 0020.

Stonyhurst College Observatory. *See* 1820 *de.*

df **France.**

(Perpignan, Commission Météorologique Départementale des Pyrénées-Orientales.)—Bulletin météorologique annuel. *See* 1820 *df.*

dg **Spain and Portugal.**

San Fernando, Instituto y Observatorio de Marina.—Anales. *See* 1810 *dg.*

dk **Austria-Hungary.**

Jaeger, Franz.—Magnetische und meteorologische Beobachtungen zu Klagenfurt. *See* 1820 *dk.*

Pola, Hydrographisches Amt der K. K. Kriegs-Marine.—Veroffentlichungen, Gruppe ii. *See* 1800 *dk.*

Prague, K. K. Sternwarte.—Magnetische und meteorologische Beobachtungen. *See* 1820 *dk.*

dl **Balkan Peninsula.**

Bucharest. *See* 0020

ea **Asiatic Russia.**

St. Petersburg, Observatoire Physique Central Nicolas.—Annales. *See* 1820 *db.*

eb **China.**

Hong-Kong Observatory.—Observations. *See* 1810 *eb.*

Zi-ka-wei, Observatoire Magnétique et Météorologique.—Bulletin mensuel. *See* 1810 *eb.*

ef **British India.**

Bombay, Government Observatory.—Magnetical . . . observations. *See* 1820 *ef.*

eg **Malay Peninsula, and Philippines.**

Batavia, Royal Magnetical and Meteorological Observatory.—Observations. *See* 1810 *eg.*

Manila, Observatorio.—Boletín mensual. *See* **1840** *eg.*

hh **Brazil.**

Rio Janeiro, Ministerio da Marinha, Directoria de Meteorologia.—Boletim das observações meteorologicas e dos rezultados magneticos. *See* **1820** *hh.*

k **Arctic.**

***Abruzzi,** Luigi Amedeo di Savoia, *Duca degli.*—Osservazioni scientifiche eseguite durante la spedizione polare. *See* **1810** *k.*

‖ **Palazzo,** Luigi.—Osservazioni magnetiche eseguite dal Com^te^ Umberto Cagni nella Baia di Teplitz. Calcolate dal Luigi Palazzo, con una introduzione dal Com^te^ Umberto Cagni. la. 8°. Milano, 1903. (*Osservazioni scient. eseguite durante la spedizione polare di S.A.R. Luigi Amedeo di Savoia Duca degli Abruzzi*, 1899–1900.)

o **Antarctic.**

Pola, Hydrographisches Amt der K. K. Kriegs-Marine.—Veröffentlichungen. Gruppe v. Internationale erdmagnetische Co-operation, 1902-1903. Erdmagnetische Simultan-Beobachtungen während der Südpolar-Forschung in den Jahren 1902–1903. la. 4°. Pola, 1903.

3040 DIURNAL AND OTHER PERIODIC MAGNETIC VARIATIONS.

Bemmelen, W[illem] van.—Erdmagnetische Pulsationen. la. 8°. (*Batavia, Natuurk. Tijdschr. Nederl. Ind.*, 62, 1902, *p.* 71.)

Steen, Aksel S.—The diurnal variation of terrestrial magnetism. la. 8°. Christiania, 1904. (*Christiania, Vid.-selsk. skr.*, 1, *math. naturv. kl.*, 1904, *No.* 2.)

3050 MAGNETIC STORMS.

Moidrey, J. de.—Perturbation magnétique du 31 octobre 1903 à Zi-ka-wei (Chine). la. 4°. Dated, Zi-ka-wei, 1903.

3060 RELATIONS BETWEEN TERRESTRIAL MAGNETISM AND THE HEAVENLY BODIES.

Chree, C[harles].—Preliminary note on the relationships between sunspots and terrestrial magnetism. 8°. (*London, Proc. R. Soc.*, 71, 1902, *p.* 221.)

II.—*OFFICIAL REPORTS AND PUBLICATIONS OF SCIENTIFIC SOCIETIES WHICH INCLUDE METEOROLOGICAL TABLES OR PAPERS.*

British New Guinea.—Annual Report on British New Guinea. 1901-2. sm. f°. [Melbourne, 1903.]

Copenhagen, Kongelige Danske Videnskabernes Selskab.—Oversigt over det . . . Forhandlinger. 1903. la. 8°. København, 1903-4.

Dublin, Royal Irish Academy.—Transactions. Vol. 32. Section A. la. 4°. Dublin, 1902-4.

Edinburgh, Royal Society.—Proceedings. Vol. 23, 1899–1901. 8°. Edinburgh, 1902.

Emden, Naturforschende Gesellschaft.—Jahresbericht. 87, 1901–1902. 8°. Emden, 1903.

Falmouth, Royal Cornwall Polytechnic Society.—Annual report. 70th, 1902. 8°. Falmouth, s.a.

Frankfurt-am-Main, Physikalischer Verein.—Jahresbericht. 1901–02. 8°. Frankfurt-am-Main, 1903.

Geneva, Société de Physique et d'Histoire Naturelle.—Compte rendu des séances. 17, 18, 20; 1900, 1901, 1903. 3 vols., 8°. Genève, 1900–1903. (*Arch. sc. phys. nat., Genève*, 9-12, 15–16.)

London, British Association for the Advancement of Science.—Report. Belfast, 1902. 8°. London, 1903.

—— British South Africa Company.—Reports on the administration of Rhodesia 1900–2. 4°. s.l.e.a. Contains meteor. obsns. for 1900–1902 at various stations.

—— Royal Society.—Proceedings. Vols. 71–72, 1902–3. 2 vols., 8° London, 1903–4.

*—— —— International Catalogue of Scientific Literature. Bacteriology. Second annual issue. 8°. London, 1903.

*—— —— —— Mathematics. First annual issue. 8°. London, 1902.

* —— —— —— Mechanics. Second annual issue. 8°. London, 1903.

*—— —— —— Physics. First annual issue. Part 2. Second annual issue. 2 vols., 8°. London, 1903.

—— Society of Arts.—Journal. Vol. 51, 1902–3. la. 8°. London, 1903.

*—— **Edinburgh, and Dublin Philosophical Magazine** and Journal of Science. Sixth series. Vols. 5–6, 1903. 2 vols. 8°. London, s.a.

Manchester Literary and Philosophical Society. Memoirs and proceedings. Vol. 47, 1902–3. 8°. Manchester, 1903.

***Nature.**—A weekly illustrated journal of science. Vols. 67–68, 1902–1903. 2 vols. la. 8°. London and New York, s.a.

***Nature,** La.—Revue des sciences et de leurs applications aux arts et à l'industrie. Journal hebdomadaire illustré. 31ᵉ année, 1902–3. 1ᵉʳ et 2ᵉ Semestres. 2 vols. sm f°. Paris, s.a.

Ottawa, Geological Survey of Canada. Annual report. New series. Vol. 12, 1899, with vol. of maps. 2 vols. la. 8°. Ottawa, 1902.

Paris, Académie des Sciences.—Comptes rendus hebdomadaires des séances . . . Tomes 136–137, 1903. 2 vols. 4°. Paris, 1903.

Philadelphia, American Philosophical Society.—Proceedings of the American Philosophical Society held at Philadelphia for promoting useful knowledge. Vol. 42, 1903. la. 8°. Philadelphia, 1903.

—— Franklin Institute.—The journal of the Franklin Institute, devoted to science and the mechanic arts. Vols. 155–156. 2 vols. 8°. Philadelphia, 1903.

Pola, K. u. K. Marine-Technisches Comité.—Mittheilungen aus dem Gebiete des Seewesens. 31. Bd., 1903. la. 8°. Pola, 1903.

Sydney, Royal Society of New South Wales.—Journal and proceedings. Vol. 36, 1902. 8°. Sydney, 1902.

Washington, Smithsonian Institution.—Annual Report of the Board of Regents . . . for the year ending June 30, 1902. 8°. Washington, 1903.

——— ——— Smithsonian contributions to knowledge. Vol. 29. 1a. 4°. Washington, 1903.

York, Yorkshire Philosophical Society.—Annual report . . . for 1902. 1a. 8°. York, 1903.

III.—*ASTRONOMY.* (E.)

0020 PERIODICALS, REPORTS OF INSTITUTIONS, SOCIETIES, CONGRESSES, &c.

Azambuja, Graciano A. de.—Annuario do Estado do Rio Grande do Sul, 1904. Anno 20. sm. 8°. Porto Alegre, 1903.

*(**London,** Nautical Almanac Office).—The nautical almanac and astronomical ephemeris for the year 1904, for the meridian of the Royal Observatory at Greenwich. 1a. 8°. Edinburgh, [1903.]

——— Royal Astronomical Society.—Monthly notices. Vol. 63, 1902-3. 8°. London, 1903.

Rio Janeiro, Observatorio.—Annuario. 19. 1903. sm. 8°. Rio de Janeiro, 1903.

Tacubaya, Observatorio Astronómico Nacional.—Anuario. 1904. Año 24. sm. 8°. México, 1903.

——— ——— Informes presentados á la Secretaria de Fomento por el Director del Observatorio Astronómico Nacional sobre los trabajos del establecimiento. desde 1° de Enero de 1902 á 30 de Junio de 1903. 8°. México, 1903.

Washington, United States Naval Observatory.—Report of the Superintendent . . . for the fiscal years ending June 30, 1902, 1903. 2 vols., 1a. 8°. Washington, 1902-3.

0030 GENERAL TREATISES, TEXT BOOKS, DICTIONARIES, BIBLIOGRAPHIES, TABLES, &c.

*__London,__ Royal Society.—International Catalogue of Scientific Literature. Astronomy. Second annual issue. 8°. London, 1903.

2030 INSTRUMENTS (GENERAL), OLD INSTRUMENTS, ASTROLABES, &c.

‖ **Charrol,** Marcel.—Note sur un astrolabe du xviie siècle. 1a. 8°. Bordeaux 1903. (*Actes soc. archéol., Bordeaux.*)

4070 SUN SPOTS.

Lockyer, Sir Norman, and **Lockyer,** W. J. S.—Solar prominence and spot circulation, 1872-1901. 8°. (*London, Proc. R. Soc.* 71, 1903. *p.* 446.)

——— William J[ames] S[tewart].—On a probable relationship between the solar prominences and corona. 8°. (*London, Mon. Not. R. Astr. Soc.*, 63, 1903, *p.* 481.)

Lockyer, William J[ames S[tewart].—Sunspot variations in latitude, 1861–1902. 8°. (*London, Proc. R. Soc.*, 73, 1904, *p.* 142.)

9420 CALENDARS.

Sudan Almanac, 1903.—Compiled in the Intelligence Department, Cairo. sm. 4°. London, s.a.

IV.—*GEOGRAPHY (PHYSICAL AND MATHEMATICAL).* (J.)

0020 PERIODICALS, REPORTS OF INSTITUTIONS, SOCIETIES, CONGRESSES, &c.

Amsterdam, Kon. Nederlandsch Aardrijkskundig Genootschap.—Tijdschrift. Tweede serie, Deel 20. 2 vols., 8°. Leiden, 1903.

[**Calcutta,** Surveyor General of India].—General report on the operations of the Survey of India Department . . . during 1901–2. sm. f°. Calcutta, 1903.

Edinburgh, Royal Scottish Geographical Society.—The Scottish Geographical Magazine. Vol. 19, 1903. la. 8°. Edinburgh, 1903.

Geneva, Société de Géographie.—Le Globe. Journal géographique. Tome 42. la. 8°. Genève, 1903.

*__Geographen-Kalender__ . . . herausgegeben von Hermann Haack. 1. Jahrg., 1903–4. sm. 8°. Gotha, 1903.

London, Royal Geographical Society.—The geographical journal. Including the proceedings of the Royal Geographical Society. Vols. 21–22. 1903. 2 vols. la. 8°. London, 1903.

New York, American Geographical Society.—Bulletin [formerly Journal]. Vols. 34, 35, 1902, 1903. 2 vols. la 8°. New York, s.a.

Petermann's (Dr. A.) Mitteilungen aus Justus Perthes' geographischer Anstalt. Herausgegeben von A. Supan. 49. Bd., 1903. 4°. Gotha, s.a.

0030 GENERAL TREATISES, TEXT BOOKS, DICTIONARIES, BIBLIOGRAPHIES, TABLES.

London, Admiralty, Hydrographic Department.—Catalogue of Admiralty charts, plans, and sailing directions, 1904. la. 8°. London, s.a.

*——— Royal Society.—International Catalogue of Scientific Literature. Geography. First annual issue. 8°. London, 1903.

Wilson-Barker, David, and **Allingham,** William.—Navigation: practical and theoretical. Second ed., revised. sm. 8°. London, 1904.

0060 INSTITUTIONS, MUSEUMS, COLLECTIONS, ECONOMICS.

Geographical Exhibition.—Catalogue of the Geographical Exhibition, arranged by the Geographical Association, and shown in London and elsewhere in 1904. Suppl. to the Geogr. Teacher, vol. 2. la. 8°. London, [1904].

01 *PHYSICAL GEOGRAPHY.*

GENERAL.

Danckelman, Freiherr von.—Mitteilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten. Mit Benutzung amtlicher Quellen, herausgegeben von Dr. Freiherr von Danckelman. Bd. 16. la. 8°. Berlin, 1903.

ff **East Africa.**

* **British Central Africa.**—Report on the trade and general conditions of the British Central Africa Protectorate for the year 1902-3, by Major F. B. Pearce, Acting Commissioner. sm. f°. London, 1903.

Contains meteor. obsns. for 1902.

* **London,** War Office, Intelligence Division.—Précis of information concerning the British East Africa Protectorate and Zanzibar. la. 8°. London, 1901.

* ——— ——— ——— Précis of information concerning the Uganda Protectorate. la. 8°. London, 1902.

Pearce, F. B.—Report on the . . . British Central Africa Protectorate. *See* BRITISH CENTRAL AFRICA.

* **British East Africa Protectorate.**—Report by Mr. A. Whyte on his recent travels along the sea-coast belt of the British East Africa Protectorate. [Cd. 1534.] sm. f°. London, 1903.

Contains some meteor. obsns. reprinted from Rep. Brit. Ass., 1901.

East Africa Protectorate.—Report by His Majesty's Commissioner on the East Africa Protectorate. [Parl. paper, Cd. 1626.] sm. f°. London, 1903.

Contains daily meteor. obsns. at Mombasa for 1901.

la **North Atlantic.**

Kiel und Helgoland, Kommission zur wissenschaftlichen Untersuchung der Deutschen Meere in Kiel und der Biologischen Anstalt auf Helgoland.—Wissenschaftliche Meeresuntersuchung. Neue Folge. 7.-8. Band. Abtheilung Kiel. 2 vols. la. 4°. Kiel und Leipzig, 1903.

40 THE OCEAN—AREA, DEPTH.

‖ **Buchanan,** J[ohn] Y[oung].—Historical remarks on some problems and methods of oceanic research. 8°. [*Proc. R. Inst. Great Britain*, 1903.]

41 TIDES AND TIDE TABLES.

Harris, R. A.—The semidiurnal tides in the northern part of the Indian Ocean. la. 4°. (*Washington, U.S. Dep. Agric., Mon. Weather Rev.*, 1903, *Meh.*)

London, Admiralty, Hydrographic Department.—Tide tables for the British and Irish ports for the year 1904; also the times and heights of high water at full and change for the principal places on the globe. la. 8°. London, [1903].

42 CURRENTS, WAVES.

Russell, H[enry] C[hamberlaine].—Current papers. No. 7. 8°. (*Sydney, N.S.W., Journ. Proc. R. Soc.*, 36, 1902, *Sept.* 3.)

50 LAND WATERS.

London, Underground Water Preservation Association.—On the underground water supply of the country. 1a. 8°. London, [1903.]

53 LAKES.

Valentin, J.—Ueber die stehenden Seespiegelschwankungen (Seiches) in Riva am Gardasee. 1a. 8°. (*K. Akad. Wissensch., Wien, Sitz. math.-naturw. Kl.*, 2. *Apl.*, 1903.)

Wedderburn, E. Maclagan-.—Seiches observed in Loch Ness. 8°. (*Edinburgh, Proc. R. Soc.*, 25, 1903.)

65 PHYSICAL ATLASES.

London, Union-Castle Mail Steamship Co., Ltd.—The Union-Castle atlas of South Africa . . . with an account of the geographical features, the climate, the mineral and other resources, and the history of South Africa. 1a. 8°. London and Capetown, 1903.

MATHEMATICAL GEOGRAPHY.

75 MARINE SURVEYS.—HYDROGRAPHY.

London, Admiralty. Hydrographic Department.—The China Sea Directory. Vol. 3, 4th ed. 1a. 8°. London, 1904.

——— ——— ——— The West India Pilot. Vol. I. From Cape Orange in Brazil to Cape Sable in Florida, with the adjacent islands. 6th ed. 1a. 8°. London, 1903.

——— ——— ——— North Sea Pilot. Part I. Shetland and Orkneys. 5th ed. 1a. 8°. London, 1903.

——— ——— ——— Sailing directions for Japan, Korea, and adjacent seas . . . Formerly published as China Sea Directory, vol. 4. 1st ed. 1a. 8° London, 1904.

84 CARTOGRAPHY.

Schück, [Karl Wilhelm] A[lbert].—Die Stabkarten der Marshall-Insulaner. sm. f°. Hamburg, 1902.

90 NAVIGATION, MEASUREMENTS OF TIME AND POSITION.

London, Admiralty, Hydrographic Department.—On the station pointer, and the manner of fixing a ship's position by its aid. Second ed. 8°. London, 1903.

V.—*MISCELLANEOUS.*

Hazell's Annual for 1904. . . . Edited by W. Palmer. 19th year. sm. 8° London, 1904.

(**Lahore,** Sanitary Commissioner).—Report on the Sanitary Administration of the Punjab . . . for the year 1902. sm. f°. Lahore, 1903.

Lloyd's Calendar. 1904. 8°. London, [1904].

London, Board of Trade.—Abstracts of the returns made to the Board of Trade of shipping casualties . . . from the 1st July, 1901, to the 30th June, 1902, . . . with charts and appendices. sm. f°. London, 1903.

——— Royal National Life-boat Institution.—The life-boat. Vol. 18, 1901-3. la. 8°. London, 1904.

——— Royal United Service Institution.—Journal. Vol. 47, 1903. 8°. London, 1903.

Nautical Magazine (The), and Journal of the Naval Reserves. Enlarged series. 72, 1903. la. 8°. London, s.a.

Regina, Department of Agriculture of the North-West Territories.—Annual report. 1902. la. 8°. Regina, 1903.

APPENDIX XI.

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, AND OF PAPERS ON VARIOUS METEOROLOGICAL INVESTIGATIONS INCLUDED IN THE PERIODICAL PUBLICATIONS OF THE OFFICE FROM THE YEAR 1866.

A. TABLES OF MEAN VALUES.

—	Publication.
Telegraphic Reporting Stations.	
Mean Values of Barometric Pressure at 8 a.m.	Daily Weather Report, 1896, July to December, pp. 1 to 9.
Dry and Wet Bulb Temperatures at 8 a.m.	
Daily Maximum and Minimum Temperatures, and of the Maximum and Minimum combined, together with Extremes of Daily Temperature for each Month, and for the Whole Year, derived from Observations made daily at 8 a.m., for the 25 Years 1871–95.	
Mean Rainfall for each Month and for the Whole Year—derived from Observations extending over the 30 Years, 1866–95.	
Mean Numbers of Hours of Bright Sunshine, with the Percentages of Possible Duration, derived from Observations extending over the 15 Years, 1881–95.	
Values for Pressure (1871–1900), Temperature (1871–1900), Rainfall (1866–1900), and Bright Sunshine (1881–1900), for each month.	Monthly Supplement to Daily Weather Report, 1900, July to December.
Climatological Stations: Weekly and Monthly Weather Report Stations.	
Table showing the Mean Monthly and Annual Rainfall at the Weekly and Monthly Weather Report Stations for the 20 Years, 1866 to 1885.	Monthly Weather Report, 1885 [ii.].
Average Temperatures for each Month and for the Whole Year, at certain of the Stations which furnish Returns for the Weekly Weather Reports and Monthly Summaries, derived from Observations extending over the 30 Years, 1871–1900.	Weekly Weather Report, 1901, pp. [18–21].
Average Rainfall and the Average Number of Rain-days for each Month and for the Whole Year, derived from Observations extending over the 35 Years, 1866–1900, as above.	Weekly Weather Report, 1901, p. [22–25].
Average Number of Hours of Bright Sunshine for each Month and for the Whole Year, together with the Percentages of the Possible Duration, derived from Records extending over the 20 Years, 1881–1900, as above.	Weekly Weather Report, 1901, p. [26–29].

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

—	Publication.
Climatological Stations: Weekly and Monthly Weather Report Stations—*continued.*	
Table I.—Showing for each District, during the Lustrum 1896–1900, and the whole Period comprehended in the 20 Years, 1881–1900, the Mean Aggregate numbers of rainy days from the beginning of the Year to the end of each week in the Year.	Weekly Weather Report, 1900, p. [17].
Table II.—Showing in the same detail the Mean Aggregate Amounts of Rainfall.	Weekly Weather Report, 1900, p. [21].
Table III.—Showing in the same detail the Mean Aggregate Values for Accumulated Heat above 42° F.	Weekly Weather Report, 1900, p. [25].
Table IV.—Showing in the same detail the Mean Aggregate Values for Accumulated Heat below 42° F.	Weekly Weather Report, 1900, p. [29].
Table V.—Showing in the same detail the Mean Aggregate Numbers of Hours of Bright Sunshine.	Weekly Weather Report, 1900, p. [33].
Table VI.—Showing in the same detail the Mean Percentages of the possible amount of Bright Sunshine.	Weekly Weather Report, 1900, p. [37].
Table showing in the same detail the Mean Temperature of the Air.	Weekly Weather Report, 1900, p. [41].
Summaries of Rainfall and Mean Temperature for the First, Second, Third, and Fourth Quarters, and for the Whole Year, during the 38 years, 1866–1903. [The separate Yearly Values for 1866-90 are contained in the Report for 1890, and those for 1891–1903, in the Report for 1903.]	Weekly Weather Report, 1903, p. [1–9].
Results of Observations at Stations of the Second Order for the Fifteen years, 1876-90.	Meteorological Observations at Stations of the Second Order, 1891, p. [186].
First Order Stations: Observatories.	
Constants for the Determination of the Monthly March of Atmospherical Pressure, &c., at the Seven Observatories for 1869–70.	Quarterly Weather Report, 1871, p. [59].
On the Diurnal Range of Rainfall at the Seven Observatories in connexion with the Meteorological Office, 1871–80. By R. H. Scott, F.R.S. [5 plates.]	Quarterly Weather Report, 1877, p. [13].
Tables and Diagrams illustrating the Diurnal Range of Barometric Pressure in the British Isles during the Years 1876-80. By F. C. Bayard, LL.M., F.R. Met. Soc. [5 plates.]	Quarterly Weather Report, 1877, p. [19].

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

—	Publication.
First Order Stations : Observatories—*continued.*	
Mean Monthly Results for the Seven Observatories for the Lustrum, 1871–75.	Quarterly Weather Report, 1875, p. [89].
Report on the Reduction of Greenwich Curves for 1875 to a Common Standard with those of Kew [with 25 plates].	Quarterly Weather Report, 1876, p. [13].
Tables of Hourly Sunshine Values, with Plates, for the Ten Years 1881–90, for Seven Observatories.	Hourly Means, &c., 1891, p. [1].
Mean Hourly and Extreme Values of Pressure and Temperature, and Amount and Frequency of Rainfall, for each month of the 25 years, 1871–95; also Amount and Frequency of Sunshine for each month of the 15 years, 1881–95.	Hourly Means, &c, 1895, p. [6–80].

B. OTHER TABLES, &C., FOR USE IN CONNEXION WITH OBSERVATIONS AT TELEGRAPHIC REPORTING AND CLIMATOLOGICAL STATIONS.

—	Publication.
Sunshine.	
Table showing for each Month and for each Degree of Latitude from 18° N. to 49° N. the Total Number of Hours during which the Sun is above the Horizon.	Monthly Weather Report, 1884 [iii].
Table A.—Showing for each Degree of Latitude, from 49° N. to 58° N. the Total Number of Hours during which the Sun is above the Horizon. in each Month of the Four Quarters of the Year.	Weekly Weather Report, 1884, p. V.
Table B.—Showing similar information for each Week of the Year.	Weekly Weather Report, 1884, p. VI.
Barometric Gradients.	
Factors for Calculation of Gradients from the barometric differences of Telegraphic Reporting Stations.	Quarterly Weather Report, 1869, p. 43.
Accumulated Temperature.	
On the Computation of the Quantity of Heat in excess of any Fixed Base Temperature, received at any place during the course of the Year, &c. By Lieut.-Gen. Strachey, R.E., F.R.S.	Quarterly Weather Report, 1878, p. [13].

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

PAPERS ON VARIOUS METEOROLOGICAL INVESTIGATIONS, &c.

—	Publication.
Anemometer Observations.	
Discussion of Anemometrical Results for Orkney, 1863-68...	Quarterly Weather Report, 1871, p. [7].
Discussion of the Anemometrical Results at Bermuda from 1st April, 1859, to 31st March, 1863.	Quarterly Weather Report, 1872, p. [13].
On the Winds at Liverpool. By W. W. Rundell	Quarterly Weather Report, 1874, p. [26].
Memorandum on the Measurement of Squalls shown on the Traces yielded by Robinson Anemometers of the "Standard" Pattern, by R. H. Curtis.	Report of the Council, 1888-89, p. 37.
Note on Experiments on Pressure of Wind made by W. H. Dines.	Report of the Council, 1889-90, p. 36.
On Mr. Dines' Anemometer Experiments	Report of the Council, 1890-91, p. 22.
On Anemometer Comparisons carried out by the aid of a Grant from the Meteorological Council, by W. H. Dines, B.A.	Report of the Council, 1891-92, p. 23.
On the Construction of the Anemometer recently erected for trial on the roof of the Meteorological Office, by W. H. Dines, B.A.	Report of the Council, 1892-93, p. 21.
Report on the Comparisons made between two Pressure Tube Anemometers on the roof of the Meteorological Office, by R. H. Curtis.	Report of the Council, 1894-95, p. 27.
Note on Anemometer Experiments, by R. H. Curtis... ...	Report of the Council, 1895-96, p. 24.
Report upon Anemometer Experiments at Holyhead, by R. H. Curtis.	Report of the Council, 1897-98, p. 21.
Description of the Bridled Anemometer designed by Sir G. G. Stokes, Bart., F.R.S., by R. H. Curtis.	Report of the Council, 1897-98, p. 28.
Report upon Anemometer Experiments at Holyhead by R. H. Curtis.	Report of the Council, 1899-1900, p. 104.
Readings of Anemometers amounting to, or exceeding a Velocity of 44 miles per hour, equivalent to an Estimated Force of 9 by Beaufort's Scale, 1900-02.	Report of the Council, 1900-01, p. 82; 1901-02, p. 117; 1902-03, p. 131.

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

—	Publication.
Atmospheric Electricity.	
Account of the Experiments on Atmospheric Electricity conducted at Kew Observatory. By Prof. J. D. Everett.	Report of the Council, 1877-78, p. 21.
Report on the Results of a Tentative Reduction of a Year's Electrograms at the Kew Observatory. [G. M. Whipple.]	Report of the Council, 1881-82, p. 29.
Researches on Atmospheric Electricity, with Reports, by C. T. R. Wilson.	Report of the Council, 1899-1900, p. 108.
Report on Investigations in Atmospheric Electricity, by C. T. R. Wilson.	Report of the Council, 1900-01, p. 114.
Remarks on the Recording of Sunshine and Atmospheric Electricity, by Dr. Chree, F.R.S.	Report of the Council 1901-02, p. 105.
Coast and Marine Meteorology.	
Notes on Easterly Gales, by R. H. Scott	Quarterly Weather Report, 1869, p. [1].
A Summary of the Results obtained from the Discussion of the Information for Square 3, being the Region of the Doldrums in the Atlantic. By Capt. H. Toynbee, Marine Superintendent.	Report of the Meteorological Committee, 1872, p. 27.
On the Effect of Sluggishness on the Readings of Marine Barometers on Shore, by Prof. Stokes.	Report of the Meteorological Council, 1879-80, p. 28.
On the Distribution of Gales round the Coasts of the British Isles [for the 15 years, 1871-85].	Report of the Meteorological Council, 1886-87, p. 21.
On the History of the Severe Storms which visited the British Isles between August 1, 1882, and September 3, 1883, as traceable from the Atlantic Charts published by the Office. By Robert H. Scott, F.R.S., Secretary.	Report of the Meteorological Council, 1887-88, p. 22.
Notes of some Results of an Examination of Atlantic Charts published by the Office, by R. H. Scott, F.R.S., Secretary.	Report of the Meteorological Council, 1888-89, p. 22.
Harmonic Analysis of Observations.	
Bessel's Paper on the Determination of the Law of a Periodical Phenomenon. Translated from the Astronomische Nachrichten, 136, for May, 1828.	Quarterly Weather Report, 1870, p. [23].
Comparison of Results obtained by means of the Harmonic Analyser, with similar Results got from Measurement and Numerical Calculation for the Seven Observatories.	Quarterly Weather Report, 1876, p. [39].

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

—	Publication.
Harmonic Analysis of Observations—*continued.*	
On the Results obtained by the use of the Harmonic Analyser	Quarterly Weather Report, 1882–83, p. 27.
Constants of formulæ expressing the mean daily range of temperature obtained by the use of the Harmonic Analyser.	Hourly Readings, &c., 1883, p. [1].
Tables and formulæ to facilitate the computation of harmonic coefficients. By Lieut.-General Strachey, R.E.	Hourly Readings, &c., 1884, p. [1].
Note on Work done with the Harmonic Analyser	Hourly Readings, &c., 1884–85, p. 22.
On the Work done with the Harmonic Analyser at the Meteorological Office.	Hourly Readings, &c., 1889–90, p. 47.
On the Harmonic Analysis of Hourly Observations of Air Temperatures at British Observatories, by Lieut.-Gen. R. Strachey, F.R.S.	Hourly Readings, &c., 1892–93, p. 27.
Meteorology of London.	
Report on Fogs. [W. J. Russell]	Report of the Council, 1880–81, p. 27.
On Fogs. [W. J. Russell]	Report of the Council, 1881–82, p. 25.
On London Rain. By W. J. Russell, Ph.D., F.R.S.	Monthly Weather Report, 1884, p. [i.]
On the Amount of Carbonic Acid in London Air. By W. J. Russell, Ph.D., F.R.S.	Monthly Weather Report, 1884, p [ii.]
Observatories, &c.	
A Description of the Self-recording Instruments recently erected by the Meteorological Committee of the Royal Society in various parts of the United Kingdom. [With plates.]	Report of the Meteorological Committee, 1867, p. 27.
Description of Observatories, with illustrations of thermometer screens.	Report of the Meteorological Committee, 1870, p. iii.
Description of a Self-recording Rain-gauge, invented by Robert Beckley, of the Kew Observatory; made by James Hicks, London.	Report of the Meteorological Committee, 1869, p. 36.
Note upon a Self-registering Thermometer adapted to Deep-Sea Soundings, by W. A. Miller, M.D., Treasurer and V.P.R.S., extracted from Proceedings of Royal Society, vol. XVII., p. 482.	Report of the Meteorological Committee, 1869, p. 25.

LIST OF THE PRINCIPAL TABLES OF MEAN VALUES, &c.—*cont.*

—	Publication.
Observatories, &c.—*continued.*	
Report on Experiments made at Strathfield Turgiss in 1869 with Thermometer Stands or Screens of various patterns, &c. By F. Gaster.	Quarterly Weather Report, 1879, p. [13].
Report on Experiments made at the Kew Observatory with Thermometer Screens of different patterns during 1879, 1880 and 1881. By G. M. Whipple, Superintendent.	Quarterly Weather Report, 1880, p. [13].
On the Methods available for the Determination of the Humidity of the Atmosphere, by W. N. Shaw.	Report of the Council, 1879-80, p. 43.
Report on Hygrometers and Evaporimeters, presented to the Meteorological Council, May 19, 1881. [W. N. Shaw.]	Report of the Council, 1880-81, p. 28.
Report on Evaporimeters. By W. N. Shaw, M.A. [2 plates]	Quarterly Weather Report, 1877, p. [35].
Report on Hygrometric Methods, &c. Part I. By W. N. Shaw, M.A.	Quarterly Weather Report, 1877, p. [41].
Abstract of Report on Hygrometric Methods, by W. N. Shaw, M.A., reprinted from the "Proceedings of the Royal Society," No. 262.	Report of the Council, 1887-88, p. 30.
Miscellaneous.	
Rainfall of the London District for Sixty Years, 1813-72. By G. Dines, F.M.S. [with diagram].	Quarterly Weather Report, 1873, p. [13].
Results of Observations made at the Pagoda, Kew Gardens, to Determine the Influence of Height on Temperature, &c. By R. H. Scott, F.R.S. [4 plates.]	Quarterly Weather Report, 1876, p. [20].
Memorandum on Cloud Photography, by Prof. Stokes, F.R.S.	Report of the Council, 1885-86, p. 22.
Experiments with Violle's Actinometer Apparatus	Report of the Council, 1889-90, p. 46.
Conspicuous Metecrological Occurrences, 1900-02	Report of the Council, 1900-01, p. 81; 1901-02, p. 116; 1902-03, p. 130.

APPENDIX XII.

LIST of INSTITUTIONS and PERSONS receiving PUBLICATIONS issued by the COUNCIL.

OBSERVERS contributing returns printed in one of the periodical publications receive a copy of the publication.

The *Daily Weather Report* is sent to sea ports and to a few places in London for exhibition.

The *Annual Report* is sent to all observers at land stations in connexion with the Office who express a wish to receive it. It is also sent to certain Professors at British Universities and Colleges, and to Agricultural Colleges.

Periodical or occasional publications are sent to the institutions and persons named in the following list, generally speaking, in exchange for publications received. (*See* Appendix X.)

UNITED KINGDOM.

Public Offices: Edinburgh	Board of Fisheries.
	Museum of Science and Art.
	Royal Observatory.
London ...	Army Medical Department.
	Board of Education, Secondary Branch.
	Ditto, Solar Physics Observatory.
	Board of Trade.
	Ditto, Superintendents of the M.M.O. at various seaports.
	Ditto, Consultative Branch.
	Ditto, Fisheries and Harbour Department.
	Chinese Maritime Customs.
	General Post Office.
	House of Lords.
	House of Commons.
	Imperial Institute.
	Registrar General.
	Standard Weights and Measures Department.
	Trinity House.
Admiralty : Dartmouth	H.M.S. "Britannia."
Greenwich	Royal Naval College.
	Royal Observatory.
London ...	Hydrographer.
	Librarian.
Portsmouth	Royal Naval College.
	H.M.S. "Briton" (Inverness).
	" "Clyde" (Aberdeen).
	" "Daedalus" (Bristol).
	" "Durham" (Leith).
	" "Eagle" (Liverpool).
	" "Medea" (Southampton).
	" "Medusa" (N. Shields).
	" "President" (W. I. Dock).
	" "Unicorn" (Dundee).

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

UNITED KINGDOM.

Aberdeen ...	Observatory.
Alnwick ...	Duke of Northumberland.
Armagh ...	Observatory.
Aysgarth ...	Rev. F. W. Stow.
Barry ...	Board of Trade Surveyor.
Bidston ...	Liverpool Observatory.
Birkenhead ...	"Conway" Training Ship.
Birmingham .	Central Free Library.
Cambridge ...	Observatory.
	Philosophical Society's Library.
Cardiff ...	University College.
Dublin ...	Sir J. W. Moore.
	Royal Dublin Society.
	Royal Irish Academy.
	R. Stoney.
Dundee ...	C. H. Brown (Agent).
Durham ...	Observatory.
Eastham ...	T. H. Babington.
Edinburgh ...	Royal Scottish Geographical Society.
	Royal Society.
	Scottish Meteorological Society.
	University Library.
Falmouth ...	Royal Cornwall Polytechnic Society.
	Observatory.
Glasgow ...	Observatory.
Greenhithe ...	"Worcester" Training Ship.
Harrow ...	W. R. Kettle.
Hull	Shipmasters' Association.
Jersey ...	St. Louis Observatory.
Leith... ...	Nautical College.
Liverpool ...	Exchange News Rooms.
	Free Public Library.
	Capt. Fry.
	Mercantile Marine Service Association.
	Nautical College.
	Richardson, Spence & Co.
	Underwriters' Rooms.
London ...	E. D. Archibald.
	F. Galton.
	Guildhall Library.
	Institution of Civil Engineers.
	Lloyd's.
	London Institution.
	Dr. H. R. Mill.
	"Nature."
	"Nautical Magazine."
	Navigation School.
	Royal Astronomical Society.

UNITED KINGDOM—*cont.*

London—*cont.*	Royal Geographical Society.
	Royal Institution of Great Britain.
	Royal Meteorological Society.
	Royal National Lifeboat Institution.
	Royal Society.
	Royal United Service Institution.
	Sailors' Palace.
	"Shipping Gazette."
	Society of Arts.
	R. Strachan.
	Capt. H. Toynbee.
Manchester ...	Philosophical Society.
Markree ...	Observatory.
Northampton.	C. A. Markham.
Oxford ...	Prof. R. B. Clifton.
	Radcliffe Observatory.
	School of Geography.
Pewsey (Wilts.)	H. P. Dixon.
Plymouth ...	Incorporated Chamber of Commerce.
	Marine Biological Laboratory.
Portland ...	Seamen's Reading Room.
Richmond (Surrey)	National Physical Laboratory.
Rugby ...	Natural History Society.
Southampton.	Ordnance Office.
	Capt. Forbes (Agent).
Southport ...	Fernley Observatory.
South Shields	Marine Schools.
Stonyhurst ...	Observatory.
Valencia ...	Observatory.
Wokingham...	G. H. Simmonds.
Yarmouth ...	Sailors' Home.
York	Philosophical Society.

BRITISH COLONIES AND DEPENDENCIES.

Australasia.

Adelaide ...	Government Astronomer.
Brisbane ...	Government Meteorologist.
	Public Library.
Hobart ...	Royal Society, Tasmania.
Melbourne ...	Observatory.
Perth ...	Meteorological Reporter.
Sydney ...	Observatory.
	Royal Society of New South Wales.
Wellington ...	Colonial Museum.
Windsor ...	Observatory.

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

BRITISH COLONIES AND DEPENDENCIES—*cont.*

Canada.

Montreal ...	McGill University Library.
Toronto ..	Meteorological Office.

India and Eastern Asia.

Allahabad ...	Meteorological Reporter.
Bangalore ...	Meteorological Department.
Bombay ...	Observatory.
Calcutta ...	Meteorological Department.
	Surveyor General.
Dehra Dun ...	Trigonometrical Survey.
Hong Kong ...	Observatory.
Kodaikanal ...	Observatory.
Simla ...	Meteorological Reporter.
Singapore ...	Principal Civil Medical Officer.

Mediterranean.

Malta ...	Observatory.

South Africa.

Cape of Good Hope.	Observatory.
Cape Town ...	Meteorological Commission.
Durban ...	Natal Observatory.
Johannesburg	Meteorological Society.
	Transvaal Meteorological Department.
Mauritius ...	Royal Alfred Observatory.

AUSTRIA-HUNGARY.

Cracow ...	Observatory.
Fiume ...	Nautical Academy.
Innsbrück ...	Observatory.
Kremsmünster	Observatory.
O'Gyalla ...	Observatory.
Pesth... ...	Central Meteorological Institute.
Pola	Hydrographic Office.
Prague ...	Hydrographic Office.
	Observatory.
	Royal Society of Sciences.
Trieste ...	Observatory.
Vienna ...	Austrian Meteorological Society.
	Central Hydrographical Bureau.
	Central Meteorological Office.
	Ministry of Agriculture.
	Hofrat, Dr. J. Hann.

BELGIUM.

Brussels(Uccle)	Observatory.
Ostend ...	Navigation School.

BULGARIA.

Sofia	Central Meteorological Station.

DENMARK.

Copenhagen ...	Hydrographic Office.
	International Council for the Study of the Sea.
	Meteorological Institute.
	Society of Sciences.

FRANCE.

Bordeaux ...	Society of Oceanography of the Gulf of Gascony.
Lyons ...	Observatory.
Marseilles ...	Meteorological Commission.
Paris	Central Meteorological Office.
	Hydrographic Office.
	Hydrometric Service.
	Institute of France.
	Meteorological Society.
Perpignan ...	Meteorological Commission.
Puy-de-Dôme.	Observatory.

GERMANY.

Aachen ...	Meteorological Station.
Berlin ...	Hydrographic Office.
	Meteorological Institute.
Bremen ...	Meteorological Observatory.
Carlsruhe ...	Central Meteorological Office.
Chemnitz ...	Meteorological Institute.
Frankfort ...	Physical Society.
Gotha ...	M. Justus Perthes' Geographical Institute.
Greifswald ...	Geographical Society.
Halle... ...	Leopold-Carolin Academy.
Hamburg ...	Deutsche Seewarte.
	Capt. A. Schück.
Kiel	Commission for the Exploration of the German Ocean.

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

GERMANY—*continued.*

Leipzig ...	University Library.
Magdeburg ...	Observatory.
Munich ...	Central Meteorological Office.
	Observatory.
Neustadt ...	Forest Academy.
Neustadt an der Haardt.	Wirkl. Geh. Rath Dr. G. von Neumayer.
Potsdam ...	Observatory.
Strassburg ...	Meteorological Agricultural Service.
Stuttgart ...	Central Meteorological Office.
Wilhelmshaven.	Observatory.

GREECE.

Athens ...	Observatory.

ITALY.

Catania ...	Meteorological Observatory.
Florence ...	Observatory.
Milan ...	Observatory.
Moncalieri ...	Observatory.
Naples ...	Observatory.
Palermo ...	Observatory.
Pesaro ...	Observatory.
Riposto ...	Observatory.
Rome ...	Central Meteorological Office.
	Vatican Observatory.
Turin ...	Observatory.
Venice ...	Observatory.

NETHERLANDS.

Amsterdam ...	Geographical Society.
	Meteorological Institute.
De Bilt, Utrecht.	Royal Meteorological Institute.

NORWAY.

Christiania ...	Meteorological Institute.

PORTUGAL.

Coimbra ...	Observatory.
Lisbon ...	Observatory.

Azores.

Ponta Delgada	Observatory.

ROUMANIA.

Bucharest ...	Meteorological Institute.

RUSSIA.

Dorpat ...	Observatory.
Helsingfors ...	Society of Sciences.
Kazan ...	Observatory.
Moscow ...	Observatory.
Nicolaieff ...	Hydrographic Office.
Odessa ...	Observatory.
Pavlovsk ...	Observatory.
St. Petersburg	Central Physical Observatory.
	Hydrographic Department.
	A. Woeikof.
Tiflis	Observatory.

SERVIA.

Belgrade ...	Central Observatory.

SPAIN.

Guardia ...	Observatory.
Madrid ...	Central Meteorological Institute.
	Observatory.
	Observatory, Chamartin de la Rosa.
Malaga ...	Society of Sciences.
San Fernando	Observatory.
Villafranca del Panades.	Observatory.

SWEDEN.

Stockholm ...	Central Meteorological Institute.
	Nautical Meteorological Bureau.
	Royal Academy.
Upsala ...	Meteorological Observatory.

SWITZERLAND.

Berne ...	Hydrometrical Bureau.
Geneva ...	Geographical Society.
Mont Blanc ...	Observatory.
Neuchâtel ...	Observatory.
Zürich ...	Central Meteorological Office.

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

AFRICA.	
Algiers ...	Meteorological Service.
Cairo... ...	Khedivial Laboratory.
	Sanitary Department of the Ministry of Interior.
	Survey Department.
AMERICA.	
Buenos Aires..	Mons. Lasagna Observatory.
Cambridge, Mass.	Harvard College Observatory.
Cordoba ...	Meteorological Office.
	National Academy.
Costa Rica ...	Meteorological Institute.
Guatemala ...	Central Laboratory.
Havana ...	Observatory.
Mexico ...	Meteorological Observatory.
	"Antonio Alzate" Scientific Society.
Monte Video...	Meteorological Society.
	Observatory.
New York ...	American Geographical Society.
	Central Park Observatory.
	State Library.
Oaxaca ...	Observatory.
Philadelphia..	American Philosophical Society.
	Franklin Institute.
AMERICA—*continued.*	
Porto Alegre..	Sr. G. A. de Azambuja
Porto Rico ...	Engineer in Chief
Quito... ...	Observatory.
Rio de Janeiro.	Meteorological Department, Ministry of Marine.
	Observatory.
Saltillo ...	Observatory.
San Luis Potosi.	Observatory.
San Salvador	Observatory.
Santiago ...	Central Meteorological Office.
Valparaiso ...	Meteorological Service.
Washington...	Chief Signal Officer.
	Department of Agriculture.
	Hydrographic Office.
	Naval Observatory.
	Smithsonian Institution.
	Surgeon General's Office.
	Weather Bureau.
ASIA.	
Batavia ...	Observatory.
Beyrout ...	Lee Observatory.
Irkutsk ...	Observatory.
Manila ...	Meteorological Observatory.
Tokio ...	Imperial Meteorological Observatory.
Zi-ka-wei ...	Observatory.

APPENDIX XIII.

ACCOUNT of RECEIPTS and PAYMENTS for the year ending 31st March, 1904:—

RECEIPTS.	£ s. d.	£ s. d.	PAYMENTS.	£ s. d.	£ s. d.
Balance from year 1902-1903	—	1,776 2 5	ADMINISTRATION:		
Parliamentary vote ..	—	15,300 0 0	Council	826 5 0	
Repayment of expenses charged under—			Secretary	625 0 0	
(1.) Incidental expenses	12 0 6		Salaries and wages ..	1,081 14 6	
(2.) Observatories ..	28 4 9		Rent, fuel, and lighting	714 17 0	
		40 5 3	Incidental and contingent expenses	318 2 2	
			Furniture, fittings, &c. ..	158 3 4	
			Expenses incidental to International Meteorological Congress ..	84 17 10	
					3,808 19 10
SUPPLY OF INFORMATION:			SPECIAL RESEARCHES:		
			Salaries and other charges	—	842 8 1
Weather Forecasts, Reports, &c.	626 10 7		LAND METEOROLOGY:		
Telegrams sent abroad	583 19 6		Observatories and stations, including remuneration of observers..	2,321 2 4	
		1,210 10 1	Salaries:—Discussion and reduction of observations, &c.	1,820 9 6	
					4,141 11 10
SUPPLY OF INSTRUMENTS, &c.:					
Repayment of cost of M.O. instruments purchased by observers..	158 18 5		WEATHER INFORMATION AND FORECASTS:		
Repayment of cost of other commissions ..	388 13 1		Telegraphic reports and storm warnings, remuneration of observers, &c.	2,782 18 2	
		547 11 6	Salaries:—Preparation and issue of reports and forecasts	1,408 14 6	
					4,191 12 8
CHARGES FOR COMMISSION:			INSPECTIONS:		
On supply of instruments &c.	—	19 10 6	Salaries and travelling expenses	—	400 14 3
			OCEAN METEOROLOGY:		
SUPERANNUATION ACCOUNT:			Salaries:—Discussion and reduction of observations	1,366 17 6	
Annuities	249 17 2				
Interest on Investment	32 14 2		Expenses incidental to the supply of instruments:—		
		282 11 4	Proportion of salaries for care and issue of instruments ..	165 0 0	
			Royal Navy	309 1 11	
			Mercantile Marine and Stations ..	479 11 7	
					2,320 11 0
			Miscellaneous commissions executed for Colonial and Foreign Institutions, &c. ..	—	401 8 2
			SUPERANNUATION:		
			Pensions and Allowances	829 12 8	
			Invested	750 0 0	
					1,579 12 8
			BALANCE:		
			Cash at Bank	1,442 15 0	
			„ at Office	46 17 7	1,489 12 7
		£19,176 11 1			£19,176 11 1

NOTES.—On March 31st the amount of 2½ per cent. Annuities held by the Council for the provision of Superannuation Annuities was £1,326 7*s.* 8*d.*

In the year 1903-4 the sum of £1,907 11*s.* 7*d.* was paid to the Post Office on account of inland and foreign telegrams, allowances to telegraph clerks, rental of private wires, &c.

INDEX.

A.

PAGE

Accessions to the Library 135
Account of receipts and payments for 1903–1904 196
Acknowledgments of assistance received 18, 19, 21
Admiralty, supply of climatological information to the 22
——, supply and stock of instruments for the 22, 55, 107
——, „ of Forecasts to H.M. Ships 25
——, „ „ Hydrographic Notices to the 22
African Colonies, observations from 12
Agencies at ports for supply of instruments to ships 55
Agricultural and sanitary purposes, statistics for 49
Anemograph stations, number and list of 29, 52, 71
—— at St. Helena, report upon the results of records 16
Anemometer comparisons at Holyhead continued 16
Annual Reports, list of principal papers in 187–190
Antarctic Expeditions, International Co-operation in the tabulation, &c., of observations in connexion with 11
Argentine Republic, co-operation with the Meteorological Organisation of the 11
Auxiliary climatological stations 29, 31, 58, 75, 76
Azores, daily telegrams from the 19, 44

B.

Balloon ascents, collection of cloud observations in connexion with ... 10
Balloons and Kites, observations of the upper air by means of 11
Barograph stations 29, 52, 71, 72
Barometric pressure over the North Atlantic, charts of 22
Beaufort's wind scale in relation to velocity equivalents 15
Ben Nevis Observatories, continuance of grant towards maintenance of ... 29
—— —— Observations supplied for International Aeronautical Investigation 32
Berridge, W., death of (Loughborough) 24
British East Africa, observations from stations in 12
British Isles, climatology of 28, 53
British Rainfall Organisation, rainfall observations supplied to 32
Bruce, Mr. W. S., report on operations in Southern latitudes, &c. 11

C.

Callendar electrical recorder installed at Cambridge 17
Cambridge (University Observatory), installation of special instruments at 16, 17
Captains who have sent in "excellent" logs, list of 21, 90

PAGE
Carpenter, Capt., report on London fog 12
Charts :—Use of uniform scale and system of projection for 7
Climatological tables for South America, the North Sea, and China Sea ... 22
Climatological stations (*see* "Normal" and "Auxiliary" climatological stations).
Climatology 28, 32, 53
Cloud observations in connexion with balloon ascents, collection of ... 10
—— ——, Report of Sub-Committee on 6
Colonial and Foreign stations, observations received from 32
—— —— —— supply of instruments gratuitously to voluntary observers 11
Conspicuous meteorological occurrences in 1903 36
Contents 2
Continental stations from which reports are received daily, list of 79
Correspondence and Accounts Branch, work of 35
Council, list of 3, 43
—— meetings of 5
Crawe, Captain E., death of 21
Crown Agents, supply of instruments through the 12, 23

D.

Daily Weather Report, method of utilising the information received for the 24
—— —— ——, publication and distribution of 24, 45
—— —— ——, exhibition of 25
—— —— ——, list of principal papers issued with 184
—— —— ——, local issue at Southport during British Association meeting 9
Devonport, forecasts supplied to Commander-in-Chief at 25
Dines' self-recording mercury barometer transferred to Cambridge ... 17
Dines, W. H., kite experiments off West Coast of Scotland and Coasts of Ireland 11
Directors, list of 3, 43
Divisions of the Office and work of each Branch 19, 20
Documents received from Foreign and Colonial land stations, list of ... 32, 53
—— —— from ships, list of 91–106
Dust, investigation as to fall of 12, 42

E.

East Africa, observations received from 12
Electrometer, self-recording, installed at Cambridge University 17
"Excellent" observers, list of 21, 90
Executive officers 3
Exhibition at Southport, list of exhibitors 8, 9
Expenditure 35, 196

F.

PAGE
Finance 20, 34, 35, 196
Fishery barometer stations, classification, number, and list of ... 23, 29, 56
—— barometers, supply of, and conditions 23, 56
Fog in the London district, report of inquiry into, 1902-1903 12
Forecast and Storm Warning Branch, work of 23
—— —— —— —— Districts 46
—— —— —— —— ——, examination of the meteorology of the ... 14
Forecasts of weather, checking of 25
—— ——, inquiries by telegraph and at the Office 26, 33
—— ——, preparation of, arrangements for issue and exhibition of, and charges for... ... ... 25, 45, 46, 47
—— ——, for the years 1894-1903 27
—— ——, summary of results of comparison of, for the year 1903-1904 ... ... 26, 28, 132
—— ——, supply of, to H.M. ships 25
—— ——, where exhibited 25
Foreign and Colonial stations, observations received from 32, 53
Foreign telegraphic stations, list of 79

G.

Gadd, Captain C., death of... 21
Gales of the British Islands, not warned for, in 1903 132
Gaster, F., services retained for special inquiries 5
Geographical Exhibition in London and chief towns of Great Britain ... 12
German Embassy, observations of upper air by means of balloons and kites 11

H.

Halliwell's pluviometer transferred to Botanic Gardens, Cambridge ... 17
Harvest forecasts, distribution of... ... ... 25, 46
Hergesell, Dr., Ben Nevis observations supplied to 32
Holyhead, continuation of anemometer comparisons at 16
Hourly Means, publication of 34
—— ——, list of principal papers in 186
—— Readings, list of principal papers in 189
Hydrographic Notices supplied to the Admiralty 22

I.

Indian Ocean, preparation of wind charts of the 22
Information to the public, memorandum as to supply of, and charges 49, 52, 53
Inquiries, number and classification of, and information supplied in reply to 26, 33, 46

PAGE

Inspection of stations 24, 31
—— ——, reports of 109–131
Instruments, stock of 107, 108
——, supply of, and conditions 11, 22, 23, 55, 57
—— ——, to Colonial Meteorological organisations 11, 23
International Co-operation :—
Antarctic Expeditions... 11
Cloud observations 10
North Sea Biological investigations... 10
Telegraphic services 5, 10
Units of measurements and scales of Charts 6
International Meteorological Committee :—Meeting held at Southport in 1903, members present 5, 6
—— —— ——, future meetings of Sub-Committees 8
—— Committee for Aeronautics, cloud observations, report, &c. ... 5, 6, 10, 32
—— —— ——, observations of the upper air by means of kites and balloons 11
Irish Lights Office, loan of log books for checking storm warnings ... 18

K.

Kite experiments off the West Coast of Scotland and Coasts of Ireland ... 11

L.

Lawrison, Captain G. M., death of 21
Lempfert, R. G. K., Report on London fog 12
Library, contents of, and arrangements for referring to books, &c. ... 33, 54
——, accessions to 33, 135
Lloyd's, supply of records of weather from various signal stations ... 23
——, as to reporting observations from steamers by wireless telegraphy ... 11
Logs received from ships 20, 21, 91

M.

Machine, printing and adding 34
Magnetic observations at Valencia Observatory continued 18
—— storm and auroral display 42
Marine Branch, work of 19
—— observations, discussion of 54
Mercantile Marine, supply and stock of instruments for the... ... 22, 55, 108
—— —— Associations, acknowledgment of co-operation of 18
Mersey Docks and Harbour Board, loan of log-books for checking storm warnings, &c. 18
Mill, Dr. H. R., and Mr. Sowerby Wallis, rainfall observations supplied to 32
Miller, Captain-Superintendent A. T., R.N., death of... 21

PAGE

Miscellaneous investigations :—
Detailed examination of the meteorology of the forecasts districts ... 11
Investigation of the "trajectories" of the air during the progress of barometric changes 12, 13, 14
Wind measurements, Beaufort's scale and wind velocities 15
Monthly Weather Report, list of principal papers in 184, 186, 189

N.

Newspapers, supply of meteorological data to 26, 47, 52
Normal climatological stations, classification and list of ... 29, 30, 53, 58, 73–75
—— —— ——, publication of returns from 32
North Sea Biological investigations 10
Nottingham, establishment of telegraphic reporting station at 24

O.

Observations at Stations of the Second Order, list of principal papers in ... 185
——, transcript of, for the Press 26, 47, 52
Observatories, classification of, arrangements with, and list of ... 29, 52, 71
——, publication of observations from 34
Observatory Branch, work of 20, 34
Observers, acknowledgments of assistance rendered by 18, 19
—— at the Stations of the several Orders, list of 71–79
Occurrences, conspicuous meteorological, in 1903 36
Ocean Meteorology 20
Office Staff 5, 19
——, establishment and objects of the 43
Orange River Colony, supply and inspection of instruments for the ... 12

P.

Papers printed in various Publications of the Office, list of 184
Pilot Charts of the North Atlantic and Mediterranean, publication of, &c. 21, 33, 54
Pluviograph Stations, list of additional 72
Post Offices, exhibition of forecasts at 47
Publications of the Office, preparation of 24, 32, 52, 53
—— —— ——, list of 85
—— —— ——, supplied to various Institutions, applications for, &c. ... 32
Presentations... ... ... 21, 54

Q.

Quarterly Weather Report, list of principal papers in... 185–189

R.

PAGE

Railway stations, sale of Daily Weather Report at 24, 45
Rainfall observations 32
—— Stations... ... ... 29, 58, 72, 76–78
Receipts and payments for 1903–1904 ... ...34, 196
"Red rain," investigations as to fall of 12, 42
Registers received from ships, list of 91
Registrar-General for England, preparation of meteorological reports for 32
—— —— for Ireland, information supplied to 32
Reports of the Office, list of principal papers in 184
Royal Navy, supply and stock of instruments for the 22, 56, 107
Routes, and number of ships observing for Office 21

S.

Sanitary and Agricultural purposes, statistics for 49
Schück, Capt. A., extract of information relating to the North Sea and China Sea 22
Scottish Antarctic Expedition, report from Mr. W. S. Bruce 11
Scottish Meteorological Society, loan of log-books for checking storm warnings 18
—— ——, continuance of grant towards maintenance of Ben Nevis Observatories 29
Sea temperature for the North Atlantic and Mediterranean, charts of ... 22, 31
—— —— stations, classification, number, and list of... ... ... 29, 31, 81
Ships, supply of instruments to 22, 55
—— list of documents received from 91–106
—— observing for the Office, lines of route and number of 21
Solar and Terrestrial changes :—Appointment of preliminary Sub-Committee 7, 8
Southport, preparation of weather reports at meeting of British Association at 9
Stations in the British Islands, classification of 29, 57
—— ——, list of 29, 59–70
—— ——, reports of inspections of 109-131
—— Foreign and Colonial, observations from 12, 53
—— —— ——, list of 23, 32, 53, 82–84
Statistics and Library Branch, work of 28
Steamship Companies, acknowledgment of co-operation of 18
St Helena, report upon anemograph records at 16
Stokes' bridled anemometer to be transferred to Cambridge... 17
Storm warnings, arrangements for, and the number and list of stations supplied with 27, 47
—— ——, obstacles to the transmission of 27
—— ——, results of comparison of, for 1903 and previous years ... 28, 132
Sunshine recorder (Campbell-Stokes), standard specification for 30
—— stations, classification and list of 29, 30, 52, 72, 73

T.

PAGE
Telegraphic information, preparation and supply of 25, 44
—— reporting stations, extension of 7h a.m. 10
—— —— ——, publication of observations from 24
—— —— ——, classification and list of... ... ... 29, 78, 79
—— reports (daily), exchange of, with European Offices 10
Temperature (accumulated), explanation of tables of 50
Terrestrial and Solar changes (*see* "Solar and Terrestrial").
Thermograph stations 29, 52, 72
Transvaal, supply and inspection of instruments for the 12
Trinity House, The Corporation of, loan of log-books for checking storm warnings 18

U.

Upper air, observations of, by means of balloons and kites 11
Units of measurement:—Appointment of committee by British Association 6, 7
—— ——, memorandum on 7

V.

Valencia Observatory, magnetic observations continued at 18
Volunteer observers, acknowledgments of assistance rendered by ... 19, 21, 24

W.

Wallis, Mr. Sowerby, and Dr. H. R. Mill, rainfall observations supplied to 32
Weather during 1903, statement of the conspicuous features of the ... 36
—— Forecasts, *see* "Forecasts of weather."
—— information displayed in front of the Office 25
—— telegraphy and forecasts 20, 25, 44
Weekly Weather Report, list of principal papers in 184–186
—— —— ——, particulars of appendices and supplement to 51
—— —— ——, publication and distribution of 32, 33, 51, 52
Wind velocities and Beaufort scale, as to revision of table for 15
Wireless telegraphy 10
Woolward, Captain R., death of 21

LONDON:
PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE
By DARLING & SON, Ltd., 34-40, Bacon Street, E.

1901.