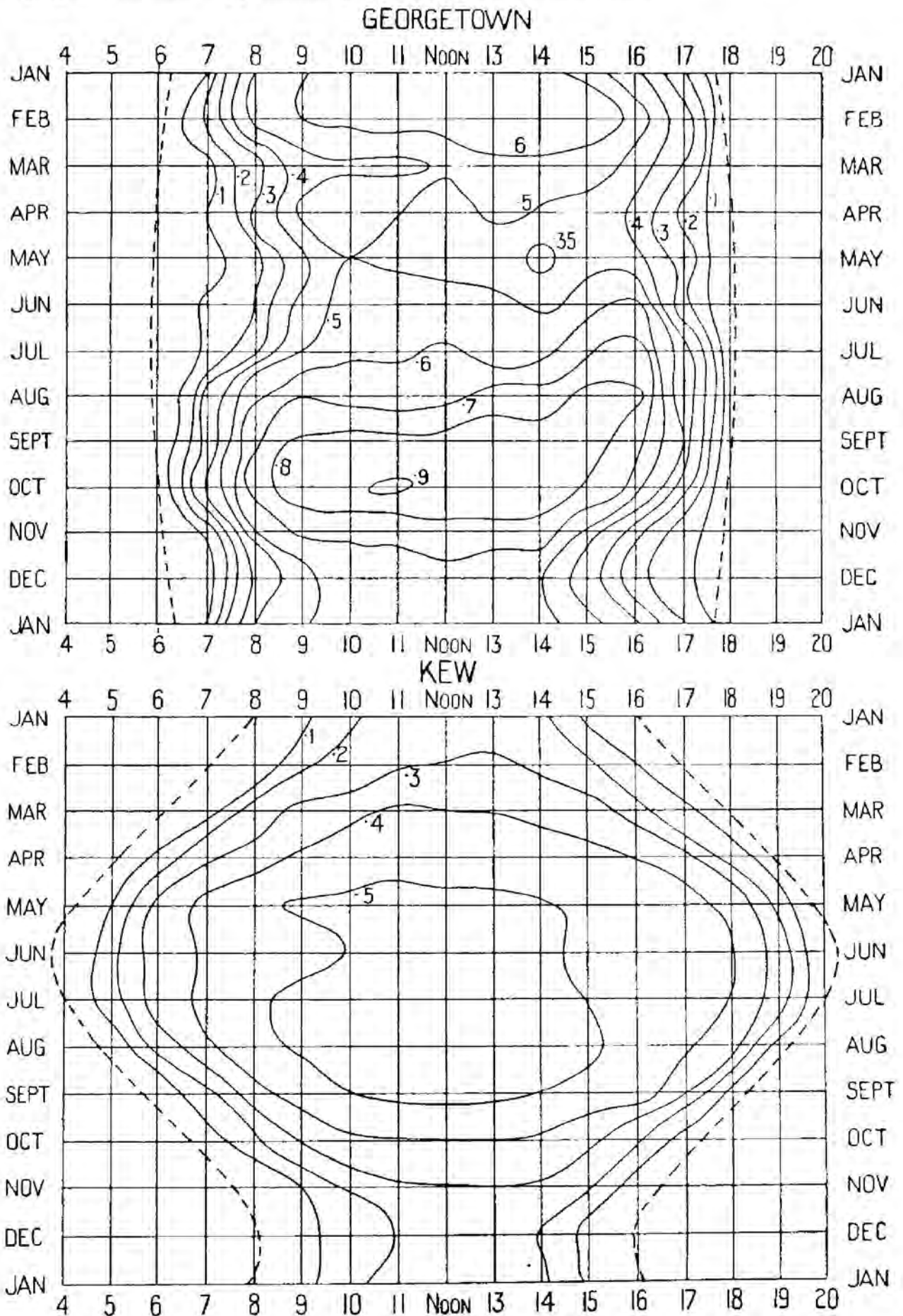


Plate 1.—Frontispiece to the 5th Report of the Meteorological Committee.

SUNSHINE RECORDS AT GEORGETOWN, BRITISH GUIANA, LAT. $6^{\circ} 49' N.$,
AND AT KEW OBSERVATORY, RICHMOND, SURREY, LAT. $51^{\circ} 28' N.$

Lines showing the fractional portion, in tenths of each hour of the day in the several months of the year, which is sunny, according to the Averages of the Records for 3 years [1906–08] at Georgetown, and for 25 years [1881–1905] at Kew. Broken lines are drawn on each diagram to indicate approximately the times of Sunrise and Sunset.



FIFTH ANNUAL REPORT
OF THE
METEOROLOGICAL COMMITTEE

TO THE
LORDS COMMISSIONERS OF HIS MAJESTY'S
TREASURY.

For the Year ended 31st March, 1910.

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



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THE METEOROLOGICAL COMMITTEE, 1909-10,

*Constituted by Minute of the Lords Commissioners of H.M.
Treasury, dated 20th May, 1905.*

Date of
Appointment.

April 1, 1905	...	Mr. W. N. SHAW, Sc.D., F.R.S., Director, <i>Chairman.</i>
"	"	... Rear-Admiral ARTHUR MOSTYN FIELD, R.N., F.R.S., Hydrographer to the Navy, till 2nd September, 1909.
Sept. 3, 1909	...	Rear-Admiral H. E. PUREY CUST, R.N., Hydrographer to the Navy.
April 1, 1905	...	Captain A. J. G. CHALMERS, Professional Member of the Marine Department, Board of Trade. Nominated by the Board of Trade.
"	"	... Sir GEORGE H. DARWIN, K.C.B., F.R.S., University of Cambridge. Nominated by the Royal Society.
"	"	... Professor ARTHUR SCHUSTER, F.R.S., Uni- versity of Manchester. Nominated by the Royal Society.
"	"	... Mr. G. L. BARSTOW. Nominated by the Treasury.
Dec. 3, 1906	...	Professor T. H. MIDDLETON, M.A., M.Sc., Assistant Secretary of the Board of Agri- culture and Fisheries. Nominated by the Board of Agriculture.

Subject to the discretion of the authorities by which they were respectively nominated, the members of the Committee hold office for a period not exceeding five years, but are eligible for reappointment.

METEOROLOGICAL OFFICE STAFF

1909-10.

DIRECTOR.

William Napier Shaw, LL.D., Sc.D., F.R.S.

MARINE BRANCH.

Marine Superintendent ... M. W. Campbell Hepworth, C.B., R.D.,
Commander, R.N.R.

Principal Assistant ... C. Harding.

Nautical Assistant ... W. Allingham.

FORECAST BRANCH.

Principal Assistant ... F. J. Brodie.

Forecast Assistants ... H. Harries, R. Sargeant.

STATISTICS AND LIBRARY BRANCH.

Superintendent ... R. G. K. Lempfert, M.A.

Principal Assistant ... T. Duncan Bell.

INSTRUMENTS BRANCH.

Superintendent ... R. H. Curtis.

Assistants ... J. Sheerman, R. F. Wallace.

CORRESPONDENCE AND ACCOUNTS.

Chief Clerk and Cashier... John A. Curtis.

Clerks ... W. G. James, A. J. Rigby, and C. H. Thompson ; A. H. Bell, C. A. Bracey, E. J. Hood, L. H. Powers, A. R. Simpkins, F. W. Snell, and J. T. Williams ; E. L. Ardley, A. T. Bench, C. E. P. Brooks, W. Hayes, C. W. Heinemann, A. G. W. Howard, J. H. James, H. Keeton, and H. L. B. Tarrant ; A. E. Pycock.
Misses E. D. Anderson, D. Buckridge, E. C. Humphreys, R. E. Smith, and A. Turney.

2 Office Keepers, 5 Boy Clerks and Probationers, 2 Messengers,
3 Boy Messengers.

Special Assistant to the Director ... R. Corless, B.A.

*Director of Experiments in Connexion
with the Investigation of the Upper
Air* ... } W. H. Dines, B.A., F.R.S.,
Pyrton Hill, Oxon.

Valencia Observatory: Superintendent J. E. Cullum.

Assistant ... J. Sugrue.

Additional Inspectors A. Watt, M.A., Secretary
Scottish Meteorological
Society ; T. W. Baker,
Kew Observatory ; E. G.
Constable, Kew Obser-
vatory

FIFTH ANNUAL REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO

THE LORDS COMMISSIONERS OF HIS
MAJESTY'S TREASURY,

For the Year ended 31st of March, 1910—the Fifty-fifth
year of the Meteorological Office.

MAY IT PLEASE YOUR LORDSHIPS,

During the past year meetings of the Committee have been held on 5th May, 14th July, 3rd November, 1st December, 15th December, 1909, 2nd February and 2nd March, 1910. The business of the year has been exceptionally important. Negotiations with the Royal Society respecting the relations between the Office and Kew Observatory hitherto controlled by the National Physical Laboratory have been brought to a satisfactory issue. The fitting and furnishing of the new premises at South Kensington, which include provision for a museum and an adequate library, have claimed much attention. Important changes have been made in some of the periodical publications of the Office. The year under review is the concluding year of the period of five years for which the Director and Committee were appointed in 1905 and the provision made for the current year takes account of the prospects of the Office in the ensuing five years.

Upon the expiration of the term of office of Rear-Admiral A. M. Field, F.R.S., Hydrographer of the Navy, Captain H. E. Purey Cust, R.N. (his successor), was appointed a member of the Committee by Treasury Minute dated 3rd September, 1909.

Office Staff.—No important changes have taken place in the Office Staff during the year. It numbers 52, exclusive of those whose services are retained by the Committee for work of various kinds at observatories and stations. Steps have been taken to make some provision, by endowment assurance or otherwise, for retiring allowances or their equivalent in the case of women clerks and the office keepers and supernumerary clerks who are not included in the scheme of superannuation for classified clerks adopted by the Meteorological Council in 1900.

Publications.—The official publications issued or signed for press during the year by authority of the Committee are as follows :—

PERIODICAL.—The Daily Weather Report.

Monthly Meteorological Charts of the Atlantic Ocean and the Mediterranean.

Monthly Meteorological Charts of the Indian Ocean and the Red Sea.

The British Meteorological Year Book for 1909, comprising :—

Part I.—The Weekly Weather Report with Quarterly and Annual Appendices and two Special Appendices giving supplementary results of the investigation of the upper air in the British Isles during the year.

Part II.—The Monthly Weather Report with a summary for the year.

Part III.—Daily Observations at Stations of the Second Order and at Anemograph Stations.

Part IV.—Hourly Readings of pressure, temperature, humidity, rainfall, and sunshine at four normal Observatories (Aberdeen, Falmouth, Kew, and Valencia) in connexion with the Meteorological Office.

Observations at Stations of the Second Order. Annual Volume for 1906.

The Observer's Handbook. 1909 Edition.

OCCASIONAL.—Barometer Manual for the use of Seamen. 6th Edition.

Codex of Resolutions at International Conferences from 1872 to 1907. Compiled by H. Hildebrandsson, Upsala, and G. Hellmann, Berlin. English Edition.

The Free Atmosphere in the region of the British Isles. Contributions to the investigation of the upper air, comprising a Report by W. H. Dines, F.R.S., on apparatus and methods in use at Pyrtton Hill, with an introduction and a note on the perturbations of the stratosphere by W. N. Shaw, Sc.D., F.R.S., Director of the Meteorological Office.

Other publications for which authority has been given and which are in preparation, but have not yet been issued, are as follows :—

Annual Volume of Observations at Stations of the Second Order for the year 1907. (In the press.)

The Trade Winds of the Atlantic Ocean. Contributions to the Study of the North-East and South-East Trade Winds, comprising a comparison of the changes in the temperature of the water of the North Atlantic and in the strength of the Trade Winds, by M. W. Campbell Hepworth, C.B., Commander, R.N.R., Marine Superintendent; Climatological Tables for St. Helena, with a Report upon the Records of the Robinson anemograph from 1892 to 1907, by John Somers Dines, B.A.; and Note on the connexion between the periodic variations of wind-velocity and of atmospheric pressure, by Ernest Gold, M.A., Schuster Reader in Meteorology. (In the press.)

Monthly Outline Sheets for charting tracks and noon values from Meteorological Logs. (In the press.)

Climatological Report for certain British Stations overseas.

The Computer's Handbook.

The Seaman's Handbook.

Gales on the British Coasts. A revised edition of the Fishery Barometer Manual.

The Seasons in the British Isles.

Normals for the four Observatories, and tables for their application in climatology.

Atlas of Tropical Hurricanes.

The periodical Publications : The Daily Weather Report.—The only change made in the course of the year apart from those incidental to the Radio-telegraphic service, which will be referred to later, consisted in the addition of a daily telegraphic report from Funchal, Madeira, through the instrumentality of Dr. Michael Grabham. It has been the wish of the committee for some years to supplement the information already received by reports from Madeira, the Canaries and Cape Verde Islands, so that the observations taken in conjunction with those from the Azores and from Atlantic liners may give a clear indication of the variations in position and intensity of the permanent high pressure area of the Atlantic and the consequent variations of the North East Trade Wind. Considerations of expense have hitherto prevented the realisation of this object, but through the good offices of Dr. Grabham an opportunity was offered for obtaining reports from Madeira on very favourable terms, and a commencement has now been made. Further negotiation is necessary in order to obtain the transmission of the report sufficiently early for it to be included in the current Daily Weather Report.

In preparation for the new year arrangement has been made to supplement the ordinary forecasts for 24 hours by a remark on the "further outlook," when the meteorological conditions are regarded as justifying the addition. It has long been recognised that the fixing of a definite period of 24 hours as that for which a forecast could always be made was somewhat arbitrary. There are some occasions where it is felt to be too long and others where it is certainly unnecessarily short, yet no distinction was drawn between these different occasions. The revised arrangement affords to the official in charge an opportunity of indicating the differences of these different occasions, while keeping within the official rule that every forecast must be accompanied by the data employed and the reasons for the conclusion. The "general inference" which precedes the forecasts is intended to convey the reasons for the forecast, and when they are judged to be applicable to a larger period than 24 hours the remark in the column for the further outlook gives the application.

Trial was given to the plan during the summer of 1909 in a scheme initiated in conjunction with the Board of Agriculture for the supply of weather information by telegraph to the representative of the Board at a series of Agricultural Shows in various parts of the country, and in extension of the scheme for notifying the probability of a spell of fine weather during the harvest season which has been in operation for two years. It was decided to begin the regular issue of the further outlook on April 1st, the commencement of the new year: and, as the change involved an alteration in the size and plan of the forms used, notice was given beforehand to newspapers and other recipients of the forms; public attention was thereby directed to the change.

It may be noted in connexion with the service for the Agricultural Shows that the daily information and forecasts were supplemented by notes on the weather of the week in which the show was being held, derived from an examination of the records of the corresponding week in the past 30 years, and on the weather of the past week as given in the latest issue of the weekly report.

Daily Weather Service : Reports by Radio-Telegraphy from the Ships of H.M. Navy and from Atlantic Liners.—Reports of observations at 7 a.m. or 6 p.m. have been transmitted by radio-telegraphy, whenever there was opportunity, from the ships of H.M. Navy in accordance with orders from the Lords Commissioners of the Admiralty. These reports are much valued; they are placed on the working charts with the same confidence in their accuracy as those from land stations. When the service was started a number of the readings of pressure, which are vital for the chart, seemed doubtful, but a copy of every message has been sent to the Hydrographer with notes upon any doubtful readings, to be forwarded by him to the ships for inquiry, and returned with comments. The result is in the highest degree satisfactory, and the special thanks of the Committee are due to Their Lordships and to the Hydrographer, not only for the additions to the data used in compiling the charts, but also for the opportunity of ascertaining the degree of accuracy which may fairly be aimed at in observations at sea in our latitudes.

The experiment in the transmission of reports by radio-telegraphy from British and German Atlantic liners which was begun in January, 1909, in conjunction with the *Deutsche Seewarte*, was continued till the end of April. It was resumed as a joint experiment by the two offices during the months of August and September with revised instructions and a more limited range of time and area for the transmission of the messages. The area from which messages were received within two hours and 24 hours respectively are shown in the map of telegraphic reporting stations, Plate X. At the close of the second experimental period the *Deutsche Seewarte* decided to discontinue the transmission of messages from German ships, and sent a letter of cordial thanks to the office for its co-operation in the experiment.

Through the courtesy of the Marconi Company, the Shipping Companies and their Officers, the messages from British ships were continued throughout the interval between the two experimental periods, and afterwards, on the same favourable terms as were arranged for the joint experiments. Upon the transfer of the shore stations to the Post Office the Postmaster-General, with Your Lordships' authority, arranged to co-operate with the Marconi Company in continuing the service on the same terms, subject to reconsideration "should the meteorological traffic be found in the future to interfere with the ordinary work of the coast stations."

Reports have been received in the course of the year from the liners mentioned in the list given in Appendix IV, and have been duly recorded in the Daily Weather Report and plotted on the working charts of the office. They are irregularly distributed through the week and over the steamer tracks, but there has been little overlapping of observations. The reports cover barometer, wind and weather. There is still some difficulty about the barometer readings; those from nearly adjacent areas are sometimes irreconcilable. Many of the ships are still unprovided with mercury barometers, and in some instances the readings of an aneroid are given even where a mercury barometer is available. There is no test of the accuracy of a group of barometer readings so searching

as the plotting of the observations on a chart. It is greatly to be wished that neighbouring ships would exchange reduced barometer readings with each other. There are quite a considerable number of occasions upon which an effective and useful chart of the distribution of pressure over the mid-Atlantic could be made from simultaneous observations of ships within reach of one another, and a weather chart constructed on board would be an interesting addition to the daily newspaper of a liner. The exchange of readings would enable the ships' officers to notice discrepancies which cannot be effectively dealt with on shore. In the meantime every effort is made to account for, or to avoid, the appearance of doubtful barometric readings. To identify errors in transmission, a carbon duplicate of the observations is sent to the office and compared with the messages received. It is returned to the observing ship with inquiries about any doubtful readings. After further experience it may fairly be expected that the same standard of accuracy will be reached as in the wireless messages from the Navy. The corrections required for a barometer reading before it is ready for transmission are numerous and somewhat intricate, and in ordinary circumstances a marine observer is not required to make them; it is therefore not to be wondered at that practice is required to bring the observations to the standard necessary to meet the test of plotting on a synoptic chart. The new daily charts of the Atlantic, referred to later, will be found interesting from this point of view.

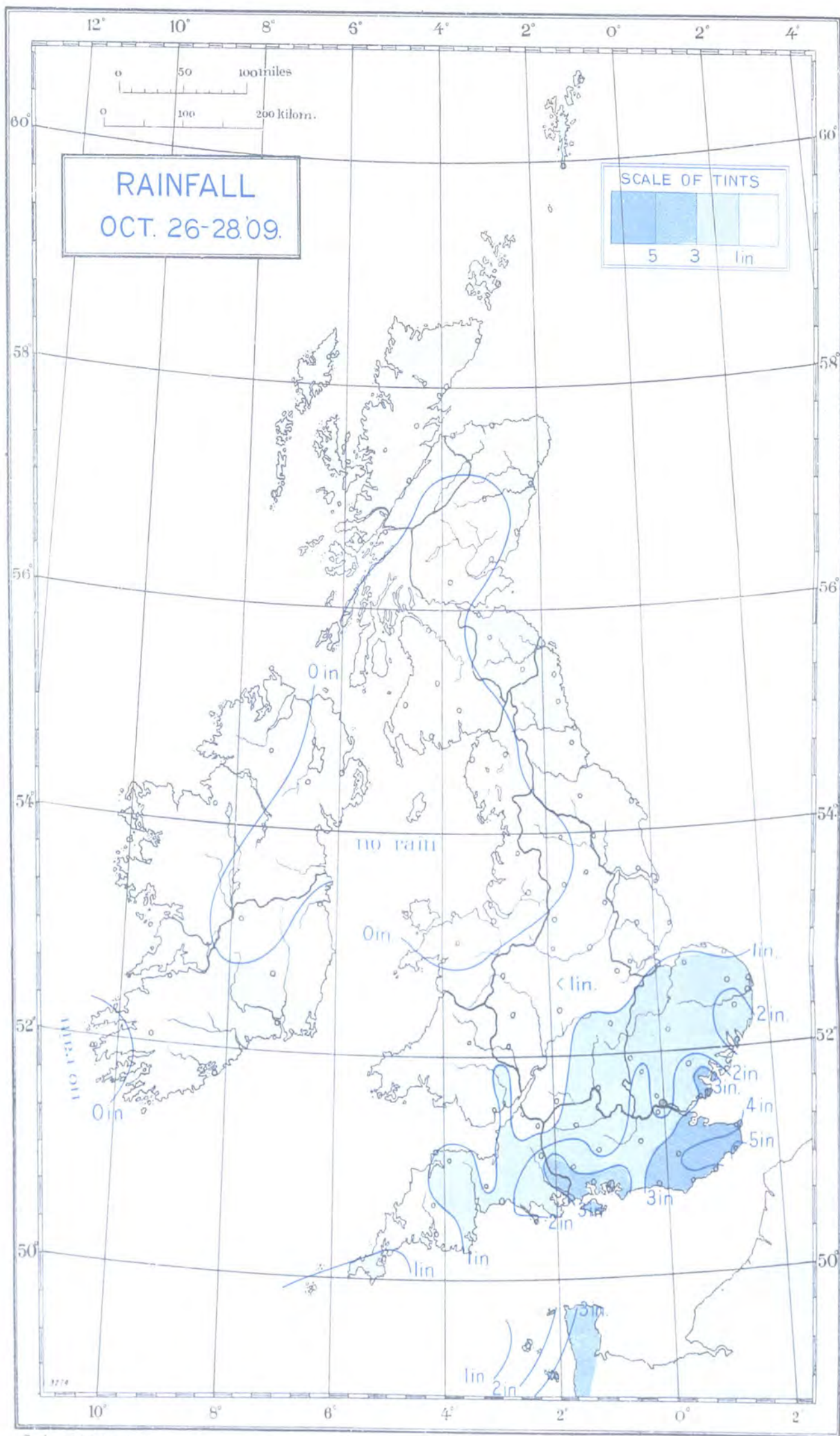
The accuracy of transmission in later months is not quite so striking as in the earlier period, but it is still excellent.

Monthly Meteorological Charts of the Atlantic.—In preparation for the year 1910-11, the Committee have made provision for a revised scheme of issue of the Atlantic charts. Rapid transit across the Atlantic has now become so well established that a number of vessels complete the passage across the ocean within a week, and the month is, from the practical point of view, too long an interval for the effective distribution of recent information. The average values, for the month, of pressure, wind, etc., which form the groundwork of the chart, are sufficiently applicable, but the information as to ice and surface temperature, which it has been customary to revise up to the date of issue, is practically out of date before a month has expired. The Committee had also in mind that some step ought to be taken to show the relations between the observations received from the Atlantic by radio-telegraphy or by cable from Madeira, Ponta Delgada, etc., and those received from shore stations, beyond what is at present practicable with the Daily Weather Report. The daily report goes to the lithographer within four hours of the time of observation, and many of the wireless messages and some of the land messages come in after the report has gone to press, so that the daily representation is incomplete in some important features. These various objects are now to be met by a weekly issue of the charts for the Atlantic based upon the same monthly averages, but revised week by week as regards recent information about ice, sea temperature, etc., and with a daily chart of pressure, wind, and as far as possible of temperature and weather over the whole region extending from the

Ural Mountains to the Rocky Mountains between the 67th and 23rd parallels of north latitude. The weekly issue takes place on Thursday direct to the outgoing liners, and on it the daily charts are brought up to that for the day before issuing. They include all the information collected in various ways by telegram at the office, and are amplified by information published in the Bulletin International of the Bureau Central Météorologique of France. The issue was arranged to begin with the chart for the month of May on April 14th, and the charts for the first two weeks were of remarkable interest, those for the second showing the conditions which caused great injury to the cotton crop of the United States. Apart from its immediate practical interest, the weekly issue promises to be of considerable value to the forecast branch of the office by giving a synopsis of the conditions over a very large area supplementary to that for the more limited region of the daily report, while the data for sea temperature and the positions of ice, which are arranged for weeks, enable the student to follow the gradual changes in the conditions of these elements over the Atlantic in direct relation with the corresponding changes on our own shores, as the periods are adjusted to correspond.

Reports of Polar Ice from Iceland.—The Danish Meteorological Office has arranged for telegrams transmitting reports received from ships as to the state of the polar ice in the neighbourhood of Iceland to be transmitted by cable from Iceland to Copenhagen. They are to be forwarded to us from there by post, or by arrangement they could be sent by telegram from Iceland direct. A number have already been received, and they form a useful addition to the information shown on the weekly temperature charts of the Atlantic. No arrangement has yet been made for their direct transmission by cable.

Monthly Meteorological Charts of the Indian Ocean.—The end of the year now under report gave occasion also for making a new departure as regards the charts of the Indian Ocean. The discussion of the data contained in the meteorological logs belonging to the Office for the Indian Ocean down to 30° S., which has been in progress since 1904, has been completed. The area most recently discussed, namely, that between 10° S. and 30° S., fills the blank between the southern boundary of the *Monthly Charts of the Indian Ocean*, and the northern boundary of official publication No. 123, *Charts of the Southern Ocean from the Cape to New Zealand*, a new edition of which was recently issued. The Office is now, accordingly, in a position to give the monthly data for the whole of the Indian Ocean and the part of the Southern Ocean within the corresponding longitudes. It has been thought best to issue these newly-completed results, which constitute an important addition to our knowledge of ocean meteorology, by extending the Indian Ocean Charts to include them, in preference to making a separate publication of the new portion or of the whole Indian Ocean to 30° S. For the time being it has been arranged to do this by enlarging the *Monthly Charts* without altering the scale of the map, but before the commencement of another year it is intended to take into consideration the range and scale of the chart. It is hoped in this connexion to realise a suggestion made by Mr. H. A.

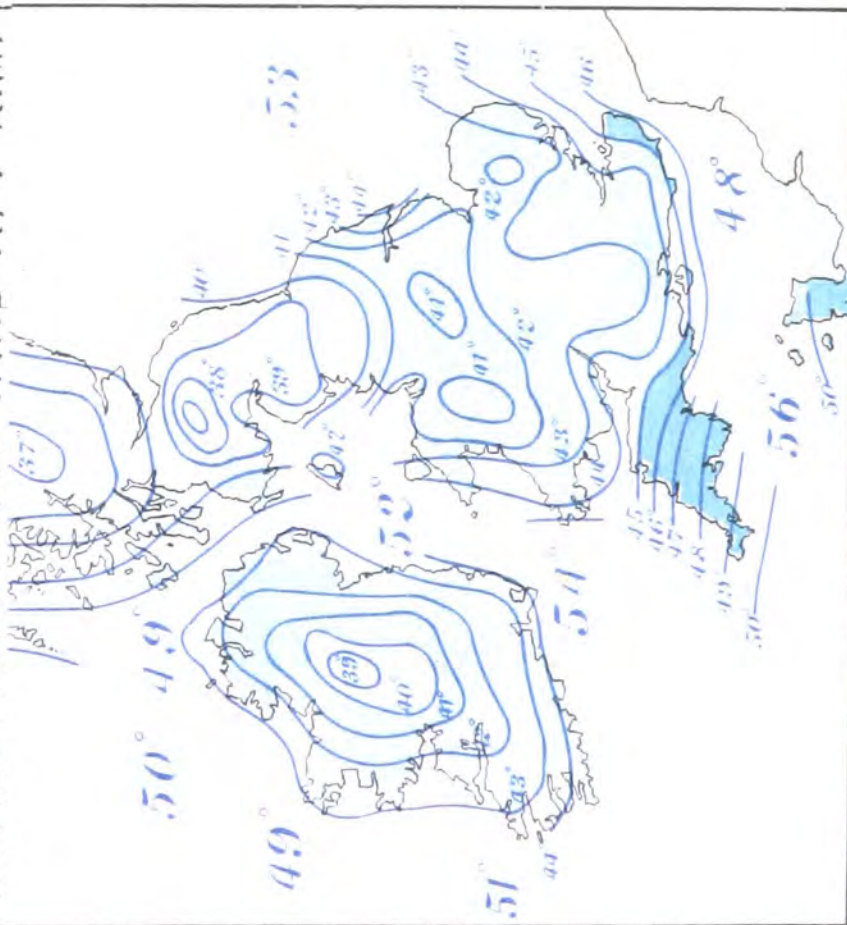


WEATHER CHART FOR THE WEEK ENDED OCT 30, 1909.

MMITTEE.

Plate III.

I. BAROMETER AND WIND AT 7 A.M.



2. MOVEMENTS OF DEPRESSIONS.



Hunt, Director of the Commonwealth Weather Bureau of Australia, when he visited London in 1908, that there should be organised co-operation between the Bureau and the Office as regards work of common interest in marine meteorology.

British Meteorological Year Book.—The year book for 1909 was completed and the collected parts ready for binding in a single volume by March 22, 1910. The committee wish to notify to Your Lordships their appreciation of the promptitude in the despatch of the regular business of the office. It is highly creditable to all branches of the office.

A new feature for the year is to be found in a special appendix to the Weekly Weather Report, dealing with the results of wind measurements. The curves derived from the 26 anemometers in the United Kingdom which come to the office are now all tabulated immediately upon their receipt, and a summary is prepared for each month exhibiting the number of hours during which the force of the wind at the several stations has been within the limits assigned for successive numbers on the Beaufort scale. The annual summary compiled from these twelve monthly sheets is published in the appendix referred to, together with the monthly results for winds of gale force and particulars of the occurrence of strong gales (force 9), and of gusts of storm force (force 10 and upwards, velocity exceeding 55 miles per hour). For these latter, data were contributed also for Edinburgh Observatory through the co-operation of the Astronomer Royal for Scotland. The result gives a conspectus of the results of wind measurements for the British Isles more effective than anything which has appeared heretofore.

For the year 1910 the Committee have arranged with H.M. Stationery Office for the use of two colours, blue and black, in the lithographic reproduction of the charts of pressure, the paths of depressions, temperature and sunshine of the Monthly Weather Report as well as those of rainfall, contributed to the Report by the British Rainfall Organization. The results, which depend upon the use of four tints of blue upon black outline, represent what can be done with the use of two lithographic stones. Before the adoption of this arrangement, specimen charts were prepared exhibiting the corresponding data for the very rainy week of October, 1909, ending with the 30th, and these are reproduced in this report, Plates II, and III. The Committee think that the improvement thus introduced into the representation of the results will be generally acknowledged, and they wish to record their thanks to the Controller of H.M. Stationery Office for his assistance in bringing the proposal to a practical issue.

Observations at Stations of the Second Order.—The completion of the volume for 1907, which is now in the press, will finally wipe off the arrears of that publication, and more time will thereafter be available for the discussion of the accumulated data.

Occasional Publications.—The English edition of the *Code of International Resolutions* is found to be very useful in providing the means of informing meteorologists in the United Kingdom and the Colonies as to the conventions upon which the international exchange of data is based.

In the course of preparation of the work on the *Free Atmosphere in the Region of the British Isles*, glass models shewing the distributions of temperature and pressure up to a height of 15 miles on 27th and 29th July, 1908, were constructed in the Office by Miss Humphreys, and from the data shown thereon the frontispiece of the publication was prepared. The models were exhibited at the *Conversazione* of the Royal Society in June, 1909, and at a meeting of the Royal Meteorological Society in March, 1910. Photographs were shown at the meeting of the British Association at Winnipeg. Permission was given to the Royal Meteorological Society to reproduce the photographs in the *Quarterly Journal*. Two of them are included in this Report as Plates IV and V. They are the first representations of the distribution in three dimensions of the meteorological elements in the higher regions of the atmosphere.

Monthly Outline Sheets for marine work have been prepared to the scale of 1 : 20,000,000, and form together a developable globe of about 2 feet in diameter. The geographical part of the work is completed and the outlines are in the press. The tinting of the various areas to show the normal distribution of the meteorological elements will be taken in hand next.

The issue of an Atlas of Tropical Hurricanes will be deferred until the new year's issue of the charts of the Indian Ocean is completed, as the charts will now show the tracks of hurricanes in the South Indian Ocean which were originally the subject of a separate publication. The proposal to prepare an Atlas of Tropical Hurricanes arose from the edition of that volume having been exhausted.

Progress has been made with all the other publications which have been authorised. In connexion with the application of the normals obtained at the Observatories in climatology, Mr. Lempfert has prepared a paper showing how the results for mean maximum and minimum temperatures at a station are affected by the time at which the instruments are read and set. As a result, it has been necessary to revise the instructions for setting the grass minimum thermometer at the climatological stations. He has also discussed the computation of daily mean temperature from the maximum and minimum, and the computation of accumulated temperature from the weekly averages of maxima and minima.

Contributions to other Official Publications and to Scientific Journals.—In addition to the occasional publications issued by the authority of the Committee, the following contributions to meteorological science may be referred to :—

In May, 1909, the Director of the Office was appointed by the Prime Minister to be a member of the Advisory Committee for Aeronautics, and in compliance with the request of the Committee he has prepared memoranda upon (1) *Wind structure*, (2) *Vertical motion in the atmosphere*, (3) *Rotary motion in the atmosphere*, (4) *The Beaufort scale of wind force and the formulæ used in anemometry*. The first was illustrated by numerous reproductions of anemometric records in possession of the Office. These

Plate IV.—TEMPERATURES and PRESSURES in a block of ATMOSPHERE 15 miles thick over a triangular portion of the BRITISH ISLES.

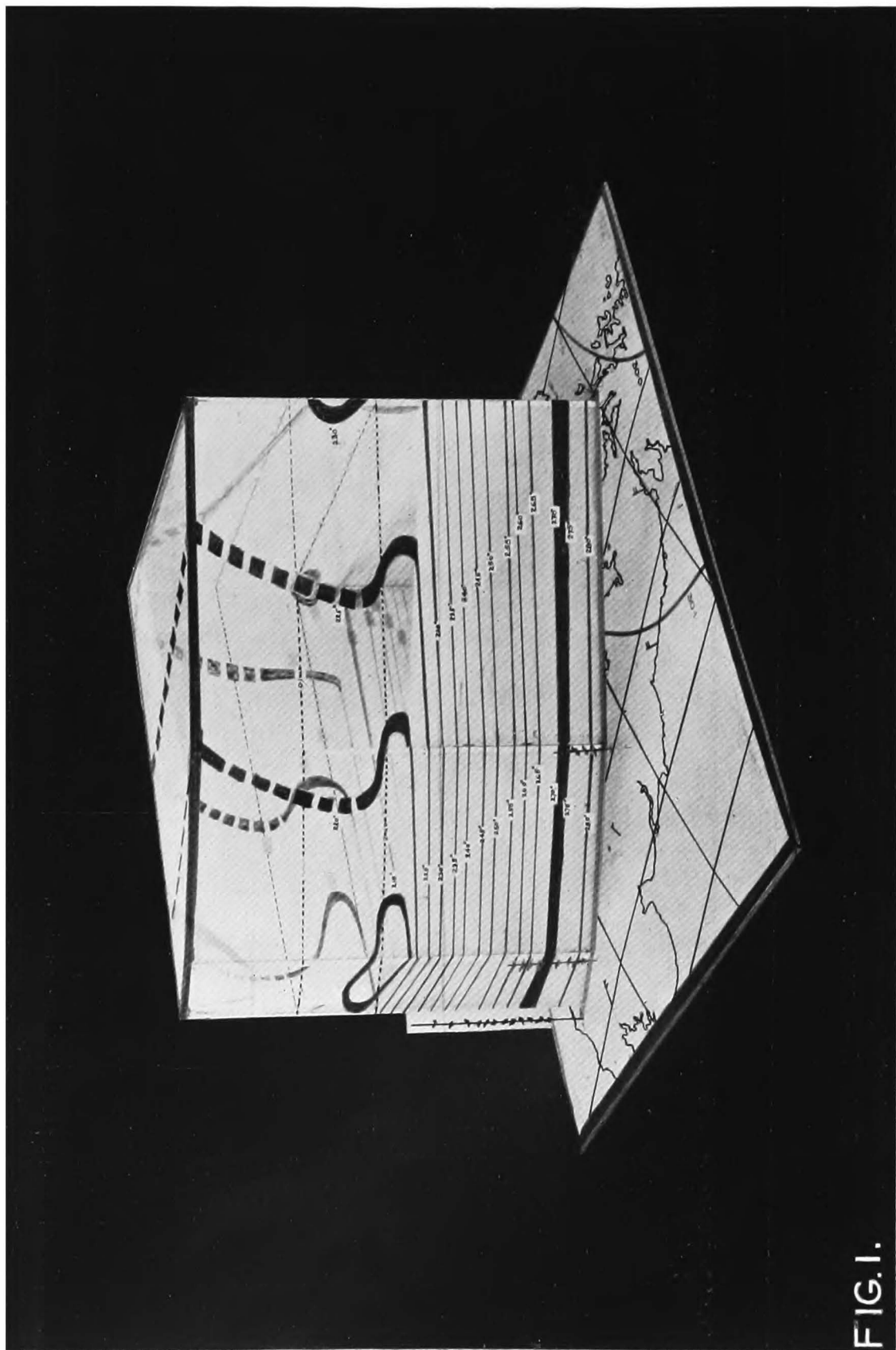
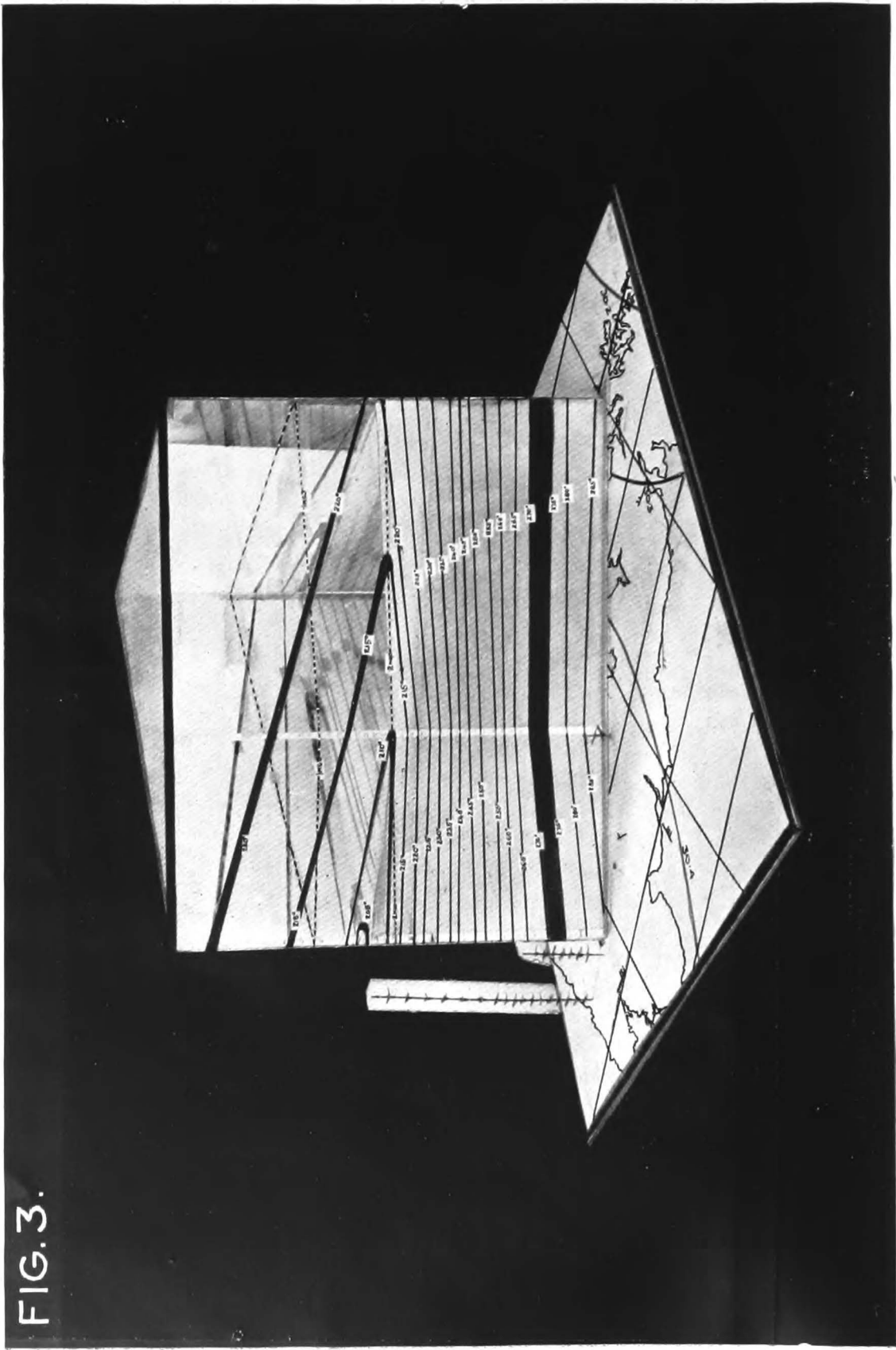


FIG. I.

From observations taken on July 27th, 1908. Block seen from the north-east. Isotherms are shown for each 5°. Absolute from 280° A. to 215° A. The space between the isotherms of 270° and 275° is filled in; for other isotherms a thickness corresponding with $\frac{1}{2}$ ° C. is covered. The beaded lines in the stratosphere are isobars for 0.2 megadyne and 0.1 megadyne per square centimetre respectively. The arrows on the standards face the wind as determined by observations with theodolites.

Plate V.—TEMPERATURES and PRESSURES in a block of ATMOSPHERE 15 miles thick over a triangular portion of the BRITISH ISLES.



From observations taken on July 29th, 1908. Block seen from the north-east. Isotherms are shown for each 5°. Absolute from 285° A. to 205° A. The space between the isotherms of 270° and 273° is filled in; for other isotherms a thickness corresponding with 1° C. is covered. The headed lines in the stratosphere are isobars for 0.2 megadyne and 0.1 megadyne per square centimetre respectively. The arrows on the standards face the wind as determined by observations with theodolites.

memoranda are published in the Report of the Advisory Committee. The following papers may also be enumerated :—

By Dr. Shaw: *The variations of currents of air indicated by simultaneous records of the direction and velocity of the wind.* Q.J. Roy. Met. Soc., vol. 36, p. 25, 1910; read December 15, 1909.

By Mr. Lempfert and Mr. Corless: *Line squalls and associated phenomena.* Q.J. Roy. Met. Soc., vol. 36, p. 135; read February 23, 1910.

By Mr. Gold, Schuster Reader in Meteorology: *Der tägliche Gang der Temperatur in 1 und 2 km. Höhe in der freien Atmosphäre.* Sitzber. Ak. Wiss. Wien, vol. 118, part 2, p. 1207, 1909. *The semi-diurnal variation of rainfall.* Q.J. Roy. Met. Soc., vol. 36, p. 21, 1910. *The relation between periodic variations of pressure, temperature and wind in the atmosphere.* Phil. Mag., Jan., 1910.

By E. Gold and W. A. Harwood. *Report on the present state of our knowledge of the upper atmosphere as obtained by the use of kites, balloons and pilot balloons.* B.A. Report, 1909.

By E. Gold and W. Schmidt. *Testing of registering balloon apparatus at low temperatures.* Q.J. Roy. Met. Soc., vol. 35, p. 275, 1909.

The duty of seeing through the press an important work by Rev. E. Goetz, S.J., of Bulawayo, on the rainfall of Rhodesia was undertaken by Mr. Lempfert.

Colonial Observations.—Progress is being made towards organised co-operation between the different parts of the British Empire in the supply of data on a uniform plan for the information of the various Governments and other persons interested, and for the use of meteorologists of all countries. All the observations received in manuscript at the Meteorological Office are now reduced and tabulated month by month as they come in, so that the year's results are ready for consultation or for publication without delay.

As an illustration of the results thus obtained a diagram representing the distribution of sunshine in different parts of the day at George Town, British Guiana, for the several months of the year, is reproduced as a frontispiece, Plate I, with a corresponding diagram for Kew Observatory. The results for George Town are for three years only, but for that period they show that in October 90 per cent. of the hours just before mid-day are sunny hours, whereas for Kew 50 per cent. of sunshine is the highest percentage of sunny hours shown on the diagram.

The meeting of British meteorologists convened for May, 1908, by the Royal Society of Canada through the good offices of the Canadian Government was postponed till 1909, when the British Association met at Winnipeg. The British and Colonial meteorologists there present met and appointed a Committee to draw up a circular letter inviting the co-operation of all meteorological institutions or Governments concerned in completing the contribution of the British Empire to the meteorological data for the globe, at the rate of two stations for every 10° square, as suggested by the Solar Commission of the International Meteorological Convention at its meeting in London in June, 1909, and in organising an exchange of data for the British Empire that will place the various economic centres of the Empire in possession of the necessary information about the weather in the

various possessions. It was thought best in the first instance to obtain the signatures of the larger Government meteorological institutions of the Empire, and after consulting the Colonial Office the circular was sent out, signed by the Directors of the Meteorological Offices of London and Toronto, to the Government meteorologists of seven of the dominions or colonies. So far it has received cordial approval from Australia, the Cape of Good Hope, and the Transvaal.

An endeavour to secure from the Colonial Government the loan of instruments for a private observer in Dominica, West Indies, has failed, because the Executive Council is of opinion that the results from a single station would give a misleading representation of the meteorology of the island.

International Co-operation : i. Scientific Aeronautics.—A meeting of the International Commission for Scientific Aeronautics was held at Monaco by invitation of H.S.H. the Prince of Monaco, on April 1st, 1909. On account of ill-health the Director was unable to attend. Mr. C. J. P. Cave attended the meeting and furnished a report of the proceedings which at his request was forwarded to "*Nature*," and was printed in that journal on 20th May, 1909.

It is interesting to note that proposals for expressing measurements of pressure in the upper air in C.G.S. units, which have been adopted for the corresponding work in this country since the beginning of the year 1909, were made independently by Professor W. Köppen, of the Deutsche Seewarte, and Professor V. Bjerknes, of Christiania. The proposals were referred to the International Meteorological Committee.

— **ii. Maritime Weather Signals.**—Meetings of the Commission appointed at Paris in 1907 for the consideration of an international scheme of maritime weather signals and other questions relating to marine meteorology were held at the Office in London on June 22nd–25th, 1909, under the presidency of the Director of the Office. It was attended by Professor Willis Moore, Chief, with Mr. C. F. Talman, Librarian, for the United States Weather Bureau; Mons. A. Angot, Director, for the Bureau Central Météorologique, Paris; Professor Grossmann, in place of Admiral Herz, for the Deutsche Seewarte; the Rev. L. Froc, Director of the Observatory, Zi-ka-wei, China; Professor H. Mohn, Director of the Norwegian Meteorological Institute. A statement of the present practice of various countries in regard to maritime weather signals was drawn up, and a proposal for an international scheme, based upon two cones for day signals and two or more lights (red or white) in vertical line for night signals, was drawn up to be reported to the International Meteorological Committee. Since the close of the meeting attention has been called to the risk of confusion likely to result from the use of two lights, one above the other, for weather signalling at night. The question will come before the International Meteorological Committee at a meeting in Berlin in September, 1910.

— **iii. Weather Telegraphy.**—Meetings of the Commission for Weather Telegraphy, also appointed at Paris in 1907, were held at the Office in the same week as those of the Commission for Maritime Weather Signals. They were attended by Mons. A. Angot, Professor Willis Moore with Mr. C. F. Talman, Professor Grossmann, Professor H. Mohn, with the Director of the Office as

President. The Naval Attaché of the American Embassy and Dr. P. Polis of Aachen, who has given special attention to the use of wireless telegraphy were also present. A number of proposals for the alteration of the International Code of Weather Telegraphy were considered, originating principally with the Deutsche Seewarte, and having for their object mainly the introduction into the scheme of Daily Reports an indication of the barometric change in progress at the time of observation. A number of resolutions were adopted which will be referred to the Meteorological Offices of this country and the Continent for their opinion, and finally dealt with by the International Meteorological Committee. The question of reports by radiotelegraphy from ships crossing the Atlantic was also considered by the Commission.

The reports of the Commissions for Maritime Weather Signals and for Weather Telegraphy have been printed.

— iv. Solar Commission.—A meeting of the Solar Commission of the International Meteorological Committee, which was appointed at Southport in 1903 to deal with the correspondence between solar and terrestrial changes, under the presidency of Sir Norman Lockyer, was held in the rooms of the Royal Society on June 28th and 29th, 1909. For the use of the Commission a list of stations to represent the meteorological conditions of the globe, arranged according to 10-degree squares, was prepared, on the basis of a distribution of not more than two stations to a 10-degree square, except for a few squares in Europe for which three stations were selected, and a few other squares for which both high and low level stations are available. The provisional list of stations gives the following summary showing the number of stations for the different countries :—

SUMMARY SHOWING PROVISION OF DATA BY DIFFERENT COUNTRIES.			
Austria-Hungary	4	Holland (Home)	1
Australia	29	(Colonial)	3
Argentina	6	India (Home and Foreign)	40
Belgium	1	Italy (Home)	2
Bolivia	5	(Colonial)	1
Brazil	5	Japan	12
Canada	20	Mexico	7
Chile	13	Norway	4
China	2	New Zealand	4
Costa Rica	1	Portugal (Home)	1
Germany (Home)	2	(Colonial)	8
(Colonial)	14	Russia and Finland	62
Denmark (Home)	1	Roumania	1
(Colonial)	9	Spain (Home)	1
Egypt	10	(Colonial)	4
Ecuador	3	Sweden	3
France (Home)	3	Switzerland	1
(Colonial)	32	Turkey	1
Great Britain (Home)	3	Uruguay	1
(Colonial)	49	United States (Home)	26
Greece	1	(Colonial)	5

The list of stations is printed for the Board of Education as an appendix to the Report of the Solar Physics Committee for 1909.

Since the meeting of the Commission Mr. Lompfert has taken out all the data for a single month for the stations on the list that are to be found in the publications contained in the library of the Office. For this purpose the latest January that could be selected

was that of the year 1905, and there are many gaps in the list, on account of the lack of observations or the lack of publications. Many of these gaps refer to stations in British Possessions, and it is on that account that an endeavour was made at the informal meeting of British meteorologists at Winnipeg to promote the collection of a homogeneous series of data for the British Empire.

— v. **Telegrams from the Iberian Peninsula.**—As President of the International Meteorological Committee the Director of the Office was asked to obtain the good offices of His Britannic Majesty's Government in securing an acceleration of the morning telegrams conveying weather reports from stations in Spain and Portugal. A memorandum setting forth the conditions which it was desired to improve was drawn up, forwarded by Your Lordships to Secretary Sir E. Grey, and by him communicated to His Majesty's representatives at Madrid and Lisbon. In response to the representation the Spanish and Portuguese Governments have been good enough to take steps for accelerating the service, and considerable improvement has resulted as regards the time of arrival in this country of messages from Corunna and Lisbon. The Committee have not yet learned whether, as may be anticipated, the improvement has also been noticed as regards the messages to Paris, Hamburg, de Bilt, Vienna, and Rome. They trust, however, that these important steps towards the completion of the system of exchange of information for Western Europe have already been secured.

New Premises for the Office.—The new building at South Kensington designed by the Office of Works to accommodate a branch Post Office and the Meteorological Office is nearing completion, and the Committee have been occupied in the consideration of the details of the arrangements for fitting and furnishing the portion of the building which the Office is to occupy in consideration of the payment of a fixed annual rent of £640, in accordance with the terms laid down by Your Lordships in letters to the First Commissioner of Works dated 30th May, 1907, and to the Director of the Office, dated 16th September, 1908. They have still under consideration the necessity of providing for the reproduction of charts, etc., on the premises, in view of the great distance of the Office from the lithographer's workshops. These have recently been removed to Denmark Hill, S.E., so that a long time is already occupied in carrying the finished transfers of the daily reports to the press and in carrying the made up packets thence to the Central Post Offices. The distance will be further increased by the removal to South Kensington. A small hand printing press has always been kept at Victoria Street and worked by the Office staff. There is suitable accommodation in the new premises available for a machine press. Much economy of time and trouble would result from having the lithographic work done in the Office itself. The Committee are in communication with H.M. Stationery Office upon the subject.

Arrangements are in progress with a view to transferring the work of the Office to the new building in October of the current year.

Central Observatory for the Office.—The approaching completion of the new building and the necessity for making suitable provision for the work of the Office for a further period of five years, upon

the termination of the first period of appointment of the Committee under Your Lordships' minute of 20th May, 1905, have given rise to prolonged negotiations with the Royal Society and the National Physical Laboratory with regard to the provision of a Central Observatory for the Office. In 1866 when the administration of the Meteorological Office was placed by Government in the charge of a committee appointed by the Royal Society, it was arranged that the Kew Observatory, which at that time was lent to the British Association, should be regarded as the central observatory for the British Meteorological Service and the two institutions were worked in close relationship. The Meteorological Office undertook to make payments to the observatory for meteorological work done on its behalf, while the expenses of the observatory in respect of work in meteorology on its own initiative, in terrestrial magnetism and solar physics, and in testing instruments were provided for either by a grant from the British Association or by fees.

In 1871 the British Association withdrew its support and the situation was met by Mr. J. P. Gassiot, F.R.S., with a gift of £10,000 placed in charge of the Royal Society on trust for the maintenance of the observatory. A committee was appointed by the Royal Society to manage the observatory and administer the Trust.

In 1899 the National Physical Laboratory was established with the observatory as its temporary headquarters and the management of the observatory passed to the Director of the Laboratory and the Executive Committee. Soon afterwards the magnetic work of the observatory became so seriously disturbed by electric tramways that Government provided a new observatory at Eskdalemuir, Dumfriesshire, and added a grant at the rate of £1,000 a year for its maintenance dating from 1st July, 1907. The grant is paid to the Royal Society and the new observatory is associated with Kew Observatory under the administration of the National Physical Laboratory.

In the course of these numerous changes the association of the Kew Observatory with the Meteorological Office has become less close, and it has become necessary to provide for a good deal of work which is ordinarily done by the central observatory of a Meteorological Institute, to be done by the office staff under unfavourable conditions. In the new premises it would be possible to make some provision for the training of the staff in the practical work of observing and to carry on experimental work. To that extent the new office could be made to serve as a central meteorological observatory, though it would not provide for the continuity of the records which have been furnished to the Office from Kew Observatory since 1867. The Committee decided that they were justified in regarding the other functions of a central observatory as of greater importance and accordingly in May, 1909, they gave notice to the National Physical Laboratory that they were not prepared to continue their grant towards the expenses of Kew Observatory beyond 31st December, 1910, in a letter from which the following paragraphs are taken :

" The grant in question is allocated for the work of a station of the first order
" at Kew Observatory, and certain other services rendered by the Laboratory in

"accordance with the memorandum of the Chairman of the Meteorological Council drawn up in 1899 as a statement of the relations then existing between the Kew Observatory Committee and the Council."

"The Committee are of opinion, in view of the changes of circumstances that have occurred since 1899, that the arrangement then formulated no longer meets the requirements of the case, and they have requested me to intimate that they do not see their way to continue the grant upon the terms then laid down."

"It is unnecessary to enter into details as to the grounds upon which the Committee base their opinion, but I may say that in their view the control and organisation of the work of the first order stations should be exercised directly from the central office, and the relations between the Office and its central observatory should be of a different order from those which have gradually established themselves since 1866 between the Meteorological Office and Kew Observatory. They do not regard the maintenance of a first order station merely for the purpose of continuing the existing record for the London district as so urgent a requirement from the meteorological point of view as other demands upon their funds."

To this letter a reply was received on 30th October, 1909, transmitting as an alternative to the withdrawal of the grant a proposal for a scheme of management of the three observatories, Kew, Eskdalemuir, and Valencia, drawn up by a committee appointed by the Royal Society together with representatives of the National Physical Laboratory including among them the Director of the Meteorological Office. By this scheme the work of the observatories would be withdrawn altogether from the administration of the National Physical Laboratory and their staffs incorporated with that of the Meteorological Office under the control of the Director and the Meteorological Committee, with the scientific advice of a committee appointed by the Royal Society to administer the Gassiot Trust. In justification of an application for an addition to the Parliamentary Grant for meteorology in order to make up for the loss to the observatory of the income derived from the testing of instruments, which would remain with the National Physical Laboratory, the following grounds were put forward.

"Two much needed reforms would thereby be secured, viz:—

"*First*, the consolidation of the work of the National Physical Laboratory, and the separation therefrom of the work of observing and experimenting in meteorology and geophysics.

"And, *secondly*, the provision of an effective observatory and experimental station for the purposes of the Meteorological Office, with opportunities for independent research under the supervision of a Committee of the Royal Society.

"The importance of a central meteorological institution has been urged on several occasions. The duties to be assigned to it comprise:—

"(1) The examination of instruments required for the stations;

"(2) The examination of all questions concerning instrumental equipment;

"(3) The trial of new instruments and methods;

"(4) Meteorological research depending on observational methods;

"(5) The routine of a station of the first order.

"There has always been an intimate connection between Kew Observatory and the Meteorological Office, and the formal engagements subsisting between these bodies were continued when Kew became a department of the National Physical Laboratory. But while nearly all the above duties came within the province of the Laboratory, yet having regard to the demands made by the other departments of its work, the possibility of making the Observatory effective as the Central Meteorological Observatory for the Kingdom has grown less and less.

"At the same time the need for such an observatory has increased; the range of subjects which enter into meteorology has widened, and it has become

“more and more clear that scientific investigations extending over a wide field can be utilized effectively in promoting the daily work of the Meteorological Office.”

The Committee asked for some modifications of the draft proposal; ultimately agreement was arrived at and the proposal forwarded to Your Lordships with the cordial concurrence of the Committee expressed in the following terms in a letter to Your Lordships covering the estimate for the expenses of the Office for the year 1910-11:—

“The scheme is set forth in outline in a memorandum which has been communicated to the Committee by the Royal Society, and which will be submitted for Their Lordships’ consideration by the President and Council. The Director was a member of the Committee which was entrusted with the preparation of the memorandum for the consideration of the Royal Society. The scheme has the cordial and unanimous approval of the Meteorological Committee. They consider the proposal to afford an opportunity for a most important step in the progress of the Office.

“The Committee do not fail to recognise that as the Director of the Office would become also the Director of the observatories, the scheme makes the Committee also responsible for the administration of the whole of the work which it is proposed should remain at Kew, and which includes terrestrial magnetism and other subjects not strictly meteorological, and also for the work of the observatory at Eskdalemuir which is mainly magnetic. A great increase of responsibility would, therefore, fall upon the Director. They recognise also that the grant-in-aid now administered by the Committee is for the expenses of the Meteorological Office, the operations of which have hitherto been limited to meteorology. They have been held to include atmospheric electricity and solar radiation, but to exclude terrestrial magnetism and seismology. They note, however, that the funds at the disposal of the Committee for the maintenance of observatories will be augmented, under suitable conditions, by sums entrusted to the Royal Society, viz., £1,000 a year, the Government Grant for the maintenance of the observatory at Eskdalemuir, and about £450 a year, the income of the Gassiot Trust, a private endowment for the maintenance of physical observations and experiments at Kew Observatory. As part of the conditions, the Society provides an advisory committee of scientific experts in the subjects to which these funds are to be devoted. It would be necessary for a separate account of the expenditure at the three observatories to be rendered to the Gassiot Committee in order that it may be reported to the Royal Society.

“The Committee do not doubt that it will be possible by the consideration of the detailed statement upon which the estimates of the Office are based each year to see that the appropriation of the funds, in accordance with the understanding set forth in the scheme, is strictly within the terms of the Parliamentary Grant.

“The relations between the different branches of geophysics are becoming more and more intimate, and there are indications that seismological observations may in the near future be utilised for purposes of weather forecasting. The variations of terrestrial magnetic force which it is the object of a magnetic observatory to record, seem to be due to movements in the upper regions of the atmosphere, and may therefore reasonably be included in the subject of meteorology. The Committee therefore view with great satisfaction the prospect of the staff of the Office being brought in close connection with the work of an observatory in which all sides of meteorological and geophysical study are dealt with. Further, they regard the practical possession by the Committee of a central observatory as affording an indispensable means for the proper training of the staff of the Office, and as enlarging very widely the possibility of doing useful scientific and practical work by the employment of voluntary or student assistants.

“They are further of opinion that the deliberations of the Gassiot Committee as proposed under the scheme will bring the work of the Office to the

"cognisance of a number of distinguished workers in meteorology and cognate subjects, and this circumstance of itself constitutes a substantial recommendation of the scheme."

In response to this joint representation on the part of the Royal Society and the Meteorological Committee, Your Lordships have approved of the principle of the proposal and have undertaken to ask Parliament for an increase of the Grant for Meteorology to carry it out, with the stipulation that, as a temporary measure, the testing work which remains with the National Physical Laboratory should still be carried on in the buildings of the Kew Observatory under the Superintendent as heretofore, and that part of the stipend of the Superintendent should be provided by the Laboratory. The Committee are accordingly making arrangements to take over the Superintendent and five members of the staff of Kew Observatory and the staff of the Eskdalemuir Observatory in accordance with Your Lordships' decision, to take effect from 1st July, 1910.

Estimates for 1910-11.—The Committee desire to express their thanks to Your Lordships for the consideration which You have given to the statement of the financial position of the Meteorological Office at the close of the first period of appointment of the Meteorological Committee 1905-1910, which was forwarded with the letter covering the estimate of expenses of the Office for the year 1910-1911.

Aeronautics.—The contribution of the Director to the Report of the Advisory Committee for Aeronautics has already been mentioned (p. 12).

In presenting an interim report to the Prime Minister the Advisory Committee included in the programme of work to be undertaken investigations with a view to throwing additional light upon the questions of vertical motion and rotary motion in the atmosphere. In the estimates for the current year a sum was assigned for this work, and at the request of the Advisory Committee the Director arranged for the investigations to be carried out under his direction at Pyrtou Hill by Mr. J. S. Dines in consultation with his father, Mr. W. H. Dines, F.R.S., who is in charge of work for the Office in connexion with the investigation of the upper air.

It is recognised that much information of great importance in aerial navigation is comprised within the records belonging to the Office, but that no adequate facilities exist for bringing the information effectively to the knowledge of practical aeronauts. The work included in the course of lectures referred to in a subsequent section is intended to give necessary preliminary information, and at the request of the Advisory Committee arrangement has been made for placing on exhibition automatic records, diagrams of variation of velocity with height, and other documents of practical interest in connexion with the navigation of the air. In the present premises there is neither space nor convenience to carry out the idea in a proper manner, but it will form a regular part of the programme for the museum which is included in the new building at South Kensington.

Many inquiries for forecasts and other information have been received in the course of the year from aeronauts. So far as the

Office is concerned, M. Paulhan's flight from London to Manchester was noteworthy for the elaborate provision that was made to keep him supplied with information of various kinds about the prospective state of the weather on his line of route.

Scale of Fog Intensity.—Among the miscellaneous work of the Office in the course of the year note should be made of an endeavour to fix the distance of visibility by day and by night for fogs of recognised intensity, according to the scale now adopted by the Office and by the Admiralty, by which a clear horizon is indicated by the figure 0 and the densest fog by the figure 5. The figures of the scale are based upon the interference of the fog with traffic, and it is desirable to form some definite idea as to how far off a vessel or light is visible firstly when a fog horn is sounded by navigators as a matter of ordinary precaution, and secondly when extreme caution is judged to be necessary. The matter has been taken up with the Elder Brethren of Trinity House, and arrangements were made for observers at six lightships to note the state of atmospheric obscurity according to the scale 0 to 5 as judged by the requirements of traffic, and at the same time to note the known land and sea marks which were visible or invisible. The returns have come in and are being examined. Some of them are extraordinarily conflicting, but others group themselves in a very orderly manner. It seems to depend largely upon the particular lightship selected. A report upon the subject will be prepared in due course.

Educational.—Meetings for the discussion of important contributions to meteorological science, principally in colonial or foreign journals, were held at the Office on alternate Monday evenings during the winter months as in previous years.

The Director, as Reader in Meteorology in the University of London, gave a course of lectures on Forecasts of Weather at the London School of Economics, Clare Market, in the Lent Term of 1910. The lectures have been prepared for publication in book form.

Captain Hepworth gave two lectures at the Royal Naval War College in January, 1910.

At the request of Sir J. Brigg, M.P., a syllabus of a course of instruction in weather study in elementary schools was prepared for presentation to Mr. Runciman.

A large number of requests for surplus copies of the Daily Weather Report for use in schools have been complied with, and subscriptions for the Daily Weather Report for schools have been received from all parts of the country.

In connexion with the preparation for discussions, lectures, and the reading of papers, a collection of lantern slides has been accumulated which are available for educational purposes.

A memorandum setting forth the arrangements made by the Office for educational purposes has been drawn up.

Magnetic Observations at Valencia.—The magnetic observations at Valencia, in co-operation with the magnetic work of the National

Physical Laboratory, under an arrangement with a committee of trustees, of which the late Earl of Rosse was the principal, have been continued,

Acknowledgments.—The Committee have again to acknowledge the courtesy of the Portuguese Government, Major Chaves, and the Commercial Cable Company, in connexion with the daily telegrams from the Azores; the Eastern Telegraph Company and the Great Northern Telegraph Company, in connexion with telegrams from the Azores, the Iberian Peninsula, and the Scandinavian kingdoms.

Acknowledgments are also due to many public departments, local authorities, and private observers in all parts of the kingdom.

The reports of the work of the several branches of the Office are as follows :—

I.—MARINE BRANCH.

Collection of Information.—The arrangements for the systematic collection of data, for the purposes of marine meteorology, from officers of the Royal Navy and the Mercantile Marine, have been continued as in previous years. The number of vessels entered in the Office books as equipped with meteorological instruments lent by the Office, for the purpose of keeping a meteorological log, was 206 as compared with 183 last year. Meteorological four-hourly log books, registers, and other documents, to the number of 2,674 were received during the year. A list of these is given in Appendix IV. Of the meteorological log books which contain four-hourly observations, 210 have been classed as “excellent,” or “very good,” as compared with 171 for the year 1908–9.

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 large amount of information has thereby been collected, which is immediately utilised in the Monthly Meteorological Charts of the North Atlantic and Mediterranean, and of the Indian Ocean and Red Sea.

The following list shows the number of contributions classified according to the different lines of route :—

Four-hourly Logs.

Greenland	...	Whaling	...	...	4
Cable Ships	...	United Kingdom	...	...	2
		North Atlantic	...	...	2
North Atlantic	...	Canada	2
		United States	8
		Gulf of Mexico	24
		West Indies	9
Mediterranean	3

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Four-hourly Logs.

Greenland	...	Whaling	4
Cable Ships	...	{	United Kingdom	2
			North Atlantic	2
North Atlantic	...	{	Canada	...	...	2
			United States	...	...	8
			Gulf of Mexico	...	...	24
Mediterranean	...	{	West Indies	...	...	9
			...	...	...	3

Black Sea	...	...	...	...	4
Africa	...	...	{ West Coast	...	1
			{ S.E. and E. Coasts	...	10
East Indies	...	...	{ viâ Cape	...	12
			{ viâ Suez	...	48
China and Japan	...	...	{ viâ Cape	...	1
			{ viâ Suez	...	20
Australia	...	...	{ viâ Cape	...	16
			{ viâ Suez	...	30
Trans-Pacific	...	...	...	...	7
New Zealand, viâ Capes	...	...	...	...	30
South America	...	...	{ East Coast	...	32
			{ West Coast	...	7
United States, West Coast	...	...	...	...	1
Surveying	...	...	{ West Coast of Africa	...	2
			{ China Sea	...	3
			{ Ceylon	...	1
			{ Vancouver	...	1

“Short” Logs.

Mediterranean	...	...	...	...	6
Cape of Good Hope to St. Paul’s Island	...	...	...	...	1
Trans-Pacific	...	...	...	...	2

North Atlantic Registers (Form No. 121), Indian Ocean Registers (Form No. 122), and Radio-Telegraphy Registers (Form No. 138).

Routes.		North Atlantic Registers. Form No. 121.	Indian Ocean Registers. Form No. 122.	Radio- telegraphy Registers. Form No. 138.
Cable Ships	United Kingdom	1	—	—
North Atlantic...	{ Canada	435	—	182
	{ United States	830	—	333
	{ Gulf of Mexico	105	—	—
	{ West Indies	165	—	—
Mediterranean	...	265	—	—
Black Sea	...	8	—	—
Africa	{ West Coast	25	—	—
	{ S.E. and E. Coasts	7	—	—
East Indies	{ viâ Cape	2	16	—
	{ viâ Suez	3	222	—
China and Japan	{ viâ Cape	—	1	—
	{ viâ Suez	—	16	—
Australia	{ viâ Cape	—	6	—
	{ viâ Suez	—	14	—
South America	East Coast	38	—	—
Total		1,884	275	515

Recognition of “excellent” observers.—Appendix III. (p. 98) contains a list of the captains 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 : —

Captain's Name.	Steamship.
Chndley, T. H., Lieut., R.N.R. ...	Kia Ora.
Griffiths, A. M.	Hillmere.
Hanson, F. W. A., Lieut., R.N.R. ...	Wilcannia.
Henderson, S., Lieut., R.N.R., R.D.	Durham Castle.
Hunt, A.	Bohemia.
Mais, E.	York Castle.
Moodie, J.	Camphill.
Morrison, D.	City of Corinth.
Steeves, T. G.	Jason.
Weir, A. R.	Clan Macintyre.

As a mark of recognition of valuable co-operation, the Director has presented various publications of the Office to observers who have returned well-kept meteorological log books.

Obituary.—The Committee note with regret the deaths of four of their old observers during 1909 :—Captain W. Scotland, S.S. *Kumara*, in May ; Captain G. Nicole, S.S. *Maori*, in August ; Captain H. Parsell, Lieut., R.N.R., S.S. *Britannic*, in November ; and Captain E. Gates Jones, Lieut., R.N.R., Ship *Grace Harwar*.

Use of Information received.—The information collected has been used in the preparation of the monthly meteorological charts of the North Atlantic and Mediterranean, and of the Indian Ocean and Red Sea, as in previous years ; the revision of the Barometer Manual for the use of Seamen ; and for fog and mist charts for the Baltic and the North Sea. Information as to the frequency of fog and mist in different parts of the Atlantic has been prepared, and is now appearing in successive issues of the Atlantic charts. Information was supplied to the Solar Physics Observatory with respect to Snow Hill meteorological observations ; to the Argentine Meteorological Office as to the alleged monsoon regions of the Chilean littoral ; to the Marine Biological Association, sea temperatures of the Indian Ocean and the coasts of the United Kingdom ; to Dr. Vaughan Cornish, observations of ocean waves and swells ; to Captain F. L. Taylor, Lieut., R.N.R., S.S. *Singapore*, navigation of Strait of Magellan ; to the Director-General of Observatories, Simla, meteorological observations from the log-books of ships navigating the Indian Ocean between 6° N. and 45° S. from 20° E. to 130° E. ; to the Deutsche Seewarte, meteorological data for the South Atlantic ; and contributions on ocean meteorology to Lloyd's Calendar for 1910. Information with respect to ice was also sent regularly to the *Shipping Gazette* and the *Journal of Commerce* during the season.

The discussion of meteorological data for the Indian Ocean to 30° S. is completed, and is to be published in the monthly meteorological charts for that ocean (p. 10).

Information supplied to the Admiralty.—Climatological tables have been compiled for various places on the shores of the United

States, the Arctic Ocean, the North Sea, the West Coast of Africa, the Pacific Islands, and the Eastern Archipelago, at the request of the Admiralty.

Hydrographic notices have been extracted from the meteorological log-books of this Office and forwarded to the Admiralty. Among those sent this year were notes relating to Bougainville Strait and Tulagi Harbour, received from Captain F. J. Bayldon, Lieut., R.N.R., S.S. *Moresby*; soundings and bottom specimens 220 miles west of Bantry Bay, from Mr. E. C. Shankland, Sub-Lieut., R.N.R., S.S. *Cambria*; soundings and bottom specimens, South Preparis Channel, from Captain G. H. Harris, Lieut., R.N.R., S.S. *Worcestershire*; Comus Shoal and Santa Maria Harbour, from Captain F. H. Swain, S.S. *Matina*; and Cape Norman Lighthouse and Watts Point, from Captain J. Martin S.S. *Akershus*.

II.—FORECAST AND STORM WARNING BRANCH.

Daily Weather Report.—The arrangements for the issue of the Daily Weather Report and Forecasts, and for the preparation of information for publication in the newspapers, have remained generally the same as those which were in operation last year.

Telegraphic Reporting Stations.—The stations from which telegraphic reports are received are shown in the lists given on pp. 68 to 88 and on Map (Plate X., p. 88).

Inspection of the Stations.—The stations indicated in the list in Appendix VI., p. 120, have been inspected during the year. The reports of the inspectors show that efficiency has been maintained.

Reports from Madeira.—A daily telegraphic report has been received from Funchal, Madeira since 1st January, 1910 (*see* p. 7).

Iceland and Færøe Reports.—The reports from five stations in Iceland and one in the Færøe have been continued throughout the year. Since April 1st, 1909, reports from Isafjord, a station in the extreme north-west of the Island, have been substituted for those from Grimstadir, a high level station in the interior.

Wireless Telegrams.—During the year ended March 31st, 112 wireless telegrams were received from the ships of His Majesty's Navy.

In the course of the 12 months ending with March, 1910, 4,388 wireless reports were received from Atlantic liners. The numbers in the several months ranged from 670 in May and 649 in April to 268 in December. The indications of a reduction in the time occupied in the transmission of the messages (to which reference was made in the last Annual Report) have become increasingly evident. During the three months ending with March, 1909, only 5 per cent. of the reports arrived at the Meteorological Office within two hours of the time at which the observations were taken, or sufficiently early to be of service in connexion with the weather map in current use, and only 18 per cent. arrived within 24 hours. During the subsequent 12 months, 8 per cent. of the reports arrived within two hours, and 42 per cent. within 24 hours of the time of observation.

Reports from Auxiliary Stations.—The information as to the weather in the British Islands has been supplemented by postal and telegraphic reports sent daily from stations belonging to various local authorities (p. 88). The number of such stations is constantly increasing, and the details supplied form a useful addition to the official telegraphic reports.

Discussion of Information.—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., p. 47.

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., p. 49.

Forecasts for H.M. Ships.—Forecasts have been supplied occasionally to His Majesty's Yacht, as desired by the Commodore. They have also been supplied for naval purposes as required by the Admiralty.

Harvest Forecasts.—During the summer months the special service of afternoon forecasts for the benefit of agriculturists and others was arranged as in previous years, and special telegraphic reports of observations at 1 p.m. were obtained for this purpose. These forecasts are sent by telegraph at 2.30 p.m. to those who express a wish to receive them regularly, and who defray the cost of the telegrams.

During the four months, June to September, the forecasts were sent, for varying periods of time, to 103 persons residing in various parts of the United Kingdom. The number was 19 in excess of that in the previous year, and was the largest since the year 1900, when applications for the forecasts were received from as many as 122 persons.

Returns giving a daily record of the weather actually experienced during the period for which the forecasts were sent were received from 30 persons, as against 25 in the previous year.

The results of a comparison made in the Office between the forecasts and the subsequent weather, as entered in these returns, show that for the country generally 87 per cent. of the forecasts were either wholly or partially successful, the value being slightly below the average of the previous nine years. The percentage of complete successes, 36, was considerably smaller than in recent years. At one station in the east of Scotland the percentage of complete success was as high as 71, while in another in the east of Ireland it was as high as 82, but in each case the forecasts were sent only for a short period. For large districts the percentage of complete success varied from 44 in England north east, to 33 in England north west, and the combined percentage of complete and partial success from 90 in England north west, to 82 in the Midland counties.

The decline in the proportion of successes, as compared with that in several previous years, was due to the extremely changeable character of the weather. Some of the heaviest rains were accompanied by a rising barometer, and were not adequately

explained by the appearance of the isobars on the daily weather maps. At various times during the season a forecast of improving weather, though apparently justified by the meteorological conditions prevailing at the time of issue, was followed by a renewal of showery or rainy weather.

Notifications of a Spell of Fine Weather.—The offer on the part of the Office to supply special information of the commencement of a probable spell of fine weather lasting for at least two days, which originated in 1907, has met with an increasing measure of approval. In 1908, applications for such information were received from 22 persons, while, in 1909, the number had increased to 44. In the case of 25 individuals, the special notification alone was required; in 19 other cases it was supplied in addition to the ordinary daily forecasts. During so unsettled a season as that of 1909, the opportunities for the issue of such a notice were rare, but on July 1st and July 19th, intimation was sent to the majority of the English districts; on June 2nd, to England north west; on August 5th, to persons residing in the midland counties, England north west and Ireland south, and again, on September 14th, to one individual in Ireland south. The notifications issued on July 1st, and September 14th, were not justified, the weather for the next two or three days remaining in an unsettled showery state. Those issued on June 2nd, and July 19th, were followed by fine weather lasting for two days; those issued on August 5th by settled weather lasting for more than a week.

Colliery Warnings.—Notice of the approach of a deep depression which may be expected to cause an unusually rapid fall of the barometer has been sent, as occasion required, to the Manager of the "Colliery Guardian."

Other Forecasts.—The arrangements for forecasts for Sea districts and for exceptionally high tides referred to in last year's report have been continued.

Telegraphic Inquiries for Forecasts.—The number of inquiries for forecasts by telegraph, exclusive of harvest forecasts, was 201.

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 below. The complete success, partial success, partial failure, and complete failure of the forecast as regards both wind and weather, are estimated according to definite rules which are designed to eliminate bias as far as possible.

The term "partial success" is applied to cases in which more than half the details included in the forecast are justified by subsequent events. With regard to *wind* the details comprise direction and force, and anticipated changes in either particular. With regard to *weather* they comprise temperature, the state of the sky (clear, cloudy, or overcast), and the probability of rain, snow, fog, thunder, &c., with occasional indications as to the duration or intensity of any or all of the phenomena mentioned. The term "partial failure" is applied in a similar way to a forecast in which more than half the details given are incorrect.

The detailed comparison of the forecasts with actuality for the year 1909 has been summarised to give results, (1) for the various months, and for the United Kingdom as a whole, and (2) for the various districts, and for the year as a whole.

SUMMARY of RESULTS of 8.30 p.m. FORECASTS in 1909.

(a.) Results for the various Months.

Months.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
January	75	54	65	23	41	32	2	5	3	-	-	-	97
February	64	56	60	27	38	33	7	5	6	2	1	1	93
March	55	57	56	31	35	33	7	8	8	7	-	3	89
April	64	57	61	25	36	30	2	6	4	9	1	5	91
May	65	54	60	26	36	31	5	7	6	4	3	3	91
June	78	51	65	19	45	32	2	3	2	1	1	1	97
July	49	50	50	44	38	41	6	10	8	1	2	1	91
August	50	51	51	35	39	37	14	7	10	1	3	2	88
September	62	50	56	33	45	39	2	4	3	3	1	2	95
October	72	48	60	26	43	35	1	8	4	1	1	1	95
November	68	53	61	28	42	35	2	5	3	2	-	1	96
December	54	41	48	34	47	40	5	10	8	7	2	4	88
The entire Year	63	52	58	29	40	35	5	6	5	3	1	2	93

(b.) Results for the various Districts.

Districts.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
Scotland, N. ...	61	57	59	32	40	36	4	2	3	3	1	2	95
" E. ...	62	53	58	29	39	34	5	6	5	3	2	3	92
England, N.E. ...	63	49	56	31	41	36	4	7	6	3	1	2	92
" E. ...	67	51	59	28	40	34	3	8	6	2	1	1	93
Midland Counties.	68	49	59	24	45	34	5	5	5	3	1	2	93
England, S. ...	70	50	60	21	41	32	4	8	6	3	1	2	92
Scotland, W. ...	60	55	58	31	38	35	5	6	5	4	1	2	93
England, N.W. ...	61	50	56	32	41	36	4	8	6	3	1	2	92
" S.W. ...	66	54	60	27	38	33	5	7	6	2	1	1	93
Ireland, N. ...	59	51	55	33	42	37	5	5	5	3	1	2	93
" S. ...	58	52	54	32	38	35	7	9	8	4	2	3	89
Summary ...	63	52	58	29	40	35	5	6	5	3	1	2	93

The detailed comparison of the forecasts with actuality for the year 1909 has been summarised to give results, (1) for the various months, and for the United Kingdom as a whole, and (2) for the various districts, and for the year as a whole.

SUMMARY of RESULTS of 8.30 p.m. FORECASTS in 1909.

(a.) Results for the various Months.

Months.	Percentages.												Sum of Successes, Complete and Partial.
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
January ...	75	54	65	23	41	32	2	5	3	-	-	-	97
February ...	64	56	60	27	38	33	7	5	6	2	1	1	93
March ...	55	57	56	31	35	33	7	8	8	7	-	3	89
April ...	64	57	61	25	36	30	2	6	4	9	1	5	91
May ...	65	54	60	26	36	31	5	7	6	4	3	3	91
June ...	78	51	65	19	45	32	2	3	2	1	1	1	97
July ...	49	50	50	44	38	41	6	10	8	1	2	1	91
August ...	50	51	51	35	39	37	14	7	10	1	3	2	88
September ...	62	50	56	33	45	39	2	4	3	3	1	2	95
October ...	72	48	60	26	43	35	1	8	4	1	1	1	95
November ...	68	53	61	28	42	35	2	5	3	2	-	1	96
December ...	54	41	48	34	47	40	5	10	8	7	2	4	88
The entire Year	63	52	58	29	40	35	5	6	5	3	1	2	93

(b.) Results for the various Districts.

Districts.	Percentages.												
	Complete Success.			Partial Success.			Partial Failure.			Complete Failure.			Sum of Successes, Complete and Partial.
	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	Wind.	Weather.	Average.	
Scotland, N. ...	61	57	59	32	40	36	4	2	3	3	1	2	95
" E. ...	62	53	58	29	39	34	5	6	5	3	2	3	92
England, N.E. ...	63	49	56	31	41	36	4	7	6	3	1	2	92
" E. ...	67	51	59	28	40	34	3	8	6	2	1	1	93
Midland Coun- ties.	68	49	59	24	45	34	5	5	5	3	1	2	93
England, S. ...	70	50	60	24	41	32	4	8	6	3	1	2	92
Scotland, W. ...	60	55	58	31	38	35	5	6	5	4	1	2	93
England, N.W. ...	61	50	56	32	41	36	4	8	6	3	1	2	92
" S.W. ...	66	54	60	27	38	33	5	7	6	2	1	1	93
Ireland, N. ...	59	51	55	33	42	37	5	5	5	3	1	2	93
" S. ...	58	52	54	32	38	35	7	9	8	4	2	3	89
Summary ...	63	52	58	29	40	35	5	6	5	3	1	2	93

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 1900–1909 the percentages of complete and partial successes of the Forecasts issued at 8.30 p.m. Until the year 1905 the annual period included was that for the 12 months ending with March. The results for 1905 to 1909, given below, are for the calendar year. The sum of successes (complete and partial) in 1909 was the highest on record, but the percentage of complete success was lower than in 1906, and was no higher than in 1908 or in 1901–02.

PERCENTAGES of SUCCESS in the FORECASTS for the whole
of the BRITISH ISLES.

Year.			Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1900–01	...		57	27	84
1901–02	...		58	26	84
1902–03	...		53	35	88
1903–04	...		56	30	86
1904–05	...		57	31	88
1905	...	...	56	32	88
1906	...	...	61	30	91
1907	...	...	54	37	91
1908	...	...	58	34	92
1909	...	...	58	35	93
Average	...		56·8	31·7	88·5

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. The signals are defined in Circular 717 of the Board of Trade, issued in February, 1874. An explanation of the system employed is given in Appendix II.

A list of the stations at which the signals are exhibited is given in Appendix II., pp. 53, 54. At the end of March, 1909, there were 237, of which 127 were in England and Wales, 71 in Scotland, 34 in Ireland, 3 in the Isle of Man, and 2 in the Channel Islands.

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, p. 64, is given in the following table.

Appended to the table are notes respecting the gales for which no warnings were issued, with brief statements as to the circumstances in which they occurred.

STORM WARNING CHECKING.
Comparison between the Warnings and the subsequent Weather
in 1909.

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 8 reached at two Stations before issue.	Warnings partially late, Force 8 reached at one Station before issue.	Storms occurring without Warning.
Scotland, N.E.	}	17	4	11	1	—	1	Jan. 11-12.
				18	5	5	2	1	2	
				12	4	6	1	—	1	
				9	2	4	3	—	—	
" E.	}	19	5	14	—	—	—	Jan. 11-12 ; Sept. 6-7.
				19	8	9	2	—	—	
" N.W.	}	12	7	2	3	—	—	Jan. 11-12 ; Apr. 2-3.
				14	5	5	4	—	—	
" W.	}	15	9	5	—	—	1	Jan. 11-12 ; Feb. 5 ; Apr. 3.
				19	9	7	1	—	2	
Irish Sea	}	15	8	4	2	—	1	Oct. 19-20. Jan. 11-12 ; Apr. 2-3.
				20	11	5	2	1	1	
Ireland, N.	}	15	10	3	—	1	1	Sept. 6-7. Jan. 11-12 ; Apr. 2-3 ; Apr. 20-22 ; May 4.
				20	8	7	3	1	1	
" S.	}	15	6	7	1	—	1	Sept. 6-7 ; Oct. 5. Apr. 2-3.
				17	11	4	1	—	1	
St. George's Channel	}	20	12	6	2	—	—	Mar. 11. Sept. 6-7 ; Oct. 5 ; Oct. 19-20 ; Dec. 14-15. Feb. 5 ; May 4.
				16	12	3	—	1	—	
Bristol Channel	...	...	}	16	8	5	2	—	1
				20	11	7	—	—	2	
England, S.W.	}	16	7	6	3	—	—	Jan. 11-12.
				22	12	8	1	1	—	
" S.	}	14	6	8	—	—	—	Jan. 11-12.
				22	11	7	2	2	—	
" S.E.	}	14	9	2	2	—	1	Jan. 11-12.
				13	8	5	—	—	—	
" N.E.	}	13	6	7	—	—	—	Jan. 11-12.
				16	7	7	1	1	—	
" E.	}	213	101	86	17	1	8	Totals
				245	123	83	22	8	9	
Totals	}	—	47.4	40.4	8.0	0.4	3.8	Percentages
				—	50.2	33.9	9.0	3.3	3.6	
For whole year	Totals	458	224	169	39	9	17	Percentages
				—	48.9	36.9	8.5	2.0	3.7	

NOTE.—In order to facilitate comparison with the statistical tables of the Board of Trade which are made up for the year ending June 30, the figures for the two halves of the year 1909—January 1 to June 30, and July 1 to December 31—are given separately for each district. The upper line of figures in each case gives the particulars for the first half of the year.

STORM WARNING CHECKING.

Comparison between the Warnings and the subsequent Weather in 1909.

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.	Storms occurring without Warning.
Scotland, N.E.	17	4	11	1	—	1	Jan. 11-12.
			18	3	5	2	1	2	
" E.	12	4	6	1	—	1	Jan. 11-12 ; Sept. 6-7.
			9	2	4	3	—	—	
" N.W.	19	5	14	—	—	—	Jan. 11-12 ; Sept. 6-7.
			19	8	9	2	—	—	
" W.	12	7	2	3	—	—	Jan. 11-12 ; Apr. 2-3.
			14	5	5	4	—	—	
Irish Sea	15	9	5	—	—	1	Jan. 11-12 ; Feb. 5 ; Apr. 3.
			19	9	7	1	—	2	
Ireland, N.	15	8	4	2	—	1	Jan. 11-12 ; Apr. 2-3.
			20	11	5	2	1	1	
" S.	15	10	3	—	1	1	Jan. 11-12 ; Apr. 2-3 ; Apr. 20-22 ; May 4.
			20	8	7	3	1	1	
St. George's Channel	15	6	7	1	—	1	Sept. 6-7 ; Oct. 5.
			17	11	4	1	—	1	
Bristol Channel	20	12	6	2	—	—	Mar. 11.
			16	12	3	—	1	—	
England, S.W.	16	8	5	2	—	1	Sept. 6-7 ; Oct. 5 ; Oct. 19-20 ; Dec. 14-15.
			20	11	7	—	—	2	
" S.	16	7	6	3	—	—	Feb. 5 ; May 4.
			22	12	8	1	1	—	
" S.E.	14	6	8	—	—	—	Jan. 11-12.
			22	11	7	2	2	—	
" N.E. ...	...	...	14	9	2	2	—	1
			13	8	5	—	—	—	
" E. ...	...	...	13	6	7	—	—	—
			16	7	7	1	1	—	
Totals	213	101	86	17	1	8	
			245	123	83	22	8	9	
Percentages	—	47.4	40.4	8.0	0.4	3.8	
			—	50.2	33.9	9.0	3.3	3.6	
For whole year	Totals	458	224	169	39	9	17	
			—	48.9	36.9	8.5	2.0	3.7	

NOTE.—In order to facilitate comparison with the statistical tables of the Board of Trade which are made up for the year ending June 30, the figures for the two halves of the year 1909—January 1 to June 30, and July 1 to December 31—are given separately for each district. The upper line of figures in each case gives the particulars for the first half of the year.

GALES EXPERIENCED in 1909 WITHOUT WARNING.

- (1) *January 11th–12th. A Westerly to North Westerly gale on the Irish Coasts, in the Irish Sea and in the West and North of Scotland.*—Caused by a secondary depression which appeared in the rear of a large disturbance beyond the Arctic Circle. At 6 p.m., January 10th, when warnings were required, there were no indications of the secondary system.
- (2) *February 5th. A Westerly to North Westerly gale in the Irish Sea and the South West of England.*—On the evening of February 4th, a depression was approaching our western coasts and the cones were hoisted in the south of Ireland and the Bristol Channel. The disturbance, which proved to be more serious than was anticipated, moved rapidly eastwards across England, and had reached the north by the following morning. It was then too late to warn the coasts in question.
- (3) *March 11th. A North Easterly gale in the Bristol Channel.*—Caused by the extension of an area of high pressure from the northward down our western coasts, and the simultaneous movement northwards of a small depression over France. The gale was reported only at the lightship stations—it was apparently not felt at all on shore.
- (4) *April 2nd–3rd. A gale from South and South East on many parts of our western coasts.*—A large anticyclone of considerable intensity covered Great Britain, while a depression over the mid Atlantic extended gradually eastwards, and produced a moderately steep gradient over our western coasts. The conditions did not at any time appear sufficiently threatening to justify the issue of warnings.
- (5) *April 20th. A Westerly gale on the South Coast of Ireland.*—Felt only at lightship stations. Nothing more than force 5 was reported at any of the telegraphic reporting stations, and from the distribution of pressure at the time it is not easy to see why any gale occurred in the district.
- (6) *April 22nd. A Southerly gale on the South Coast of Ireland.*—Caused by the rather sudden advance of a deep depression from the westward on the night of the 21st. Next morning warnings were issued to all our western coasts excepting the south of Ireland, where the gale had already commenced.
- (7) *May 4th. A South Easterly to Easterly gale in the South of Ireland and the South West of England.*—A large anticyclone extended at the time over Great Britain from the continent. The gale was caused by a temporary increase in the barometric gradient owing to the movement

of a depression out in the Atlantic. The changes in pressure appeared far too slight to justify the issue of warnings.

- (8) *September 6th-7th. A Westerly to North Westerly gale on many parts of our western coasts.*—Caused by a deep depression which advanced suddenly to the Hebrides from the north westward on the night of September 5th-6th. Very strong winds were forecasted, but the indications on the evening of September 5th did not seem sufficiently threatening to necessitate the issue of warnings.
- (9) *October 5th. A South Westerly to North Westerly gale in the South of Ireland and the Bristol Channel.*—A depression of growing intensity appeared off the north of Ireland on the morning of October 5th, and the signals were then hoisted in all our north western districts. The gale extended further south than was anticipated. It was not reported at any of the telegraphic reporting stations.
- (10) *October 19th-20th. A South Westerly gale in the Irish Sea and the Bristol Channel.*—Caused by a depression which spread in from the westward. Telegraphic communication with Blacksod Point was interrupted, and the report from that station for October 19th, 6 p.m., was not received until the afternoon of the 20th. Had it arrived in time warnings would probably have been issued on the evening of the 19th to all our west and south-west coasts.
- (11) *December 14th-15th. An Easterly to North Easterly gale in the Bristol Channel.*—Warnings were issued with success on the afternoon of December 14th, for an easterly gale on the south and south-east coasts of England. The gale covered a somewhat wider area than was anticipated.

Comparison of results for 1909 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 1900-1909 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c.
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
1904	539	59.4	30.4	89.8	6.7
1905	632	52.5	35.9	88.4	9.5
1906	739	54.7	33.3	88.0	8.5
1907	573	55.2	37.0	92.2	5.9
1908	628	53.4	32.3	85.7	10.7
1909	458	18.9	36.9	85.8	8.5
1900-09 ...	587	57.1	31.7	88.8	8.0

of a depression out in the Atlantic. The changes in pressure appeared far too slight to justify the issue of warnings.

- (8) *September 6th-7th. A Westerly to North Westerly gale on many parts of our western coasts.*—Caused by a deep depression which advanced suddenly to the Hebrides from the north westward on the night of September 5th-6th. Very strong winds were forecasted, but the indications on the evening of September 5th did not seem sufficiently threatening to necessitate the issue of warnings.
- (9) *October 5th. A South Westerly to North Westerly gale in the South of Ireland and the Bristol Channel.*—A depression of growing intensity appeared off the north of Ireland on the morning of October 5th, and the signals were then hoisted in all our north western districts. The gale extended further south than was anticipated. It was not reported at any of the telegraphic reporting stations.
- (10) *October 19th-20th. A South Westerly gale in the Irish Sea and the Bristol Channel.*—Caused by a depression which spread in from the westward. Telegraphic communication with Blacksod Point was interrupted, and the report from that station for October 19th, 6 p.m., was not received until the afternoon of the 20th. Had it arrived in time warnings would probably have been issued on the evening of the 19th to all our west and south-west coasts.
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1906	739	54.7	33.3	88.0	8.5
1907	573	55.2	37.0	92.2	5.9
1908	628	53.4	32.3	85.7	10.7
1909	458	48.9	36.9	85.8	8.5
1900-09 ...	587	57.1	31.7	88.8	8.0

Averages.—The corresponding figures, giving the average results for the last nine years and for the three preceding decades, are as follows :—

Period.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not followed by increase of Wind.
		p.c.	p.c.	p.c.	p.c.
1871-80 ...	362	51·9	25·7	77·6	16·8
1881-90 ...	507	57·3	25·1	82·4	15·5
1891-1900 ...	518	62·7	27·5	90·2	5·8
1901-09 ...	595	56·1	32·4	88·5	8·2

III.—STATISTICS AND LIBRARY BRANCH.

CLIMATOLOGY OF THE BRITISH ISLES.

Distribution of Stations.—A list of stations in connexion with the Office, in which particulars are given of the orders of the stations and of the official publications for which the returns have been prepared, will be found in Appendix II. on pp. 43 to 98.

Clarendon type has been used for the names of stations which have been added to the list in the course of the year.

The distribution of these stations in the various districts may be summarised as follows :—

	Normal Observatories.	Normal Climatological.	Auxiliary Climatological.	Telegraphic Reporting.	Sunshine (including Observatories).	Additional Rainfall.	Additional Anemograph.	Additional Barograph.
0. Scotland, N. ...	0	6	1	4	6	3	1	6
1. " E. ...	1	5	4	3	9	2	1	3
2. England, N.E. ...	0	11	7	2	12	7	2	3
3. " E. ...	0	8	6	2	12	12	3	3
4. " Midlands ...	0	10	22	2	18	14	1	3
5. " S.E. ...	0	6	24	2	26	17	3	4
London District ...	1	4	3	1	8	2	0	2
6. Scotland, W., and Isle Man.	2	8	5	0	7	3	0	1
7. England, N.W., and N. Wales.	1	11	12	2	21	6	4	4
8. England, S.W., and S. Wales.	1	4	15	3	20	24	2	1
9. Ireland, N. ...	0	2	2	3	2	5	1	5
10. " S. ...	1	7	9	3	7	9	3	3
11. Western Channel ...	0	1	1	2	4	0	1	1
Total ...	7	83	111	29*	152	104	22	39

* Of these, 13 observe at 7 a.m., 1 p.m., and 9 p.m., and thus come under the international definition of a station of the second order. These stations have not been included in the 83 normal climatological stations.

Records have also been received from 5 thermograph stations, 8 autographic raingauge stations, 1 hygrograph station, 61 sea temperature stations. Daily reports are received by telegraph from 45 foreign stations (*see* p. 87).

Observatories are also maintained at Greenwich (The Royal Observatory), Oxford (Radcliffe Observatory), Bidston (Mersey

Docks and Harbour Board), Southport (the Corporation), and Berkhamsted (E. Mawley, Esq.), and from these, records for occasions of special interest have been courteously supplied when asked for.

Changes in Stations.—The normal climatological station at Laudale, which has contributed data to the annual volumes of "Observations at stations of the second order" since 1879, has been discontinued, but the observations of rainfall and temperature are still being continued and are included in the Weekly Weather Report. The normal climatological station at Rousdon Observatory, from which returns were received through the Royal Meteorological Society, has also been discontinued.

Among the stations which have been started or have come into connexion with the Office during the year, must be mentioned the Observatory at Eskdalemuir, from which regular reports have been received for incorporation in publications of the Office from January, 1910: a normal climatological station in connexion with Mungret College, Limerick; a normal climatological station, which is also equipped with a recording anemometer, at Llaneluad in Anglesey; and a normal climatological station established by the Hampstead Scientific Society on Hampstead Heath. The following auxiliary climatological stations have been added to the list: Basingstoke, Belper, Matfield, Deal, Seaford, Ruthwell, Paignton, Fowey, Sheepstor (Dartmoor). Five new rainfall stations have been added to the list, while 12 stations of this order have dropped out.

Obituary.—The Committee record with regret the deaths of the following observers:—

Sir John Clark, Bart., who contributed observations from Tillypronie through the Scottish Meteorological Society.

Mr. A. W. Moore, J.P., C.V.O., who for many years maintained a station at Cronkbourne, near Douglas. The observations have been continued by the Corporation of Douglas.

Mr. T. Turner, J.P., who for many years contributed through the Royal Meteorological Society observations from Cullompton. The observations are being continued by Mr. M. T. Foster.

The Rev. D. Macaulay, who contributed rainfall data from Sandside, Reay. The observations are being continued.

Inspections.—A list of stations inspected during the year by representatives of the Office is given in Appendix VI., p. 119.

Publications.—The statistical publications of the Office have been grouped together under the general title "The British Meteorological Year Book." All four parts of this publication for 1909 were issued before the end of the financial year.

Part I., the Weekly Weather Report, has been issued with three appendices in the same form as in the previous year. Appendix III., the summary of gales experienced during the year at anemograph stations, has been amplified by a table showing for each station the number of hours during which wind velocities corresponding with each number of the Beaufort scale prevailed.

Part II., the Monthly Weather Report. No change has been made in the tables included in the reports. From the commencement of 1910, the maps issued with the reports have been printed in blue on a black outline, and the intensity of the meteorological phenomena has been indicated on them by four gradations of blue stippling. The pictorial representation of the month's meteorology has become much more effective. The rainfall maps have been supplied as in previous years by the Director of the British Rainfall Organization. They are constructed from data from nearly 1,000 stations, and form a most important feature of the Reports.

Part III., "Meteorological Observations at Stations of the Second Order and at Anemograph Stations," has been issued regularly within six weeks of the close of each month. It contains daily observations at 20 Climatological Stations and an abstract of the tabulations from selected Anemograph Stations.

Part IV., "Hourly Readings at four Observatories in connexion with the Meteorological Office."

Arrears.—Some progress has been made in overtaking the arrears of the Annual Volumes of "Observations at Stations of the Second Order." The Volume for 1906 has been issued, and that for 1907 is now in the press.

Returns for Registrar-General.—Weekly and quarterly summaries have been prepared regularly for the Registrar-General of Births, Deaths, and Marriages for England and Wales and for Ireland. No change has been made in the form of these reports.

Seasons in the British Isles.—Some progress has been made with the preparation of the Report on the Seasons in the British Isles referred to on p. 29 of the report for last year, but it has been impossible to complete the work.

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. 89.

Among the additions to the list during the year under review may be mentioned a station started near Guayanavičja, in Venezuela, by the Goldfields of Venezuela, Ltd. It is equipped as a normal climatological station, and in addition it possesses an autographic barograph and thermograph from which it is hoped that interesting information will be acquired regarding the diurnal variation of pressure and temperature in the interior of the South American Continent.

The returns received from all stations have been examined and summarised month by month.

INQUIRIES.

The inquiries dealt with in the Statistics and Library Branch during the year were 822, of which 305 were by letter and

the rest personal inquiries. The following table gives a classification of the inquiries with the corresponding figures for previous years :—

		For Scientific or Commercial Purposes.	For Evidence in Legal Proceedings.	For Forecasts of Weather.	From Newspaper Correspondents for Special In- formation.	Miscellaneous.	Answered by Letter.	Answered Personally.
1903-4	...	253	94	158	217	65	166	626
1904-5	...	259	116	89	221	70	136	619
1905-6	...	293	99	77	206	84	160	599
1906-7	...	427	73	79	166	24	247	522
1907-8	...	503	83	108	175	24	305	588
1908-9	...	540	99	83	99	87	301	607
1909-10	...	469	98	104	112	39	305	517

The inquiries included in the table under the heading "for forecasts of weather" are personal inquiries for information supplementary to that contained in the official forecasts and exhibited at the entrance to the Office and in St. James's Park.

EXCHANGE OF PUBLICATIONS.

Exchanges of publications have been arranged with the following :—

Naturforscher Verein, Brünn.
International Agricultural Institute, Rome.
Observatorio de Cartuja, Granada.
Hydrographic Office, Stockholm.
The Mount Rose Observatory, Nevada.
The Observatory, Guanajuato (Mexico).

LIBRARY.

The subject card catalogue for the books added to the library since the last list of additions was printed *in extenso*, as an appendix to the Report of the Meteorological Council for the year 1904-5, has been brought up to date. The classification adopted is that of the International Catalogue of Scientific Literature. The additions to the library received during the past year, which have numbered upwards of 700 books and pamphlets, have been catalogued on this system. The total number of books in the library is now 21,500.

In Appendix VII., p. 121, will be found (1) a list of persons and institutions from whom publications containing meteorological data have been received during the last five years with a brief indication of the nature of the information given ; (2) a list of periodicals containing memoirs on meteorological subjects, which are received by the Office.

Among the most important additions to the library during the past year may be mentioned :—

La pluie en Belgique, par A. Lancaster ; *Deutsche Südpolar Expedition, 1901-1903, Teil 1* ; *Rainfall of Rhodesia*, by E. Goetz ; *Meteorology, General Course, Vol. 1*, by A. Klossovsky (in Russian) ; *Magnetic observations of the National Antarctic Expedition, 1901-1904* ; A discussion of

Australian meteorology, by W. J. S. Lockyer ; Croisière océanographique accomplie à bord de la *Belgica* dans la Mer du Groënland, 1905 ; Wissenschaftliche Ergebnisse der Schwedischen Südpolar Expedition, 1901-1903, Bd. 2, Lief. 1 u. 2.

Among those acquired by purchase have been :—

Manual de meteorología práctica, por R. Amengual ; Traité élémentaire de météorologie, 2^e éd., par A. Angot ; The force of the wind, by H. Chatley ; Das Klimaproblem der geologischen Vergangenheit und historischen Gegenwart, von W. R. Eckardt ; Fighting the polar ice, by A. Fiala ; Die Luftelektrizität von A. Gockel ; Ergebnisse der Arbeiten des Samoa-Observatoriums, N^{rs} 1-3 ; Transactions of the International Union for Co-operation in Solar Research, Vol. 2 ; Physikalisch-chemische Tabellen, von H. Landolt und R. Börnstein ; Nouvelle méthode de prévision du temps, par G. Guilbert ; Die atmosphärische Elektrizität, von H. Mache und E. Schweidler ; Traité de géographie physique, par Emmanuel de Martonne ; Norwegian Aurora Polaris Expedition, 1902-1903, Vol. 1 ; Nearest the Pole, by R. E. Peary ; Meteorologische Optik, von J. M. Pernter und F. M. Exner ; Von Danckelmann's Mitteilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten ; and a selection of the volumes of the International Catalogue of Scientific Literature.

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.—INSTRUMENTS BRANCH.

SUPPLY OF INSTRUMENTS.

Supply to the Navy.—The number of instruments supplied to ships of the Royal Navy during the year was 810, as compared with 716 last year.

The Mercantile Marine.—To the Mercantile Marine 881 instruments were issued during the year, an increase of 240 compared with the number supplied in the previous year. 286 thermometers, 47 hydrometers, and 30 screens have been written off the books as broken, lost, or irrecoverable. A Stevenson Screen, with dry and wet bulb thermometers, and a Richard's Hair Hygrograph have been lent to Fleet-Surgeon Home, R.N., for hygrometrical experiments on board H.M.S. *Daedalus* at Bristol. Upon the recommendation of the Governor of the Falkland Islands instruments have also been lent to Messrs. Salvesen & Co. for use at Leith Harbour, S. Georgia.

Colonial Governments.—The number of instruments, charts for recording instruments, registers, &c., supplied on repayment through the Crown Agents for the Colonies, or direct to Colonial Governments was less than last year. The total number of instruments of all kinds amounted to 568 as compared with 2,772 in the preceding year, whilst charts for recording instruments, registers, and other books amounted to 13,409 as compared with 11,197.

Requisitions from the following Colonies were complied with :—

The Commonwealth of	Perak (2).
Australia (3).	South Nigeria (3).
Transvaal (4).	Mauritius.
British South Africa (2).	Gold Coast (2).
Somaliland (2).	Cyprus (2).
Fiji (2).	Nyasaland.
Hong Kong.	Bechuanaland.
Gibraltar.	

Local Authorities and Institutions.—Among these were included :—

Douglas Corporation.	Vienna Meteorological
Bexhill Corporation.	Bureau.
City of Coventry.	Northumberland Agricultural
Hunstanton District	College.
Council.	Clyde Biological Station.
Borough of Lancaster.	Oundle School.
Mungret College,	Aspatia Agricultural College.
Limerick.	Victoria Park, Swansea.
Derbyshire Education Com-	Borough of Burnley.
mittee.	Bradford Corporation.

Private Observers.—Instruments have also been supplied on repayment to a number of private stations in connexion with the Office, including the Royal Gardens at Balmoral, and at Abergeldie Castle ; the Inverliever Estate ; the Duke of Sutherland (four stations) ; Belvoir Castle ; Gordon Castle ; and Llaneugrad, Anglesey, for which station a complete set of instruments, including a Pressure-tube Anemometer, was supplied.

Telegraphic Reporting Stations.—The instrumental equipment of the telegraphic reporting stations has been maintained.

Storm Cones.—Storm warning cones have been replaced at 14 stations.

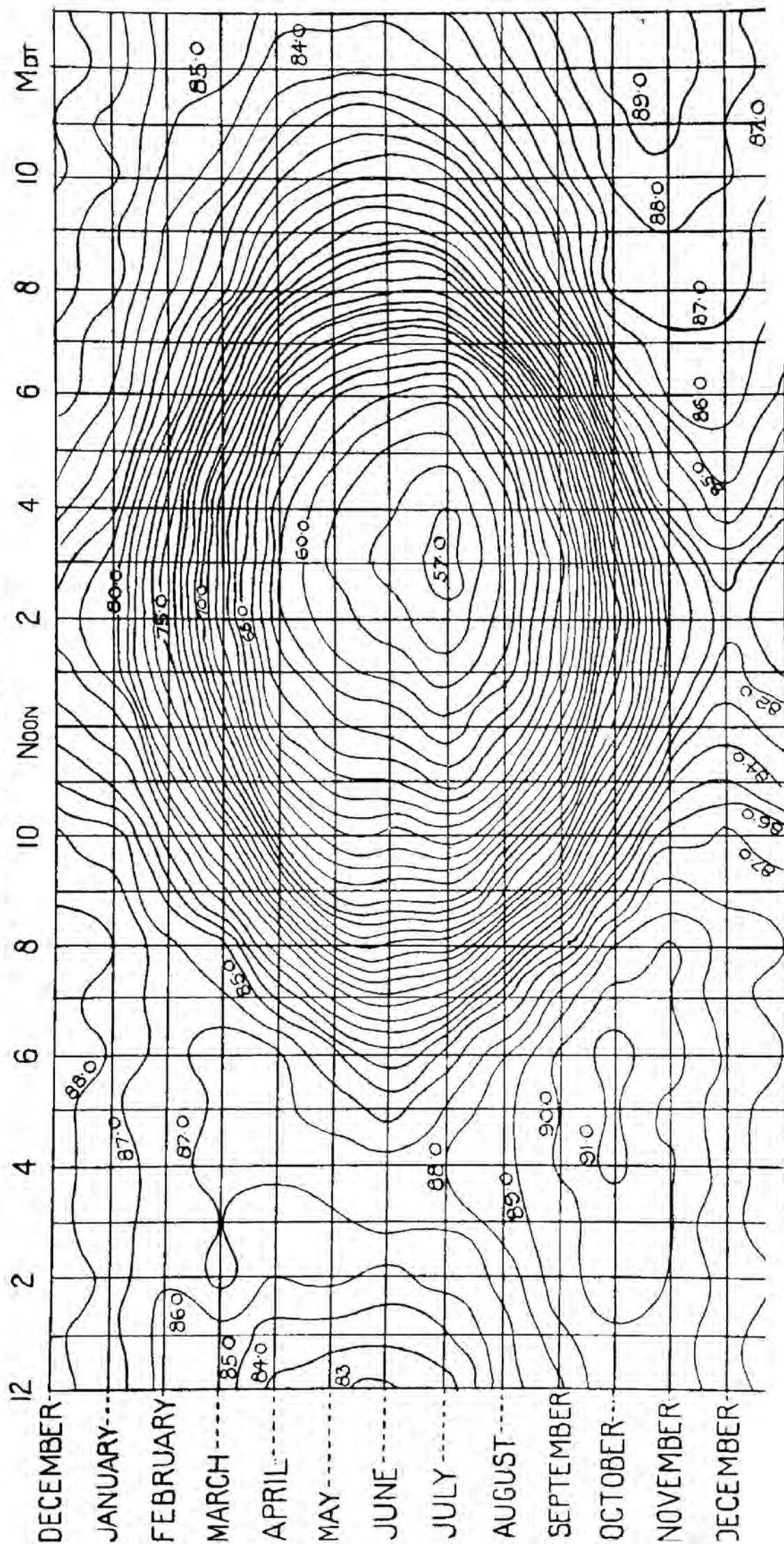
Fishery Barometers.—Inspectors of the Fisheries Board for Scotland, the Department of Agriculture and Technical Instruction in Ireland, and of the Board of Agriculture and Fisheries in England and Wales have continued to examine and report upon the barometers supplied for the use of fishermen in their respective districts. The stations supplied with these barometers now number 226, of which 64 are in England, 6 in Wales, 61 in Ireland, 90 in Scotland, 4 in the Isle of Man, and 1 in Jersey. The fishery barometers at West Mersea, Fleetwood, Moville Town, Carloway, and Boreray have been renewed.

NORMAL METEOROLOGICAL OBSERVATORIES, ANEMOGRAPH AND SUNSHINE STATIONS.

Observatories.—The work of the four observatories connected with the Office has been carried on as usual. As examples of results obtained from the hourly tabulation of self-recording instruments, diagrams representing the diurnal and seasonal variation of the humidity of the air at Kew and Aberdeen are here produced. (Plates VI. and VII.).

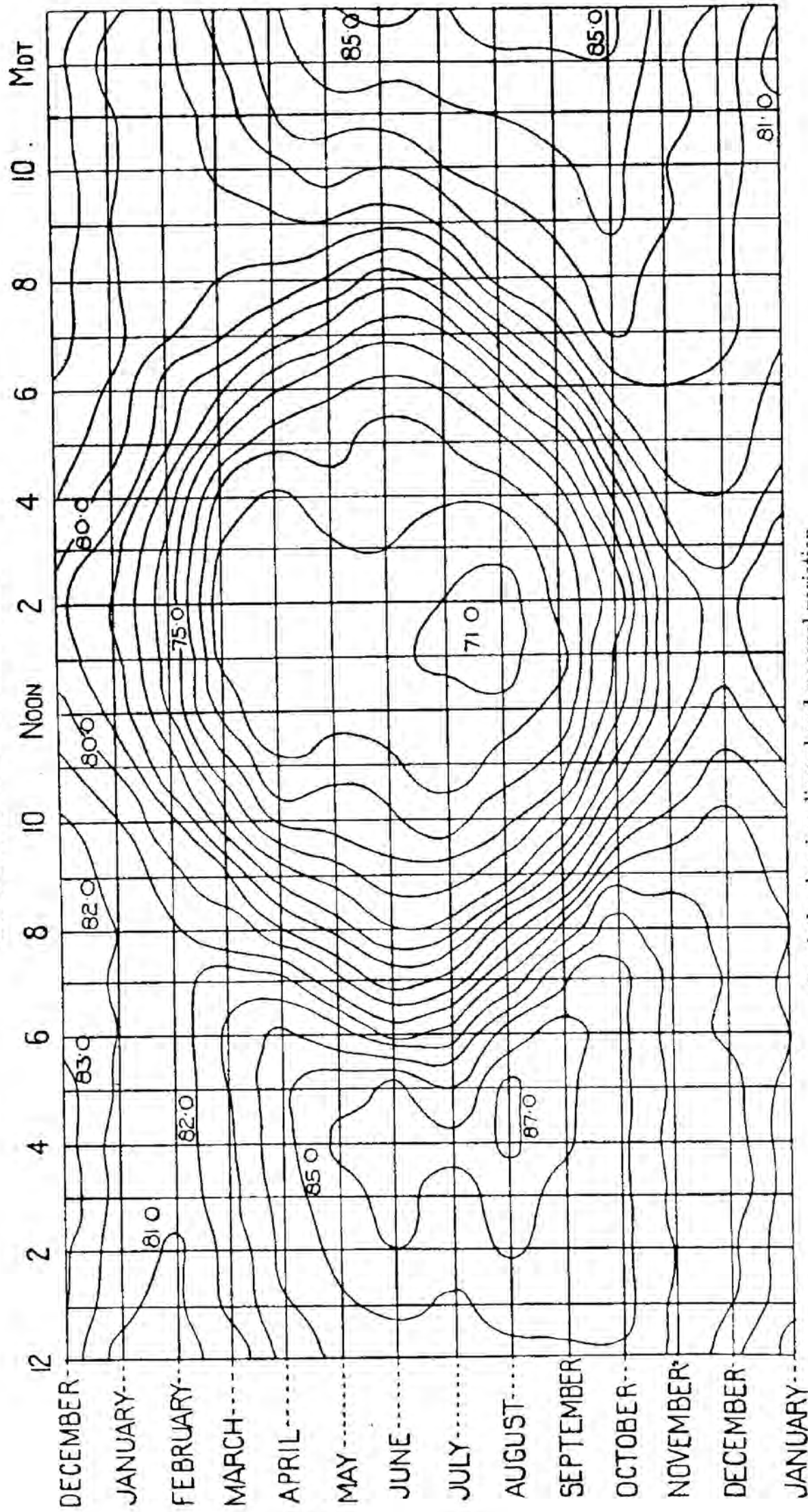
Anemograph Stations.—The number of anemograph stations which are maintained by the Office, or from which records are regularly

RELATIVE HUMIDITY. IN PERCENTAGES. KEW. 20 YEARS MEAN, 1886 - 1905.



Isopleths showing diurnal and seasonal variation.

RELATIVE HUMIDITY _ IN PERCENTAGES _ ABERDEEN 20 YEARS MEAN _ 1886-1905.



Isopleths showing diurnal and seasonal variation.

received at the Office, is now 26. The autograph records are tabulated week by week, so that the information they contain may become available for public use without delay. Information from a selection of them is published monthly with the observations at stations of the second order (*British Meteorological Year Book*, Part III.), and an annual summary of gales is published as an appendix to the *Weekly Report* (*Year Book*, Part I.).

Records of Sunshine.—The number of stations from which returns of "bright" sunshine are received continues to increase, and at the close of the year amounted to 151. With three exceptions they are all situated in the British Isles, the exceptions being Georgetown, British Guiana; the Falkland Islands; and Chin-kiang, China. The original records from 120 stations are retained in the Office, whilst those from the remainder are sent to the Office monthly for examination and are then returned.

V.—INVESTIGATION OF THE UPPER AIR.

The general scheme of operations at Pyrton Hill under the direction of Mr. W. H. Dines, F.R.S., has remained unchanged during the year.

International Co-operation.—The dates fixed by the International Commission for Scientific Aeronautics as days of international co-operation in 1909 were:—January 11, 12, 13; February 4; March 4; March 31, April 1, 2; May 6; June 3; June 30, July 1, 2; August 5; September 2; October 6, 7, 8; November 4; December 6, 7, 8, 9, 10, 11.

The last named constituted the special international week for which the Office arranged to conduct observations at Crinan, Argyllshire, as well as at Pyrton Hill, while the Joint Committee of the Royal Meteorological Society and the British Association for the Advancement of Science made arrangements for observations to be made at Dhulough, Co. Galway, by Captain C. H. Ley, late R.E., and at Barbados, by Professor d'Albuquerque, with the assistance of other officials of the Colonial Government. Throughout the year ended 31st December, 1909, the operations of the aerological station of Manchester University at Glossop Moor were continued with great activity and on June 2nd and 3rd, 25 balloons carrying self-recording instruments were sent up within 24 hours. Observations were also undertaken by Mr. C. J. P. Cave, at Ditcham Park, and by Mr. S. H. R. Salmon, at Brighton, who co-operated in the international scheme throughout the year. Special observations of clouds on the days of international ascents and the days preceding were made at the observatories of Greenwich, Kew, Aberdeen, and Valencia.

The observations are partly by means of kites and partly by balloons carrying self-recording instruments, partly also by pilot balloons which are observed from below.

Kite and Balloon Ascents at Pyrton Hill and Crinan.—At Pyrton Hill, kites carrying recording apparatus were sent up on 93 occasions during the year 1909. The only accidents that occurred were on January 18th, and October 15th, when kites broke away owing to the excessive strain on the wire in high winds.

Thirty-one balloons carrying instruments recording temperature and height were sent up from Pryton Hill, in 1909. Each balloon carried a card offering a reward of 5s. to the finder upon receipt of the instrument undamaged. In 14 cases out of the 31 the instrument was found and the reward claimed. Eight balloons were liberated from Crinan and three instruments were returned.

These proportions are unfortunately exceptionally small as compared with other stations.

Publication and Discussion of Results.—The results of all the kite and balloon ascents are published in the British Meteorological Year Book, Part I. (Weekly Weather Report). Observations made on the days appointed by the International Commission were forwarded to Professor Hergesell of Strassburg for publication also in international form along with the results obtained simultaneously in other countries.

The contribution to the publication of the results at Strassburg by international arrangement has been continued. The latest issue of the publication received before the close of the financial year, 31st March, 1910, was that for May, 1908.

The results as regards wind velocity for all the kite ascents in 1908 and 1909 have been plotted on diagrams to show the variation with height for the stratum of the atmosphere up to 1,000 metres (3,330 feet) above sea level, in order that information on the subject may be available for the use of aeronauts.

The Report on Apparatus and Methods in use at Pryton Hill, noticed in last year's report, has already been referred to, pp. 6 and 12.

Nearly all the recording instruments for use at the co-operating stations of the British Isles during the year were made at Pryton Hill.

VI.—CORRESPONDENCE AND ACCOUNTS BRANCH.

Appendix I., p. 42, shows the receipts and payments during the year ended 31st March, 1910. The amount voted by Parliament was £15,900, and the miscellaneous receipts amounted to £4,297 9s. 8d.

The following abstract shows approximately the net payments of this and the preceding year, together with the increase or decrease in 1909-10, as compared with the previous year:—

NET EXPENDITURE.	1908-9.	1909-10.	Increase.	Decrease.
GENERAL ADMINISTRATION:	£	£	£	£
Director	1,000	1,000	—	—
Office Salaries	6,802	6,996	194	—
Rent, Fuel, and Lighting...	719	727	8	—
Alterations to premises and contingencies	74	—	—	74
Postage	493	588	95	—
TELEGRAMS, &c.	1,474	1,615	141	—
TRAVELLING EXPENSES ...	315	341	26	—
INSTRUMENTS	381	531	150	—
ALLOWANCES TO OBSERVATORIES, &c.	3,183	3,174	—	9
SUPERANNUATION ACCOUNT	1,191	1,092	—	99
Total £	15,632	16,064	614	182

The following notes explain the chief causes of variation in the year 1909-10.

The decrease under superannuation and part of the increase under salaries are due to changes in the amount invested, the lapse of a pension of £144 and the consequent revision of salaries.

The increase of £141 for telegrams shows only part of the charges incurred for wireless telegrams as the accounts rendered covered only eight months. The payments under this head are also reduced on account of an unusually low charge for storm warning telegrams (*see* p. 32).

The increase under instruments is due to the increase of office stock and to repayments outstanding at the close of the year.

W. N. SHAW,
Chairman.

July 6, 1910.

APPENDICES.

APPENDIX I.

ACCOUNT OF RECEIPTS AND PAYMENTS for the year ended 31st March, 1910 :—

RECEIPTS.				PAYMENTS.			
	£	s.	d.		£	s.	d.
Balance from year 1908-09	—		2,327 10 4	Director	—		1,000 0 0
Parliamentary vote ..	—		15,900 0 0	OFFICE SALARIES:			
DEPARTMENTAL EXPENSES REPAID:				Clerical Staff, monthly	2,507 15 0		
Forecasts, &c.	175	3	4	" " weekly ..	437 6 10		
Marine, Statistics, and				Messengers, " ..	230 6 8		
Observatories	83	3	3		305 4 6		7,390 13 0
Instruments	136	7	6	OFFICE EXPENSES:			
			394 11 1	Rent, Fuel, &c.	727 0 8		
INCIDENTAL EXPENSES				Furniture, Fittings, &c.	123 4 11		
REPAID:				Incidental	277 12 3		1,127 17 10
Forecasts, &c.	365	15	3	POSTAGE AND TELE-			
Other Branches	98	18	6	GRAMS:			
Stationery Office Ac-				General Postage ..	270 6 5		
count	53	4	1	Postage of Daily			
			517 18 1	Weather Reports ..	317 13 6		
TELEGRAPH CHARGES				Telegrams, &c.	2,201 7 2		2,789 7 1
REPAID:				TRAVELLING EXPENSES			
Home	139	18	1	AND INSPECTIONS ..	—		341 6 7
Telegrams sent abroad	446	8	11				
			586 7 0	SUPERANNUATION ..	—		1,720 13 0
INSTRUMENTS:				COSTS OF INSTRUMENTS:			
Royal Navy	510	5	5	Royal Navy	510 5 5		
Mercantile Marine, Sta-				Mercantile Marine, Sta-			
tions, &c.	1,208	9	11	tions, &c.	1,779 14 10		2,290 0 3
			1,758 15 4	ALLOWANCES FOR OB-			
SUPERANNUATION AC-				SERVATORIES, OB-			
COUNT:				SERVERS, &c.	—		3,273 4 2
Annuities	566	5	0	LECTURES AND EXPERI-			
Interest on Investment	52	19	0	MENTS	—		385 2 8
Income Tax returned ..	9	7	6	BALANCE:			
			628 11 6	Cash at Bank	2,153 0 4		
LECTURES AND EXPERI-				" " at Office	38 14 4		
MENTS	—		411 3 8	Advance for Inspec-			
				tions	15 0 0		2,206 14 8
							£22,525 0 0
			£22,525 0 0				

Note.—On 31st March, 1910, the amount of 2½ per cent. Annuities held for the provision of Superannuation Annuities was £2,761 1s. 3d.

APPENDICES.

APPENDIX I.

ACCOUNT of RECEIPTS and PAYMENTS for the year ended 31st March,
1910 :—

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance from year 1908-09	2,327	10 4	Director	1,000	0 0
Parliamentary vote ..	15,900	0 0	OFFICE SALARIES:		
DEPARTMENTAL EXPENSES REPAID:			Clerical Staff, monthly	2,507	15 0
Forecasts, &c.	175	3 4	" " weekly..	4,347	6 10
Marine, Statistics, and			Messengers, " ..	230	6 8
Observatories	83	3 3		305	4 6
Instruments	136	7 6			7,390 13 0
	394	14 1	OFFICE EXPENSES:		
INCIDENTAL EXPENSES REPAID:			Rent, Fuel, &c.	727	0 8
Forecasts, &c.	365	15 3	Furniture, Fittings, &c.	123	4 11
Other Branches	98	18 6	Incidental	277	12 3
Stationery Office Account	53	4 4			1,127 17 10
	517	18 1	POSTAGE AND TELEGRAMS:		
TELEGRAPH CHARGES REPAID:			General Postage	270	0 5
Home	139	18 1	Postage of Daily		
Telegrams sent abroad	446	8 11	Weather Reports ..	317	13 6
	586	7 0	Telegrams, &c.	2,201	7 2
INSTRUMENTS:					2,789 7 1
Royal Navy	510	5 5	TRAVELLING EXPENSES AND INSPECTIONS ..	—	341 6 7
Mercantile Marine, Stations, &c.	1,248	9 11	SUPERANNUATION ..	—	1,730 13 9
	1,758	15 4	COSTS OF INSTRUMENTS:		
SUPERANNUATION ACCOUNT:			Royal Navy	510	5 5
Annuities	506	5 0	Mercantile Marine, Stations, &c.	1,779	14 10
Interest on Investment	52	19 0			2,290 0 3
Income Tax returned ..	9	7 6	ALLOWANCES FOR OBSERVATORIES, OBSERVERS, &c. ..	—	3,273 4 2
	628	11 6	LECTURES AND EXPERIMENTS	—	385 2 8
LECTURES AND EXPERIMENTS	—	411 3 8	BALANCE:		
			Cash at Bank	2,153	0 4
			" at Office	38	14 4
			Advance for Inspections	15	0 0
					2,206 14 8
	£22,525	0 0		£22,525	0 0

Note.—On 31st March, 1910, the amount of 2½ per cent. Annuities held for the provision of Superannuation Annuities was £2,761 1s. 3d.

APPENDIX II.

STATEMENT OF PROVISIONS FOR THE SUPPLY OF
INFORMATION TO THE PUBLIC, 1910-11.

THE METEOROLOGICAL OFFICE.

The office was established in 1854 as a department of the Board of Trade. From 1866 to 1877, with a Parliamentary Grant in Aid, it was under the management of a Committee, and from 1877 to 1905 under a Council appointed by the Royal Society. It is now under the control of a Director and Committee appointed by H.M. Treasury.

Kew Observatory and the Eskdalemuir Magnetic Observatory were transferred from the National Physical Laboratory, July 1, 1910, with subventions from the Royal Society. The Gassiot Committee appointed by the Royal Society consisting of the officers of the Society and eleven other members acts as an Advisory Committee for the work at the Observatories.

Director :

WILLIAM NAPIER SHAW, LL.D., Sc.D., F.R.S.

Marine Superintendent :

Commander M. W. CAMPBELL HEPWORTH, C.B., R.D., R.N.R.

Superintendent of Statistics :

R. G. K. LEMPERT, M.A.

Superintendent of Instruments :

R. H. CURTIS.

Chief Clerk and Cashier :

JOHN A. CURTIS.

OFFICE PREMISES.

63, Victoria Street, S.W., till September 30th, 1910.

Exhibition Road, South Kensington, from October 1st, 1910.

Telegraphic address—"Weather, London."

Office hours and general arrangements.—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 inquiries for forecasts and for information concerning the present weather conditions (*see* Section B, Telegraphic Information) from 8.30 a.m. to 8 p.m. on week days, and from 6 p.m. to 8 p.m. on Sundays.

Supply of Information and Charges.—The books and documents in the Office library, and the manuscript returns in the possession of the Office, may be consulted or copied at the Office, free of charge, by any person, by permission of the Director. Extracts from them

are supplied to any person making written application to the Director 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 usual minimum charge is 5s. There are certain special exceptions with a smaller charge; a schedule of these will be sent on application.

The extracts will, if required, be attested by a sworn declaration before a Commissioner for Oaths, at a fee of £1 1s. (in addition to the charge of 1s. 6d. made by the Commissioner for Oaths). A special fee of from £2 2s. for each day's attendance is charged if a representative is required to attend in court in London with reference to the statements contained in the extracts supplied.

The facilities for the supply of information have been classified under the following heads:—

A. Marine Information.

B. Telegraphic Information.

Daily Weather Reports, Forecasts and Storm Warnings.

C. Statistical Information.

The British Meteorological Year Book—

Part I., Weekly Weather Report.

Part II., Monthly Weather Report.

Part III., Observations at Stations of the Second Order and at Anemograph Stations.

Part IV., Hourly Readings from the Self-Recording Instruments at Four Observatories.

Unpublished Observations.

D. Information from land stations outside the British Isles.

E. The Library.

F. Supply of Instruments and Forms to Observers.

Fishery Barometers.

G. Publication of Observations contributed by Volunteer Observers or by the Representatives of Local Authorities.

H. Regulations for the Supply of Information from Instruments belonging to the Meteorological Office by the Custodians of the Instruments.

I. Observatories and Stations in connexion with the Meteorological Office.

K. List of Publications.

A.—MARINE INFORMATION.

General Information.—Observations have been forwarded to the Office, in special log books and registers, since 1855, by officers of the Royal Navy and the Mercantile Marine, and this valuable co-operation continues. In addition a large number of logs and remark books kept on board H.M. ships have been lent to the Office by the Admiralty, and by the large shipping firms, from time to time, for the purpose of extracting meteorological data. The information thus received is dealt with in various ways, and the results, which are published for the benefit of seamen and others, are indicated on pp. 95 to 96. Copies of these publications are presented from time to time to officers who contribute regular returns.

Information is given to seamen, upon application to the Meteorological Office, either in person or by letter, with respect to the meteorological conditions likely to prevail along a proposed route, either for sailing vessels or for steamships.

Monthly Charts.—Meteorological Charts of the North Atlantic and Mediterranean have appeared each month since 1901, and a similar monthly series for the Indian Ocean and Red Sea since May, 1906. On the face of these charts there are graphically represented, for the respective ocean areas, the normal winds, currents, distribution of atmospheric pressure, and temperature of air and sea surface, the magnetic variation, and the best routes for sailing vessels and steamships, according to the season. On the North Atlantic charts, in addition, there are given the average limits of trade winds, gales, fog, and ice, mean paths of centres of cyclones, storm signals, and wireless telegraphy stations; time of high water at Dover; recent reports of ice, including, in the months of April, May, June, November and December, the latest intelligence, by cablegram, from the Signal Service of Canada, in regard to the state of the ice in the Gulf of St. Lawrence and its approaches. On the Indian Ocean charts there are given the average limits of trade winds and monsoons, surface temperature and currents near Cape Guardafui; information relative to the meteorology of the Red Sea, and tracks of cyclones in the Indian Ocean and the Arabian Sea. During the south-west monsoon season, important cable notices from the Director General of Indian Observatories, with respect to the state of the weather conditions in the Arabian Sea and Bay of Bengal are also given.

Daily Synoptic Charts of the N. Atlantic. **Weekly Charts of Sea Temperature.**—Since April, 1910, the charts of the North Atlantic and Mediterranean have been issued in weekly instalments. This arrangement affords an opportunity of including on the backs of the charts seven maps giving the distribution of pressure and other elements on each day of the week ended on the day before the issue of the chart, over Europe, the North Atlantic, and the East of America. The charts are prepared from reports received from land stations in Europe in connection with the telegraphic work of the Office, from reports from ships of His Majesty's navy and the mercantile marine, received by wireless telegraphy and from the information for American stations published in the *Bulletin International*, issued by the Bureau Central Météorologique in Paris. Five charts are also shown giving for successive periods of seven days the most recent information regarding the temperature of the sea water in the North Atlantic. The most recent information as to the occurrence of ice both in the Gulf of St. Lawrence and in the open ocean, and as to derelicts is also included.

Special Articles.—The special features of the current issue of the Meteorological Charts of the North Atlantic and Mediterranean, include monthly inset charts showing the percentages of fog, mist, and gales over the North Atlantic for each month; the latest information to hand up to the time of going to press each month with respect to ice in the Southern Ocean.

On the backs of the Meteorological Charts of the Indian Ocean and Red Sea information has been given relative to various subjects

which are of importance to navigators and others, including a comprehensive account of Southern Ocean ice; results of meteorological observations on the shores of the Red Sea; a monthly statement of currents experienced by the cable steamer *Sherard Osborn* near the East Coast of Africa between 1906 and 1908; and cyclone tracks of the South Indian Ocean.

Terms of Subscription.—Copies of both series of charts may be obtained from the Superintendents of the Mercantile Marine Offices at the principal ports of the United Kingdom, by captains and officers of merchant ships, price 6*d.* each. They may also be purchased from the Admiralty agents for the sale of charts, and from the agents for His Majesty's Stationery Office at Edinburgh, and at Dublin, at the rate of 5*s.* for an annual series of 12 charts, or 6*d.* for each chart, in addition to the cost of transmission. The Indian Ocean Charts are also obtainable on similar or equivalent terms from Messrs. James Murray and Company, at Calcutta, and at the shipping offices at Bombay and Madras. Captains and officers who co-operate with the Meteorological Office by sending regular reports receive copies of the Monthly Meteorological Charts free.

Dates of Issue of the Charts.—The weekly instalments of the Monthly Charts of the North Atlantic and Mediterranean appear on Thursday of each week. The Charts of the Indian Ocean are published on the 1st day of the month preceding that to which the information refers.

Instruments for Observers.—Subject to certain regulations the instruments necessary for the keeping of a Meteorological Log Book will be lent by the Office to the captains of British ships who undertake to make regular four-hourly records during their voyages to and from foreign ports, enter them in the specially arranged log book provided for the purpose, and return the latter, on completion, to the Marine Superintendent. A rough book for entering up the observations when taken, is also supplied, and this becomes the property of the captain for future reference. The set of instruments lent to captains by the Meteorological Office comprises one mercury barometer, six thermometers, with screen, for registering the shade temperature of the external air and the temperature of the sea surface, and four hydrometers. The expenses incurred by the co-operating captains with respect to postage of log books and the transit of instruments, are borne by the Meteorological Office.

The ships are supplied either directly from the Meteorological Office or through the following agents:—

Cardiff—Captain J. Weir, Examiner of Masters and Mates,
Local Marine Board.

Dundee.

Glasgow—Messrs. D. McGregor & Co., Ltd., 57, Bothwell
Street.

Greenock—Messrs. D. McGregor & Co., Ltd., 32, Brynmner
Street.

Hull—Captain W. Ellery, Examiner of Masters and Mates
Mercantile Marine Office.

Liverpool—Commander F. M. Sergeant, R.N.R., Chief Examiner and Secretary, Local Marine Board, Canning Place (E.).

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.

B.—TELEGRAPHIC INFORMATION.

DAILY WEATHER REPORTS. FORECASTS AND STORM WARNINGS.

Between 7.15 a.m. and 9.30 a.m. telegraphic messages are received daily, reporting meteorological observations at 29 stations (marked T in list of stations, pp. 68 to 86) in the British Isles, chiefly on the coast, at 39 stations (p. 87) on the Continent of Europe including Gibraltar and at the Azores, at five stations in Iceland and one in the Færøe Islands. The observations are now made at 7 a.m. at all stations, except Birr Castle, Oxford, Lisbon, and the Azores. 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. The observations received from Iceland give only the readings of the barometer and the dry bulb thermometer, the direction and force of the wind, and the state of the weather.

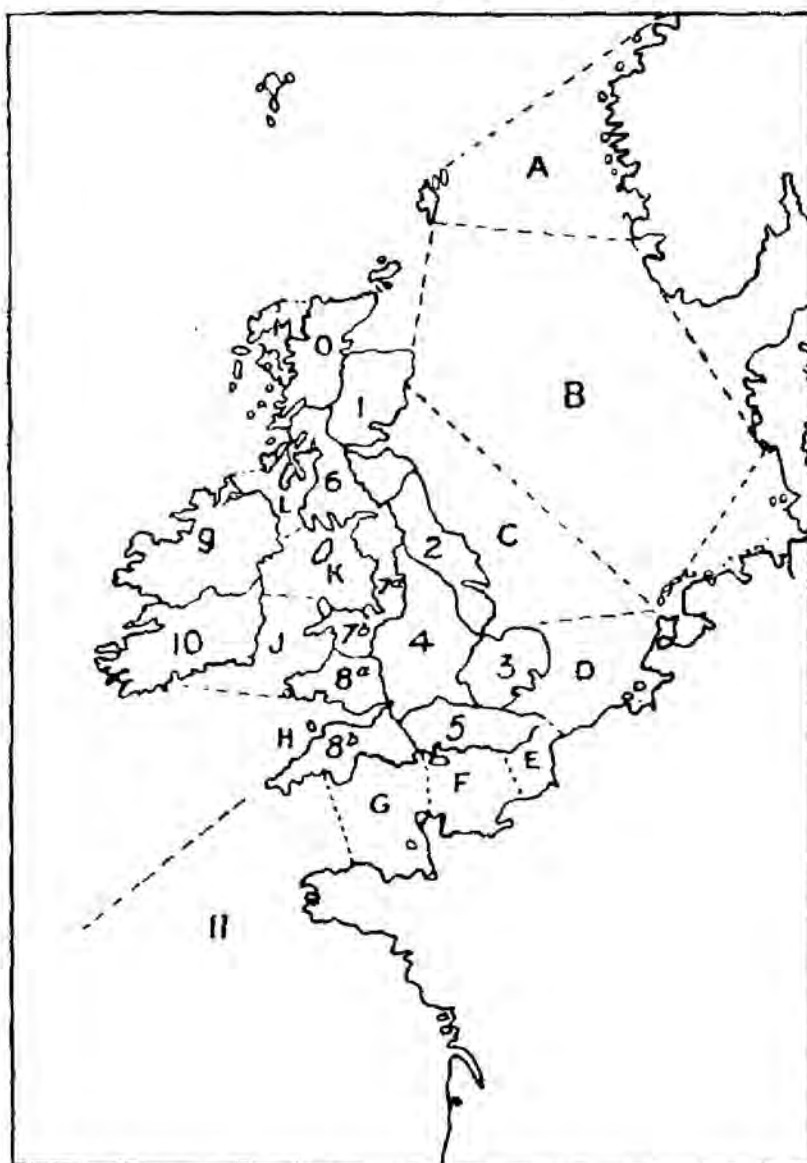
These reports are supplemented by a number of additional observations made at various stations in the United Kingdom, and sent either by telegram or by post, by private persons or local officials. Moreover, the "Bulletin International" published in Paris, reproducing meteorological telegrams from the 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.

Through the courtesy of the Lords Commissioners of the Admiralty occasional reports of observations at sea off our southern and western coasts are transmitted by wireless telegraphy from the ships of H.M. Navy. Wireless reports are also received almost daily from ocean liners crossing the Atlantic.

The telegraphic information is tabulated and charted by about 9 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, the twenty-four hours following the next noon, or midnight, as the case may be, are formulated; a note as to the further outlook is added if the meteorological conditions are such as to justify an anticipation for more than twenty-four hours ahead.

At a selection of stations additional observations are taken and telegraphed to the Office at 1 p.m., and occasionally modifications are made in the morning forecasts as a result of these observations. This information is usually available by 3 p.m.

Forecast Districts.—For the purposes of forecasts of weather the region of the British Isles is divided into land districts and sea districts, as indicated in the accompanying map.



FORECAST DISTRICTS.

LAND.*	SEA.
0. SCOTLAND, { (a.) Islands. (b.) Mainland.	A. SHETLAND AND THE NAZE.
1. SCOTLAND, EAST.	B. GREAT FISHERY AND DOGGER BANKS.
2. ENGLAND, { (a.) North. (b.) South.	C. NORTH SEA, North of the Wash.
3. ENGLAND, EAST.	D. NORTH SEA, South of the Wash.
4. MIDLAND COUNTIES, { (a.) East. (b.) West.	E. STRAITS OF DOVER.
5. ENGLAND, SOUTH-EAST.	F. ENGLISH CHANNEL, East of the Isle of Wight.
6. { (a.) SCOTLAND, WEST. (b.) ISLE OF MAN.	G. ENGLISH CHANNEL, West of the Isle of Wight.
7. { (a.) ENGLAND, N.W. (b.) NORTH WALES.	H. BRISTOL CHANNEL.
8. { (a.) SOUTH WALES. (b.) ENGLAND, S.W.	J. ST. GEORGE'S CHANNEL.
9. IRELAND, { (a.) West. (b.) East.	K. IRISH SEA.
10. IRELAND, { (a.) East. (b.) West.	L. NORTH CHANNEL.
11. MOUTH OF CHANNEL and Bay of Biscay.	M. THE MINCH.

* For the grouping of the counties to represent approximately the forecast districts, see List of Stations, pp. 68 to 86.

THE DISTRIBUTION OF FORECASTS AND TELEGRAPHIC INTELLIGENCE.

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 the weather prospects for the several districts of the British Isles and for the Bay of Biscay, is prepared for press and sent to the lithographers at 11 a.m. daily, except on Sundays and Bank Holidays. It is ready for issue by 1 p.m., and is then delivered by hand or posted by book post at 1.30 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 in advance at the Meteorological Office of the cost of transmission (postage and wrappers). The subscription for this service, if for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c., is at the rate of £1 per annum for delivery by book post, £2 for delivery, where feasible, by hand. Copies for other periods than the official quarters of a year are charged at the rate of 2s. for a complete month and 1d. per copy for periods of less than a month. Single copies, price 1d. each, can be obtained after 2 p.m. on the day of issue at the Office, and at the railway bookstalls at the following terminus stations:—Victoria (L.B.S.C., and S.E. & C. Railways), Charing Cross, King's Cross, St. Pancras, Euston.

Reports for Educational Purposes.—By arrangement with H.M. Stationery Office, upon giving the necessary notice, additional copies of the Daily Weather Report for one day, or a succession of days, will be printed off and supplied for class use at the rate of 7d. for 10 copies, exclusive of postage.

Surplus copies of charts prepared for exhibition, or of back numbers of the Daily Report, are available for educational purposes upon application to the Director. No charge is made for this service, but the cost of postage must be defrayed.

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 10 a.m. and 8 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 Director, 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.

The Director will also arrange for the supply of 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.

Public Exhibition.—The latest reports and forecasts for the land districts and for the Western Channel and Bay of Biscay, with a map, are exhibited as early as possible, for the information of the public, at the entrance to the Office, and, by the courtesy of His Majesty's Office of Works, in St. James's Park, opposite the Horse Guards. Abbreviated reports for a few coast stations are displayed in the street, on the balcony of the Office. Forecasts for the sea districts, with notes on the probable tides, are exhibited on a screen outside the Inquiry Branch of the Office.

Typewritten copies of the morning forecasts for all districts are ready at 10 a.m., and are distributed by hand to clubs and societies situated in or near Pall Mall at a charge of 10s. per annum. They are sent by post at a charge of 2s. 6d. 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.

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

Written Special Forecasts.—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 6d. 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 also be obtained.

Inquiries by Telegraph.—By arrangement with H.M. Postmaster-General (*see* the Post Office Guide, "Meteorological Telegrams"), 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 6d. 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 [Essex].

or,

Next forecast for [Dublin].

From

(Name),

(Address).

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 6d. 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 10 a.m. and 7.30 p.m. To avoid delay, letters

of request for telegraphic information or forecasts should be marked on the outside "Forecast Branch."

Inquiries by Telephone.—Forecasts will be sent in reply to inquiries by telephone if a sum has been previously deposited with the Office to cover the authorised charges for departmental expenses. Further information as to the service by telephone can be obtained on application at the Office.*

Harvest Forecasts.—Arrangements have been made for a special service of afternoon reports during the season of the Hay and Corn Harvests (June 1st to September 30th), with a view to a special series of forecasts daily (Sundays excepted) at 2.30 p.m. The forecasts for any district are supplied by telegraph to agriculturists and others upon prepayment of the cost of the telegrams (twelve 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.

Notification of Spell of Settled Weather.—The Office is prepared to send notification by telegram when the conditions appear favourable for a spell of settled fine weather. The notification will take the form of a forecast covering a period of not less than two days following the date of issue. Those who wish this notification to be sent must deposit a fee of 2s. 6d., which includes the cost of the telegram.

The deposit must be repeated if a second notification is required.

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.

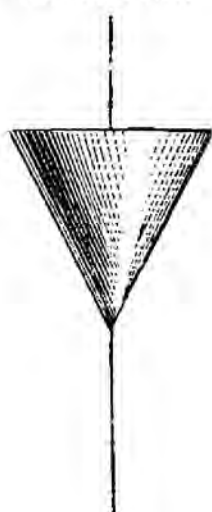
At dusk, whenever a signal ought to be flying if it were daylight, a night signal, consisting of three lanterns hung on a triangular frame, should be hoisted in place of the cone.

* *Note.*—A forecast is a statement of the weather to be expected during the period to which the forecast refers, arranged, generally speaking, as follows:—Direction and force of the wind, state of the sky as regards cloud, prospect of rain, snow, or thunder, temperature, and, in the case of the sea districts, sea disturbance. For example, the forecast for a land district referring to the twenty-four hours from the following noon or midnight, according to the time of issue, may read: "Light south-easterly to easterly winds; fine at first, cloudy later, with local thunder showers. Becoming cooler." The forecast for a sea district may read: "Strong southerly and south westerly winds, with squally, showery weather and a rough sea."

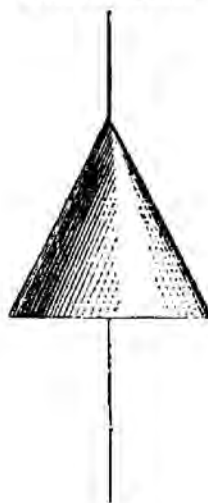
STORM SIGNALS EXHIBITED.

DAY SIGNALS.

South Cone.



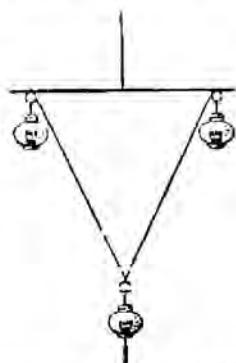
North Cone.



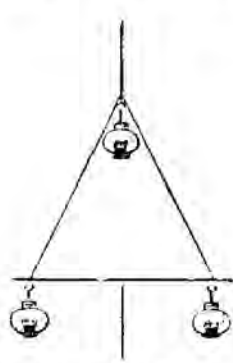
NIGHT SIGNALS

(Instead of the cone), Lights in Triangle.

For South Cone.



For North Cone.



Three lanterns and one yard, 4 ft. long, will be sufficient.

The “*South*” *Cone* (point downwards) is hoisted for gales and strong winds—

From S.E., veering to S.W., W., or N.W.,
 „ S.W., veering to W. or N.W.,
 „ W., veering to N.W.,
 and also from E., veering to S. or S.W.

The “*North*” *Cone* (point upwards) is hoisted for gales and strong winds—

From S.E., E., or N.E., backing to N.,
 „ N.W., veering to N., N.E., or E.,
 „ N., veering to N.E. or E.,
 „ N.E., veering to E.

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, point downwards (for South Cone), or point upwards (for North Cone), as the case may be. The lamps should be kept burning until, say, 9 or 10 o'clock.

Gales sometimes follow one another in quick succession. An order to “*Keep up*” will be sent if the warning is to be continued beyond the ordinary limits ; and an order to “*Lower*” will be sent if there

is reason to believe that danger is over before the regular time has lapsed.

If a gale has commenced before warnings are issued, notice to hoist the cone will still be sent if it is expected that the gale will continue, or increase in force, but not otherwise.

Sudden Shifts of Wind.—A Southerly gale often *veers* quickly to a point North of West, but a gale from the Eastward is more likely to *back* to the Northward.

It is important to bear this in mind, especially in anchorages or harbours exposed to the Northward.

Meaning of Signal.—The signal shows that an atmospheric disturbance is in existence which will *probably* cause a gale, from the quarter indicated, within a distance of (say) 50 miles of the place where the signal is hoisted. The Signal Station itself is sometimes comparatively sheltered. The meaning of the signal is simply, "Look out! Bad weather of such and such a character is probably approaching you."

The warning is intended to continue from the time the telegram leaves the Meteorological Office until 8 o'clock on the evening of the following day.

The Meteorological Office supplies the canvas cone and a card providing space for the exhibition of the telegrams and giving information as to the meaning of the warnings, but it does not supply the lanterns for night signals. 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.

LIST OF STORM SIGNAL STATIONS.

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., Thurso, Dunnet Head, Wick, Tarbet Ness L.H., Cromarty, 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, Buckhaven, Methil, Wemyss West, Burntisland, *Grangemouth, Bo'ness, Granton, *Newhaven, †Leith, Fisherrow, *Dunbar, Cockburnspath, St. Abb's Head, Eyemouth.

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

Scotland, W.—*Glasgow, Greenock, Rothesay, Lamnish, Carradale, Campbeltown, 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.

* Telegrams only exhibited.

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

WESTERN.

Ireland, S.—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, Dingle, Tralee, †Limerick, Loophead L.H., Galway.

Ireland, N.—Killybegs L.H., Tory Island L.H., Lough Swilley L.H., Rathmullen, Malin Head, Mulroy, Portrush, Port Ballintrae, Ballycastle.

Irish Sea.—Belfast, Donaghadee, Howth, Kingstown, Point of Ayre, Ramsey, Douglas, Silloth, Maryport, Workington, Whitehaven, Barrow, Walney Island L.H., Morecambe, Fleetwood, Blackpool, Lytham, Preston, †Southport, Formby, Liverpool, Runcorn, New Brighton, Hoylake, New Ferry, Penmaenmawr, Port Penrhyn, Point Lynas L.H., Holyhead, South Stack L.H., Carnarvon, Port Dinorwic.

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

Bristol Channel.—Caldy L.H., †Tenby, Pembrey, Llanelly, Swansea, Briton Ferry, Porthcawl, Nash L.H., Penarth, Cardiff (Bute Dock and Barry Dock), Newport, Weston-super-Mare, Burnham, *Bridgwater, Ilfracombe, Bull Point L.H., *Barnstaple, Appledore, Hartland Point L.H., Lundy Island, 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, Plymouth (*Millbay Docks), Devonport (Mount Wise and the †Dockyard), Prawle Point, Salcombe (2 stations), Teignmouth, Exmouth.

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

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

EASTERN.

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

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

* Telegrams only exhibited.

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

C.—STATISTICAL INFORMATION.

THE BRITISH METEOROLOGICAL YEAR BOOK.

Terms of Subscription.—The Statistical Publications of the Office have been grouped together under the general title “British Meteorological Year Book.” For 1909 the Year Book consists of four parts, as follows :—

Part I.—The Weekly Weather Report. Issued on Thursday of each week. Price 6*d.* per number. Annual subscription (which includes the Monthly Weather Report, *see* below) 30*s.* postage paid. The appendices to the report can be obtained separately, price from 4*d.* each.

Part II.—The Monthly Weather Report with an annual summary. Issued on the 27th of each month as supplement to the Weekly Weather Report. Price 6*d.* each issue.

Part III.—Observations at Stations of the Second Order and at Anemograph Stations. Issued in monthly parts, within about six weeks of the close of each month. Price 1*s.* 6*d.* each issue. Annual Volume consisting of 12 monthly numbers with Introduction, Title Page and Map, 16*s.*

Part IV.—Hourly Readings at the four Observatories in Connexion with the Meteorological Office. Issued in monthly sections for each observatory within about six weeks of the close of each month. Price 6*d.* each section. Annual Volume with Title Page and Introduction, 25*s.*

Parts I. and II. of the Year Book can be purchased either directly or through any bookseller from the Agents to H.M. Stationery Office, Messrs. Wyman & Sons, Fetter Lane, E.C., Oliver and Boyd, Edinburgh and E. Ponsonby, 116, Grafton Street, Dublin. Parts III. and IV. are on sale at the Meteorological Office only. (For terms of subscription to the Daily Weather Report, *see* p. 49.)

Copies of the British Meteorological Year Book are sent to the following public libraries and private institutions in London, viz.:—

The British Museum ; Guildhall Library ; Imperial Institute ; Royal Botanic Gardens* ; Royal Society ; Royal Astronomical Society ; Royal Meteorological Society ; The Society of Arts* ; Lloyd's ; Royal United Service Institution ; London Institution ; Solar Physics Observatory ; Royal Institution ; General Register Office* ; Royal Observatory, Greenwich ; Royal Naval College, Greenwich ; Board of Education (Victoria and Albert Museum) ; Institution of Civil Engineers ; Local Government Board* ; Board of Trade* ; Board of Agriculture and Fisheries† ; The Admiralty† ; British Balneological and Climatological Society* ; The Metropolitan Water Board ; British Rainfall Organization ; Kew Observatory.

* Parts I. and II. only.

† Parts I., II., and III. only.

Copies are also filed at the public libraries at Aberystwyth, Birmingham, Bradford, Brighton, Darwen, Dumfries, Guernsey (Guille-Alles Library), Huddersfield, Liverpool, Middlesbrough, Penzance, Preston, Rhyl, Stamford, Shrewsbury, Swansea, Southend, Great Yarmouth, as well as at the University Libraries of Edinburgh; Trinity College, Dublin; Queen's College, Belfast; Birmingham; Leeds; the Radcliffe Observatory, Oxford, and the Philosophical Library, Cambridge.

PART I.—WEEKLY WEATHER REPORT WITH APPENDICES.

Weekly Summaries.—The Weekly Weather Report gives a summary of the weather of the week ending with Saturday, intended principally for agricultural and sanitary purposes.

An advance copy of the MS. of the Weekly Report is prepared on Tuesday in each week, and is supplied free of charge to newspapers.

A division of the country into twelve districts, which are identical with the forecast districts of the Daily Weather Report, is adopted. The districts are further grouped into extreme north, eastern and western districts, and extreme south (islands in the English Channel).

In its present form the Report contains:—

- I.—General remarks on the meteorological conditions of the week, with a table describing in words the divergence of the warmth, rainfall, and sunshine experienced in each district from the average for the district for the time of the year.
- II.—A table summarising in numerical form the conditions of temperature, rainfall, and sunshine for each district for the week, the current season, and the calendar year.
- III.—A table containing the data from stations from which the values for districts are calculated.
- IV.—A table containing information for selected stations concerning the minimum temperature on the grass and the temperature in the ground.
- V.—A table giving information of the temperature of the seawater at a selection of stations on the coasts of the British Isles.
- VI.—A series of maps showing the distribution of pressure and wind over Europe and Iceland at 7 a.m. and 6 p.m. on each day, and the temperature, weather, and sea disturbances at 7 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 which have taken place.
- VII.—A table giving the results of observations of the upper air taken by means of kites and balloons. These results include particulars as to temperature, humidity, and wind (direction and force) at various levels.

The weekly statistical tables of values for districts have been prepared in their present form since 1878.

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. 47), so that the area represented is much larger than that covered by the Daily Weather Report.

For the statistical summaries, the information from the telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from over 100 other stations. Of these 27 supply only the daily amounts of bright sunshine.

Appendices.—Subscribers for the Weekly Weather Report receive the following appendices:—

(a.) An *Appendix*, issued quarterly and annually, containing *quarterly and annual summaries of the rainfall, mean temperatures and bright sunshine* of each district for each year since 1878.

(b.) An *Appendix*, 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 several districts.

(c.) An *Appendix*, issued annually, giving a summary of the *gales* experienced at anemograph stations in connexion with the Office.

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

(e.) 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.

PART II. MONTHLY WEATHER REPORT AND ANNUAL SUMMARY.

Monthly and Annual Summaries.—The Monthly Weather Report is issued as a supplement to the Weekly Weather Report. Each number contains (1) a general account of the weather for the month; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at Normal Climatological Stations; (3) a summary of maximum and minimum temperature, temperature in the ground and on the grass, rainfall, and sunshine at auxiliary Climatological Stations; (4) the differences, where possible, from the average pressure, temperature, rainfall and sunshine; (5) four maps showing the monthly distribution of barometer and wind, the movements of barometric depressions, the distribution of mean temperature, and the distribution of bright sunshine; (6) a full-page map prepared by the Director of the British Rainfall Organization from data from nearly 1,000 stations showing the distribution of Precipitation.

The number for March, 1910, contains tables of results for 209 stations, namely:—23 telegraphic stations and 83 normal climatological stations, together with a summary of temperature, rainfall, and sunshine, or one or more of these elements, at 112 other stations. For 13 of the 23 telegraphic stations summaries are given for the

hours 7 a.m., 1 p.m., 9 p.m., a combination which entitles the stations to rank as normal climatological stations.

An Annual Summary on similar lines has been added since the year 1904.

PART III. METEOROLOGICAL OBSERVATIONS AT STATIONS OF THE SECOND ORDER AND AT ANEMOGRAPH STATIONS.

Daily Readings.—This publication contains daily values for 20 stations in the British Islands of observations made at stations of the second order at 9 a.m. and 9 p.m. Particulars of the headings under which observations are taken are given on p. 65. The publication also contains daily summaries of the records from 12 stations equipped with autographic anemometers.

A similar publication, but containing no data from anemograph stations, has been issued in annual volumes since 1876. These annual volumes contain, in addition, monthly and annual summaries for a large number of stations which are now included in the Monthly Weather Report. The volume for the year 1907 has not yet been published. The prices of the volumes vary from 20s. to 35s.

PART IV. HOURLY READINGS OBTAINED FROM THE SELF-RECORDING INSTRUMENTS AT FOUR OBSERVATORIES IN CONNEXION WITH THE METEOROLOGICAL OFFICE.

This publication contains hourly values of pressure, dry bulb temperature, humidity, wind direction and velocity, rainfall and bright sunshine for each of the four observatories—Valencia, Aberdeen, Falmouth, Kew. Particulars of the corresponding publications for previous years are given on p. 94.

UNPUBLISHED OBSERVATIONS.

The Office also receives, in return for an annual grant, duplicates of the curves from the autographic instruments at Glasgow* and Stonyhurst* observatories, and the tabulations of these curves are available if required.

Anemographic records are received from Alnwick Castle, Armagh, Brighton, Deerness,* Dover,* Dublin, Falmouth (Pendennis Castle), Fleetwood, Holyhead,* Kingstown,* Llaneugrad, North Shields,* Plymouth,* Pyrton Hill, Roche's Point,* Scilly,* Shoburyness, Southport,* Warlingham, and Yarmouth.*

The names of all stations in the British Isles from which information of any kind is received, and a statement of the order of the stations and of the publication for which the returns are prepared are given in the lists on pp. 68 to 86. All the records are available for the use of the public on the conditions set forth on p. 43.

* Results from anemographs at these stations are now published in "Observations at Stations of the Second Order and at Anemograph Stations."

D.—INFORMATION FROM LAND STATIONS OUTSIDE THE BRITISH ISLES.

Foreign and Colonial Stations.—Periodical returns are received from certain stations in different British Colonies and dependencies, or in foreign countries.

A list of the stations, stating the character of the observations taken, is given on pp. 89 to 92. It includes two anemometer stations, Gibraltar and St. Helena.

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

E.—THE LIBRARY.

Library.—In return for copies of publications the Office receives the weather reports and other publications of the official meteorological organisations of the world, and of many private organisations. A list arranged geographically of the institutions sending periodical publications containing meteorological data is given in Appendix VII.

The library has also gradually acquired a large collection of pamphlets and books bearing upon meteorological subjects.

The terms on which books and documents in the library can be consulted are stated on p. 43.

F.—SUPPLY OF INSTRUMENTS AND FORMS TO OBSERVERS.

Loan of Instruments.—In accordance with the terms of the Parliamentary grant the Office does not lend instruments for the use of observers except in the following cases :—

- (1.) To the Captains of vessels who undertake to keep a Meteorological log during their voyage and forward it to the Office. (*See* p. 46.)
- (2.) To the Telegraphic Reporting Stations in the British Isles.
- (3.) To the First Order Stations in connexion with the Office.
- (4.) To selected Stations in less frequented parts of the world where observations are deemed to be specially desirable.
- (5.) To a limited number (230) of fishing communities.

Supply of instruments for observers at Land Stations.—The Director is authorised to supply, at a cost of 5 per cent. in addition to the 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 Director will also, if desired, give advice about the site and exposure of the instruments.

Supply of forms.—Forms for recording the observations, and tables for reducing them, are supplied to observers for the Office free of charge. The postage of returns, addressed to the Director of the Meteorological Office, need not be prepaid.

Blank sunshine cards are supplied without charge to a number of stations, not exceeding 10 in each district (including official stations), on condition that the cards are returned to the Office for filing. In other cases, cards are supplied, at a special price, to observers contributing returns. Forms for other self-recording instruments are supplied to observers free of cost, provided that the records are deposited with the Office and that the forms required are of a type kept in stock by the Office for use at Official Stations.

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

FISHERY BAROMETERS.

The Office possesses a number of Barometers which it lends for the use of fishing communities, where it is shown that the instrument will be of material service. As a condition of 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. At a few of the stations the experiment has been made of lending a self-recording aneroidograph with an open scale instead of the ordinary mercurial barometer.

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.—*Uya Sound, Burravoe, *Nesting, Lerwick, *Sandwick, *Scalloway, Symbister, *Hamnavoe, *Walls.

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

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

England, East coast.—*Berwick, *North Shields, *South Shields, *Sunderland (Roker), *West Hartlepool, *Staithes, *Scarborough, *Filey, *Flamborough, *Bridlington Quay, *Withernsea, *Hull, *Lynn (2), *Wells, *Gorleston, *Lowestoft, *Walberswick, *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), *Poole, *Weymouth, *Portland.

England, South-West coast.—*Budleigh Salterton, *Exmouth, *Cawsand, *Mevagissey, *Gorranhaven, *Devoran, *Portscatho,

* The Director has been in correspondence with the Fishery Boards concerning these stations.

*Penryn, *Durgan, *Porthallow, *Falmouth, *Coverack, *Newlyn (2), *Mousehole, *Penbeith Cove, *Porth Guarra, *St. Ives, *Hayle, *Port Isaac, *Bideford, Burnham, Highbridge, Weston-super-Mare.

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

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

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

Scotland, South-West coast.—*Port Patrick, *Cairn Ryan, *Port William.

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

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

Ireland, West coast.—Valencia, Dingle, Tralee, Kilonan, Galway, Spiddal, Cleggan, Elly Bay, Ballyglass, Ballycastle (Co. Mayo), Mullaghmore, Donegal, Tribane, Killybegs, Teelin, Malinmore, Port Noo, Rosbeg, Burton Port, Kincashla, Bunbeg, Inniscow Island.

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

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

Hebrides.—*Ness, *Carloway, *Marvaig, *Crossbost, Stornoway, Portnaguran, Valtos, Obb, Bernera, *Boreray, *Lemreway, Loch Boisdale.

G.—PUBLICATION OF OBSERVATIONS CONTRIBUTED BY VOLUNTEER OBSERVERS OR BY THE REPRESENTATIVES OF LOCAL AUTHORITIES.

I. General Regulations.—(a.) The observations must in all cases be taken by a competent observer, from approved instruments, satisfactorily exposed. Approval of the instruments and exposure is subject to periodical inspection by the Office.

Regularity in taking the observations and dispatching the reports is essential.

(b.) The sunshine cards upon which returns have been based must be sent to the Meteorological Office for examination at the close of each month. Cards supplied to observers at the special price referred to on p. 60 will be returned after examination.

* The Director has been in correspondence with the Fishery Boards concerning these stations.

(c.) The Director reserves the right to discontinue at any time, temporarily or permanently, the incorporation of information received from any station in the Official reports.

(d.) Observers contributing returns to one of the publications of the Office receive an official copy of the publication. It is requested that these copies may be filed in a public library or similar institution, or be returned to the Office when the observer has no further personal use for them.

II. Publication in the Daily Weather Report.—For publication in the Daily Weather Report, the information must be in accordance with one of the forms here specified :—

(a) **Full Telegraphic Report at 7 a.m.**—A complete record of barometer, temperature, wind, &c., based upon observations made at 7 a.m., and at 6 p.m. of the previous day, and telegraphed each morning in time to reach the Office not later than 9 a.m. This information must be sent in code, a copy of which, with other necessary instructions, will be supplied by the Office. A manuscript copy of the observations on a form provided for the purpose must be sent at the end of each month.

(b.) **Short Telegraphic Report at 6 p.m.**—A report, telegraphed in the evening, and containing observations of the barometer, wind, temperature and weather at 6 p.m., the maximum temperature and the amount of bright sunshine for the day, and the minimum temperature and the amount of rainfall for the previous 24 hours. These observations must be sent in code form in time to reach the Office not later than 7 p.m., the statistical information being supplemented by brief notes respecting any exceptional phenomena which may have occurred, such as thunderstorms, unusually heavy rain, &c.

When the sun is above the horizon after 6 p.m., *i.e.*, from about March 20th to September 23rd, the amount of sunshine given must be that recorded up to 6 p.m. *only*, but in such cases a post card must be dispatched to the Office later in the evening, giving the amount *for the whole day*.

In exceptional circumstances a telegraphic report of sunshine only may be accepted, provided that it is supplemented by information by post. The cost of telegraphy must be borne locally.

Information derived from the 6 p.m. telegraphic reports is included in the evening remarks and summaries prepared in the Office for communication to Newspapers and Press Agencies. It must be supplemented whenever possible by the postal report at 9 p.m. described under (c).

(c.) **Postal Report at 9 p.m.**—A record similar to that indicated under (b), but reporting observations by postcard (Form 231). If the postal arrangements are such that a letter posted after 9 p.m. can be delivered at the Meteorological Office by 9 a.m. on the following day, the report should be made up for the 24 hours ended 9 p.m., and posted immediately after that hour.

(d.) **Postal Report at 6 p.m.**—In places where the postal arrangements do not admit of the service indicated under (c), a report in similar form may be made up for the 24 hours ended 6 p.m. and posted as soon as possible after that hour.

NOTE.—At auxiliary climatological stations, for which extremes of temperature and rainfall amounts for the 24 hours ending at 9 a.m. are required, as well as the data referred to in the messages dispatched at 6 p.m., separate minimum thermometers and raingauges should be provided for the two sets of observations. A single maximum thermometer will suffice, if the instrument be read, but not *set*, at 6 p.m. At normal climatological stations, when the extremes of temperature used

for climatological purposes should be for the 24 hours ending 9 p.m., a double set of thermometers is not required if both thermometers are *set* only once a day, viz., at 9 p.m.

III. Publication in the Weekly Weather Report.—Observations are accepted from a limited number of stations for publication in the Weekly Weather Report. The information should consist of observations taken once daily of the maximum and minimum temperature and of the rainfall, together with the duration of bright sunshine, and brief notes on the weather of each day.

Observations of the minimum temperature on the grass, and of underground temperature at the depths of 1 foot and 4 feet are also included. Each return should be posted as soon as possible after the Sunday morning reading, in order that it may reach London by Monday.

IV. Publication in the Monthly Weather Report, and in the Monthly Issue of Observations at Stations of the Second Order.—For this purpose a monthly return must be sent so as to reach the Office *not later than the 10th* of the following month. Three forms of return are at present in use. In Form 355 provision is made for the complete set of observations made at a normal Climatological Station at which observations are recorded three times a day. In Form 319, the headings of the columns are similar, but they are arranged in different order, and provision is made for the entry of only two observations each day. Form 312 is similar to Form 319, but less extended.

H.—REGULATIONS FOR THE SUPPLY OF INFORMATION FROM INSTRUMENTS BELONGING TO THE METEOROLOGICAL OFFICE BY THE CUSTODIANS OF THE INSTRUMENTS.

The custodians of instruments maintained by the Meteorological Office are not allowed to supply information derived from the instruments in their charge without previous permission obtained from the Director.

Permission is not given when the information required can be obtained directly from the Office in the course of post. Applicants for information should in that case be referred to the Office.

In special circumstances the Director will give permission for information to be extracted by the custodian for the use of Local Authorities, provided—

- (1) That a note shall be appended to the information thus supplied to the effect that “The information is derived from instruments belonging to the Meteorological Office, and is subject to correction or modification”;
- (2) That if the information be published, the note shall also be published;
- (3) That a copy be kept of the information supplied, to be forwarded to the Meteorological Office if required.

If arrangement is made for the payment of the custodian for this service the Director must be informed.

In cases in which the extraction of provisional information is permitted, instructions for observing or tabulating will be given to the custodian, which must be strictly followed.

I.—OBSERVATORIES AND STATIONS IN CON- NEXION WITH THE METEOROLOGICAL OFFICE.

CENTRAL OBSERVATORY.

Kew Observatory, Old Deer Park, Richmond, Surrey.

Superintendent : C. Chree, LL.D., Sc.D., F.R.S., *Assistant
Director of Observatories.*

Telegraphic Address : "Weather, Richmond, Surrey."

MAGNETIC OBSERVATORY.

Eskdalemuir Observatory, Langholm.

Superintendent : G. W. Walker, M.A.

WESTERN OBSERVATORY.

Valencia Observatory, Cahirciveen, Ireland.

Superintendent : J. E. Cullum.

Kew Observatory was built in 1769 as a private observatory and an astronomical and physical laboratory for King George III. The building was placed at the disposal of the British Association in 1842 and taken over by the Royal Society of London in 1871. The Observatory formed a department of the National Physical Laboratory from 1900 to 1910, and passed under the management of the Meteorological Office from July 1, 1910. Besides the work of a normal meteorological observatory (station of the first order of the international classification), the observatory undertakes experimental and research work in Meteorology, including Atmospheric Electricity, Terrestrial Magnetism, and Seismology.

Eskdalemuir Observatory was established by Government to continue the work of recording the magnetic elements which had been carried on at Kew Observatory and had been disturbed by electric tramways. It was opened in 1908. The work of the observatory includes routine work and experimental research in Terrestrial Magnetism, Atmospheric Electricity and Meteorology, as well as the maintenance of several Seismographs.

Valencia Observatory was established by the Meteorological Office in 1867 on Valencia Island. In 1891 it was transferred to Westwood House, Cahirciveen. Besides the work of a First Order Station and a Telegraphic Reporting Station, regular observations of magnetic force are made by arrangement with a committee organised by the late Earl of Rosse.

Other stations in connexion with the Office are shown in the list which follows on p. 68.

The returns from stations marked "S" are supplied by the Scottish Meteorological Society, those marked "M" by the Royal

REPORT OF THE METEOROLOGICAL COMMITTEE 1909-1910.

Map showing Positions of Climatological Stations.



Scale 1:5,000,000.

Ordnance Survey, Southampton, 1910.

The heights of the stations above Mean Sea Level are inserted against the positions, and will serve to identify the names of the stations as given in the List of Stations on pp.

REPORT OF THE METEOROLOGICAL COMMITTEE 1909-1910.
Map showing the Positions of the Stations having Self-Recording Instruments.



Meteorological Society. Stations marked respectively "M" or "S" are in connexion with the Societies as well as with the Office.

The list shows the order of classification of the stations and also the publication for which the returns are prepared in the Office. In specifying the order of the station a distinction has been drawn between eye observations and the records of autographic instruments. In general the returns received have formed the basis for the classification, but in cases in which more extensive observations are taken, but not forwarded to the Office, the corresponding symbol has been enclosed in brackets. The list makes no pretence to completeness in respect of these. The symbols used are explained as follows :—

- I. Normal Meteorological Observatory : Station of the First Order.—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 autographic records are checked by frequent eye observations, and hence the symbol "I" has been entered in the table under both "Eye observations" and "Autographic."
- II. Normal Climatological Station : Station of the Second Order.—Daily observations at 9 a.m. [3 p.m.] and 9 p.m. local time (or other accepted combinations of hours) of pressure, temperature (wet and dry-bulb), wind, amount of cloud, and weather, with the daily maximum and minimum of temperature, the daily rainfall, and remarks on the weather. Stations at which the additional observation at 3 p.m. is taken are distinguished by appending a suffix ₃ to the symbol, thus—II₃.
- III. Auxiliary Climatological Station : Station of the Third Order.—Observations similar in kind to those at the Normal Stations, but either (a) less full, (b) taken only once daily, (c) taken at hours other than 9 a.m. and 9 p.m.
- T. Telegraphic Reporting Station.—Daily observations at 7 a.m., 1 p.m., and 6 p.m. G.M.T., similar in general character to those taken at Normal Climatological Stations, reported to the Office each day by telegraph. At some telegraphic stations an additional observation is taken at 9 p.m., and as the combination of hours 7 a.m., 1 p.m., 9 p.m. is accepted as suitable for stations of the Second Order of the international classification, these stations are distinguished by the two symbols T II₃.
- . (Eye Observations.) Additional Rainfall Station.—Daily observations, generally at 9 a.m., of the amount of rainfall.
- ☞. Additional Anemograph Station.—Continuous records of wind velocity (force) and, in most cases, also of wind direction.
- B. Additional Barograph Station.—Continuous record of atmospheric pressure.

- Θ. Additional Thermograph Station.—Continuous record of atmospheric temperature.
- . (Autographic.) Additional Autographic Rain-gauge Station.—Continuous record of rainfall.
- H. Hygrograph Station.—Continuous record of the relative humidity of the air.
- ⊙. Sunshine Station.—Continuous record of bright sunshine taken with a Campbell-Stokes recorder.
- K. Kite or Balloon Station.—Records of Temperature, Humidity and Wind in the upper air.

The publications for which the returns are prepared are indicated by the following letters :—

- D. Published *in extenso* in the “Daily Weather Report.”
- d. Published in abridged form in the “Daily Weather Report.”
- W. Weekly summary of temperature and rainfall and, if available, of sunshine, published in the “Weekly Weather Report.”
- w. Weekly summary of bright sunshine only, or of grass minimum, or earth temperatures, or of observations in the upper air, published in the “Weekly Weather Report.”
- M. Full monthly summary in the international form published in the “Monthly Weather Report.”
- m. Abridged monthly summary published in the “Monthly Weather Report.”
- (m.) Monthly totals of bright sunshine only or of rainfall only, published in the “Monthly Weather Report.”
- S. Daily values published in “Observations at Stations of the Second Order” (1910).
- R. Monthly summary published in the Reports of the Registrar General of Births, Deaths, and Marriages for England and Wales, or for Ireland.
- r. Weekly summary published in the Reports of the Registrar General for England and Wales, or for Ireland.
- ☞. Daily summary of anemometer results published in “Observations at Stations of the Second Order and at Anemograph Stations.”

Height above Mean Sea Level.—The figures given in this column refer in general to the height of the ground on which the rain-gauge stands. At those stations which do not possess a rain-gauge, the figures refer to the height of the particular instrument in use.

The positions of the climatological and rainfall stations may be identified on the map, plate VIII., p. 64, from the figures which give their heights above Mean Sea Level, as shown in the following list.

* * From a number of stations in the British Isles printed summaries of observations are received. These have been included in the Geographical list of Institutions, &c., which issue publications (Appendix VII. to the Annual Report of the Meteorological Committee).

The following make monthly returns in a form similar to that in which observations are received from the normal or auxiliary climatological stations :—

Bolton.—The Museums and Meteorological Observatory.

Croydon.—Natural History Society.

Northampton.—Natural History Society.

Truro.—Cornwall County Council Sanitary Committee.

LIST OF STATIONS ARRANGED ACCORDING TO DISTRICTS AND COUNTIES.

The Counties are grouped in Districts which are numbered as follows :—

- | | | | | |
|---------------------|--|--|--|--|
| 0. Scotland, N. | { (a) Islands.
(b) Mainland. | 5. England, S.E.
London County. | 9. Ireland, N. | { (a) Western Part.
(b) Eastern Part. |
| 1. Scotland, E. | | 6. (a) Scotland, W., and (b) Isle of Man. | 10. Ireland, S. | { (a) Eastern Part.
(b) Western Part. |
| 2. England, N.E. | { (a) Northern Part.
(b) Southern Part. | 7. (a) England, N.W., and (b) North Wales. | 11. English Channel (Western Section). | |
| 3. England, E. | { (a) Northern Part.
(b) Southern Part. | 8. (a) South Wales and (b) England, S.W. | | |
| 4. Midland Counties | { (a) Eastern Part.
(b) Western Part. | | | |

County and Station	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
O. SCOTLAND, NORTH.*								
(a.) Islands.								
Hebrides:—								
Castlebay, Barra Isle ...	56 57	9 29 W.	38	T II,	B ⊙	D.W.M.	09	J. Smith, for M.O.
Stornoway ...	58 11	6 22 W.	51	T II,	B ⊙	D.W.M.	09	W. Grant, for M.O.
Shetlands:—S. Baltasound ...	60 44	0 48 W.	31	III	⊙	W.m.	09	J. Edmonston Saxby, F.R.C.S., Ed.
Lerwick ...	60 9	1 8 W.	—	—	B	—	09	G. Gray, Harbour Master.
Sumburgh Head ...	59 51	1 17 W.	112	T II,	B	D.W.M.	09	Rev. W. Brand, for M.O.
Deerness ...	58 56	2 45 W.	160	II	☞	W.M.S.	09	M. Spence.
(b.) Mainland.								
Caitness:—								
Sandside, Reay ...	58 34	3 48 W.	55	●	—	—	—	Nicol McNicol.
Wick ...	58 27	3 6 W.	80	T	B	D.W.M.	09	Miss Sinclair, for M.O.
Cromarty:—								
Strathpeffer Spa ...	57 37	4 28 W.	200	II	⊙	W.M.d.	08	N. McLean, for H. W. Kaye, B.A., M.B.
Inverness:—								
Fort Augustus ...	57 8	4 40 W.	68	II	⊙	W.M.	07	Rev. C. von Dieckhoff, O.S.B. and Rev. Ambrose Geoghegan, O.S.B.
Fort William ...	56 49	5 7 W.	175	II	—	W.M.	07	W. T. Kilgour.

Ross :—	Lochboisdale ...	...	57 10	7 20 W.	—	—	—	Arch. MacLennan.
	Ardrross Castle ...	...	57 45	4 21 W.	—	—	—	W. Laing Minty.
	S. Fortrose ...	...	57 35	4 8 W.	III	—	—	Archd. Thom, M.A.
	\$Glencarron ...	...	57 30	5 14 W.	II	—	W.M.	D. D. Munro.
	Kinlochewe ...	...	57 36	5 24 W.	●	—	—	A. McLennan, for Hon. W. Peel, M.P.
Sutherland :—	\$Dunrobin Castle	..	57 59	3 56 W.	II	—	M.S.	D. Melville, for the Duke of Sutherland, K.G.
1. SCOTLAND, EAST.								
Aberdeen :—	Aberdeen Observatory	...	57 10	2 6 W.	I, T	I, B	D.W.M.	Professor C. Niven, F.R.S., and G. A. Clarke, for M.O.
	\$Balmoral ...	...	57 2	3 12 W.	III	—	W.M.	J. Michie, M.V.O., and John M. Troup.
	Dyce ...	...	57 13	2 10 W.	●	—	—	James E. Crombie, LL.D.
	\$Tillypronie ...	...	57 10	2 56 W.	II	—	M.S.	Robert Littlejohn, for the late Sir John F. Clark, Bart.
Banff :—	\$Gordon Castle ...	...	57 37	3 5 W.	II	⊙	W.M.	C. Webster, for the Duke of Richmond and Gordon, K.G.
Berwick :—	\$Marchmont ...	...	55 44	2 25 W.	II	⊙	W.M.	J. A. Wood, for Sir J. H. Hume Campbell, Bart.
Clackmannan :—	No station.	...	55 57	3 12 W.	—	☞	—	The Astronomer Royal.
Edinburgh :—	Edinburgh, Royal Observatory.	...	55 57	3 12 W.	—	⊙	w.(m.)	The Regius Keeper.
	Edinburgh, Royal Botanic Garden.	...	55 58	3 10 W.	T	B	D.W.M.	D. Drummond, Post Office, for M.O.
Elgin :—	Leith ...	...	56 29	3 8 W.	III	⊙	w.m.	G. Davie, for J. Martin White.
Fife :—	No station.	...	56 28	2 56 W.	II	—	M.S.	J. Carnochan.
Forfar :—	S. Balruddery ...	...	57 3	2 25 W.	III	⊙ ⊕ B	w.m.	J. Smith.
Haddington :—	\$Dundee ...	...	56 58	2 13 W.	III	⊙	d.n.	J. Hart, for Town Clerk.
Kincardine :—	No station.	...	...	...	...	...	...	...
	S. Crathes ...	...	...	...	...	...	...	...
	Stonehaven ...	...	...	...	...	...	...	...

* *Note*.—The parts of this district forming section (a) Islands, include the Shetlands, the Orkneys, and the Hebrides. The latter form part of the counties Inverness and Ross.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer
				Eye Obs.	Autographic.			
1. SCOTLAND, EAST— <i>cont.</i>								
Kinross:— No station.								
Linlithgow:— No station.								
Nairn:— ...	57 36	3 52 W.	82	T	☉	D.W.M.	09	Miss Penny, for M.O. and Dr. Sclanders.
Peebles:— S. West Linton	55 45	3 4 W.	800	III	☉	W.m.	08	Rev. J. S. Begg.
Perth:— *Crieff ...	56 22	3 50 W.	440	II	—	W.M.	07	George Reid, for Dr. Meikle.
Forquandenny	56 21	3 29 W.	175	—	B ●	—	—	Miss M. Wood.
Roxburgh:— No station.								
Selkirk:— No station.								
2. ENGLAND, NORTH EAST.								
(a) <i>Northern Part.</i>								
Durham:— Durham ...	54 46	1 35 W.	336	II	☉	W.M.R.	09	Prof. R. A. Sampson, M.A., F.R.S.
Seaham Harbour	54 50	1 19 W.	139	II	—	M.	07	G. H. Aird.
Northumberland:— Alnwick Castle	55 25	1 43 W.	210	III	☉	W.m.	09	Robert Kyle, for the Duke of Northumberland, K.G.
Cockle Park, Morpeth	55 13	1 41 W.	324	II	☉	w.M.S.R.	09	T. E. W. Dobson, for the Northumberland County Council.
Font Watershed, Dam Site.	55 14	1 54 W.	620	●	—	—	—	H. G. Coventry, C.E., for the Corporation of Tynemouth.
Heddon-on-the-Wall ...	55 0	1 47 W.	400	●	—	—	—	Rev. W. G. Pringle.
Newcastle-on-Tyne ...	54 59	1 36 W.	152	III	☉	w.m.	07	N. H. Martin, F.R.S.E., F.C.S.
North Shields	55 0	1 27 W.	96	T	B	D.W.M.R.r.	09	R. Mont, Post Office, for M.O.

Yorkshire, N. Riding:—	North Shields High Lighthouse.	55 0	1 27 W.	—	—	☐	☐	09	Capt. T. Robson, for M.O.
	Tynemouth ...	55 1	1 26 W.	90	II ₄	☉	d.	09	J. Edward Burnett.
	Ampleforth ...	54 12	1 6 W.	349	II	—	m.	09	Rev. D. Barton, O.S.B.
	Hovingham Hall	54 10	0 59 W.	120	●	—	—	—	Bingley Day, for Sir W. H. A. Worsley, Bart.
	Marlton	54 24	1 18 W.	249	II	—	W.M.	08	J. Hanagan, for Sir Hugh Bell, Bart.
	M. Scarborough	54 18	0 24 W.	100	II	☉	d.W.M.	08	W.W. Larkin, for the Corporation.
	Whitby	54 29	0 37 W.	88	II	☉	M.	07	Thos. Newbitt, for the Literary and Philosophical Society.
	York. Deighton Grove	53 54	1 3 W.	38	●	—	—	05	Miss M. L. Whitehead.
	" The Museum ...	53 57	1 5 W.	56	II	—	—	07	Oxley Graham, M.A., for the Yorkshire Philosophical Society.
	" Bootham	53 57	1 5 W.	105	—	☉	W.M.R.r.	07	Hugh Richardson, M.A.
	Bridlington (Grammar School).	54 5	0 13 W.	56	III	(B) ☉	—	08	A. Thornton, M.A.
	Hall ...	53 45	0 16 W.	2	II	☉	M.R.r.w.	08	H. B. Witty, for the Corporation.
	Spurn Head ...	53 34	0 7 E.	26	T	B	D.W.M.R.	09	J. E. Ayers, for M.O.
	(b) Southern Part.								
Lincolnshire:—	Claypole	53 2	0 46 W.	70	●	—	—	—	Rev. F. Hamilton.
	Fulbeck	53 3	0 37 W.	180	III	B ☉	W.m.	07	Rev. Vere F. Willson, M.A.
	Lincoln...	53 14	0 33 W.	58	III	—	W.m.R.	09	W. Barr, for the Corporation.
	Marcham-le-Fen	53 8	0 5 W.	10	●	—	—	01	Mrs. G. L. Kime.
	Rauceby Hall...	53 6	0 29 W.	124	III	☉	w.m.	09	J. Hope, for General Sir M. Willson, K.C.B.
	Skegness	53 5	0 21 E.	12	III	☉	d.w.M.	08	S. Coetmore Jones, for the District Council.
	Tealby ...	53 24	0 16 W.	251	II	—	m.	09	Rev. S. Lewin, B.A.
	Temple Bruer...	53 4	0 30 W.	—	●	—	—	03	Miss Alice S. Morley.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic			
3. ENGLAND, EAST.								
(a) Northern Part.								
Norfolk:—								
Cromer ...	52 56	1 17 E.	196	II	☉	W.M.R.	06	W. H. Archer, for Urban District Council.
Gedleston	52 23	1 31 E.	37	II	☉ (B &)	W.M.	09	E. T. Dowson.
Willingington	52 48	0 33 E.	88	II	☉	W.M.S.R.	08	Rev. H. E. B. Ffolkes, M.A.
M. Norwich	52 37	1 17 E.	93	III	—	W.R.m.	08	A. W. Preston.
Thetford	52 25	0 45 E.	169	●	—	—	—	E. S. Greenwood, for Town Council.
Yarmouth	52 37	1 43 E.	17	T, II ₃	B ☉	D.W.M.	09	Coastguard, for M.O. and for Corporation.
" Gorleston ...	52 35	1 43 E.	104	—	☉	—	09	—
(b) Southern Part.								
Bedford:—								
Aspley Guise ...	52 1	0 38 W.	410	—	☉	m.	—	Mrs. Dymond.
Woburn, Ridgmont ...	52 1	0 36 W.	291	II	—	M.	08	H. M. Frear, F.C.S., for the Royal Agricultural Society.
Cambridge:—								
Cambridge Bot. Garden	52 12	0 8 E.	41	II	☉	W.M.S.R.	07	R. Irwin Lynch, M.A.
" The Observatory.	52 13	0 6 E.	83	—	B	—	05	A. R. Hinks, M.A., for Sir Robert Ball, F.R.S.
" Newnham Coll.	52 13	0 5 E.	—	III	H	—	09	Miss Stephen.
Essex:—								
Clacton-on-Sea...	51 47	1 9 E.	54	T, II ₂	☉ B	D.W.M.R.	08	A. W. Shadick, for Urban District Council.
Shoeburyness ...	51 32	0 47 E.	13*	III	☉	W.m.	09	The Superintendent of Experiments.
Southend-on-Sea	51 32	0 43 E.	90	III	☉	w.m.	06	E. J. Elford, for the Corporation.
" Waterworks	51 32	0 43 E.	110	● (S)	—	—	—	Rev. J. Dunne Parker, LL.D.
W.Bennington	51 54	0 5 W.	406	II	—	M.R.	09	E. Mawley.
W.Berkhamsted ...	51 46	0 34 W.	400	II	☉ (I)	M.R.	09	—
Offley Vicarage	51 56	0 21 W.	523	●	—	—	—	Rev. E. P. Gatty.

	Rothamsted	...	51 48	0 22 W.	424	III	☉	W.m.		
Huntingdon :—	No station.	...	51 36	0 29 W.	337	●	—	—	09	A. D. Hall, M.A., for the Lawes Agricultural Trust.
Middlesex :—	Harefield	...	52 27	0 37 E.	48†	●	—	—	—	G. Eland.
Suffolk :—	Brandon	...	51 58	1 22 E.	10	III	☉	d.W.m.	07	Lt.-Col. B. Spragge, D.S.O.
	Felixstowe	...	52 29	1 45 E.	83	II	☉	w.d.M.	08	F. B. Jennings, for the District Council.
	Lowestoft	...								C. W. Edwards, for the Corporation.
4. MIDLAND COUNTIES.										
(a) Eastern Part.										
Buckingham :—	Beaconsfield	...	51 56	0 38 W.	360	●	—	—	—	C. T. Marcon, M.A.
	Winslow	...	51 57	0 53 W.	379	III	—	m.	06	R. A. Easton.
Derby :—	Belper ...	...	53 1	1 29 W.	222	III	—	m.	—	W. W. Tunncliffe, B.Sc., F.C.S.
	M. Buxton ...	...	53 17	1 55 W.	987	II ₃	☉ (B)	d.W.M.R.	08	W. Pilkington, and F. T. Kieldsen.
	Chatsworth	...	53 14	1 37 W.	—	III	B ⊕	—	02	The Duke of Devonshire, K.G.
	Howard Estate, Glossop	...	53 27	1 57 W.	1,100	K	—	w.	—	Prof. J. E. Petavel, F.R.S., for the University of Manchester.
Leicester :—	Belvoir Castle	...	52 54	0 47 W.	259	II	☉	R.M.	09	W. H. Divers, for the Duke of Rutland, K.G.
	Syston ...	...	52 43	1 5 W.	178	●	—	—	96	S. K. Daniels.
Northampton :—	Chipping Warden	...	52 9	1 16 W.	—	●	—	—	—	Rev. S. F. Cartwright.
	Great Billing	...	52 16	0 50 W.	273	●	—	—	—	Rev. G. H. Mallins, M.A.
	Oundle (The School)	...	52 29	0 28 W.	144	III	☉	—	04	F. H. E. Martin, for F. W. Sanders, M.A., Headmaster.
	"	...	52 29	0 28 W.	146	●	—	—	04	N. E. Dixon, C.E.
Nottingham :—	Raunds ...	...	52 22	0 33 W.	205	III	—	W.m.	08	Leon G. H. Lee.
	Bawtry, Hesley Hall	...	53 27	1 4 W.	65	III	—	W.m.	09	B. I. Whitaker, J.P.
	Kingston-on-Soar	...	52 51	1 14 W.	125	III	—	m.	08	Fred Wakerly.
	Nottingham	...	52 56	1 9 W.	82	T, II ₃	☉ (B ●)	D.W.M.R.r.	09	Arthur Brown, M.Inst.C.E., and Philip Boobyer, M.D., for the Corporation.
	Workop (Hodsock)	...	53 22	1 5 W.	56	III	☉ (B ●)	w.m.	08	Col. H. Mellish, J.P.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

† Head of Anemometer 52 ft. above M.S.L.

* Head of Anemometer 103 ft. above M.S.L.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
4. MIDLAND COUNTIES—cont.								
(a) <i>Eastern Part</i> —cont.								
Oxford :—	51° 46'	1° 16' W.	208	[I] T	⊙ [I]	D.W.M.R.	09	Dr. A. A. Rambaut, M.A., F.R.S.; W. Wickham, for M.O.
Rutland :—	51° 38'	1° 1' W.	500	—	K $\frac{1}{2}$ B	w.	—	W. H. Dines, F.R.S., for M.O.
	52° 37'	0° 45' W.	522	●	—	—	—	N. W. Wortley.
	52° 38'	0° 43' W.	469	III	—	—	—	E. Hunter.
Warwick :—	52° 25'	1° 30' W.	270	III	⊙	R.m.	07	E. Hugh Snell, M.D., for the Corporation.
Rugby School ...	52° 22'	1° 15' W.	379	III	(B)	m.	08	Rev. D. E. Shorto, M.A.
	52° 28'	1° 56' W.	535	II	⊙	d.W.M.R.r.	07	Alfred Cresswell, for the Midland Institute.
Yorkshire, W. Riding :—	53° 39'	1° 20' W.	131	III	—	—	06	W. H. Waite.
Bradford	53° 49'	1° 46' W.	439	III	⊙	m.r.	09	H. Lander for the Corporation.
Garforth	53° 48'	1° 22' W.	195	II	⊙	M.	09	Prof. Seton, B.Sc., for the Uni- versity of Leeds.
Giggleswick	54° 4'	2° 17' W.	500?	III	(B) ⊙	—	05	C. F. Mott, M.A.
M. Harrogate	54° 0'	1° 33' W.	476	III	⊙	d.W.m.	08	C. E. Rivers, for the Corporation.
Huddersfield	53° 39'	1° 47' W.	409	II ₃	⊙ (●)	M.R.r.	09	J. Firth, Registrar, for the Cor- poration.
Leeds ...	53° 43'	1° 33' W.	132	III	(B)	—	08	H. Crowther, for the Leeds Philo- sophical Society.
Sheffield	53° 23'	1° 29' W.	429	II	⊙	w.M.R.	08	E. Howarth, F.R.A.S.
Wakefield	53° 41'	1° 30' W.	96	II	—	M.R.	08	Alex. French, M.R.C.S., L.R.C.P.
(b) <i>Western Part</i> .								
Gloucester :—	51° 32'	2° 35' W.	147	III	—	r.	07	R. C. Cann Lippincott.
Bristol, Over Court Park	51° 27'	2° 37' W.	229	III	⊙	W.R.m.	09	D. Rintoul, M.A.
Clifton, Bristol	51° 27'	2° 37' W.	229	III	⊙	S.M.R.	09	A. C. Saxby, for the Corporation.
Cheltenham	51° 54'	2° 3' W.	214	II	⊙	—	09	—

Cirencester	...	51 43	1 57 W.	446	III	⊙	W.m.	08	Prof. M. Kershaw, B.A., for the Royal Agricultural College.
Dursley	...	51 41	2 21 W.	256	●	—	—	96	E. Fryer Smith.
Forest of Dean:—									
Blakeney Hill	...	51 46	2 30 W.	500?	●	—	—	—	John Tyler
Braceland	...	51 49	2 38 W.	500	●	—	—	—	E. P. Popert
Edgehills Lodge	...	51 51	2 29 W.	700	●	—	—	—	Campbell Anderson
Ruardean Hill	...	51 50	2 32 W.	900	●	—	m.	05	John Morris
Whitemead Park	...	51 46	2 34 W.	200	●	—	m.	05	William Morris
Worcester Lodge	...	51 48	2 35 W.	550	●	—	—	—	William Morris
Hidcote	...	52 5	1 46 W.	524	●	—	—	97	Major W. Wright, R.A.
Hereford:—							W.m.	07	Canon T. B. Harrington, O.S.B.
Shropshire:—							W.M.R.S.	09	Capt. C. S. Reid, R.E.
Shrewsbury	...	52 43	2 45 W.	191	II	—	M.R.	09	Rev. W. M. D. La Touche, B.A.
Stokesay	...	52 26	2 52 W.	370	II	—	W.m.	08	Col. B. H. Philips.
Stafford:—							m.	09	G. C. Lawson.
Mayfield	...	53 0	1 46 W.	374	III	(B) ⊙	—	—	D. H. Owen.
Worcester:—							—	—	Rev. John Tomson.
Birmingham, Sparkhill	...	52 27	1 52 W.	424	III	—	—	—	
Rochford	...	52 18	2 36 W.	315	●	B	—	01	
5. ENGLAND, SOUTH-EAST.									
Berkshire:—									
Bucklebury Place	...	51 26	1 24 W.	409	III	—	m.	08	J. W. Harris, for A. W. Sutton.
Maidenhead	...	51 30	0 43 W.	101	III	—	m.	06	G. H. Palmer.
Reading (Leighton Park School).	...	51 26	0 57 W.	264	II	B ⊙	M.	07	J. Ridges, M.A., Headmaster.
Wokingham	...	51 23	0 48 W.	216	III	B	m.	06	Medical Superintendent of Sanatorium.
Hampshire:—									
Basingstoke	...	51 16	1 6 W.	289	III	—	m.	—	A. M. Pitkin, F.R.G.S.
Bournemouth	...	50 43	1 53 W.	145	III	⊙	d.w.m.	08	C. Dales, for Town Council.
Petersfield (Ditcham Park.)	...	51 0	0 57 W.	550	—	K	w.	—	C. J. P. Cave, M.A.
M. Portsmouth	...	50 48	1 6 W.	11	III	—	R.r.w.m.	07	A. Mearns Fraser, M.D., for the Corporation.
M. Sandown	...	50 48	1 8 W.	20	III	⊙ (B)	m.	—	G. E. Gilchrist, for the Sandown Advancement Board.
Southampton	...	50 55	1 24 W.	65	II	⊙	W.M.S.R.	09	A. Vaughan, for Director-General of Ordnance Survey.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection	Observer.
				Eye Obs.	Autographic.			
5. ENGLAND, SOUTH-EAST—cont.								
Hampshire—cont. Southsea ...	50 47	1 6 W.	—	—	☉	d.	09	A. Mearns Fraser, M.D., for the Corporation of Portsmouth.
Stockbridge(Ashley)	51 5	1 27 W.	235	●	B	—	—	Legh S. Powell.
Swarraton ...	51 8	1 11 W.	310	III	—	W.m.	09	Rev. W. L. W. Eyre, M.A.
Totland Bay ...	50 41	1 33 W.	140	III	☉	m.	04	J. Dover, M.A.
M. Ventnor ...	50 36	1 13 W.	80	III	☉	W.m.R.	06	Miss M. Gibson, for Royal National Hospital for Consumption.
Broadstairs ...	51 21	1 26 E.	140	●	☉	(m.)	—	Howard Hurd, C.E., and Rev. H. C. V. Snowden, for District Council.
Canterbury ...	51 17	1 5 E.	39	III	—	w.	05	A. Lander.
Deal ...	51 13	1 24 E.	23	III	☉	d.	—	S. Miller.
Dover ...	51 7	1 18 E.	198	●	—	—	96	—
Dover ...	51 7	1 19 E.	231	T	☉	D.M.	09	W. C. Hawke, C.E., for the Corporation of Dover.
Kearsney, Chilton Farm.	51 8	1 17 E.	125	●	—	—	—	—
Dungeness ...	50 55	0 58 E.	21	T	B	D.W.M.	09	W. S. Wilder, Lightkeeper, for M.O.
Folkestone ...	51 5	1 11 E.	121	III	☉ (●)	d.m.	08	J. W. Stainer, for the Corporation.
Hildenborough ...	51 13	0 15 E.	160	●	—	—	—	Charles H. Scott.
Littlestone-on-Sea ...	50 59	0 59 E.	—	—	☉	d.w.(m.)	05	H. T. Tubbs.
M. Margate ...	51 24	1 24 E.	35	III	☉	d.W.m.	08	J. Stokes, J.P., for the Corporation.
Matfield ...	51 9	0 22 E.	319	III	—	m.	—	D'Arcy Reeve.
Ramsgate ...	51 20	1 25 E.	—	—	☉	d.w.(m.)	08	T. G. Taylor, C.E., for the Corporation.
Sandgate ...	51 4	1 9 E.	50	●	—	—	99	R. A. Skelton and Chas. J. Conquest.
Sandwich ...	51 17	1 20 E.	6	●	—	—	03	Royal St. George's Golf Club.
Tankerton ...	51 22	1 2 E.	72	●	—	—	—	F. Gaster.
Tonbridge ...	51 12	0 17 E.	319	●	—	—	—	J. Waley Cohen.
Funbridge Wells...	51 8	0 16 E.	421	III	☉	W.m.	09	F. G. Smart, M.B.

Surrey :—	Byfleet ...	51 20	0 29 W.	65	●	—	—	—	R. W. Pretor-Pinney.
	Epsom ...	51 20	0 17 W.	160	III	—	m.	—	S. C. Russell.
	Newdigate ...	51 0	0 17 W.	259	●	(B)	—	—	R. J. Wallace.
	Send ...	51 15	0 32 W.	99	●	(B)	—	—	J. W. G. Bond.
	Warlingham ...	51 18	0 3 W.	609	●	⊕	—	—	R. H. Curtis.
	Wisley ...	51 17	0 26 W.	150	III	⊙	W.m.	09	The Superintendent, for the Royal Horticultural Society.
Sussex :—	Bexhill-on-Sea ...	50 50	0 33 E.	27	II	⊙	d.m.	08	G. Brisley, M.P.S., for the Corporation.
	M. Bognor ...	50 47	0 40 W.	20	III	⊙	d.w.m.	06	H. Gardner, for the Bognor Climatological Society.
	M. Brighton ...	50 49	0 8 W.	31	III	⊙	d.w.m.R.r.	09	H. Heasman, for the Medical Officer of Health.
	Brighton ...	50 49	0 8 W.	380	—	K	w.	—	S. H. R. Salmon.
	Cuckfield ...	51 1	0 9 W.	389	●	—	—	97	E. Gosden.
	Eastbourne ...	50 46	0 17 E.	39	II	⊙	d.w.M.R.	08	S. R. Henderson, for the Medical Officer of Health.
	Hastings Cemetery	50 52	0 34 E.	499	●	—	—	—	Walter Field.
	" Waterworks	50 51	0 34 E.	270	—	⊙	d.w.(m.)	06	J. Farnham, for the Corporation.
	Heathfield ...	50 58	0 16 E.	499	●	—	—	—	J. F. Leigh Clare.
	Hove ...	50 47	0 10 W.	—	—	⊙	m.	—	A. Griffith, M.O.H., for the Corporation.
	Leaves ...	50 52	0 1 E.	57	III	—	m.	08	Hon. C. Brand.
	St. Leonards ...	50 51	0 33 E.	178	II	—	W.M.	08	H. Colborne, M.R.C.S., for the Corporation.
	West Marina	50 51	0 32 E.	20?	III	—	—	06	T. Eldridge, for the Corporation.
	Seaford ...	50 46	0 6 E.	30	III	⊙	d.	—	Col. F. W. Savage.
	Watergate Park ...	50 56	0 55 W.	239	●	—	—	99	W. M. Christy.
	Westbourne ...	50 52	0 55 W.	30	—	⊙	(m.)	07	Rev. L. B. Birkett.
	M. Worthing ...	50 49	0 22 W.	36	III	⊙	d.w.m.	08	R. H. W. Wilschaw, M.B., D.P.H., for the Corporation.
	M. Marlborough ...	51 25	1 44 W.	424	III	⊙	W.m.	08	G. G. Becker, M.A., and Meddows Taylor.
Wilts :—	Salisbury (Wilton)	51 4	1 51 W.	180	II	—	M.R.	07	Thos. Challis, for the Earl of Pembroke, G.C.V.O.
	Salisbury ...	51 5	1 50 W.	165	II	—	—	—	Capt. H. Tudor Williams.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
LONDON DISTRICT.								
Barnet	51 39	0 10 W.	211	III	—	—	06	F. J. Bancroft, B.Sc., M.I.A.C.E., M.I.M.E.
Camberwell—								
The Green ...	51 28	0 5 W.	17	—	●	—	03	W. Oxtoby, M.I.C.E., for the Camberwell Borough Council.
Forest Hill ...	51 26	0 4 W.	160	—	●	—	03	
Leyton Square ...	51 29	0 4 W.	14	—	●	—	03	
Peckham Rd. ...	51 28	0 5 W.	21	—	●	—	03	
Camden Square ...	51 33	0 8 W.	110	II	○ (B ●)	M.R.	—	H. Robert Mill, D.Sc., LL.D.
Chelsea... ..	51 29	0 10 W.	24	●	—	—	—	T. W. E. Higgins, C.E., for the Chelsea Borough Council.
City (Bunhill Row) ...	51 31	0 5 W.	80	—	○	w.(m.)	—	Messrs. De la Rue.
East Ham	51 32	0 3 E.	12	III	—	—	—	J. Banks, for the Corporation.
Greenwich	51 28	0 0	155	I	(1)	W.M.R.r.	—	The Astronomer Royal.
Hampstead	51 33	0 11 W.	450	II	○	M.	09	E. L. Hawke, for the Hampstead Scientific Society.
Isleworth	51 29	0 20 W.	24	III	—	—	—	A. Worsley.
Kensal Green	51 32	0 13 W.	100	●	—	—	—	C. W. Heinemann.
Kew	51 28	0 19 W.	18	I	—	W.M.R.	08	C. Chree, Sc.D., F.R.S., Superin- tendent of the Observatory, for the Meteorological Office.
Pall Mall	51 30	0 7 W.	—	—	B	—	—	Athenaeum Club.
St. Norwood	51 26	0 6 W.	220	II	—	M.R.	09	W. Marriott.
Plumstead	51 29	0 6 E.	300	—	○	m.	01	J. G. Waller.
Tottenham	51 36	0 5 W.	51	II	○	W.M.R.	06	J. F. Butler-Hogan, M.D., LL.D., for Urban District Council.
Westminster	51 30	0 8 W.	27	T	● B θ	D.W.M.R.	—	The Staff of the Meteorological Office.
Training Coll.	51 30	0 8 W.	107	—	○			J. H. Cowham and Rev. H. B. Workman, D.Lit.

6. (a) SCOTLAND, WEST.

Argyleshire:—	Ardnadam	...	55 59	4 56 W.	64	III	(B)	—	—	Rev. J. Cairns Mitchell, B.D.
	Gruine, Isle Mull.	of	56 30	6 0 W.	100	●	—	—	—	J. W. Melles,
	Laundale	...	56 41	5 41 W.	14	III.	—	—	07	J. A. Fletcher.
	Loch Awe:—									
	Cruachan Bothy	...	56 14	5 28 W.	283	●	—	—	—	John Boyd, Crown Forester.
	Ford	...	56 10	5 26 W.	148	●	—	—	—	Edwin Bailly, M.D., for District Council.
	Oban	...	56 25	5 30 W.	20	II	⊙	—	09	D. S. Melville, for Col. Malcolm.
Ayr:—	Poltalloch	...	56 8	5 30 W.	132	II	—	—	07	A. Ogg, for J. W. McConnell.
	Celmonell	...	55 8	4 53 W.	150	III	(B)	—	09	George Stewart, for the West of Scotland Agric. Coll.
	Kilmarnock	...	55 37	4 36 W.	90	III	⊙	—	08	D. Penney.
Bute:—	Rothesay	...	55 50	5 4 W.	115	II	—	—	07	C. C. Easterbrook, M.D., for the Crichton R. Institution.
Dumbarton:—	No station.									G. W. Walker, M.A., Superintendent of the Observatory.
Dumfries:—	Dumfries	...	55 4	3 36 W.	160	II	⊙	—	09	W. H. Whellens, for A. Johnstone Douglas.
	Eskdalemuir	...	55 19	3 12 W.	799	I	I	—	—	W. Thomson, for Col. F. Murray Bailie.
	S. Ruthwell	...	55 0	3 26 W.	67	II	⊙	—	07	Prof. L. Becker, Ph.D., for M.O.
Kirkcudbright:—	Cally (Gatehouse)		54 52	4 12 W.	120	II	—	—	08	John Wilson, for A. Henderson Bishop.
Lanark:—	Glasgow	...	55 53	4 18 W.	180	I	I	—	—	Frank Cottle, for the Corporation.
Renfrew:—	Thorntonhall	...	55 46	4 15 W.	440	III	⊙ B	—	—	Mrs. A. W. Moore.
Stirling:—	No station.									
Wigton:—	No station.									
6. (b) ISLE OF MAN.										
	Douglas	...	54 10	4 28 W.	277	II	⊙	—	08	
	"	...	54 10	4 29 W.	137	—	B	—	—	

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
7. (a) ENGLAND, NORTH WEST.								
Cheshire:—								
Bidston	53° 24'	3° 4' W.	188	(I) T	(I) ☉	D.W.M.R.r.	04	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Har- bour Board.
Hawarden Bridge	53° 12'	3° 1' W.	22	III	—	W.m.	08	F. B. Summers.
M. Hoylake	53° 23'	3° 12' W.	307	III	☉	W.m.	02	Tom Robinson, for Urban Dis- trict Council.
Liscard	53° 25'	3° 5' W.	84	●	B	—	—	H. Norman Edge.
Aspatria	54° 46'	3° 21' W.	250	II	☉ (☞)	W.M.R.	09	J. Smith Hill, B.A., B.Sc., Agri- cultural College.
Carlisle	54° 53'	2° 57' W.	111	II	—	—	04	H. S. Cartmell, for the Corporation.
Newton Rigg	54° 40'	2° 19' W.	559	II	☉	W.M.	08	W. T. Lawrence, for the Cumber- land County Council.
Uldale (Chapel House Reservoir).	54° 43'	3° 9' W.	599	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:— M. Blackpool	53° 49'	3° 3' W.	66	II	☉ (B ☞ ●)	d.W.M.	08	E. W. Rees Jones, M.D., D.P.H., for the Corporation.
Burnley	53° 48'	2° 15' W.	459	III	☉ (B)	m.r.	08	Thos. Holt, M.D., for the Cor- poration.
Carnforth (Over Kel- let).	54° 8'	2° 44' W.	174	III	☉	m.	08	W. Farrer.
Darwen	53° 41'	2° 28' W.	722	III	☉	d.M.	08	F. G. Haworth, M.B., for the Corporation.
Fleetwood	53° 56'	3° 1' W.	—	—	☞	—	09	The Urban District Council, for the Meteorological Office.
Graythwaite	54° 19'	3° 0' W.	180	●	—	—	—	H. I. Grosspelins.
Lancaster	54° 3'	2° 47' W.	311	III	☉ (☞) ●	m.	09	Neville Holden, F.R.A.S., for the Storey Institute
Rossall Beach	53° 55'	3° 2' W.	0	III	B	d.	—	T. G. Benn.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
7. (a) ENGLAND, NORTH WEST.								
Cheshire:—	53 24	3 4 W.	188	(I) T	(I) ⊙	D.W.M.R.r.	04	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Har- bour Board.
Hawarden Bridge	53 12	3 1 W.	22	III	—	W.m.	08	F. B. Summers.
M. Hoylake	53 23	3 12 W.	30?	III	⊙	w.m.	02	Tom Robinson, for Urban Dis- trict Council.
Liscard	53 25	3 5 W.	84	●	B	—	—	H. Norman Edge.
Aspatria	54 46	3 21 W.	250	II	⊙ (✓)	W.M.R.	09	J. Smith Hill, B.A., B.Sc., Agri- cultural College.
Carlisle	54 53	2 57 W.	111	II	—	—	04	H. S. Cartmell, for the Corporation.
Newton Rigg	54 40	2 49 W.	559	II	⊙	W.M.	08	W. T. Lawrence, for the Cumber- land County Council.
Uldale (Chapel House Reservoir).	54 43	3 9 W.	599	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:— M. Blackpool	53 49	3 3 W.	66	II	⊙ (B) (●)	d.W.M.	08	E. W. Rees Jones, M.D., D.P.H., for the Corporation.
Burnley	53 48	2 15 W.	459	III	⊙ (B)	m.r.	08	Thos. Holt, M.D., for the Cor- poration.
Carnforth (Over Kel- let).	54 8	2 44 W.	174	III	⊙	m.	08	W. Farrer.
Darwen	53 41	2 28 W.	722	III	⊙	d.M.	08	F. G. Haworth, M.B., for the Corporation.
Fleetwood	53 56	3 1 W.	—	—	✓	—	09	The Urban District Council, for the Meteorological Office.
Graythwaite	54 19	3 0 W.	180	●	—	—	—	H. I. Grosspelius.
Lancaster	54 3	2 47 W.	311	III	⊙ (✓) (●)	m.	09	Neville Holden, F.R.A.S., for the Storey Institute
Rossall Beach	53 55	3 2 W.	0	III	B	d.	—	T. G. Benn.

Manchester (Oldham Road).	53 29	2 13 W.	190	II	⊙	M.R.w.	08	J. Niven, M.A., M.B., for the Corporation.
" (Whitworth Park).	53 28	2 14 W.	125	II	K ⊙ (B)	d.M.	08	The University of Manchester.
" (Prestwich)	53 32	2 17 W.	320	II	⊙	W.M.R.	08	F. Gore, for Medical Superintendent of the Asylum.
M. Southport	53 39	2 59 W.	37	II ₃	(I) ⊙	d.w.M.R.	07	J. Baxendell, for the Corporation.
Stonyhurst	53 51	2 28 W.	375	I	⊙	W.M.S.R.	09	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:— Kirkby Lonsdale	54 12	2 36 W.	304	●	—	—	—	R. A. Clarke.
7. (b) NORTH WALES.								
Anglesey:— Holyhead (Salt Island)	53 18	4 39 W.	57	—	⊙	⊙	09	F. M. Cotton, C.E., for M.O.
" (town)	53 18	4 39 W.	48	T. II ₃	⊙	D.W.M.	09	T. Chope, for M.O.
Llaneugrad	53 20	4 16 W.	414	II	⊙	M.	—	W. E. Sotheby.
Colwyn Bay	53 16	3 44 W.	82	III	⊙	d.m.	08	Wm. Jones, A.M.I.C.E., for Urban District Council.
M. Llandudno	53 20	3 50 W.	71	II	⊙	d.W.M.R.	07	William Little, for the Town Council.
Pearhyn Quarry	53 10	4 6 W.	527	●	—	—	01	W. J. Griffith, for E. A. Young.
Bettws-y-Coed	53 7	3 53 W.	101	II	⊙	d.W.M.R.	08	Dr. H. W. Fox, for District Council.
Llanbedr Hall (Ruthin)	53 8	3 17 W.	450	●	—	—	—	George A. Grace-Calvert, M.B.
Penbedw	53 12	3 11 W.	650	—	B	—	—	H. W. Buddicom.
Rhyl	53 19	3 29 W.	30	III	⊙	d.w.m.	08	A. A. Goodall, for District Council.
St. Asaph (St. Beuno's College).	53 15	3 23 W.	479	III	(B)	m.	—	Rev. J. Rowland, S.J.
Merioneth:— Aberdovey	52 33	4 4 W.	22	III	⊙	w.m.	07	W. J. Eves.
M. Towyn	52 35	4 5 W.	10	III	⊙	d.m.	07	E. Lewys Lloyd, M.D., for Urban District Council.
Montgomery:— No station.								
8. (a) SOUTH WALES.								
Brecknock:— Llangamarch Wells	52 7	3 32 W.	550	III	⊙	W.m.R.	09	W. Black Jones, M.D., B.Sc., D.P.H.
Cardigan:— M. Aberystwyth	52 25	4 4 W.	59	III	⊙	d.w.m.	07	A. Thomas, M.D., for the Urban Council.
Lampeter	52 7	4 5 W.	498	●	—	—	—	John C. Harford.
Llandovery	51 59	3 48 W.	248	●	—	—	—	Douglas T. M. Jones.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level

Manchester (Oldham Road).	53 29	2 13 W	190	II	⊙	M.R.w.	08	J. Niven, M.A., M.B., for the Corporation.
" (Whitworth Park).	53 28	2 14 W.	125	II	K ⊙ (B)	d.M.	08	The University of Manchester.
" (Prestwich)	53 32	2 17 W.	320	II	⊙	W.M.R.	08	F. Gore, for Medical Superintendent of the Asylum.
M. Southport	53 39	2 59 W.	37	II ₁	(I) ⊙	d.w.M.R.	07	J. Baxendell, for the Corporation.
Stonyhurst	53 51	2 28 W.	375	I	I	W.M.S.R.	09	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:—Kirkby Lonsdale	54 12	2 36 W.	304	●	—	—	—	R. A. Clarke.
7. (b) NORTH WALES.								
Anglesey:—Holyhead (Salt Island)	53 18	4 39 W.	57	—	—	—	09	F. M. Cotton, O.E., for M.O.
" (town)	53 18	4 39 W.	48	T. II ₁	—	D.W.M.	09	T. Chope, for M.O.
Llaneugrad	53 20	4 16 W.	414	II	⊙ (B)	M.	—	W. E. Sotheby.
Colwyn Bay	53 16	3 44 W.	82	III	⊙	d.m.	08	Wm. Jones, A.M.I.C.E., for Urban District Council.
M. Llandudno	53 20	3 50 W.	71	II	⊙	d.W.M.R.	07	William Little, for the Town Council.
Penrhyn Quarry	53 10	4 6 W.	527	●	—	—	01	W. J. Griffith, for E. A. Young.
Bettws-y-Coed	53 7	3 53 W.	101	II	⊙	d.W.M.R.	08	Dr. H. W. Fox, for District Council.
Llanbedr Hall (Ruthin)	53 8	3 17 W.	450	●	—	—	—	George A. Grace-Calvert, M.B.
Penbedw	53 12	3 11 W.	650	—	—	—	—	H. W. Buddicom.
Rhyl	53 19	3 29 W.	30	III	⊙	d.w.m.	08	A. A. Goodall, for District Council.
St. Asaph (St. Beuno's College).	53 15	3 23 W.	479	III	(B) ⊙	m.	—	Rev. J. Rowland, S.J.
Merioneth:—Aberdovey	52 33	4 4 W.	22	III	⊙	w.m.	07	W. J. Eves.
M. Towyn	52 35	4 5 W.	10	III	⊙	d.m.	07	E. Lewys Lloyd, M.D., for Urban District Council.
Montgomery:—No station.	52 7	3 32 W.	550	III	⊙	W.m.R.	09	W. Black Jones, M.D., B.Sc., D.P.H.
S. (a) SOUTH WALES.	52 25	4 4 W.	59	III	⊙	d.w.m.	07	A. Thomas, M.D., for the Urban Council.
Brecknock:—Llangammarch Wells	52 25	4 4 W.	59	III	⊙	—	—	John C. Herford.
Cardigan:—M. Aberystwyth	52 7	4 5 W.	498	●	—	—	—	Douglas T. M. Jones.
Lampeter	51 59	3 48 W.	248	●	—	—	—	
Cardigan:—Lampeter	51 59	3 48 W.	248	●	—	—	—	

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
8. (a) SOUTH WALES—cont.								
Glamorgan :—	Cardiff	51 28	3 10 W.	50	III	☉	W.m.r.	07 E. Walford, M.D., for the Corporation.
	Port Talbot	51 34	3 45 W.	179	●	☉	(m.)	03 Miss Talbot; G. Lipscomb.
	Swansea	51 37	3 55 W.	24	III	—	m.	07 D. Bliss, for the Corporation.
Pembroke :—	Haverfordwest	51 48	4 58 W.	93	(II)	☉ (B)	(m.)	01 J. W. Phillips.
	Pembroke (St. Ann's Head).	51 41	5 11 W.	149	T, II ₁	☉	D.W.M.R.	08 J. F. Spicer, A. S. Jackson, Lightkeepers, for M.O.
	Tenby	51 41	4 42 W.	79	—	☉	w.(m.)	03 Miss M. B. Truscott, for the Corporation.
Radnor :—	Llandrindod Wells	52 14	3 23 W.	699	●	—	—	— W. B. de Winton.
	Rhayader Watershed	52 18	3 29 W.	*	(15) ●	—	—	— Corporation of Birmingham, Water Department.
8. (b) ENGLAND, SOUTH WEST.								
Cornwall :—	Falmouth	50 9	5 4 W.	167	I	I	W.M.R.	09 Royal Cornwall Polytechnic Society, for M.O.
	" Pendennis Castle.	50 8	5 3 W.	—	—	☉	—	09 Coastguard, for M.O.
	Fowey	50 21	4 38 W.	—	III	☉	m.	— Dr. W. H. Boger.
	M. Newquay	50 25	5 4 W.	100	III	☉	w.(m.)	04 C. C. Vigurs, B.A., M.D., for Urban District Council.
	M. Penzance	50 7	5 32 W.	54	III	☉ (B)	m.	08 Chas. H. Benn, for District Council.
Devonshire :—	Arlington Court	51 8	3 58 W.	613	III	—	W.m.	06 Miss Chichester.
	Barnstaple	51 5	4 3 W.	24	III	—	—	06 Thos. Wainwright, for the North Devon Athenæum.
	at Cullompton	50 51	3 23 W.	202	III	☉	W.m.	07 M. T. Foster.
	Paignton	50 26	3 34 W.	11	II	☉ (B)	m.d.	— F. J. Rodgers, for Town Council.
	Plymouth	50 22	4 8 W.	116	II,	☉ ☉ (B)	d.W.M.S.R.r.	09 H. Victor Prigg, A.M.I.C.E., for the Corporation.

<i>Rousdon</i>	...	...	50 43	3 0 W.	515	II	☉ (B)	M.	07	C. Grover, for The Hon. Lady Peek.
M. Salcombe	...	...	50 14	3 46 W.	300	—	☉	(m.)	04	V. W. Twining, M.D.
M. Sheepstor	...	...	50 29	4 1 W.	749	III	—	m.	—	Rev. H. H. Breton, M.A.
M. Teignmouth	...	...	50 33	3 29 W.	20	III	☉	d.m.	—	G. Rossiter for M.O.H.
M. Torquay	...	...	50 28	3 31 W.	12	III	☉	d.w.(m.)	00	F. March, for the Corporation.
W. Whitechurch	...	...	50 32	4 6 W.	593	II	—	M.	07	E. E. Glyde.
W. Woolacombe	...	...	51 10	4 12 W.	59	II	☉	S.M.R.	07	R. N. Kivell, for Miss Chichester.
Parkstone	...	...	50 43	1 56 W.	197	●	—	—	00	C. Mabey.
Portland Bill	...	...	50 32	2 27 W.	19	T, II,	B	D.W.M.R.	09	G. Carpenter, Lightkeeper, for M.O.
Shaftesbury	...	...	51 1	2 12 W.	722	III	—	W.m.	09	Rev. F. Ehlers.
M. Weymouth	...	...	50 36	2 27 W.	21	III	☉	d.m.	08	I. J. Brown.
Abergavenny	...	...	51 49	3 2 W.	178	●	—	—	—	A. V. Whitehead.
Abersychan	...	...	51 44	3 5 W.	698	●	—	—	—	W. P. James.
Newchurch	...	...	51 41	2 48 W.	525	●	—	—	—	—
Newport	...	...	51 35	3 0 W.	32	III	—	—	04	C. Cullum, for the Corporation of Newport.
Pant-y-r-eos	...	...	51 38	3 4 W.	449	●	—	—	00	—
Ynis-y-fro	...	...	51 33	3 3 W.	151	●	—	—	00	—
M. Bath	...	...	51 23	2 21 W.	66	T	(B) ☉	D.W.M.R.	09	W. H. Symons, M.D., for the Corporation.
9. IRELAND, NORTH.										
(a) <i>Western Part.</i>	...	...	...	...	...	...	...	...	...	...
Galway	Ardry	...	53 19	9 0 W.	—	—	B	—	—	W. M. Tattersall, for the Department of Agriculture for Ireland.
	Recess	...	53 28	9 44 W.	90	●	—	—	—	M. Macarthy, for the M. G.W. Railway.
Leitrim	Carrigallen	...	53 58	7 38 W.	3507	●	—	—	—	Miss Morrow.
Mayo	Blacksod Point	...	54 6	10 4 W.	37	T, II,	B	D.W.M.R.r.	09	The Chief Officer, Coastguard, for M.O.
	Mallaranny	...	53 55	9 40 W.	119	●	—	—	08	The Manageress of the Hotel for the M. G.W. Railway.
Roscommon	No station.	...	...	...	...	...	—	—	—	—
Sligo	Markree Castle	...	54 11	8 27 W.	122	II	☉	W.M.S.R.	09	J. R. Armstrong, for Captain Cooper, M.P.

The names of Stations added to the list since April, 1900, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, from the figures which give their heights above Mean Sea Level.
 * 15 Rainfall Stations.

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

County and Station,	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
9. IRELAND, NORTH— <i>cont.</i>								
(b) <i>Eastern Part.</i>								
Antrim :—	54° 35'	5° 56' W.	61	III	—	M.R.	09	John Wylie, B.A., and G. Robinson, for Prof. Morton.
Armagh :—	54° 58'	5° 56' W.	41	●	—	—	—	The Earl of Antrim.
Cavan :—	54° 21'	6° 39' W.	196	II	☉	W.M.S.R.	09	J. L. E. Dreyer, Ph.D., for M.O.
Donegal :—	55° 11'	7° 58' W.	54	III	—	m.	—	J. J. MacGrath, L.R.C.P.
Down :—	54° 40'	8° 27' W.	221	●	—	—	—	John C. Ward.
Fermanagh :—	55° 23'	7° 24' W.	230	T	B	D.W.M.R.r.	09	Chief Officer, Coastguard, for M.O.
Londonderry :—	54° 50'	8° 30' W.	—	—	B	—	05	J. McLoone, Postmaster.
Longford :—	54° 38'	5° 32' W.	40	T, II ₃	B	D.W.M.R.r.	09	T. Arnell, Coastguard, for M.O.
Louth :—								
Meath :—								
Monaghan :—								
Tyrone :—								
Westmeath :—								
10. IRELAND, SOUTH.								
(a) <i>Eastern Part.</i>								
Carlow :—	53° 20'	6° 15' W.	47	II	B	d.W.M.R.	07	Sir John W. Moore, M.D., D.Sc.
Dublin :—	53° 22'	6° 21' W.	155	II	☉	w.M.S.	09	Lt.-Col. C. C. J. Pery, R.E., Ordnance Survey Office.

" Botanic Gardens.	53 23	6 16 W.	67	II	—	m.	07	F. W. Moore, M.R.I.A.
" Trinity College	53 21	6 16 W.	12	II	⊙	M.(R.)w.	07	W. J. Good and W. H. Clark, for Prof. Thrift.
<i>Dundrum</i> ...	53 16	6 14 W.	200	III	—	—	—	Dr. Arthur S. Goff.
Killiney ...	53 16	6 7 W.	249	●	—	—	—	R. O'Brien Furlong, C.B. and Mrs. G. B. Symes.
M. Kingstown ...	53 17	6 8 W.	42	III	⊙	m.	09	R. A. O'Donovan, M.D., for the Corporation.
" Harbour ...	53 17	6 8 W.	—	—	☞	☞	09	Captain A. F. Holmes, R.N., for L.M. Office of Works.
Kildare :— Clongowes Wood College.	53 19	6 41 W.	245	III	(B ⊙) ⊙	m.	09	Rev. J. J. Nerney, S.J.
Kilkenny :— Kilkenny ...	52 39	7 14 W.	212	III	B	W.m.	09	E. Sutton, for the Marquis of Ormonde, K.P.
King's Co. :— Birr Castle ...	53 6	7 55 W.	175	II, T	⊙	D.W.M.S.R.r.	09	Dr. Doedicker, for the Earl of Rosse.
Queen's Co. :— Mountmellick	53 7	7 20 W.	253	III	—	m.	09	W. A. Robinson.
Waterford :— Waterford ...	52 16	7 7 W.	—	—	B	—	02	Harbour Authorities.
" No station.	52 16	7 7 W.	20 ?	III	—	W.m.R.	07	J. N. White.
Wexford :—	53 12	6 6 W.	153	●	—	—	—	Miss A. L. Scott.
Wicklow :— Bray ...	53 5	6 6 W.	256	II	—	m.	02	L. T. Burra, M.D.
M. Newcastle ...								
(b) <i>Western Part.</i>								
Clare :— Ennistymon ...	52 57	9 17 W.	130	●	—	—	—	Rev. C. W. McDowell, M.A.
Hurdlestown ...	52 48	8 38 W.	157	●	—	—	—	Lt.-Col. W. O. Bentley, R.A.
Mount Callan ...	52 53	9 16 W.	479	●	—	—	98	Lt.-Col. Tottenham.
Newmarket-on-Fergus.	52 46	8 53 W.	85	●	—	—	98	Alfred Barker, for W. W. A. Fitzgerald.
Ballinacurra ...	51 52	8 10 W.	24	III	⊙	w.m.	07	John H. Bennett.
<i>Donevile</i> ...	52 13	8 34 W.	266	●	—	—	—	Capt. J. W. Evans, J.P.
Roche's Point ...	51 47	8 15 W.	32	T	—	D.W.M.R.r.	09	M. FitzMahony, Post Office, for M.O.
" "	51 47	8 15 W.	—	—	☞	☞	09	Captain G. Osborne, for Cork Harbour Commissioners.

The names of Stations added to the list since April, 1902, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate II., p. 64, by the figures which give their heights above Mean Sea Level.

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

County and Station.	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Autographic.			
10. IRELAND, SOUTH—cont.								
(b) <i>Western Part</i> —cont.								
Kerry :—	52° 3'	9° 53' W.	—	●	—	—	—	Admiral E. F. Jeffreys, C.V.O.
	52° 4'	9° 30' W.	174	III	—	W.m.R.	09	E. W. Griffin, M.D.
	51° 56'	10° 15' W.	30	I, T	I, B	D.W.M.R.r.	08	J. E. Cullum, for M.O.
	51° 56'	10° 20' W.	—	●	—	—	01	A. O'Donoghue.
Limerick :—	52° 37'	9° 7' W.	108	III	—	W.m.	09	J. J. Alcorn, for Lord Monteagle, K.P.
	52° 38'	8° 40' W.	40	●	—	—	09	Sir A. W. Shaw.
Tipperary :—	52° 38'	8° 41' W.	—	II	(B)	M.	—	Rev. W. O'Leary, S.J.
	52° 22'	7° 56' W.	199	III	—	W.m.	—	R. W. Smith, Jun.
11. ENGLISH CHANNEL (WESTERN SECTION).								
Guernsey :—	49° 27'	2° 32' W.	180	III	⊙	W.m.	08	F. E. Carey, M.D.
	49° 27'	2° 31' W.	297	II	⊙ (B θ)	w.M.R.	08	Adolphus Collenette.
Jersey :—	49° 12'	2° 11' W.	25	T, II ₃	—	D.W.M.R.	08	J. Fisher, for M.O.
	49° 11'	2° 6' W.	—	—	⊙	d.w.(m.)R.	06	Signal Officer, Fort Regent, for M.O.
Scilly :—	49° 56'	6° 18' W.	131	T, II,	B ↗ ⊙	D.W.M.R.	09	The Coastguard, for M.O.

The names of Stations added to the list since April, 1909, are printed in clarendon type. The positions of the Stations can be identified on the map, Plate VIII., p. 64, by the figures which give their heights above Mean Sea Level.

LIST OF FOREIGN STATIONS FROM WHICH REPORTS ARE RECEIVED DAILY BY TELEGRAPH. (See PAGE 47.)

Name of Station.	Authority.
² Reykjavik } ^{2*} Blönduós } ^{2*} Akureyri } (Iceland) ... ² Ísafjörð } ² Seyðisfjörð } ² Thorshavn, Faeröe Islands ..	} Meteorological Institute, Copenhagen. } Captain Ryder, <i>Director</i> .
Haparanda Hernösand ² Stockholm Wisby Karlstad Bodö	} Meteorological Office, Stockholm. } Dr. Hamberg, <i>Director</i> .
² Christiansund ^{1 2} Skudesnaes Færder	} Meteorological Institute, Christiania. } Professor Mohn, <i>Director</i> .
² The Skaw Fanö Cuxhaven Berlin Frankfurt Munich	} Meteorological Institute, Copenhagen. } Captain Ryder, <i>Director</i> . } Deutsche Seewarte, Hamburg. } Admiral Herz, <i>Director</i> .
² The Helder Brussels	} Meteorological Institute, Utrecht. } Dr. van Everdingen, <i>Director</i> . } Meteorological Service, Brussels. } M. J. Vincent, <i>Director</i> .
Cape Gris Nez La Hève *Ushant ² Brest (St. Mathieu) Lorient (Ile de Groix) *Er-Hastellie ^{1 2} Rochefort (Ile d'Aix) *Chassiron *La Coubre ² Biarritz ² Paris Belfort Lyons Nice Perpignan *Capé Béarn Sanguinaire (Corsica)... .. Corunna	} Bureau Central Météorologique, Paris. } M. Alfred Angot, <i>Director</i> . } Central Meteorological Institute, Madrid. } The late M. A. Arcimis, <i>Director</i> .
Lisbon Madeira (Funchal) ² Azores (Ponta Delgada) " (Horta)	} Observatory, Lisbon. } M. Pina Vidal, <i>Director</i> . } Meteorological Service of the Azores. } Major Chaves, <i>Director</i> .

Note.—The stations marked (1) report also at 1h. p.m., and those marked (2) at 6h. p.m. Lisbon reports at 4h. p.m. instead of 6h. p.m., and Ponta Delgada at 3h. p.m.
* The reports from these stations are not published in the Daily Weather Report.

LIST OF ADDITIONAL STATIONS FROM WHICH REPORTS ARE RECEIVED FOR THE DAILY WEATHER REPORT. (See p. 47.)

Station.	Hour of Observation.	Station.	Hour of Observation.
Strathpeffer ..	6 p.m. By wire.	Bournemouth	6 p.m. By wire and post.
Oban	6 p.m. By wire.	Southsea ..	6 p.m. By wire.
Dublin	4 p.m. By post.	Bognor	6 p.m. By wire and post.
Rossall Beach	6 p.m. By post.	Worthing ..	6 p.m. By wire and post.
Blackpool ..	6 p.m. By wire; and 4 p.m. by post.	Brighton ..	6 p.m. By wire and post.
Southport ..	6 p.m. By wire; and 9 p.m. by post.	Eastbourne ..	6 p.m. By wire and post.
Rhyl	8 a.m. By wire; and 6 p.m. by wire and post.	Bexhill-on-Sea	9 p.m. By post.
Colwyn Bay	6 p.m. By wire and post.	Hastings ..	6 p.m. By wire and post.
Llandudno ..	6 p.m. By wire; and 9 p.m. by post.	Folkestone ..	6 p.m. By wire and post.
Bettws-y-Coed	6 p.m. By wire.	Ramsgate ..	6 p.m. By wire and post.
Towyn	6 p.m. By wire and post.	Margate ..	6 p.m. By wire and post.
Aberystwyth	6 p.m. By wire.	Felixstowe ..	6 p.m. By wire and post.
Plymouth ..	9 p.m. By post.	Lowestoft ..	6 p.m. By wire and post.
Paignton ..	6 p.m. By wire and post.	Skegness ..	6 p.m. By wire and post.
Forquay ..	6 p.m. By wire and post.	Scarborough ..	6 p.m. By wire; and 9 p.m. by post.
Teignmouth ..	9 p.m. By post.	Harrogate ..	6 p.m. By wire and post.
Weymouth ..	6 p.m. By wire and post.	Buxton	6 p.m. By wire and post.
		Darwen	9 p.m. By post.
		Manchester ..	9 p.m. By post.
		Birmingham ..	9 p.m. By post.

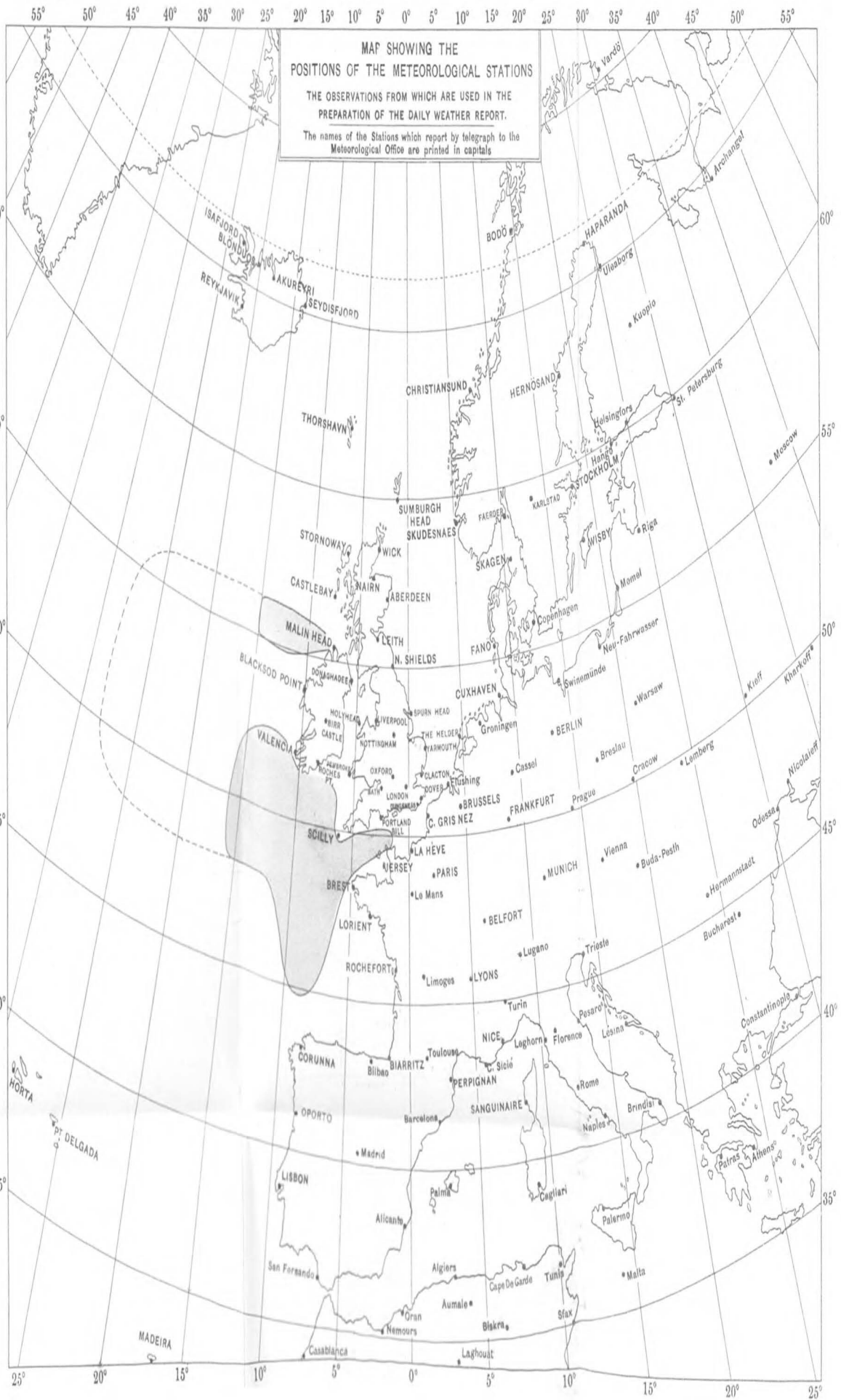
LIST OF SEA TEMPERATURE STATIONS.

§ *Aberdeen, Cove Bay.	§ *Newquay, Cornwall.
*Arran, North, Galway.	†North Arklow Lightship.
†Bahama Bank Lightship.	*North Arran (see Arran).
§ *Ballantrae, Ayrshire.	†North-West Lightship.
*Ballydonegan, Co. Cork.	†Outer Dowsing Lightship.
†Barrels Rock Lightship.	†Owers Lightship.
*Blacksod Point, Co. Mayo.	§ *Pennan Bay (Aberdour).
†Blackwater Bank Lightship.	§ ⁴ Plymouth.
§ *Burnmouth, Ayton, Berwick.	§ ⁵ Port Erin.
Burntisland.	*Portrush.
†Carnarvon Bay Lightship.	†Royal Sovereign Lightship.
§ *Cleggan, Co. Galway.	*St. Ann's Head, Pembroke.
†Coningbeg Lightship.	§ *Salcombe, Devon.
§ *Cromarty.	§ *Scarborough.
†Daunts Rock Lightship.	*Scilly Islands (St. Mary's).
§ ¹ Eastbourne.	§ *Seafeld, Co. Clare.
†East Goodwin Lightship.	†Seven Stones Lightship.
†English and Welsh Grounds Lightship.	†Shambles Lightship.
†Fastnet Rock Lighthouse.	§†Sheephaven (Dunfanaghy).
*Holyhead Harbour Office.	§†Shipwash Lightship.
§ *Kirkwall.	†Skulmartin Lightship.
†Kish Bank Lightship.	†Solway Lightship.
§ *Lamlash, Isle of Arran.	†South Arklow Lightship.
†Leman and Ower Lightship.	†South Rock Lightship.
§ *Lerwick.	†Spurn Lightship.
*Liscannor, Co. Clare.	*Stornoway.
§ ³ Margate.	*Sunderland.
†Morecambe Bay Lightship.	§ *Teelin, Co. Donegal.
†Newarp Lightship.	° Usan (Montrose).
	§ *Wick.

The observers are indicated thus:—* Coastguard, † Lightkeepers, ¹ S. R. Henderson, ² F. M. Cotton, C.E., ³ W. J. Woodruff, ⁴ H. Victor Prigg, ⁵ Biological Station.

§ Stations marked thus send weekly returns for publication in the Weekly Weather Report.

Note.—The shaded portions of the Atlantic and Bay of Biscay indicate the areas from which wireless reports were received within 24 hours of the time at which the observations were made. The dotted lines indicate the limits of the areas from which they were received within 24 hours.



Note.—The shaded portions of the Atlantic and Bay of Biscay indicate the areas from which wireless reports were received within 2 hours of the time at which the observations were made. The pecked lines indicate the limits of the areas from which they were received within 24 hours.



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 not included in this list.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station.	Year of Commencement of Observations.	Observer.
MEDITERRANEAN.						
Cyprus, * †Famagusta	35 7 N.	33 57 E.	34	II	1881	{ The Chief Medical Officer.
" †Kyrenia	35 21 N.	33 19 E.	54	II	1881	
" †Larnaca	34 55 N.	33 37 E.	19	II	1881	
" †Limassol	34 40 N.	33 1 E.	26	II	1881	
" †Nicosia	35 11 N.	33 22 E.	493	II	1881	
" †Papho	34 46 N.	32 25 E.	202	II	1881	{ Colonial Secretary's Department. Edwin C. Hathaway, for Lloyds. H. B. Johnstone, H.B.M. Vice-Consul. N. A. de Silva. A. S. Kheiri, B.A., for Alfred H. Joy, M.A., Director of the Syrian Protestant College. H. Echiboukdjian, for Rev. Alex. MacLachlan, President, International College.
Gibraltar	30 6 N.	5 21 W.	48	II	1883	
Morocco, †Cape Spartel	35 47 N.	5 56 W.	191	II	1893	
" Mogador	31 30 N.	9 42 W.	19	●	1903	
" Safi	+32 17 N.	9 8 W.	40	●	1905	
Syria, Beyrout	33 54 N.	35 28 E.	172	II	1883	{ M. T. Dawe, Director of the Scientific Department.
Turkey, Smyrna	38 26 N.	17 9 E.	50	III	1908	
AFRICA.						
Central :—						
Uganda, Entebbe	0 4 N.	32 28 E.	3,863	III	1896	{ M. T. Dawe, Director of the Scientific Department.
" Fort Portal	0 43 N.	30 8 E.	5,299	III	1901	
" Gondokoro	4 51 N.	31 42 E.	1,500	III	1901	
" Jinja	0 26 N.	33 11 E.	3,722	III	1901	

* By arrangement with the Colonial Office and the Survey Department of Egypt the returns for these stations are sent in the first instance to the Survey Department for use in connexion with its Monthly Weather Report. They are sent to the Office for ultimate filing.

† 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.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

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.	Order of Station.	Year of Commencement of Observations.	Observer.
<i>AFRICA—continued.</i>						
<i>Central—continued.</i>						
Uganda, Kampala	0 19 N.	32 35 E.	3,905	III	1907	M. T. Dawe, Director of the Scientific Department. Returns have been received also from 23 stations in Uganda which record rainfall only.
" Koba	2 19 N.	31 29 E.	—	III	1907	
" Masaka	0 21 N.	31 47 E.	—	III	1902	
" Masindi	1 40 N.	31 50 E.	3,764	III	1906	
" Mbarara	0 31 N.	30 47 E.	4,500	III	1901	
" Nimule	3 39 N.	32 10 E.	2,034	III	1903	
<i>West:—</i>						
Gold Coast, Aburi	5 50 N.	0 10 W.	556	III	1893	Medical Department, Accra.
" Accra	5 35 N.	0 6 W.	—	III	1893	
" SAddah	5 50 N.	0 38 E.	—	III	1895	
" Axim	4 50 N.	2 12 W.	—	III	1895	
" Cape Coast Castle	5 15 N.	0 30 W.	—	III	1895	
" Gambaga	10 31 N.	0 26 W.	—	III	1899	The Secretariat, Zungeru.
" Kintampo	8 5 N.	1 30 W.	—	III	—	
" Kumasi (Coomassie)	6 50 N.	2 16 W.	859	III	1899	
" Kwitta (Keta)	5 59 N.	0 59 E.	—	III	1895	
" Sekondi	5 0 N.	1 40 W.	20	III	1904	
" Sunyani	7 22 N.	2 19 W.	—	III	1908	The Secretariat, Zungeru.
" Tamale	9 23 N.	0 50 W.	—	III	1908	
" Tarkwa	5 11 N.	2 0 W.	245	III	1907	
<i>Northern Nigeria:—</i>						
Bauchi	10 17 N.	9 49 E.	2,300	III	1907	
(Geidam) Dumjeri	12 53 N.	11 57 E.	7,900	III	1907	
Ilorin	8 29 N.	4 32 E.	968	III	1907	
Kano	12 0 N.	8 33 E.	2,000	III	1907	
Katagum	12 17 N.	10 22 E.	108	III	1907	
Keffi	8 50 N.	7 52 E.	—	III	1907	
Kontagora	10 24 N.	5 24 E.	1,300	III	1907	

Lokoja	7 48 N.	6 44 E.	270	III	1907	The Secretariat, Zungeru.
Maifoni	...	...	...	11 48 N.	13 12 E.	1,200	III	1907
Sokoto	...	...	...	13 1 N.	5 14 E.	1,160	III	1907
Yola	...	...	...	9 12 N.	12 30 E.	850	III	1907
Zaria	...	...	...	11 6 N.	7 43 E.	2,230	III	1907
Zungeru	9 49 N.	6 10 E.	530	III	1907	The Principal Medical Officer.
Sierra Leone	...	...	...	8 30 N.	13 9 W.	179	II	1895
Southern Rhodesia :—	21 0 S.	29 0 E.	4,496	●	1908	Mrs. C. E. Fripp.
Ringstead Reef (Essexvale)	...	...	...	...	...	...	...	...
SOUTH AMERICA.									
British Guiana, Georgetown	6 49 N.	56 10 W.	0	⊙	1906	F. A. Stockdale, Government Botanist.
" " Mazaruni (Penal Settlement).	...	...	...	—	—	—	⊙	1908
Venezuela, Guayanaviçã (El Perú)	7½ 0 N.	62 0 W.	1,000?	II B ⊕	1910	Dr. E. H. Griffen, for the Goldfields of Venezuela, Ltd.
CHINA.									
Chinkiang	32 13 N.	119 27 E.	40	II ⊙	1905	Capt. Lewis H. Tamplin.
NORTH ATLANTIC OCEAN.									
Bermuda Dockyard	32 20 N.	64 51 N.	30	—	1889	Lightkeepers, for Board of Trade.
Bahamas, Nassau	...	...	...	+25 2 N.	77 25 W.	—	III	1895
" +* Abaco	...	...	...	25 51 N.	77 11 W.	75	II	1859
" +* Cay Lobos	...	...	...	22 22 N.	77 35 W.	—	II	1877
" +* Cay Sal	...	...	...	23 42 N.	80 25 W.	40	II	1859
" +* Inagua	...	...	...	20 56 N.	73 41 W.	40	II	1871
" +* Watling's Island	...	...	...	24 8 N.	74 26 W.	120	II	1889
Barbados	...	...	...	+13 12 N.	59 35 W.	181	II	1895
+* Sombbrero	...	...	...	18 36 N.	63 28 W.	34	II	1867
	

* Lighthouse; contributes 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.

‡ The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

§ No observations received, Feb. 1902–June, 1909.

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.	Order of Station.	Year of Commencement of Observations.	Observer.
SOUTH ATLANTIC OCEAN.						
Falkland Islands :—						
*†Cape Pembroke	51 41 S.	57 42 W.	70	II	1859	J. Pearce, Lighthousekeeper, for the Board of Trade.
†Stanley... ..	—	—	—	⊙ B	—	His Excellency the Governor.
†St. Helena: St. Matthew's Vicarage ...	16 0 S.	5 40 W.	1,887	II	1885	A. L. C. Hands.
" Central, Oak Bank	—	—	1,696	●	1902	J. Homagee.
" St. Paul's Vicarage	—	—	1,694	●	1905	Alfred Porter.
South Georgia, Grytviken	54 14 S.	36 33 W.	10	II	1906	R. MacDougall, for the Argentine Fishery Company, transmitted by the Governor of the Falkland Islands through the Board of Trade.
PACIFIC OCEAN.						
British Solomon Islands :—						
Tulagi	9 5 S.	160 8 W.	163	III	1907	The Resident Commissioner.
Fiji :—						
Suva	18 8 S.	178 0 E.	44	II	1906	C. H. Knowles, Superintendent Department of Agriculture.
Fanning Island	3 54 S.	159 23 W.	—	III	1903	The Pacific Cable Board.
Malden Island	3 59 S.	155 0 W.	—	II	—	Geo. H. Crocker.
†Ocean Island	0 52 S.	169 36 E.	159	II B.	1905	W. H. Knight, for the Pacific Phosphate Company.
INDIAN OCEAN.						
Madagascar :—						
Antananarivo	18 55 S.	45 16 E.	—	●	1903	T. P. Porter, H.B.M. Consul.
Mauritius, Royal Alfred Observatory ...	20 6 S.	57 31 E.	181	(I)	1901	T. F. Claxton, Director.

* Lighthouse ; contributes register containing observations every 4 hours.

† The Meteorological instruments in use at this Station are lent by the Meteorological Committee.

K.—LIST OF PUBLICATIONS ISSUED UNDER THE AUTHORITY OF THE METEOROLOGICAL COMMITTEE OF THE ROYAL SOCIETY (1867 TO 1876), THE METEOROLOGICAL COUNCIL (1877 TO 1905), OR THE METEOROLOGICAL COMMITTEE APPOINTED BY TREASURY MINUTE, MAY 20TH, 1905.*

The list is arranged under the following headings :—

1. Reports of the Meteorological Office and of International Meetings.
2. Observations and Data for Stations in the United Kingdom.
3. Observations and Data for Foreign and Colonial Stations.
4. Marine Meteorology, Atlases and Memoirs.
5. Reports of Investigations in Dynamical and Statistical Meteorology and other Memoirs.
6. Handbooks and Text Books.

1. Reports of the Meteorological Office and of International Meetings.

Reports of the *Meteorological Committee* of the Royal Society (8vo.) :—

1867–1877. At prices varying from 4d. to 1s. per Report, except 1876–1877, 3s. 5d.

Reports of the *Meteorological Council* (8vo.) :—

1878–1905. At prices varying from 5d. to 1s. 5d., except 1884–5, 4s. 4d.

Reports of the *Meteorological Committee* (8vo.) :—

1905–06. Price 1s. 4d.

1906–07. „ 1s. 7d.

1907–08. „ 1s. 5d.

1908–09. „ 1s. 5d.

1909–10. „

International Codex of Resolutions adopted at Congresses, Conferences and at Meetings of the Permanent International Committee 1872–1907 (No. 200). 1s. 3d. (8vo.)

Reports of Proceedings at International Meetings (8vo.) :—

Leipzig. 1872. (Non-Official, No. 6.) 1s.

Vienna. 1873. (No. 21.) 1s.

Vienna and Utrecht. 1873 and 1874. (Non-Official, No. 9.) 1s. 6d.

London. 1874. Maritime Meteorology. (No. 23.) 2s.

London. 1876. With Supplement. (Non-Official, No. 11.) 2s.

Utrecht. 1878. (Non-Official, No. 13.) 6d.

Rome. 1879. (No. 36.) 1s. 6d.

Berne. 1880. (Non-Official, No. 14.) 1s.

Copenhagen. 1882. (Non-Official, No. 15.) 2s. 6d.

Paris. 1885. (Non-Official, No. 16.) 1s. 1896. (No. 127.) 1s. 1907. (No. 197.) 1s. 6d.

Zürich. 1888. (Non-Official, No. 17.) 4d.

Munich. 1891. (No. 102.) 1s. 6d.

Upsala. 1894. (No. 115.) 1s.

St. Petersburg. 1899. (No. 148.) 2s.

Southport. 1903. (No. 164.) 2s.

Innsbruck. 1905. (No. 195.) 2s.

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

Reports . . . on Atmospheric Electricity, Maritime Meteorology, and Weather Telegraphy. 1878. (Non-Official, No. 12.) 2s. (8vo.)

* The publications are sold by Messrs. Wyman and Sons and other agents for the sale of the publications of H.M. Stationery Office; Annual Reports by Parliamentary Book-sellers; Pilot Charts and Charts published by the Admiralty, by J. D. Potter.

2. Observations and Data for Stations in the United Kingdom.

Daily Weather Report. Subscription 5s. per official quarter. (4to.)

BRITISH METEOROLOGICAL YEAR BOOK from 1908. (4to.)

Part I.—**Weekly Weather Report.* 6d. per week. With Appendices priced separately.

Part II.—*Monthly and Annual Supplements:* Monthly Weather Report: summaries of observations from about 200 stations in the British Isles, and charts. 6d. each part. Subscription for Parts I. and II., inclusive of postage, 30s. per annum.

Part III.—*Monthly issue of daily observations at Stations of the Second Order and Anemograph Stations.* In parts, January to December, 1908, at 2s. each; from January, 1909, at 1s. 6d. each.

Part IV.—*Monthly issue of Hourly Readings at four Observatories in connexion with the Meteorological Office.* In separate parts for each Observatory. 6d. each.

Monthly Weather Reports (4to):—

1884-1887.† In Monthly Parts 1s. 6d. to 2s. 6d. each, except May to December, 1887, which is in wrapper, price 12s.

Quarterly Weather Report (4to):—

1869-1880. At prices varying from 4s. to 10s. each Quarterly Part.

1877-1880:—Appendices and Plates are published for these years at 27s. or 28s. per Yearly set.

‡ *Hourly Readings from the Self-Recording Instruments at the* . . . Observatories (4to):—

1881-1886. In Parts, varying in price from 10s. to 30s. each.

1900-1909. 25s. each, or 6d. per month each station. 1910 *see* British Meteorological Year Book. Part IV.

Hourly Means (for Five-days and Calendar Months) of the Readings obtained from the Self-Recording Instruments at the . . . Observatories under the Meteorological Council (4to):—

1887-1899. In Annual Volumes, at prices varying from 15s. to 38s.

Meteorological Observations at Stations of the Second Order (4to):—

§ 1876-1906. At prices varying from 20s. to 35s.

1907. In the Press. 1908-1909, 16s. each.

1910. (*See* British Meteorological Year Book. Part III.)

AVERAGES:—

Quinquennial table of averages of Temperature, Rainfall, and Sunshine at Stations in the British Isles. Latest issue, for the period ended 1905 (about 150 Stations). 1s. (4to.) Forms Appendix III. to Weekly Weather Report, 1906.

Rainfall:—

Diurnal Range of Rain at the Seven Observatories in connexion with the Meteorological Office, 1871-1890. (No. 143. 1900.) 2s. 6d. (8vo.)

Rainfall Tables of the British Isles for 1866-80. Compiled by G. J. Symons, F.R.S. (No. 47. 1883.) 7s. 6d. (8vo.)

Rainfall Tables of the British Islands, 1866-90. (No. 114. 1897.) 6s. (8vo.)

Sunshine:—

Sunshine Records of the United Kingdom for 1881. (No. 56. 1883.) 4s. (8vo.)

Ten Years' Sunshine in the British Isles, 1881-90. (No. 98. 1891.) 2s. (8vo.)

Temperature:—

Temperature Tables for the British Islands. (No. 154. 1902.) 10s. 6d. Supplement:—Difference Tables for each Five Years for the Extrapolation of Mean Values. 3s. (4to.)

ATLAS:—

Meteorological Atlas of the British Isles. (No. 53. 1883.) 5s. 6d. (4to.)

* The publication of the Weekly Weather Report began in February, 1878. Annual subscription, including Supplements and Appendices, post paid, 1878-1883, 12s. 6d.; 1884-1888, 21s. 2d.; 1889-1907, 30s.

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

‡ For the years 1874-1880 the Hourly Readings were issued in lithographed form. Price 20s. per annum. The Hourly Readings for Kew and Valencia are for the years 1895-1900.

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

3. Observations and Data for Foreign and Colonial Stations.

- Contribution to the Meteorology of Japan.—By Staff-Com. Thomas H. Tizard, H.M.S. "Challenger." (No. 28. 1876.) [Out of Print.]
 Meteorological Observations at the Foreign and Colonial Stations of the Royal Engineers, and the Army Medical Department, 1852-1886. (No. 83. 1890.) 23s.
 Meteorological Observations made at Sanchez, Samaná Bay, St. Domingo, 1886-1888.—By the late W. Reid, M.D. (No. 89. 1890.) 8s. 6d.
 Report on the Meteorology of Kerguelen Island.—By Rev. S. J. Perry, S.J., F.R.S. (No. 37. 1879.) 3s.
 Climatological Observations at Colonial and Foreign Stations :—
 I. :—Tropical Africa, 1900-1902, with Summaries and Map.—By E. G. Ravenstein, F.R.G.S. (No. 165. 1904.) 6s. (4to.)

4. Marine Meteorology, Atlases and Memoirs.

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. (No. 80. 1891.) 10s. (4to.)

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. (No. 27. 1876.) 24s. (17 × 20 ins.)
 Monthly Current Charts for the Atlantic Ocean. From information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 132. 1897.) 10s. (22½ × 18 ins.)

Atlantic, North :—

- Charts of Meteorological Data for Square 3, Lat. 0°-10° N., Long. 20°-30° W. (20 × 13½ ins.) and Remarks to accompany the Monthly Charts, which show the Best Routes across the Equator for each Month, &c. (17 × 16½ ins.) (No. 20. 1874.) 20s.
 Charts illustrating the Weather of the North Atlantic Ocean in the Winter of 1898-99. (No. 142. 1901.) 6s. 6d. [Out of Print.]
 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. (No. 12. 1872.) 2s. 6d. (4to.)
 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. (No. 13. 1872.) 5s. (4to.)
 Meteorology of the North Atlantic during August, 1873, with 31 Synoptic Charts. (No. 32. 1878.) With book of Charts, 15s. (15 × 22 ins.)
 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). (No. 71. 1886.) 17s. each Part. (26 × 22 ins.)

Atlantic, South :—

- Charts showing the Surface Temperature of the South Atlantic Ocean in each month of the Year. (No. 4. 1869.) 2s. 6d. (18½ × 12½ ins.)
 Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 159. 1902.) 7s. (27 × 20½ ins.)
 Monthly Wind Charts of the South Atlantic. Published by the Admiralty. (No. 168. 1903.) 6d. each. (20 × 27 ins.)
 The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. (No. 177. 1905.) 9d. (8vo.)

Atlantic, Indian, and Pacific Oceans :—

- Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (No. 59. Second Edition, 1903.) 4s. 6d. (19½ × 14½ ins.)
 Charts showing the Mean Barometric Pressure over the Atlantic, Indian, and Pacific Oceans. (No. 76. 1887.) 10s. 6d. Supplementary Chart. 6d. (27 × 20½ ins.)

4. Marine Meteorology—continued.

CHARTS—continued.

Atlantic (North) and Mediterranean :—

Monthly Meteorological Charts, commencing April, 1901. (No. 149.)
6d. each. Subscription for one year, 5s. (exclusive of postage.) (22 × 30 ins.)

Indian Ocean :—

Monthly Current Charts for the Indian Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 124. 1896.) 7s. (20 × 24½ ins.)

Monthly Meteorological Charts of the Indian Ocean and Red Sea. Commencing May, 1906. (No. 181.) 6d. each. Subscription for one year, 5s. (exclusive of postage.) (1906–10 30 × 22 ins., 1910–11 30 × 30 ins.)

Indian Ocean (North) :—

Meteorological Charts of the portion of the Indian Ocean adjacent to Cape Guardafui and Ras-Hafun. (No. 92. 1891.) 6s. (17½ × 23¾ ins.)

Indian Ocean (South) :—

Cyclone Tracks in the South Indian Ocean, from information compiled by Dr. Meldrum, C.M.G., F.R.S. (No. 90. 1891.) [Out of print.]*

Meteorological Charts for the Ocean District adjacent to the Cape of Good Hope, with accompanying Remarks. (No. 43. 1882.) Charts, 25s.; Remarks, 7s. (19½ × 24 ins.)

Pacific Ocean :—

Quarterly Current Charts for the Pacific Ocean, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 134. 1897.) 5s. (26½ × 28½ ins.)

Wind Charts for the Coastal Regions of South America, from information collated and prepared in the Meteorological Office. Published by the Admiralty. (No. 159. 1902.) 7s. (27 × 20½ ins.)

Red Sea :—

Meteorological Charts of the Red Sea. (No. 106. 1895.) 21s. (22 × 13½ ins.)

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123. 1899.) [New Edition, 1907.] 6s. (17½ × 19½ ins.)

OTHER PUBLICATIONS ON MARINE METEOROLOGY :—

Contributions to our Knowledge of the Meteorology of the Arctic Regions. (Official, No. 34. 1885.) Vol. I: Part I., 2s.; II., 10s.; III., 6s.; IV., 5s.; V., 6s. (4to.)

Contributions to our Knowledge of the Meteorology of the Antarctic Regions. (No. 18. 1873.) 2s. (4to.)

Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of South America. (No. 11. 1871.) 2s. 6d. (4to.)

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.]

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.]

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.) 6d. (8vo.)

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.) 1s. (8vo.)

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. (No. 44. 1882.) 7s. 6d. (4to.)

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.]

* Reproduced upon the Meteorological Charts for the Indian Ocean, No. 181.

5. Reports of Investigations in Dynamical and Statistical Meteorology and other Memoirs.

London Fog Inquiry, 1901-03 :—

Report of the Council, with Report by R. G. K. Lempfert, M.A. (1904). (No. 160. 1904.) 2s. 6d.

Report by Captain Alfred Carpenter, R.N., D.S.O (1903). 2s.

Dynamical Meteorology :—

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

Report of an Inquiry into the Connexion between Strong Winds and Barometric Differences.—By Robert H. Scott. (Non-Official, No. 1. 1868.) 6d. (8vo.)

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.]

Barometric Gradient and Wind Force. Report to the Director of the Meteorological Office by E. Gold, M.A., Fellow of St. John's College, Cambridge, Superintendent of Instruments. (No. 190.) Price 2s. 6d. (4to.)

Life History of Surface Air Currents. A Study of the Surface Trajectories of Moving Air.—By W. N. Shaw, Sc.D., F.R.S. (Director of the Meteorological Office) and R. G. K. Lempfert, M.A. (No. 174. 1906.) 7s. 6d. (4to.)

The Free Atmosphere in the Region of the British Isles. Contributions to the Investigation of the Upper Air. (No. 202. 1909.) Price 2s. 6d. (4to.)

Statistical Meteorology :—

The Beaufort Scale of Wind-force. Report of the Director of the Meteorological Office upon an Inquiry, with a Paper by G. C. Simpson, M.Sc., and Notes by Sir G. H. Darwin, K.C.B., F.R.S., W. H. Dines, F.R.S., and Commander Campbell Hepworth, C.B., R.N.R., Marine Superintendent. (No. 180. 1906.) 1s. 6d. (4to.)

Harmonic Analysis of Hourly Observations of Air Temperature and of Pressure at British Observatories. (No. 93. 1891.) 12s. (4to.)

The Trade Winds of the Atlantic Ocean. Contributions to the Study of of the North-East and South-East Trade Winds. (No. 203.) (4to.) [In the Press.]

6. Handbooks and Textbooks. (8vo.)

Barometer Manual. (No. 8. 1871.) [Out of Print.]

Barometer Manual for the Use of Seamen. With an Appendix on the Thermometer, Hygrometer, and Hydrometer. Sixth Edition, extensively Revised. 1909. (No. 61.) 3d. A Text Book of Marine Meteorology.

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

Instructions for Meteorological Telegraphy. New Edition, 1906. (No. 2.) Prepared for the use of Observers exclusively.

The Observer's Handbook. A new Edition of Dr. Scott's Instructions in the use of Meteorological Instruments. (No. 191.) 3s.

Hints to Meteorological Observers in Tropical Africa, with Instructions for taking Observations, and Notes on Methods of recording Lake Levels. Second Edition, revised 1907. (No. 162.) 9d.

FORECASTING :—

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

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

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Excellent" during the year ending March 31, 1910. 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 "Ex- cellent" Logs.	Ship.
Barcham, S.	3	S.S. "Britannia."
Bayldon, F. J., Lieut. R.N.R. ...	9	S.S. "Moresby."
Bennett, C. D., Comm. R.N.R., R.D.	15	S.S. "Macedonia."
Carnon, J. R., Lieut. R.N.R. ...	6	S.S. "Caledonian."
Chudley, T. H., Lieut. R.N.R. ...	1	S.S. "Kia Ora."
Darley, C. E.	3	S.S. "Clan Buchanan."
Docherty, H.	12	Ship "Eva Montgomery."
Griffiths, A. M.	3	S.S. "Hillmere."
Hanson, F. W. A., Lieut. R.N.R. ...	1	S.S. "Wilcannia."
Harris, G. H., Lieut. R.N.R. ...	12	{ S.S. "Worcestershire." S.S. "Leicestershire."
Hemming, H. C.	4	S.S. "Den of Ogil."
Henderson, S., Lieut. R.N.R., R.D.	1	S.S. "Durham Castle."
Henning, G. C., Comm. R.N.R. ...	2	S.S. "Mooltan."
Higgins, C. J.	4	S.S. "Macinnes."
Hollis, H.	2	S.S. "Niwaru."
Hunt, A.	1	S.S. "Bohemia."
Kemp, A. H.	9	S.S. "Mimiro."
Kempson, C. H., Lieut. R.N.R. ...	6	S.S. "Athenic."
Kirkwood, R.	2	S.S. "Saxon Prince."
Lingham, W. G., F.R.A.S., F.R. Met. Soc.	5	{ S.S. "Wilcannia." S.S. "Wakool."
Mais, E.	1	S.S. "York Castle."
Millican, J. W.	33	S.S. "Keyingham."
Moodie, J.	1	S.S. "Campbell."
Morrison, D.	1	S.S. "City of Corinth."
Moseley, F. J., Comm. R.N.R. ...	4	S.S. "Durham Castle."
Mullan, F.C., F.R.G.S.	29	S.S. "Ramsay."
Notley, F.B.S., Comm. R.N.R., R.D.	2	S.S. "China."
Pattman, R.	7	Ship "Loch Torridon."
Simpson, A., F.R. Met. Soc. ...	51	S.S. "Pericles."
Steeves, T. G.	1	S.S. "Jason."
Weir, A. R.	1	S.S. "Clan Macintyre."
Young, G.	4	S.S. "Clan Macfadyen."

APPENDIX IV.

METEOROLOGICAL REGISTERS received during the Year 1909-10.

(1.)—From the ROYAL NAVY.—*Meteorological Logs* (9).

H.M. Ship.	Commanding Officer.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Cambrian" ...	E. W. E. Wemyss, Capt.	H. L. L. Pennell, Lieut., E. G. Morris, Lieut., J. C. S. Hilton, Lieut., R. P. Ross, Sub-Lieut.	1	Mths. Days 1 16	Colombo to Australia.
"Egeria" ...	J. F. Parry, Capt. ...	A. F. S. Grant, Lieut. ...	1	6 20	Surveying, Vancouver Coasts.
"Merlin" ...	F. C. Learmonth, Capt.	V. I. Griffith, Sub-Lieut. ...	2	7 25	Surveying, China Sea.
"Mutine" ...	C. E. Monro, Capt. E. C. Hardy, Commr.	C. I. Greer, Lieut., T. Lundholm, Sub-Lieut.	3	11 19	Surveying, West Coast of Africa.
"Sealark" ...	B. O. M. Davy, Commr.	J. W. Seddon, Lieut. ...	1	8 10	Surveying, Ceylon Coast.
"Waterwitch" ...	H. P. Douglas, Lieut. and Commr.	C. H. Knowles, Lieut. ...	1	3 22	Surveying, China Sea.
(2.)—SPECIAL SERVICE.—Uncommissioned Ships (2).					
"Conway," H.M.S. ...	H. W. Broadbent, R.D., Commr. R.N.R.	Cadets ...	1	2 16	River Mersey.
"Worcester," H.M.S.	D. Wilson Barker, Commr. R.N.R., F.R.S.E., F.R.A.S., &c.	Cadets ...	1	4 0	Off Greenhithe.

METEOROLOGICAL REGISTERS received during the Year 1909-10—continued.

(3.)—From the MERCANTILE MARINE.—*Meteorological Logs (270).*

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"African Prince," S.S.	C. B. Andersson	E. Purdy, R. D. Williams	2	Mths. 5 Days. 11	Calcutta, <i>via</i> Cape, Suez, Monte Video, New Orleans.
"Alfalfa," S.S.	A. Osmond	C. L. Willats, L. J. Buret, R. H. Dadsworth.	1	58 3	River Plate, Bahia Blanca.
"Amazon," S.S.	H. E. Rudge	R. O. Lloyd W. M. Mathews, A. S. Mackay, Sub-Lieut. R.N.R.	1	3 17	Pernambuco.
"Amberton," S.S.	A. Heron	J. T. Colvin, S. T. Stratton, W. J. Miller	1	2 5	Bahia Blanca.
"Aorangi," S.S.	J. D. S. Phillips	E. A. Wrigley, E. C. Mason, E. P. Cooper, C. S. Hudson.	3	10 18	Trans-Pacific, Victoria, B.C., and Brisbane.
"Apollo," S.S.	T. A. Tait	A. Jones, A. W. Drew, G. Sinclair	1	4 0	Bahia Blanca.
"Assyria," S.S.	R. J. Garrick	R. O. Lewis	3	6 9	Calcutta, <i>via</i> Suez.
"Athenic," S.S.	C. H. Kempson, Lieut. R.N.R.	G. A. Alcock, Lieut. R.N.R., V. W. Hickson, Lieut. R.N.R., F. J. Burd, W. S. Thornton, E. K. Irving, Sub-Lieut. R.N.R.	3	8 23	New Zealand, <i>via</i> Capes.
"Atrato," S.S.	F. M. Watson	R. Harvey, W. Tarrant, C. Delahay, S. L. Smith.	1	3 21	West Indies, Colon, New York.
"Asuncion de Lar- rinaga," S.S.	J. V. de A. Echevarria	J. D. de Arana	1	6 6	East Coasts of North and South America.
"Avon," S.S.	L. R. Dickinson	A. Dadd, F. Cook, W. H. Townsend, Sub-Lieut. R.N.R., K. D. Shoesmith.	1	5 4	River Plate.
"Balaena," S.S.	J. W. Murray	E. G. Drake, Lieut. R.N.R., E. G. Martin, W. G. Preece, H. C. Hake, A. N. Newitt, A. D. Riseley.	1	4 0	Greenland Seas, Whaling.
"Barranca," S.S.	W. Long	D. J. Calley, J. M. Hewison, M. Thomson	3	9 19	Port Limon.
"Benlarig," S.S.	A. Wallace	A. S. Brewis, W. L. Charlton, E. Bush, J. McGreivy.	2	6 23	China, Japan, India, <i>via</i> Suez.
"Blackwell," S.S.	T. W. Scurr		2	4 24	Calcutta, <i>via</i> Suez.

"Bohemia," S.S.	{ A. Hunt G. Mitchell	{	{ G. Mackenzie, A. Fraser ...	...	3	8	6	Calcutta, <i>via</i> Suez.
"Bostonian," S.S.	{ J. Parry ...	{ ...	{ J. Trickey, J. Arkle, J. Wilson, — Westlake, Porter.	...	1	3	4	Boston, U.S.A.
"Breconshire," S.S. ...	{ J. M. Tomlinson	{ ...	{ G. Kershaw, T. Hughes, E. M. Legge, Sub- Lieut. R.N.R.	...	1	3	27	Calcutta, Hong Kong, <i>via</i> Suez.
"Britannia," S.S. ...	{ S. Barcham	{ ...	{ W. R. Calder, Sub-Lieut. R.N.R., C. E. Short, A. Parnis.	...	1	3	3	Bombay, China, <i>via</i> Suez.
"Caledonian" S.S. ...	{ J. R. Carnon, Lieut. R.N.R.	{ ...	{ R. D. Allinson, L. Mann	...	2	6	29	U.S.A.
"Campbell," S.S. ...	{ J. Moodie	{ ...	{ J. Horne, J. Johnstone	...	1	3	29	Baltimore, San Francisco, <i>via</i> Magellan, Melbourne.
"Carpentaria," S.S. ...	{ J. S. Hutchison, Commr. R.N.R.	{ ...	{ W. G. Fitt, J. W. Schlischer, J. H. Long- hurst.	...	2	7	6	Australia, <i>via</i> Suez and Cape.
"Cheshire," S.S.	{ H. P. Langston... W. Sturges	{ ...	{ F. W. Midgley, C. E. Stone, W. McGhie, P. de Legh, C. Hill, R. Sharp, B. W. Adamson, E. Fall.	...	3	6	2	Rangoon, <i>via</i> Suez.
"China," S.S.	{ E. Street	{ ...	{ B. E. Hetherington, Lieut. R.N.R., H. A. Monro, A. J. Morton, E. F. Hannan, J. L. Hughes, N. A. Wicks.	...	3	8	10	Australia, <i>via</i> Suez.
"Chirripo," S.S. ...	{ Commr. R.N.R. E. H. Jones	{ ...	{ E. J. West, G. E. Ryan, O. Pitts, R. Langston, C. Hake.	...	2	5	25	Port Limon.
"City of Corinth," S.S.	{ A. J. Elliot	{ ...	{ J. McArthur	...	3	6	4	Calcutta, <i>via</i> Suez.
"Clan Buchanan," S.S.	{ D. Morrison	{ ...	{ F. R. Elwell, H. Matthews, E. C. Joel, — Swanson, — Elliot, — Leck.	...	2	5	20	Bombay, Madras, <i>via</i> Cape and Suez.
"Clan Forbes," S.S. ...	{ A. W. Simpson R. G. Becket	{ ...	{ W. I. Mason, Lieut. R.N.R., A. W. P. Gibb, T. B. Storey, Sub-Lieut. R.N.R., J. H. Bain, E. C. Whiteford, W. C. Campbell, J. Hock- ing.	...	3	7	10	East Indies, <i>via</i> Cape and Suez.
"Clan Lindsay," S.S.	{ W. Harris	{ ...	{ A. H. Young, F. J. Hawley, S. Knight	...	1	2	8	Bombay, Chittagong, <i>via</i> Suez.
"Clan Macfadyen," S.S.	{ G. Young	{ ...	{ A. Clark, S. B. Watson, A. H. Hutton, E. B. Turtle, G. C. Macey, J. Gibbons.	...	3	8	7	Cochin, Mangalore, <i>via</i> Cape and Suez.
"Clan Macfarlane," S.S.	{ W. H. Price	{ ...	{ R. Davidson, R. W. Mackie, G. G. Lardner, F. Beard, D. MacKinnon, P. Hart, A. D. Callaghan, O. Smith.	...	2	10	22	Mauritius, Vancouver, B.C., China, Japan, Australia, <i>via</i> Capes and Suez.

METEOROLOGICAL REGISTERS received during the Year 1909-10--continued.

(3.)—From the MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Clan Macinnes," S.S.	C. J. Higgins	C. T. C. Barker, E. S. Simpson	3	Mths. Days. 14 3	Calcutta, China, Java, Manilla, Japan, California, Japan, California, British Columbia, Samoa, Australia, New Zealand, <i>via</i> Suez.
"Clan Macintosh," S.S.	W. J. Lennox	— Wright, — Horn, — Easterbrook, — Hocking, — Butcher, — Harvey, — Coppin, — Stenson, — Jackson, — MacKenzie.	2	6 13	Durban, Mauritius, Bombay, Chittagong, <i>via</i> Cape and Suez.
"Clan Macintyre," S.S.	A. R. Weir	G. P. Phillips, W. Crichton, T. W. Commander, M. I. Pirie, H. Penney, H. M. Ryder.	2	6 16	Natal, Mauritius, Australia, New Zealand, Chittagong, <i>via</i> Cape and Suez.
"Clan Macleod," S.S.	H. G. Fishenden, Lieut. R.N.R.	H. S. Southward, G. C. Matthews, J. B. Young, G. C. Macey, H. V. Wen.	2	7 28	Calcutta, Monte Video, New Zealand, Makassar, Saigon, <i>via</i> Capes and Suez.
"Clan Urquhart," S.S.	C. Sommerfelt	T. W. Young, J. Robson, J. R. Letts, C. T. Nicoll.	2	6 2	Bombay, Calcutta, <i>via</i> Suez.
"Clyde," S.S.	A. P. Dix, Lieut. R.N.R.	F. Bateman, A. W. Hudson, W. F. Bulleid, R. E. L. Treweek, J. E. Atkins, Sub-Lieut. R.N.R.	2	10 0	River Plate, West Indies, Colon, New York.
"Cornwall," S.S.	W. Howell	A. C. Jarvis, T. N. Edge, A. MacRae	1	4 6	New Zealand, <i>via</i> C.G.H. and Magellan.
"Crown of Arragon," S.S.	G. Grindlay	J. A. D. Risk, A. Thomson, N. McCormack	3	5 28	Demerara, West Indies, Galveston, Quebec.
"Den of Ogil," S.S.	H. C. Hemming	E. Twidle, G. C. Reed, R. Hedworth	1	3 14	Calcutta, Christmas Id., <i>via</i> Suez.
"Derbyshire," S.S.	E. Robin	F. Beckett, H. Lyons, W. McGhie, J. Miller, R. Kelleb.	4	8 0	Rangoon, <i>via</i> Suez.
"Diana," S.S.	H. Mackay	W. Shephard	1	3 10	Greenland Seas, Whaling.
"Dominic," S.S.	W. Smale	G. Parry	1	2 4	Para, New York, Galveston.

"Druidstone," S.S. ...	S. W. Decent ...	H. Haynes, P. O. Hughes ...	1	1	26	Black Sea.
"Dunbar Moor," S.S. ...	W. B. Barton ...	W. Tate, A. P. Hamon, — Adams, T. H. Gale, J. H. Russell, B. F. Carrington.	3	7	20	Nicolaieff, Bombay, Karachi, <i>via</i> Suez.
"Dunottar Castle," S.S.	G. K. Gandy, R. D., Lieut. R.N.R.	A. H. Hutchings, E. Windsor, A. B. Black...	1	3	26	Norway, Mediterranean.
"Durham Castle," S.S.	F. J. Moseley, Commr. R.N.R.	P. Durkin, Lieut. R.N.R., B. Ray, J. J. Kersey, A. J. Densham, E. C. Pilkington, Lieut. R.N.R.	3	7	16	Cape Town.
"East Point," S.S.	H. M. Cruise ...	— Young, — Sims, — Hadley ...	1	3	1	Philadelphia.
"Egypt," S.S.	F. P. Whitehead, Lieut. R.N.R.	D. Asbury, M. E. Dunston, C. Young, S. J. Woodroffe, S. Pearson, S. Marsden, J. Lilley.	2	8	2	Bombay, <i>via</i> Suez.
"Empress of China," S.S.	L. R. W. Beavis ...	F. W. N. Higgins, Lieut. R.N.R.	1	4	0	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Empress of India," S.S.	H. I. Young ...	J. N. Day ...	1	3	8	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Empress of Japan," S.S.	F. R. Summers ...	...	1	3	20	Trans-Pacific, Victoria, B.C., and Hong Kong.
"Eva Montgomery," Ship.	W. Davison, Lieut. R.N.R.	J. L. Campbell, — Courroy ...	2	13	2	W.C. South America.
"Fulwell," S.S. ...	R. Archibald, Commr. R.N.R.	...	1	2	16	Calcutta, <i>via</i> Suez.
"Gio Batta Beverino," Barque.	E. Beetham, Lieut. R.N.R.	R. Mallett, E. F. Newton ...	1	5	23	New South Wales, W.C.S.A.
"Glamorganshire," S.S.	S. Robinson, Lieut. R.N.R.	...	1	4	4	China, Japan, <i>via</i> Suez.
"Glen Affric," S.S. ...	H. C. Norris ...	H. T. Angus, T. C. Morris, N. Colbridge ...	1	2	15	Calcutta, Karachi, <i>via</i> Suez.
"Glenelg," S.S.	W. Lane ...	H. A. Vicary, A. S. Whyte, S. Horne ...	1	7	23	East Indies, United States, Madagascar, <i>via</i> Cape and Suez.
"Grace Harwar," Ship	A. Hart ...	I. Millar, D. L. Muirhead, R. Brown, T. Thomas.	1	6	7	Iquique.
	E. Gates James, Lieut. R.N.R.	R. E. Barton, A. H. Seaton ...	1			

METEOROLOGICAL REGISTERS received during the Year 1909-10—continued.

(3.)—From the MERCANTILE MARINE.—Meteorological Logs—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Hesperian," S.S. ...	W. S. Main ...	D. M. Kelso ...	1	Mths. Days. 3 24	U.S.A., Canada.
"Hillmere," S.S. ...	A. M. Griffiths ...	I. Dawson, T. Moore, M. W. White ...	3	7 28	Rio, West Indies, Gulf of Mexico Wilmington, N.C.
"India," S.S. ...	R. L. Haddock, Commr. R.N.R.	C. W. Burleigh, Lieut. R.N.R., E. C. Miller, Sub-Lieut. R.N.R., G. Lake, Sub-Lieut. R.N.R., H. P. Conyn, Sub-Lieut. R.N.R., T. A. Smith, F. C. Archer, A. Roddick, Sub-Lieut. R.N.R., R. H. Stringer, Sub- Lieut. R.N.R.	3	6 27	Australia, Bombay, <i>via</i> Suez.
"Ionic," S.S. ...	S. A. Anning, Lieut. R.N.R.	W. Paul, A. E. Bowles, T. Thomas, C. Alex- andre.	3	8 28	New Zealand, <i>via</i> Capes.
"Jason," S.S. ...	E. C. Roberts ...	G. J. B. Rogers, J. R. Scott ...	3	8 21	China, Makassar, Japan, Australia, <i>via</i> Suez, Cape.
"Julia Park," S.S. ...	T. G. Steeves ...	Jno. Thomson ...	2	5 27	Monte Video.
"Kaikoura," S.S. ...	M. Mackenzie ...	A. F. Beaton, N. J. Wilde, R. J. Gibb ...	1	3 1	New Zealand, <i>via</i> Capes.
"Kaipara," S.S. ...	A. W. McKellar, Lieut. R.N.R.	G. Worthington, W. T. Point, G. Stedham ...	1	2 26	New Zealand, <i>via</i> Capes.
"Keyingham," S.S. ...	N. R. de la C. Cornwall, Lieut. R.N.R.	I. Tweedie, A. Thompson ...	2	7 20	U.S.A., Mediterranean, E.C.S.A., Port Said.
"Kia Ora," S.S. ...	J. W. Millican ...	— Lewis, — Kershaw, — Gaskell, — Clements.	1	3 17	New Zealand, <i>via</i> Capes.
"Kildonan Castle," S.S.	T. H. Chudley, Lieut. R.N.R.	N. Aplin, J. McMahon, F. Tunbridge ...	2	6 27	Cape Town.
"Kincraig," S.S. ...	J. Tyson ...	— Bassuers, — Paterson, — Bailey ...	1	3 23	Japan, <i>via</i> Suez.
"Kincraig," S.S. ...	A. G. Reid ...				

"Kintail," S.S.	...	D. G. Griffiths ...	D. Kerr, R. McDougall, E. L. Thomas, F. Wilson, L. Wiseman.	2	4	18	Calcutta, Bassein, <i>via</i> Suez, Buenos Aires.
"Kunara," S.S.	...	A. Morton ...	H. S. Solomon, C. J. G. Gordon-Canning, Mid. R.N.R., A. S. Verity, J. Fisher, J. Wilson.	2	6	7	New Zealand, <i>via</i> Capes.
"Leander," S.S.	...	H. R. Ketley ...	J. H. Williams, T. Williams ...	1	3	23	Rosario, Archangel, Port Said.
"Le Cog," S.S.	...	F. W. Peterson ...	C. J. Bailey, O. S. Leech, J. Main J. Marrais	1	3	23	Kustendje, New York.
"Leicestershire," S.S.	...	G. H. Harris, Lieut. R.N.R.	— Blanchard, — Bergen, — Turnour, — Wood, — Smarden, — Boyce, F. J. White ...	2	4	4	Rangoon, <i>via</i> Suez.
"Loch Torridon," Barque.	...	R. Pattman ...	F. J. White ...	1	6	7	Australia, <i>via</i> Capes.
"Lusitania," S.S.	...	W. T. Turner ...	W. Wingate, Sub-Lieut. R.N.R.	1	3	4	New York.
"Macduff," S.S.	...	C. H. Burch ...	— Cook, — Clark, — Gay, — Kidley ...	1	3	12	Saigon to Bombay, Mauritius, Calcutta.
"Macedonia," S.S.	...	C. D. Bennett, R.D., Commr. R.N.R.	A. H. Ayres, Sub-Lieut. R.N.R., M. Gar- wood, C. Roddick, F. E. French, Sub- Lieut. R.N.R., G. G. Randall, E. P. Lyndon.	3	8	3	Bombay, China, Australia, <i>via</i> Suez.
"Magdalena," S.S.	...	W. H. B. Trigge, Lieut. R.N.R.	A. Thompson, L. F. Drake, T. W. H. Hose- good, P. Gould, H. L. Jenkins.	1	3	11	West Indies, New York.
"Majestic," S.S.	...	F. E. Beadnell, Lieut. R.N.R.	J. Bertenshaw ...	1	4	1	New York.
"Manchester Corpora- tion," S.S.	...	B. F. Hayes, R.D., Commr. R.N.R.	H. Wilkinson, — Cabot, F. Clough ...	1	3	22	Philadelphia.
"Manchester Ex- change," S.S.	...	P. J. Heath ...	G. M. Mitchell, T. A. Brooks, C. L. Whorral	1	3	24	Mobile, New York, E.C.S.A., Florida.
"Manica," S.S.	...	T. A. Adamson ...	S. C. Walton, L. W. T. Lewis, V. H. Harding, E. W. Manship, D. T. Edwards.	2	7	16	Seychelles, <i>via</i> , Cape, Calcutta, Saigon, Boston, U.S.A., <i>via</i> Suez.
"Manistee," S.S.	...	F. O. Potts ...	F. G. Downes, J. M. Isaacson, R. A. Thorburn, Mid. R.N.R., L. Sinclair, W. A. Williamson, V. F. Sizer.	2	7	2	Port Limon.
"Maori," S.S.	...	W. J. Forrester ...	A. C. Read, J. Pearce, Sub-Lieut. R.N.R., C. A. Rowlinson, Lieut. R.N.R., C. W. Probyn, Mid. R.N.R.	1	1	20	Buenos Aires.
"Marere," S.S.	...	G. Nicole ...	P. E. Mells, F. A. Renaut, R. S. Durham, C. H. Purkis, F. G. Williams, N. S. Marks.	2	5	16	Australia, <i>via</i> Capes and Suez.
	...	J. Firth ...					

METEOROLOGICAL REGISTERS received during the Year 1909-10—continued.

(3.)—From the MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.		Voyage.
				Mths.	Days.	
"Marion Josiah," Ship.	J. MacDonald	...	2	14	18	Australia, W.C.S.A., <i>via</i> Capes.
"Mars," S.S. ...	T. A. Tait	...	1	3	26	Cape, Pondicherry. U.S.A., <i>via</i> Suez.
"Matina," S.S.	F. H. Swain	...	3	8	8	Central America.
"Miami," S.S.	E. W. Castle	...	1	3	6	Port Limon.
"Mimiro," S.S.	A. H. Kemp	...	2	6	22	Australia, New Zealand, <i>via</i> Capes and Suez.
"Minia," S.S.	W. G. S. De Carteret	...	2	8	20	Cable work, N.A.
"Morarch," S.S.	J. Wrake	...	2	4	13	Cable work, United Kingdom Coasts.
"Monmouth," S.S. ...	H. G. Kendall, Lieut. R.N.R.	...	1	3	10	Canada.
"Monmouthshire," S.S.	G. E. Warner, Lieut. R.N.R.	...	1	3	27	China, Japan, <i>via</i> Suez.
"Mooltan," S.S. ...	G. C. Henning, Commr. R.N.R.	...	4	9	27	Australia, <i>via</i> Suez.
"Morning," S.S.	W. Adams	...	1	6	3	Davis Strait, Whaling.
"Ness," S.S. ...	T. McWilliams	...	2	6	7	Buenos Aires, Black Sea, U.S.A.
"Nicoya," S.S.	S. H. Simmons	...	2	7	5	Port Limon.
"Niwaru," S.S.	H. Hollis	...	2	6	20	Australia, New Zealand, <i>via</i> C.G.H.

"Nonsuch," S.S.	...	A. G. Alston, Lieut. R.N.	T. F. Gibson, J. Goulding, R. K. McLean, E. Young.	2	5	28	Bombay, Australia, Constantinople, Calcutta, <i>via</i> Cape.
"Nubia," S.S.	...	F. J. Fox	R. Johnes-Smith, A. Keith-Yates	3	8	3	China, Japan, Calcutta, <i>via</i> Suez.
"Olympia," S.S.	...	A. Tait	G. Guthrie, G. S. Salmon, W. D. Butler, N. J. Doig, J. P. M. H. Martin.	1	3	20	Bombay, <i>via</i> Suez.
"Omrah," S.S.	...	W. S. Shelford, Lieut. R.N.R.	H. Seale, A. Fielding, Lieut. R.N.R., F. R. O'Sullivan, R. C. Glazebrook, Lieut. R.N.R., H. G. Thomson, Sub-Lieut. R.N.R., C. W. Stevens, Lieut. R.N.R., A. H. Fraser, Lieut. R.N.R., H. A. Deane.	3	7	14	Australia, <i>via</i> Suez.
"Ophir," S.S.	...	A. J. Coad, Commr. R.N.R. J. F. H. Healey, R.D., Lieut. R.N.R. H. G. Staunton, Lieut. R.N.R.	R. W. L. Marshall, Sub-Lieut. R.N.R., H. V. Hart, Lieut. R.N.R., H. Phillips, Lieut. R.N.R., R. B. Thomson, Lieut. R.N.R.	3	7	10	Australia, <i>via</i> Suez.
"Orari," S.S. ...	...	J. P. Forsdick	P. G. Hyde, A. Willes, F. Pattinson	1	2	28	New Zealand, <i>via</i> Capes.
"Orient," S.S.	...	H. G. Staunton, Lieut. R.N.R.	H. G. Adams, L. V. James, C. T. Keigwin, Lieut. R.N.R., A. L. Owens, Sub-Lieut. R.N.R., M. J. Parson.	2	4	28	Australia, <i>via</i> Suez.
"Ormuz," S.S.	...	P. N. Layton, Lieut. R.N.R. J. Avern, Sub-Lieut. R.N.R. J. F. Ruthven, A.I.N.A., F.R.G.S., &c. D. R. W. Parsons, Lieut. R.N.R. J. F. Ruthven, A.I.N.A., F.R.G.S., &c. D. R. W. Parsons, Lieut. R.N.R.	H. C. Brewster, Lieut. R.N.R., H. D. Groom, G. F. Parsons.	2	5	14	Australia, <i>via</i> Suez.
"Orontes," S.S.	...	...	L. A. Brooke - Smith, Lieut. R.N.R., V. Seymour, Sub-Lieut. R.N.R., E. P. Cameron, Sub-Lieut. R.N.R., C. J. R. Webb, Sub-Lieut. R.N.R.	2	5	29	Australia, <i>via</i> Suez.
"Orsova," S.S.	...	...	F. R. O'Sullivan, I. N. Jones, H. T. M. Watkins, Lieut. R.N.R., W. Gordon-Bennett.	2	4	28	Australia, <i>via</i> Suez.
"Osterley," S.S.	...	W. J. Jenks	A. Fielding, Lieut. R.N.R., L. V. James, B. Blecher, H. S. Gillett, Sub-Lieut. R.N.R.	1	2	13	Australia, <i>via</i> Suez.
"Otaki," S.S. ...	...	L. G. Silba	H. Wynyard, H. L. Penny, C. Gavegan, Sub-Lieut. R.N.R., L. Rose, J. Aitken.	2	6	16	New Zealand, <i>via</i> Capes.

METEOROLOGICAL REGISTERS received during the Year 1909-10—continued.

(3.)—From the MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Otway," S.S.	F. S. Symons ...	E. E. Smith, J. L. Marshall, Sub-Lieut. R.N.R.	2	Mths. Days. 4 24	Australia, <i>viâ</i> Suez.
"Pacquare," S.S.	J. H. H. Scudamore, Lieut. R.N.R.	R. B. Drake, H. Ashley, H. A. Deane, P. H. Day, A. N. Newitt, O. Pitts.	2	6 12	Port Limon.
"Pakeha," S.S.	L. B. Gillman ...	R. A. Kelly, L. D. McKirdy, Sub-Lieut. R.N.R., E. Calvert.	1	4 13	New Zealand, <i>viâ</i> Capes.
"Palma," S.S.	G. W. Cockman, R.D., Commr. R.N.R.	P. L. Sandberg, W. H. Davies, W. A. Blomfield, Mid. R.N.R., A. P. Gunston, Mid. R.N.R., E. G. Fryer, Mid. R.N.R., C. O. Clifford.	2	7 13	China, Japan, Australia, <i>viâ</i> Suez.
"Peerless," S.S.	H. Cook ...	C. Vickers ...	3	8 28	Monte Video, Pensacola, New Orleans.
"Pericles," S.S.	A. Simpson, F.R.Met. Soc.	P. C. Collins, E. Legge, O. File, W. Case, J. Jackson.	2	5 17	Australia, <i>viâ</i> Cape of Good Hope.
"Port Antonio," S.S.	A. C. Selfe, Lieut. R.N.R. W. R. Rowe, F.R.Met. Soc.	G. A. Griffin, C. L. Woollard, Sub-Lieut. R.N.R., J. N. Rodick, Sub-Lieut. R.N.R., G. K. Evans, J. B. Fleet, Mid. R.N.R., A. E. Harvey.	2	5 4	Jamaica.
"Port Henderson," S.S.	W. R. Rowe, F.R.Met. Soc.	G. K. Evans, C. L. Woollard, Sub-Lieut. R.N.R., J. B. Fleet, Mid. R.N.R., G. R. Hudson, Lieut. R.N.R., A. E. Harvey.	3	9 14	Jamaica.
"Port Kingston," S.S.	O. Jones ...	H. G. B. Bentley, Sub-Lieut. R.N.R.	2	6 24	Jamaica.
"Port Royal," S.S.	A. C. Selfe, Lieut. R.N.R.	G. A. Griffin, A. W. Creese, G. Terry, Sub-Lieut. R.N.R.	1	1 27	Jamaica.
"Potosi," S.S.	A. T. D. Pearson ...	— Jones, — Metcalf, — Flinn	1	5 11	W.C.S.A.
"Ramsay," S.S.	F. C. Mullan, F.R.G.S. ...	R. Bailey, A. Edwards, F. S. Hamilton	3	9 3	Rio Janeiro, Black Sea, U.S.A., West Indies, Natal, Manila, Manchuria, <i>viâ</i> Cape and Suez.

"Reventazon," S.S. ...	J. Clarke	...	D. McInnes, A. C. Reid, J. W. Gallop	...	2	5	13	Santa Marta, New York.
"Rewa," S.S. ...	A. W. Mann	...	F. G. Bright, T. M. Hall, F. E. Guerrier	...	1	3	26	Karachi, <i>viâ</i> Suez.
"Rimutaka," S.S. ...	H. E. Greenstreet	...	S. J. Plummer, C. K. Paris, Sub-Lieut.	...	2	6	0	Australia, New Zealand, <i>viâ</i> Capes.
"Ryde," S.S. ...	E. T. Smith	...	R.N.R., A. McKinstry, D. Gordon Stables.	...	1	3	27	Monte Video, Mobile.
"Saxon Prince," S.S. ...	W. G. Diver	...	J. E. Turner, J. Granger	...	2	5	0	New York, New Orleans, River Plate.
"Scotia," S.S. ...	R. Kirkwood	...	T. Jennings, R. Milliken, J. Smith, W. Milroy, T. H. Hamilton.	...	1	4	10	Greenland Seas, Whaling.
"Segura," S.S. ...	T. Robertson, F.R.S.G.S.	...	W. S. R. Robertson	...	1	3	24	China, Japan, <i>viâ</i> Suez.
"Shadwell," S.S. ...	R. Hayes	...	H. W. Robson, F. L. Tongue, Sub-Lieut.	...	3	7	9	Calcutta, <i>viâ</i> Suez.
"Shira," S.S. ...	J. T. Douglas	...	R.N.R., A. E. Gudgeon.	...	2	4	17	East Indies, U.S.A., <i>viâ</i> Suez.
"Singapore," S.S. ...	W. H. Knox	...	J. W. Bolam, J. McGreivy, R. Mallett,	...	1	1	27	Para, Tampa.
"Suevic," S.S. ...	J. Cann	...	C. C. Lee, G. J. Cooper, A. Brewis.	...	1	2	26	Australia, <i>viâ</i> C.G.H.
"Tagus," S.S. ...	L. F. Taylor, Lieut.	...	F. Carter	...	2	6	23	Central America, U.S.A.
"Tintagel Castle," S.S. ...	R.N.R.	...	W. S. Fish	...	4	10	1	Cape Ports, Mauritius, Beira.
"Tongariro," S.S. ...	C. E. Starck, Lieut.	...	F. F. Steele, H. Pawley	...	3	8	27	New Zealand, <i>viâ</i> Capes.
"Waimate," S.S. ...	R.N.R.	...	R. H. Kitson, G. B. Gedge, W. Weller,	...	2	7	6	New Zealand, <i>viâ</i> Capes.
"Wakanui," S.S. ...	W. W. Verrall, Lieut.	...	A. Thompson, D. Henderson, C. Hadow, S. Dean.	...	1	3	12	New Zealand, <i>viâ</i> Capes.
"Wakool," S.S. ...	R.N.R.	...	G. R. Parker, Sub-Lieut. R.N.R., E. S. Vincent, Lieut. R.N.R., C. F. Brown, Sub-Lieut. R.N.R., C. Steer, F. M. Miller, R. Dodsworth.	...	1	4	0	Australia, <i>viâ</i> C.G.H.
"Wandsworth," S.S. ...	I. A. Sutcliffe	...	J. S. Cairns, A. Rivers, R. B. O'Brien, C. W. J. Nursey, J. Moffatt, Sub-Lieut. R.N.R., P. Ballard.	...	2	5	20	Tenerife, River Plate, Savannah.
"Waverley," S.S. ...	J. J. Cameron, Lieut.	...	W. Field Hook, C. W. J. Nursey, J. Moffatt, Sub-Lieut. R.N.R., T. M. Stephenson, — Hamilton.	...	2	3	20	Mediterranean, U.S.A.
"Whakatane," S.S. ...	R.N.R.	...	S. Vine, O. P. Crawford, H. L. Upton, P. M. Black.	...	1	3	14	New Zealand, <i>viâ</i> Capes.
	V. C. White-Parsons	...	N. E. Ritson, H. Ashby, H. Carson	...	1	5	20	
	W. G. Lingham, F.R.A.S., F.R. Met. Soc.	...	A. C. Bucknell, D. McNeil, W. J. Hall	...	2	3	14	
	W. H. Bloomfield	...	R. Robertson, P. Henderson, P. Frazer	...	1			
	H. R. Wheatley	...	— Bradshaw, — Rose, — Stevenson	...				
	F. A. Hemming	...		...	

METEOROLOGICAL REGISTERS received during the Year 1909-10—continued.

(3.)—From the MERCANTILE MARINE.—*Meteorological Logs*—continued.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Wilcannia," S.S.	W. G. Lingham, F.R.A.S., F.R.Met. Soc.	A. Grove, Sub-Lieut. R.N.R., G. D. Turner, D. E. Hotchkiss, J. M. Pougnet, T. C. Bayard, W. T. Williams.	3	Mths. Days. 12 10	Australia, <i>via</i> C.G.H.
"Winkfield," S.S.	F. W. A. Hanson, Lieut. R.N.R. I. Watson	— Howell, — Adams, — McCourt ...	1	4 27	East Indies, Australia, W.S.C.A., <i>via</i> Suez and Cape Horn.
"Worcestershire," S.S.	G. H. Harris, Lieut. R.N.R.	— Travis, — Bryce, — English, — Bromley	1	2 3	Rangoon, <i>via</i> Suez.
"York Castle," S.S.	E. Mais ...	F. A. Smyth, Sub-Lieut. R.N.R., H. R. Northwood, J. Bishop.	1	4 6	New York, Beira, Baltimore, <i>via</i> C.G.H.
"Zent," S.S.	J. G. Parsons ...	G. W. Peberham, R. H. Smith, V. F. Sizer, G. D. V. Creagh.	2	7 6	Central America.

(4.)—ABBREVIATED METEOROLOGICAL REGISTERS.

(a.) From the Royal Navy (—).

(b.) From the Mercantile Marine (10).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Arana," S.S.	R. Walton ...	G. A. Simpson, W. C. Ashton, W. B. Richardson	6	Mths. Days. 3 29	Mediterranean.
"Mascotte," Barque	G. B. Serra ...	... ..	1	1 15	Monte Video.
"Moresby," S.S.	F. J. Bayldon, Lieut. R.N.R.	... ..	2	2 4	Between Brisbane and Solomon Islands.
"Sabine," S.S.	S. H. Owen ...	N. C. Wright ...	1	2 28	Cape to St. Paul's Id.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

(5.)—NORTH ATLANTIC REGISTERS—FORM NO. 121 (1,884).

INDIAN OCEAN REGISTERS—FORM NO. 122 (275).

RADIOTELEGRAPHY REGISTERS—FORM NO. 138 (515).

Ships from which Radiotelegraphy Registers have been received are shown by the symbol †.

Line.	Ship.	Captain and No. of Registers.
Alala S.S. Co. ...	Alala ...	B. B. Griffiths, 1.
Allan ...	Carthaginian ...	R. G. Bamber, 2.
	Corinthian ...	W. Dunlop } 12.
	†Corsican ...	A. Rennie } 12.
	Grampian ...	J. T. Gambell, 40.
	Hesperian ...	J. M. Johnston } 20.
	Hibernian ...	J. T. Gambell } 20.
	Ionian ...	W. S. Main, 24.
	Laurentian ...	G. Hamilton, 11.
	Mongolian ...	B. T. Eastaway, 12.
	Numidian ...	H. Imrie, 8.
	Ontarian ...	J. Williams, 6.
	Orcadian ...	T. Moar, 20.
	Pomeranian ...	A. J. Peters } 4.
	Pretorian ...	G. Hamilton } 4.
	Sardinian ...	D. Tannock, 2.
	Siberian ...	J. Henderson, 13.
	Sicilian ...	E. Pitts, Commr. R.N.R., R.D., 18.
	†Tunisian ...	B. Henry, 16.
	Ulunda ...	D. Tannock, 2.
	†Victorian ...	W. Wallace, 10.
	†Virginian ...	J. A. Fairfull, 32.
American ...	Friesland ...	F. W. Chambers, 2.
	Haverford ...	E. Outram, 30.
	Merion ...	A. H. Vipond, 30.
	†New York ...	J. Davies } 9.
	†Philadelphia ...	J. Evans } 9.
	†St. Louis ...	J. H. A. Thornton, 20.
	†St. Paul ...	J. B. Hill, 10.
Anchor ...	Algeria ...	W. J. Roberts, 21.
	†Caledonia ...	A. R. Mills, 22.
	†California ...	J. C. Jamison, 32.
	Circassia ...	F. M. Passow, 19.
	†Columbia ...	P. McLean, 2.
	Dalmatia ...	W. Baxter } 24.
	Elysia ...	J. Wilson } 24.
	†Furnessia ...	J. Blaikie, 5.
	Olympia ...	C. F. Osborne, Commr. R.N.R., R.D., 10.
	Scindia ...	F. H. Wadsworth, 7.
"Arana" S.S. Co. ...	Arana ...	J. Black } 6.
Atlantic Transport ...	Mackinaw ...	W. Mitchell } 6.
	Manhattan ...	A. Haig, 6.
	Marquette ...	J. Lumsdane } 18.
	Maryland ...	J. Black } 18.
		W. Mitchell } 18.
		A. Tait, 16.
		W. Kelso, 16.
		R. Waiton, 14.
		O. P. Clarke } 11.
		G. L. Gondie } 11.
		W. Johnston, 2.
		A. E. Tribe, Lieut. R.N.R., 3.
		J. McMath, 8.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

Line.	Ship.	Captain and No. of Registers.
Atlantic Transport— <i>cont.</i>	Mesaba ...	O. P. Clarke
	†Minneapolis ...	F. H. Claret, Lieut. R.N.R. } 10.
	†Minnehaha ...	F. H. Claret, Lieut. R.N.R., 28.
	Minnesota ...	S. Layland, 32.
	†Minnetonka ...	P. Laverock } 9.
	†Minnewaska ...	H. B. Pope } 9.
	Mobile ...	E. G. Cannons, 32.
	Montana ...	T. F. Gates, 38.
	Haileybury ...	J. T. J. Wylie, 10.
	Leicestershire ...	P. Laverock, 14.
Austin Friars S.S. Co.	Worcestershire ...	G. H. Sheppard, 3.
Bibby ...	Suffolk ...	G. H. Harris, Lieut. R.N.R., 10.
Birt, F. B. ...	Ramsay ...	G. H. Harris, Lieut. R.N.R., 7.
Bolton S.S. Co. ...	Anselm ...	G. T. Deith, 3.
Booth ...	Boniface ...	F. C. Mullan, F.R.G.S., 1.
	Hilary ...	A. MacKenzie, 6.
	Marenhense ...	R. G. M. Williamson, 8.
Bowring, C. T. & Co.	Brika ...	A. W. Stoker } 4.
Bristol "City" ...	Chicago City ...	E. J. Collings } 4.
British and Burmese	Martaban ...	E. Robinson, 3.
	Pegu ...	E. E. Cooper, 1.
British India ...	Colaba ...	W. M. Hunter, 12.
	Culna ...	W. Duguid, 9.
Brocklebank ...	Malakand ...	W. Morris, 8.
Bucknall ...	Buceros ...	J. Robertson, Lieut. R.N.R., 10.
	Karonga ...	S. MacLachlan } 12.
	Kasenga ...	J. Farquharson } 12.
	Katuna ...	T. G. Legg, 2.
	Koranna ...	J. Hutcheon } 2.
Buenos Ayres Great Southern Railway Co.	Alfalfa ...	W. Kearsley } 2.
Cairn ...	Fremona ...	R. Leslie, 2.
Canadian-Pacific Rail- way Co.	†Empress of Britain ...	A. W. Dobbs, 1.
	†Empress of Ireland ...	A. Lee, 12.
	†Lake Champlain ...	J. H. Beare, 6.
	†Lake Erie ...	A. Osmond, 4.
	†Lake Manitoba ...	
	†Lake Michigan ...	
	Milwaukee ...	J. Cunningham, 3.
	†Monmouth ...	J. A. Murray, 41.
	†Montcalm ...	J. V. Forster, Lieut. R.N.R., 17.
	†Montezuma ...	G. S. Webster, Lieut. R.N.R., 23.
	†Montfort ...	F. Carey, 17.
	†Montreal ...	G. C. Evans, 22.
	†Montrose ...	C. Troop } 22.
	†Mount Royal ...	H. Parry } 22.
	†Mount Temple ...	E. Griffiths, Lieut. R.N.R., 1.
Clan ...	Clan Macintosh ...	H. G. Kendall, Lieut. R.N.R., 7.
Clyde S.S. Co. ...	Spithead ...	C. W. Hodder, 22.
Compagnie Générale Transatlantique.	La Provence ...	H. G. Potter } 10.
"Crown" S.S. Co. ...	Crown of Navarre ...	A. E. Evans } 10.
		A. E. Evans, 12.
		R. H. McNeill, 9.
		H. G. Potter
		H. Parry
		E. Griffiths, Lieut. R.N.R. } 7.
		C. Troop } 8.
		A. Parcells } 8.
		J. H. Moore, 19.
		W. J. Lennox, 9.
		E. C. Tuckwell, 1.
		E. Poncelet, 4.
		A. McKillop, 6.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

Line.			Ship.	Captain and No. of Registers
Cunard	...	...	Aleppo ...	W. C. Crathorne, Lient. R.N.R., 1.
			Brescia ...	G. W. Melsom, Sub-Lieut. R.N.R., 10.
			†Campania ...	J. T. W. Charles, Commr. } R.N.R., R.D. } 28.
			†Carmania ...	R. C. Warr } C. A. Smith, Commr. R.N.R., } R.D. }
			†Caronia ...	J. C. Barr, 33.
			†Carpathia ...	D. Dow, Commr. R.N.R., R.D., 24.
			Cherbourg ...	C. A. Smith, Commr. R.N.R., R.D., 12.
			Cypria ...	C. Morison, 6.
			†Ivernia ...	H. N. Goulden, 3.
			Lucania ...	H. M. Benison, Lieut. R.N.R. } 33.
			†Lusitania ...	T. Potter } R. C. Warr, 2. }
			Lycia ...	J. B. Watt } W. T. Turner } 32.
			†Mauretania ...	J. T. W. Charles, Commr. } R.N.R., R.D. }
			Pannonia ...	G. F. Jeffries, 2.
			Pavia ...	J. Pritchard } 32.
			Saragossa ...	W. T. Turner } W. R. D. Irvine, Lieut. R.N.R., 17. }
			†Saxonia ...	G. F. Jeffries } 7.
			Sylvania ...	H. M. Benison, Lieut. R.N.R. } G. W. Melsom, Sub-Lieut. R.N.R., 9. }
			Tyria ...	E. H. Pentecost, Commr. } R.N.R. } 28.
			Ultonia ...	J. T. W. Charles, Commr. } R.N.R., R.D. }
			†Umbria ...	W. B. Cresser, Lieut. R.N.R., 2.
			Veria ...	W. C. Crathorne, Lient. } R.N.R. } 10.
			Devona ...	W. B. Cresser, Lieut. } R.N.R. }
			†Canada ...	C. A. Smith, Commr. R.N.R., R.D., 9.
			Cornishman ...	R. C. Warr } D. S. Miller, Lieut. R.N.R. } 9.
			†Dominion ...	J. T. W. Charles, Commr. } R.N.R., R.D. }
			Irishman ...	G. W. Melsom, Sub-Lieut. R.N.R., 12.
			Ottawa ...	D. R. Murray, 12.
			Ottoman ...	R. O. Jones, 39.
			Vancouver ...	E. Maddox } J. H. A. Thornton } 15.
			Welshman ...	W. L. Mendus, 14.
Elder, Dempster	...	...	Port Antonio ...	— Moorhouse, 1.
			Port Henderson ...	J. Evans, 8.
			Port Kingston ...	T. Deans, 3.
Elders & Fyffes	...	...	Port Royal ...	? , 2.
			Barranca ...	T. Howell, 8.
			Manistee ...	W. R. Rowe } A. C. Selfe, Lieut. R.N.R. } 14.
			Matina ...	W. R. Rowe, F.R. Met. Soc., 16.
			Nicoya ...	O. Jones, 20.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

Line.	Ship.	Captain and No. of Registers.
Elders & Fyers— <i>cont.</i>	Pacuare	J. H. H. Scudamore, Lieut. R.N.R., 6.
	Reventazon	J. Clarke, 14.
	Zent	J. Parsons, 16.
Ellerman	City of Athens	J. Wilson } 3.
		W. Knaut }
	City of Benares	?, 4.
	City of Glasgow	W. Greenhorn, 1.
	City of Manchester	H. Findlay, 12.
	Crosby Hall	T. Field, 7.
Elswick S.S. Co.	Elswick Grange	G. Wilson, 11.
English & American Shipping Co. (Danish)	Gafsa	G. Boulter, 2.
	Pola	W. R. Bennett, 6.
Gulf Transport	Dania	P. Petersen, 9.
	Ikbal	E. S. Pearce, 1.
	Imani	S. C. Penberthy, 8.
	Imaum	G. Wigdahl, 2.
	Indore	E. S. Pearce } 2.
		F. Jackson }
	Inkula	E. A. Alcide, 11.
	Inkum	W. E. Price, 3.
	Irak	A. Delargy, 5.
	Iran	T. B. Peabody, 7.
	Istrar	C. M. M. Jacob, 9.
H.M.S.	Terror	B. H. Fanshaw, Commr. R.N., 15.
Hardy, R.	Headlands	H. Lugg, 2.
Harrison	Author	G. N. Kearne, 9.
	Barrister	F. E. Westhorpe, 1.
	Civilian... ..	P. Lord } 9.
		G. Goldman }
	Counsellor	D. G. Cownie } 9.
		P. Lord }
	Custodian	D. G. Cownie, 9.
	Engineer	W. Llewellyn, 4.
	Historian	H. H. Pyle, 14.
	Huntsman	C. S. Rhodes, 14.
	Matador	W. T. Simmon, 2.
	Musician	G. B. Woolfenden, 2.
	Navigator	F. E. Westhorpe, 4.
	Tactician	R. Owen, 12.
	Traveller	G. N. Kearne, 1.
	Warrior	A. B. Sandiford, 3.
"Hurons" S.S. Co.	Hurons	J. Dorward } 13.
		O. Ritchie }
Indian S.S. Co. (Italian)	Orwell	D. C. Horne, 1.
	Silverstream	D. Garziona, 1.
Kish S.S. Co.	Simonside	— Pick, 1.
Laing S.S. Co.	Langdale	F. R. Clarke, 9.
Leyland, F.	Albanian	C. E. Harrison, 1.
	Almerian	E. Cook, 2.
	Antillian	W. Japha, 9.
	Armenian	J. Jacobsen, 3.
	Asian	W. E. Wood, 1.
	Atlantian	A. H. Highton, 9.
	Barbadian	G. H. Willis } 10.
		J. Macdonald }
		G. H. Manning }
	Bohemian	R. McCullum, 7.
	Bostonian	J. Parry, 6.
	Belgian	G. Williams, 3.
	Californian	B. Bruce } 4.
		F. A. Parkin }
	Cestrian	E. Thomas, 4.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

Line.	Ship.	Captain and No. of Registers.
Leyland, F.—cont.	Colonian... ..	T. Chadwick, 5.
	Cuban	T. W. Lofthouse } 9. W. Masters }
	Devonian	A. W. V. Trant, 1.
	Georgian	W. E. Wood, 4.
	Iberian	T. B. Jago, 16.
	Indian	B. Bruce, 2.
	Jamaican	J. Robb } 4. B. Bruce } P. T. Reid }
	Meltonian	A. Parker, 4.
	Michigan	S. W. Watkins, 2.
	Oxonian	W. Dickinson, 2.
	Philadelphian	J. Gardner } 9. R. D. George }
	Tampican	W. Roberts, 8.
	Victorian	T. J. Kearney } 5. E. C. Hiscox }
	Winifredian	F. Shepherd, 6.
Leyland Shipping Co.	Planet Neptune	W. E. Price, 3.
Manchester Liners ...	Manchester Corporation	P. J. Heath, 10.
Meek, H. D.	Keyingham	J. W. Millican, 4.
Mercantile S.S. Co. ...	Lena	S. G. Dale, 3.
Nederland	Kawi	N. Guthrie } 4. W. Bagchus }
	Koning Willem II.	J. Teensma, 2.
	Sindoro	W. Bagchus, 9.
	Tabanan	N. Guthrie, 4.
	Vondel	J. Teensma, 5.
Nippon Yusen Kaisha	Sanuki Maru	K. Homma, 2.
Norddeutscher Lloyd	Bremen	E. Von Borell, 1.
	Seydlitz	A. Ahlborn, 3.
Norfolk and North American S.S. Co.	Crown Point	J. Wall } 10. J. C. Walker }
(Norwegian)... ..	Akershus	J. Martin, 1.
Peninsular and Oriental.	Assaye	O. Jones, Commr. R.N.R., R.D., 9.
	Banca	A. Collyer, Lieut. R.N.R., 3.
	Borneo	W. H. S. Hall, 1.
	Egypt	F. R. Summers, 18.
	Mongolia	C. F. Preston, Commr. R.N.R., 8.
	Nile	E. P. Martin, Lieut. R.N.R., 12.
	Nyanza	H. S. Bradshaw, 6.
	Persia	W. H. Houghton, Commr. R.N.R., 15.
	Salsette	H. G. H. Lewellin, Lieut. } 9. R.N.R. } W. Hayward, Lieut. R.N.R. }
	Sumatra... ..	C. J. Benton, Lieut. R.N.R., 1.
Prince... ..	African Prince	C. B. Andersson, 1.
	Black Prince	J. Thomas, 4.
	British Prince... ..	P. A. Johnston, 2.
	Moorish Prince... ..	H. R. Oliver, Lieut. R.N.R., R.D., 1.
	Norman Prince... ..	W. E. Barrett, 2.
	Saxon Prince	R. Kirkwood, 5.
	Welsh Prince	A. B. W. Sheppard, Lieut. R.N.R., 2.
Pyman S.S. Co. ..	Waverley	H. R. Wheatley, 10.
Red Star	†Finland	J. C. C. Moller, 9.
	†Kroonland	J. C. C. Moller } 9. T. Bradshaw }
	†Lapland	H. Doxrud, 19.
	†Vaderland	T. J. Barman, 41.
	†Zeeland	J. S. Ball, 10.

METEOROLOGICAL REGISTERS received during the year 1909-10
—continued.

Line.	Ship.	Captain and No. of Registers.
Rotterdam Lloyd ...	Besoeki ...	E. Havinga, 1.
	Goentoer ...	M. van der Putte } 12.
	Kediri ...	P. De Boer }
	Tambora... ..	K. A. Bunge, 2.
Shakespear S.S. Co....	Ovid ...	W. Bagchus, 1.
Star	Star of Canada ...	L. Cubitt, 1.
	Star of Scotland ...	J. M. Hart, 1.
Telegraph Construc- tion and Mainten- ance Co.	Cambria ...	J. M. Hart, 2.
		J. E. Leach, 2.
Thomson, W. ...	Benarty ...	J. D. Sarchet, 8.
	Bengloe ...	W. A. Guy, 1.
	Benlarig ...	A. Wallace, 2.
	Benvenue ...	R. Kroble, 5.
Trechmann S.S. Co.	Frieda ...	R. C. Hill, 4.
	Wilster ...	T. Martin, 6.
Tyzack & Branfoot S.S. Co.	Camberwell ...	J. F. Henderson, 11.
Ulster S.S. Co. ...	Bengore Head ...	W. J. Finlay }
		— Pritchard } 9.
		— Ferguson }
Union-Castle ...	Dunottar Castle ...	G. K. Gandy, Lieut. R.N.R., R.D., 2.
	Galeka ...	T. H. Wilford, 8.
	Guelph ...	J. N. Culyerwell } 4.
White Star	Kildonan Castle ...	L. A. Millard }
	†Adriatic ...	J. Tyson, 5.
	Afric ...	E. J. Smith, Commr. R.N.R., 20.
	†Arabic ...	F. B. Howarth, Lieut. R.N.R., 5.
		W. Finch, Lieut. R.N.R. } 28.
	†Baltic ...	H. S. Smith, Lieut. R.N.R. }
	Bovic ...	J. B. Ranson, Lieut. R.N.R., 14.
	†Cedric ...	?, 5.
		C. A. Bartlett, Commr. }
	†Celtic ...	R.N.R., R.D. }
		J. O. Carter, Commr. R.N.R. }
	†Cretic ...	A. E. S. Hambelton, Lieut. R.N.R., 22.
	†Cymric ...	J. B. Kelk, 7.
	Georgic ...	W. Finch, Lieut. R.N.R. }
		J. Mathias, Lieut. R.N.R. }
	†Laurentic ...	W. H. Clarke, 2.
	†Majestic ...	B. F. Hayes, Commr. R.N.R., R.D., 24.
	†Megantic ...	F. E. Beadnell, Lieut. R.N.R., 5.
	†Oceanic ...	H. S. Smith, Lieut. R.N.R., 8.
	†Romanic... ..	H. J. Haddock, C.B., R.D., Commr. R.N.R., 22.
		H. F. David, Lieut. R.N.R., R.D., 14.
	†Teutonic... ..	R. Lobez, Lieut. R.N.R. }
		R. W. James }

APPENDIX V.

INSTRUMENTS supplied, &c., to the MERCANTILE MARINE.

Particulars.	Baro- meters.	Ther- mometers.	Hydro- meters.	Screens
April 1st, 1909, afloat	165	1,199	698	202
Issued since	76	518	229	58
Returned since	241 35	1,717 261	927 100	260 17
Written off as lost, &c.	206 —	1,456 286	827 47	243 30
April 1st, 1910, afloat	206	1,170	780	210

DISPOSITION of MERCANTILE MARINE INSTRUMENTS, April 1st, 1910.

Particulars.	Baro- meters.	Ther- mometers.	Hydro- meters.	Screens.
In merchant ships	206	1,170	780	210
„ store at M.O.	1	2	46	2
At Liverpool Agency	2	30	8	5
„ Glasgow „	3	24	18	3
„ Dundee „	4	23	—	2
„ Hull „	3	20	15	7
„ Cardiff „	1	8	6	3
„ Southampton „	4	20	20	4
„ Sunderland „	2	9	7	3
Total April 1st, 1910	226	1,306	900	239
Under repair, April 1st, 1910	2	25	—	—

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

(a.) THERMOMETERS AND SCREENS.

—	Thermometers.					Screens.
	Ordin- ary.	Maxi- mum.	Mini- mum.	Solar.	Grass Mini- mum.	
April 1st, 1909, in use	366	73	69	10	11	119
Issued since	50	6	7	—	1	1
Returned since	416 37	79 2	76 4	10 —	12 —	120 1
Written off	—	—	—	—	—	—
April 1st, 1910, in use	379	77	72	10	12	119

(b.) OTHER INSTRUMENTS.

	Baro- meters.	Aneroids and Baro- graphs.	Sun- shine Re- corders.	Rain Gauges.	Anemo- meters.	Storm Signal Cones.
April 1st, 1909, in use ...	320	37	37	98	34	223
Issued since ...	11	—	—	3	1	11
Returned since ...	331	37	37	101	35	234
Written off ...	11	1	—	2	4	—
	—	—	—	—	—	11
April 1st, 1910, in use ...	*320	36	37	99	31	223

* 224 barometers (mercurial) and 2 barographs are lent for the use of seafaring communities at fishing villages and ports.

STOCK ACCOUNT of INSTRUMENTS received and issued on repayment to the Crown Agents for the Colonies, Colonial Governments, and other Observers, from 1st April, 1909, to 31st March, 1910.

	Thermometers.					Steven- son's Screens.	Tropical Screens.
	Ordin- ary.	Maxi- mum.	Mini- mum.	Solar.	Grass Min.		
Stock, April 1st, 1909	113	12	9	8	3	—	1
Received since ...	416	67	70	42	60	13	12
Issued since ...	529	79	79	50	63	13	13
	496	70	65	45	51	12	5
Stock, April 1st, 1910	33	9	14	5	12	1	8

	Baro- meters.	Rain- gauges.	8 inch glasses.	5 inch glasses.	Sunshine Frames.	Sunshine Balls.	Cones.
Stock, April 1st, 1909	6	8	4	10	5	3	12
Received since ...	16	228	63	168	12	12	12
Issued since ...	22	216	67	178	17	15	24
	17	215	54	168	9	9	19
Stock, April 1st, 1910	5	21	13	10	8	6	5

In addition, the following miscellaneous instruments were received and issued during the period :—

1 Dines Recording Anemo- graph.	1 Kinora Camera.
2 " " Anemo- meters.	1 Lander Anemometer.
1 Burrough's Adding Machine	1 Lehfeldt's Barometer.
26 Large Scale Barographs.	25 Small Cup Anemometers.
24 " " Thermographs.	1 Bifilar Micrometer.
7 Small Barographs.	1 Cathetometer.
	7 Hygrographs.
	8 Earth Thermometers.

APPENDIX VI.

REPORT ON THE INSPECTION OF STATIONS IN CONNEXION
WITH THE OFFICE IN 1909.

The inspectors were as follows :—

Districts 0, 1 and 6	...	...	...	Mr. A. Watt, Mr. H. Harries.
District 2	...	...	...	Mr. R. G. K. Lempfert, Mr. A. Watt.
" 3	...	...	...	Mr. E. G. Constable.
" 4	...	...	...	Mr. R. G. K. Lempfert, Mr. A. Watt.
" 5	...	...	...	Captain Hepworth, Mr. R. Corless.
" 7	...	...	...	Mr. H. Harries.
" 8	...	...	...	Mr. T. W. Baker.
" 9	...	...	...	Mr. F. J. Brodie.
" 10	...	...	...	Mr. R. H. Curtis.
Observatories and Anemograph Stations.	{ Mr. T. W. Baker and Mr. E. G. Constable, by arrangement with the Director of the National Physical Laboratory; Mr. R. H. Curtis.			

By arrangement with the Scottish Meteorological Society, Mr. A. Watt was appointed as additional inspector for the year ending 31st March, 1910.

At the observatories and anemograph stations the instruments were dismantled and cleaned, and all necessary repairs were carried out. At those observatories which are also climatological or telegraphic reporting stations the arrangements for this work were examined.

The reports show that efficiency has been maintained on the whole; in a number of cases the inspectors were able to make suggestions for improving the observations by bringing them more into line with recognized conventions. Points requiring attention which could not be settled on the spot have been dealt with by correspondence.

The following is a list of the stations visited :—

OBSERVATORIES.

Aberdeen.	Oxford.
Armagh.	Stonyhurst.
Falmouth.	Valencia.
Glasgow.	

· ADDITIONAL ANEMOGRAPH STATIONS.

Alnwick Castle.	Kingstown.
Brighton.	North Shields.
Deerness.	Pendennis Castle (Falmouth).
Dover.	Plymouth.
Dublin (Phoenix Park).	Roche's Point.
Fleetwood.	Scilly.
Gorleston.	Shoeburyness.
Holyhead.	Yarmouth.

NORMAL CLIMATOLOGICAL STATIONS

Ampleforth.	Geldeston.
Armagh.	Glasgow.
Aspatria.	Hampstead.
Belfast.	Huddersfield.
Belvoir Castle.	Markree Castle.
Birr Castle.	Oban.
Cockle Park.	Plymouth.
Colmonell.	Shrewsbury.
Dublin (Phoenix Park).	Southampton.
Dumfries.	Stokesay.
Dundee.	Stonyhurst.
Dunrobin Castle.	Tealby.
Durham.	Tillypronie.
Garforth.	

AUXILIARY CLIMATOLOGICAL STATIONS

Alnwick Castle.	Lancaster.
Balta Sound.	Lincoln.
Bawtry.	Llangammarch Wells.
Bradford.	Mayfield.
Brighton.	Mountmellick.
Clifton.	Rauceby Hall.
Clongowes Wood College.	Rothamsted.
Foynes.	Seaford.
Kilkenny.	Shoeburyness.
Killarney.	Tynemouth.
Kingstown.	Wisley.

TELEGRAPHIC REPORTING STATIONS.

Aberdeen.	Nairn.
Barra Island.	North Shields.
Bath.	Nottingham.
Birr Castle.	Oxford.
Blacksod Point.	Portland Bill.
Donaghadee.	Roche's Point.
Dover.	Scilly.
Dungeness.	Spurn Head.
Holyhead.	Stornoway.
Leith.	Valencia.
Malin Head.	Wick.

MISCELLANEOUS STATIONS.

Cambridge (Newnham College,	Lerwick (Barograph).
Hygograph).	Limerick (Rainfall).

Mr. W. Marriott visited the following stations which are in connexion with the Royal Meteorological Society as well as with the Office :—

Bennington, Berkhamsted, Bognor, Bournemouth, Brighton, Cheltenham, Guernsey, Margate, Marlborough, Norwood, Portsmouth, Sandown, Shaftesbury, Swarraton, Tunbridge Wells, Ventnor, Weymouth, Worthing.

APPENDIX VII.

GEOGRAPHICAL LIST OF INSTITUTIONS AND PERSONS FROM WHOM PUBLICATIONS CONTAINING **Meteorological Data** HAVE BEEN RECEIVED DURING THE LAST SEVEN YEARS.

The list is arranged in accordance with the revised topographical classification adopted in the International Catalogue of Scientific Literature. *In each section the names of institutions which collect observations from a network of stations, or which publish observations on an extended scale, have been placed first.* In a number of instances, particularly in the case of tropical countries, observations are published by authorities not domiciled in the country. In these instances the names of the places of observation have been given as far as space permits, and the names of the institutions issuing the publications have been printed in *italic* type. If no names of places are quoted, it may be assumed that returns from a number of stations are given.

The character of the information available has been indicated by quoting the numbers in the International Catalogue under which the publications have been classified.

The year quoted is the last complete year for which the information has been received.

The classification numbers employed are as follows :—

- 1710 and 1730. Climatology—Agricultural and Hygienic.
- 1180. Rainfall Tables.
- 1800. Meteorological Observations—General.
- 1810. Hourly Values.
- 1820. Daily Values.
- 1825. Monthly and Yearly Mean Values.
- 1830. Daily Weather Reports.
- 1840. Weather Reports—Weekly, Monthly, &c.

† Indicates publications which give information for the upper air, obtained with balloons or kites.

**GEOGRAPHICAL LIST OF INSTITUTIONS AND PERSONS
SUPPLYING PUBLISHED METEOROLOGICAL DATA.**

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic. 1710 & 1730	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
GENERAL.								
International Committee for Scientific Aeronautics, Strassburg.	—	—	1907	—	—	—	—	—
Board of Trade, London—Commercial, Labour, and Statistical Department.	—	—	—	—	—	1907	—	—
Symons's Meteorological Magazine ..	—	—	—	—	—	1900	—	—
d. EUROPE AND MEDITER- RANEAN SEA AND ISLANDS.								
Deutsche Seewarte, Hamburg	—	—	—	—	—	—	—	1909
da. Scandinavia: Sweden, Norway, Denmark, Iceland, Faeroes:—								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1907	—	1909	1907	1909	1909
Norsk Meteorologisk Institut (Christiania).	—	1908	1908	1908	1908	1908	—	—
Svensk Meteorologisk Institut (Stockholm).	—	—	—	—	—	—	—	1909
K. Svenska Vetenskaps-Akademie (Stockholm).	—	—	—	—	1908	1908	—	—
Stockholm (H. E. Hamberg) ..	—	—	—	—	—	—	—	—
Uppsala, Observatoire Météorolo- gique de l'Université.	—	—	1908	1908	1908	—	—	—
Vassimaure, K. Svenska Vetensk. Akademie, Stockholm.	—	—	—	1907	—	—	—	—
db. Russia in Europe:—								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1906	1906	1906	1906	1909†	1908
Finland, Meteorologische Zentralanstalt (Helsingfors).	—	—	1902	1902	1902	1902	—	1907
Kaiserliche Livländische Ge- meinnützige u. Ökonomische Sozietät. Dorpat (Juriel).	—	1905	—	—	—	—	—	—
Dorpat, Meteorologisches Obser- vatorium.	—	—	1908	1908	1908	—	—	—
Dorpat, Station Météorologique de l'Ecole Reale.	—	—	—	—	1906	—	—	—
Kazan, Observatoire Météoro- logique.	—	—	—	—	1902	—	—	—
Kieff, Observatoire Météorol- ogique.	—	—	—	1907	1907	—	—	—
Moscow (E. Leyst)	—	—	1907	—	—	—	—	—
Moscow, Meteorologisches Ob- servatorium der K. Universität	—	—	—	1907	1907	—	—	—
Nimi-Oltchedaell, Observatoire Météorologique.	—	—	1909	1909	1909	1909	—	—
Odessa, Observatoire Météoro- logique et Magnétique de l'Uni- versité Impériale.	—	1905	1905	—	1906	1906	—	—
St. Petersburg, Observatoire Météorologique de l'Institut Forestier Impériale.	—	—	—	—	1906	—	—	—
Tiflis, Physical Observatory ..	—	—	—	—	—	—	—	1908
Warsaw, Station Centrale Météor- ologique du Musée de l'Indus- trie et de l'Agriculture.	—	—	1903	—	1903	1903	—	—

* Means of temperature in Stockholm for 1756 to 1905 and in Sweden for 1856 to 1907.

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
d. EUROPE AND MEDITER- RANEAN ISLANDS—cont.								
dc. German Empire:—								
Deutsche Seewarte (Hamburg)	—	—	1908	1908	1908	1908	1909†	1908
Prussia, K. Meteorologisches Institut (Berlin).	—	1907	1901	1904	1904	1909	—	1909
Alsace-Lorraine, Meteorolo- gischer Landesdienst (Strass- burg).	—	—	1901	1901	1901	1908	—	—
Baden, Central Bureau für Meteorologie und Hydro- graphie (Carlsruhe).	—	1909	1908	—	1908	1908	—	1909
Bavaria, K. Meteorologische Central Station (Munich).	—	—	1908	1908	1908	1908	1909	—
Hessen, G. Hydrographisches Bureau (Darmstadt).	—	1909	1908	1908	1908	—	—	1909
Saxony, K. Sächs. Landes- Wetterwarte (Dresden).	—	—	1905	1905	1905	1905	1909	1908
Württemberg, K. Statistisches Landesamt und Meteorolo- gische Central Station (Stutt- gart).	—	—	1909	1900	1903	1908	—	1909
Aachen, Meteorologisches Obser- vatorium.	—	—	1908	1908	1908	1903	1909	—
Berlin, Wetter Bureau	—	—	—	—	—	—	1909	—
Bremen, Meteorologische Station	—	—	1908	1908	1908	—	—	—
Eberswalde, Meteorologische Station.	—	—	—	—	—	—	—	1903
Emden, Naturforschende Gesell- schaft.	—	—	—	—	—	1907	—	—
Frankfurt am Main, Physika- lischer Verein.	—	—	—	—	1908	—	—	—
Lindenberg, K. Preussisches Aeronautisches Observatorium.	—	—	1908†	—	—	—	—	—
Potsdam, K. Preuss. Met. Institut	—	—	1908	1908	1908	—	—	—
dd. Holland; Belgium; Luxem- burg:—								
K. Nederlandsch Meteorologisch Institut (de Bilt).	—	1907	1907	1907	1907	1907	1909	1909
Observatoire Royal, Uccle, Brus- sels.	—	—	1904	1904	1904	1904	1909	—
Mons (A. Bracke)	—	—	—	—	1905	—	—	—
de. British Islands:—								
Meteorological Office (London)	—	—	—	1909	1909	1909	1909	1909†
British Rainfall (H. R. Mill) ..	—	1908	—	—	—	—	—	—
R. Meteorological Society (Lon- don).	—	—	1908	—	1908	1908	—	—
Scottish Meteorological Society (Edinburgh).	—	1907	1907	—	—	1907	—	—
Board of Agriculture and Fisheries, London.	1908	—	—	—	—	—	—	—
General Register Office, Dublin	1909	—	—	—	1909	1909	—	1909
General Register Office, London	1909	—	—	—	—	—	—	1909
Registrar General's Office, Edin- burgh.	1909	—	—	—	—	1909	—	1909
Royal Observatory, Greenwich	—	—	1907	1907	1907	—	—	—
Royal Society of Edinburgh [Fort William and Ben Nevis].	—	—	—	1897	—	—	—	—
Bath, Medical Officer of Health	1909	—	—	—	—	—	—	—
Blackpool, Public Health Office	1908	—	—	—	—	1908	—	—
Bognor, Medical Officer of Health	1908	—	—	—	—	1908	—	—
Bolton, The Museums and Meteorological Observatory.	—	—	—	—	—	1907	—	1909

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d. EUROPE AND MEDITER- RANEAN ISLANDS—cont.								
de. British Islands—cont.								
Borden Wood, Sussex (E. Lamb)	—	—	—	—	—	1908	—	—
Bournemouth (C. Dales) ..	—	—	—	—	—	1907	—	—
Brighton, Medical Officer of Health.	1902	—	—	—	—	—	—	—
Burnley, Medical Officer of Health.	1908	—	1908	—	—	—	—	—
Buxton, Devonshire Hospital ..	—	—	—	—	—	1908	—	—
Canterbury (A. Lander) ..	—	—	—	—	—	1908	—	—
Cardiff, Naturalists' Society ..	—	1907	—	—	—	1907	—	—
Cardiff, Waterworks Engineer's Office.	—	1905	—	—	—	—	—	—
Chester (J. C. Mitchell) ..	—	—	—	—	—	1905	—	—
Clongowes Wood College ..	—	—	—	—	—	1908	—	—
Cockle Park, Morpeth ..	—	—	—	—	—	1904	—	—
Coventry, Medical Officer of Health.	1908	—	—	—	—	1908	—	—
Croydon, Natural History and Scientific Society.	—	1908	—	—	1908	—	—	—
Devon, North (T. Wainwright) ..	—	—	—	—	—	1906	—	—
Dorset (<i>late</i> H. S. Eaton) ..	—	1903	—	—	—	—	—	—
Eastbourne, Borough Meteorol- ogist.	—	—	—	—	—	1908	—	—
East Ham, Public Health De- partment.	1907	—	—	—	—	1907	—	—
Falmouth, R. Cornwall Poly- technic Society.	—	—	—	—	—	1909	—	—
Great Central Railway ..	—	1909	—	—	—	—	—	—
Harrogate, Harlow Moor Ob- servatory.	—	—	—	—	—	1907	—	—
Hastings, Borough Meteorologist.	—	—	—	—	—	1908	—	—
Hertfordshire (J. Hopkinson) ..	—	1906	—	—	—	1906	—	—
Hoylake and West Kirby, Urban District Council.	—	—	—	—	—	1908	—	—
Isle of Man (A. W. Moore) ..	—	—	—	—	—	1904	—	—
Kew National Physical Labora- tory.	—	—	—	—	—	1908	—	—
Liverpool Observatory, Bidston.	—	—	—	—	1908	—	—	—
London, Royal Botanic Society	—	—	—	—	1906	—	—	—
Lowestoft, Medical Officer of Health.	1908	—	—	—	—	1908	—	—
Manchester, Godlee Observa- tory.	—	—	—	—	1908	—	—	—
Manchester, Public Health Office	1904	—	—	—	1904	—	—	—
Margate, Borough Meteorologist	—	—	—	—	—	1908	—	—
(Netley.) <i>Army Medical Depart- ment, London.</i>	—	—	—	—	—	1906	—	—
Northampton, Natural History Society.	—	1908	—	—	—	—	—	1908
Norwich (A. W. Preston) ..	—	—	—	—	—	1908	—	—
Nottingham (A. Brown and P. Boobyer).	—	1909	1909	—	—	—	—	—
Nottingham, Rural District Council of Basford.	1903	—	—	—	—	1903	—	—
Paisley, Coats Observatory ..	—	—	—	—	—	1905	—	—
Perth, Natural History Museum	—	—	—	—	—	1908	—	—
Portsmouth, Medical Officer of Health.	1908	—	1908	—	—	—	—	—
Rousdon Observatory ..	—	—	—	—	—	1903	—	—
Rugby School Natural History Society.	—	—	—	—	—	1906	—	—
Scarborough, Borough Meteor- ologist.	—	—	—	—	—	1906	—	—
Seaham Harbour, Medical Officer of Health.	1907	—	—	—	—	1907	—	—
Sevenoaks (W. W. Wagstaffe) ..	—	—	—	—	—	1905	—	—
Shropshire (W. M. De La Touche)	—	1907	—	—	—	—	—	—
Southampton, Medical Officer of Health	1906	—	—	—	—	1906	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
d. EUROPE AND MEDITER- RANEAN ISLANDS—cont.								
<i>de. British Islands—cont.</i>								
Southport, Fernley Observatory	—	—	1908	1908	1909	1908	—	—
Stonyhurst College Observatory	—	—	—	—	—	1909	—	—
Throcking (C. W. Harvey)	—	—	—	—	—	1904	—	—
Totland Bay, Isle of Wight (J. Dover).	—	—	—	—	—	1909	—	—
Truro, Cornwall County Council, Sanitary Committee.	1909	—	—	—	—	1908	—	1909
Truro (G. Penrose)	—	—	—	—	—	1900	—	—
Waterford (C. E. Perceval Bolton).	—	—	—	—	—	—	—	1906
Whitechurch (E. E. Glyde)	—	—	1909	—	—	—	—	—
Worksep (H. Mellish)	—	—	—	—	—	1908	—	—
York, Yorkshire Philosophical Society.	—	—	—	—	—	1908	—	—
<i>df. France and Corsica:—</i>								
Bureau Central Météorologique de France (Paris).	—	1906	1906	1906	1906	1906	1909	1909
Avignon, Commission Météorol- ogique du Département de Vaucluse.	—	—	1903	—	—	1903	—	—
Beaulieu, Sèvres et Vacquey (G. Eiffel).	—	—	1903	—	1905	—	—	—
Bordeaux, Commission Météor- ologique de la Gironde.	—	1908	—	—	1908	—	—	—
Chevreuse, Observatoire ..	—	—	—	—	1907	—	—	—
Lyons, Commission Départe- mentale de Météorologie du Rhône.	—	1908	1908	—	—	—	—	—
Marseilles, Commission de Mé- téorologie du Département des Bouches-du-Rhône.	—	—	1908	—	1908	—	—	—
Paris, Observatoire Municipal (Observatoire de Montsouris).	—	—	—	—	1907	—	—	—
Paris, Service Hydrométrique du Bassin de la Seine.	—	1907	—	—	—	—	—	—
Perpignan, Commission Mé- téorologique.	—	—	1907	—	1907	1907	—	—
Puy-de-Dôme, Observatoire ..	—	—	—	—	1905	—	—	—
<i>dg. Iberian Peninsula (including Pyrenees): Spain (with Balearic Islands); Portugal:—</i>								
Instituto Central Meteorológico (Madrid).	—	—	—	—	—	1908	1909	—
Observatorio Do Infante D. Luiz (Lisbon).	—	—	—	—	1906	1906	1909	—
Observatorio, Madrid ..	—	—	—	—	1907	1900	—	—
Coimbra, Observatorio Meteor- ológico e Magnetico da Uni- versidade.	—	—	1908	1908	1908	—	—	—
Gibraltar, Army Medical Dep., London.	—	—	—	—	—	1906	—	—
Granada, Observatorio Meteoro- ológico de Cartuja.	—	—	1908	1908	1909	—	—	—
Llana, Observatorio Belloch ..	—	—	1904	—	—	—	—	—
Madrid, Chamartin de la Rosa, Observatorio Meteorológico.	—	—	—	—	1906	—	—	—
Mahon (Minorca), Bureau Central Mét., Paris.	—	—	—	—	—	1906	—	—
Oña, Observatorio ..	—	—	—	—	1909	—	—	—
Oporto, Observatorio Meteorol- ógico da Princesa D. Amelia.	—	—	—	—	—	1909	—	—
San Fernando, Instituto y Obser- vatorio de Marina.	—	—	1908	1908	1908	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d. EUROPE AND MEDITER- RANEAN ISLANDS—cont.								
<i>dh. Italy: Sicily and Sardinia:—</i>								
Ufficio Centrale Meteorologico e Geodinamico Italiano (Rome).	1909	—	1906	—	—	1906	1909	—
Bologna, Osservatorio della R. Università.	—	—	—	—	1908	—	—	—
Catania, R. Osservatorio ..	—	—	—	—	—	1908	—	—
Florence, R. Museo di Fisica e Storia Naturale.	—	—	—	—	1908	—	—	—
Florence, Osservatorio Ximeniano	—	—	—	—	—	1907	—	—
Messina, Osservatorio ..	—	—	—	—	1907	—	—	—
Milan, R. Osservatorio Astrono- mico di Brera.	—	—	—	—	1907	—	—	—
Moncalieri, Osservatorio del Real Collegio Carlo Alberto.	—	—	—	—	1909	—	—	—
Naples, R. Osservatorio di Capo- dimonte.	—	—	—	—	1906	1906	—	—
Riposto, Osservatorio Meteorol- ogico del R. Istituto Nautico.	—	—	—	—	1909	—	—	—
Rome, Specola Vaticana ..	—	—	—	—	1905	—	—	—
Turin, Osservatorio della R. Uni- versità.	—	—	—	—	1908	—	—	—
Venice, Osservatorio Meteoro- logico del Seminario Patri- arcale.	—	—	—	—	1906	—	—	—
Venice, Ufficio Idrografico ..	—	—	—	1909	1908	—	—	—
<i>di. Switzerland:—</i>								
Schweizerische Meteorologische Central Anstalt (Zürich).	—	1907	1908†	1908	1908	1908	1909	—
Berne, Abteilung für Landes- hydrographie.	—	1908	1908	1904	1908	—	—	—
Davos Traffic Association ..	—	—	—	—	1909	—	—	1908
Genève et le Grand St. Bernard (R. Gautier).	—	—	—	—	1908	—	—	—
Lausanne, Institut Agricole ..	—	—	—	—	1908	—	—	—
St. Moritz (R. Gautier et H. Duime).	—	—	—	—	1908	—	—	—
<i>dk. Austria-Hungary, with Bosnia and Herzegovina:—</i>								
K. K. Central Anstalt für Meteor- ologie und Erdmagnetismus (Vienna).	—	—	1907	1907	1908†	1907	1909	—
K. K. Hydrographischer Dienst in Oesterreich (Vienna).	—	1906	—	—	1906	—	—	1909
Hydrographisches Amt der K. K. Kriegs-Marine (Pola).	—	—	1908	1908	1908	1906	—	—
K. Ung. Reichs-Anstalt für Meteor. and Erdmagn. (Buda- pest).	—	1906	1906	1906	1909	1906	1909	—
Bosnisch-Herzegovinischo Lan- desregierung (Sarajevo).	—	—	1907	1907	1907	1907	—	—
Agram, Meteorologisches Obser- vatorium.	—	1906	1906	1906	1906	—	—	—
Brünn, Meteorologische Com- mission des naturforschenden Vereines.	—	—	1905	—	—	1905	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
d. EUROPE AND MEDITER- RANEAN ISLANDS—cont.								
dk. Austria-Hungary, with Bosnia and Herzegovina—cont.								
Cracow, C. K. Akademii Umiejet- nosci u. Krakowie.	—	—	—	—	1902	—	—	—
Cracow, K. K. Sternwarte ..	—	—	—	—	1909	—	—	—
Cracow, Observatorium ..	—	—	—	—	—	1908	—	—
Fiume, K. K. Marine-Akademie	—	—	—	—	1906	—	—	—
Innsbruck, Meteorologisches Observatorium.	—	—	1906	1906	1906	—	—	—
Klagenfurt (F. Jäger) ..	—	—	—	—	1907	1907	—	—
Kremsmünster, Sternwarte ..	—	—	1906	1906	—	—	—	—
Prague, K. K. Sternwarte ..	—	—	—	—	1908	—	—	—
Trieste, [I.R.] Osservatorio Astro- nomico-Meteorologico.	—	—	1905	1905	1905	1905	—	—
Trieste, I.R. Osservatorio Marit- timo.	—	—	—	—	—	—	1909	—
Vienna, K. K. Sternwarte ..	—	—	—	—	1903	—	—	—
dl. Balkan Peninsula:—								
Observatorul Astronomic si Meteorologic (Bucharest).	1909	1909	1902	1902	1902	1902	1909	1909
Observatoire National (Athens)	—	—	—	—	—	1903	—	—
Belgrade, Observatoire Central Monastir and Cavalla. Bureau Central M ^t ., Paris.	—	—	—	1903	—	—	—	1903
Roumania (S.C. Hepites) ..	—	1903	—	—	—	—	—	—
Salonika, Gymnase Bulgare ..	—	—	—	—	—	1908	—	—
Salonika and Scutari. K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	—	—	—	1907	—	—
Salonika. Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	—	1906	—	—
Sofia, Institut Météorologique Central.	—	—	1908	1908	1908	1908	—	—
Sofia, Station Centrale Météorol- ogique de Bulgarie.	—	1909	—	—	—	—	—	1909
Thera. (F. Frhv. Hiller von Gaertringen.)	—	—	1902	1902	1902	1902	—	—
dm. Mediterranean and Islands:—								
Cyprus Public Works Depart- ment (Nicosia).	—	1909	—	—	—	1907	—	—
Malta and Cyprus. Army Medical Dep., London.	—	—	—	—	—	1906	—	—
Malta. Bureau Central M ^t ., Paris	—	—	—	—	—	1902	—	—
dq. English Channel, including Channel Islands:—								
Guernsey (A. Collenette) ..	—	1909	—	—	—	1909	—	—
Jersey, Observatoire St. Louis ..	—	—	1909	1909	1909	—	—	—
e. ASIA AND MALAY ARCHI- PELAGO.								
ea. Asiatic Russia:—								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1906	1906	1906	1906	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
e. ASIA AND MALAY ARCHI- PELAGO—cont.								
east. West Siberia:—								
Tobolsk, Tomsk. <i>Observatoire Physique Central Nicolas, St. Petersburg.</i>	—	—	—	—	1906	1906	—	—
east. East Siberia:—								
Irkutsk, <i>Observatoire Magné- tique et Météorologique. Observatoire Physique Central Nicolas, St. Petersburg.</i>	—	—	1905	1905	1905	1905	—	—
	—	—	—	—	1906	1906	—	—
east. Central Asiatic Russia:—								
<i>Observatoire Physique Central Nico- las, St. Petersburg.</i>	—	—	—	—	1906	1906	—	—
east. China and Dependencies: Tibet, Corea:—								
Hong-Kong, Observatory ..	—	—	1908	1908	1909	—	—	—
Chimulpo, Meteorological Ob- servatory.	—	—	1908	—	1908	—	—	—
Chimulpo, Peking, Urgar. <i>Ob- servatoire Physique Central Nicolas, St. Petersburg.</i>	—	—	—	—	—	1906	—	—
<i>Deutsche Seewarte, Hamburg</i> ..	—	—	—	1907	1901	1907	—	—
Hong-Kong and Wei-hai-wei. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1906	—	—
Kashgar, &c. <i>Meteorological Office, India (Simla).</i>	—	—	—	—	—	1908	—	—
Kharbin (Manchuria), <i>Observa- toire Physique Central Nicolas, St. Petersburg.</i>	—	—	1906	1906	1906	1906	—	—
Ou-tchang. <i>K. K. Central-Ans- talt für Meteorologie, Vienna.</i>	—	—	—	—	—	1906	—	—
Peking, Inspectorate General of Customs.	1904	—	—	—	—	—	—	—
Tokio, <i>Central Meteorological Ob- servatory.</i>	—	—	—	—	1906	—	—	—
Tchang-Sin-Tien, Tien-Tsin, Yunnan-Sen, &c. <i>Bureau Cen- tral Mët., Paris.</i>	—	1906	—	—	—	1906	—	—
Weihawei, Medical Officer ..	—	—	—	—	—	1906	—	—
Zikawei, <i>Observatoire Mag- nétique et Météorologique.</i>	—	—	1906	1906	1906	1906	1908	—
east. Japanese Islands, Formosa:—								
Central Meteorological Observa- tory (Tokio).	—	—	1907	1907	1907	1907	1909	—
Mizusawa, International Lati- tude Observatory.	—	—	1908	—	1908	1908	—	—
Tsukubasan, Observatorium ..	—	—	1903	1903	1903	—	—	—
east. French Indo-China: Tonquin, Annam, &c.:—								
<i>Bureau Central Mët., Paris</i> ..	—	1905	1906	—	1906	1906	—	—
east. Siam:—								
Battambang, Pnom-Penh, Vien- Tiane (Laos), &c. <i>Bureau Cen- tral Mët., Paris.</i>	—	—	—	—	—	1906	—	—

GEOGRAPHICAL LIST—continued.

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<i>e. ASIA AND MALAY ARCHI- PELAGO—cont.</i>								
<i>ef. British India: Himalaya, Bur- mah, Ceylon:—</i>								
Meteorological Office, India, (Simla).	—	1908	1909	—	1909	1909	1909	1908
Agricultural Department, Cal- cutta.	—	1908	—	—	—	—	—	—
Meteorological Office, Bengal, Calcutta.	—	1907	1907	—	—	1908	1909	1908
Observatory, Colombo	—	—	1908	—	—	1909	—	—
Allahabad, Meteorological Office	—	1907	—	—	—	1907	—	—
Bangalore, Mysore Government Meteorological Department.	—	1908	1908	—	1908	1908	—	—
Bombay, Government Observa- tory.	—	—	1905	—	1905	—	—	—
Ceylon, Royal Botanic Gardens	—	1903	—	—	—	—	—	—
Kodaikanal, Observatory ..	—	—	—	—	—	1908	—	—
Meteorological Reporter to Government, Punjab.	—	—	—	—	—	1909	—	1909
Karikal, Pondichery, Yanaon (Madras Pres.), &c. Bureau Central Met., Paris.	—	—	—	—	—	1906	—	—
<i>eg. Malay Peninsula and Archi- pelago, Philippines, &c.:—</i>								
Royal Magnetical and Meteor- ological Observatory (Batavia).	—	1907	1906	1906	—	1906	—	—
Philippine Weather Bureau, Manila Central Observatory.	—	—	1907	1907	1908	—	—	1908
Principal Civil Medical Officer, Straits Settlements (Singapore).	—	1904	1907	—	1907	1907	—	—
British North Borneo (British N. Borneo Herald).	—	—	—	—	1907	—	—	—
Buitenzorg, Institut Botanique de l'Etat.	—	—	—	—	1907	—	—	—
Penang, Singapore. Meteorolo- gical Office, India (Simla).	—	—	—	—	—	1918	—	—
Singapore, Army Medical Dep., London.	—	—	—	—	—	1906	—	—
Taiping, State Surgeon's Office..	—	—	—	—	—	1908	—	—
<i>ch. Persia, Afghanistan, Baluchi- stan, Pamirs:—</i>								
Bushire, Ispahan, Jask, Kabul, Quetta, &c. Meteorological Office, India (Simla).	—	—	—	—	—	1908	—	—
Bushire. Bureau Central Met., Paris.	—	—	—	—	—	1905	—	—
Enzeli, Khousseinabad (Seis- tan). Observatoire Physique Central Nicolas, St. Petersburg.	—	—	—	—	—	1906	—	—
<i>ei. Asiatic Turkey, Arabia, Syria:—</i>								
Aden, Baghdad, Bahrein, Busrah, Muscat, Beyrout. Meteor- ological Office, India (Simla).	—	—	—	—	—	1908	—	—
Babylon. Deutsche Seewarte, Hamburg.	—	—	—	—	—	1907	—	—
Beyrout, Jerusalem, &c. E. K. Central-Anstalt für Meteorologie, Vienna.	—	—	1907	—	1907	1907	—	—

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	1716 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
e. ASIA AND MALAY ARCHI- PELAGO—cont.								
eh. Asiatic Turkey, Arabia, Syria —cont.								
Hebron. <i>Scottish Met. Soc., Edin- burgh.</i>	—	—	—	—	—	1907	—	—
Lo Krey (Syria), Smyrna, and other stations. <i>Bureau Central Mét., Paris.</i>	—	1905	—	—	1906	1906	—	—
Scutari. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1906	—	—
Sinope, Bouiounk-Dere. <i>Observa- toire Physique Central Nicolas, St. Petersburg.</i>	—	—	—	—	—	1906	—	—
f. AFRICA AND MADAGASCAR.								
fa. Mediterranean States: Moroc- co, Algiers, Tunis, Tripoli:—								
Service Météorologique du Gouvernement Général de l'Algérie.	—	—	—	—	—	—	1909	—
Algeria and Tunis, Benghazi (Tripoli), Tangier, Mogador. <i>Bureau Central Mét., Paris.</i>	—	—	1906	—	1906	1906	—	—
Casablanca, Mogador, Saffi. <i>Deutsche Seewarte, Hamburg.</i>	—	—	—	—	—	1907	—	—
Tripoli. <i>Ufficio Centrale Met. e Geodinam. Ital., Rome.</i>	—	—	—	—	—	1896	—	—
fb. North-east Africa: Egypt, Nile Valley to 5° N., Abyssinia:—								
Survey Department, Cairo ...	—	1905	1907	1907	1907	1907	1909	1908
Department of Public Health, Cairo.	1909	—	—	—	1909	—	—	1909
Egyptian Sudan. <i>Meteorological Office, London.</i>	—	—	—	—	—	1902	—	—
Adis-Abéba (Abyssinia). <i>Obser- vatoire Physique Central Nicolas, St. Petersburg.</i>	—	—	—	—	—	1906	—	—
Khartoum. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1904	—	—
Ismailia, Port Said, Suez, Harar (Abyssinia). <i>Bureau Central Mét., Paris.</i>	—	—	—	—	1906	1906	—	—
fc. Sahara and the Central Sudan:—								
Fort Lamy (Tchad), &c. <i>Bureau Central Mét., Paris.</i>	—	—	—	—	—	1906	—	—
fd. West Africa, including French Sudan, from Morocco to the Congo:—								
Acra. Observatory ...	—	—	—	—	—	1906	—	—
Afrique Occidentale Française ...	—	—	—	—	—	1908	—	—
Gambia, Medical Officer ...	—	—	—	—	—	1909	—	—
Lagos, Survey Department ...	1909	—	—	—	—	—	—	—
Sierra Leone Observatory ...	—	1903	—	—	—	—	—	—
Zungeru (Northern Nigeria), Principal Medical Officer.	1908	—	1908	—	1908	1908	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology - Agri- cultural and Hy- gienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
f. AFRICA AND MADAGASCAR —cont.								
fd. West Africa, including French Sudan, from Morocco to the Congo—cont.								
Sierra Leone, Accra, Cape Coast, Kumasi. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1906	—	—
Dahomey, French Guinea, French Sudan, Ivory Coast, Senegal. <i>Bureau Central Mët., Paris.</i>	—	—	—	—	1906	1906	—	—
Mamfe, Tintu (Cameroon). <i>Deutsche Seewarte, Hamburg.</i>	—	—	—	—	—	1907	—	—
fe. Congo State and Angola:—								
Akka (<i>Meteorological Office, Lon- don.</i>).	—	—	—	—	—	1902	—	—
Lambaréné, Libreville and other stations. <i>Bureau Central Mët., Paris.</i>	—	—	—	—	1906	1906	—	—
ff. East Africa; British (with Uganda); German; Portu- guese (north of the Zam- besi); British Central Africa; Lake Region.								
British East Africa .. } <i>Meteoro-</i> British Central Africa } <i>logical</i> Rhodesia } <i>Office,</i> Uganda } <i>London.</i> German East Africa. <i>Deutsche</i> <i>Seewarte, Hamburg.</i>	{ — — — —	{ — — — —	{ — — — —	{ — — — —	{ — — — —	1902 1902 1902 1902	{ — — — —	{ — — — —
Boroma and Zumba. <i>Haynald</i> <i>Observatorium, Kaloesa.</i>	—	—	1897	1897	1897	—	—	—
Mombasa. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1903	—	—
British East Africa Agricultural Department (Nairobi).	—	—	—	—	—	1905	—	1905
Rhodesia. <i>Government Statist ..</i>	—	—	—	—	—	1907	—	—
Uganda Protectorate, Scientific and Forestry Department (Entebbe).	—	—	—	—	—	1908	—	—
Zanzibar. <i>Meteorological Office, India (Simla).</i>	—	—	—	—	—	1908	—	—
Zomba, Forestry and Botanical Department.	—	1903	—	—	1909	—	—	—
fg. South Africa—South of Angola and the Zambesi:—								
Meteorological Commission (Cape Town).	—	1908	1908	1902	—	1908	—	—
Transvaal Meteorological De- partment (Johannesburg).	—	1909	1908	1908	1908	—	1909	1909
Beira, Observatorio Meteoro- logico.	—	—	—	—	1909	—	—	—
Bulawayo (E. Goetz)	—	—	—	—	—	1904	—	—
Durban, Natal Observatory ..	—	1902	1908	—	—	1908	—	—
Fort Napier (Natal), Pretoria. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1906	—	—
German S.W. Africa (E. Ott- weiler).	—	1905	—	—	—	—	—	—
Loanda, Observatorio	—	—	—	—	—	—	1908	—
Southern Rhodesia, &c. <i>Meteoro- logical Office, London.</i>	—	—	—	—	—	1902	—	—

GEOGRAPHICAL LIST—continued.

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	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
f. AFRICA AND MADAGASCAR —cont.								
fh. Madagascar and Comoro Group:—								
Tananarive, Observatoire ..	—	—	1908	1908	1908	1908	—	—
Bureau Central M ^t ., Paris ..	—	1906	—	—	1906	1906	—	—
fi. Red Sea and Islands:—								
K. Akademie der Wissenschaften, Vienna.	—	—	—	[1903]	[1903]	—	—	—
Perim. Meteorological Office, India (Sindia).	—	—	—	—	—	1908	—	—
g. NORTH AMERICA.								
gh. Canada as a whole:—								
Meteorological Service, Dominion of Canada (Toronto).	—	—	—	—	—	—	1909	1908
Department of Marine and Fisheries (Ottawa).	—	—	1906	1906	1906	1906	—	—
Toronto Observatory ..	—	—	—	—	—	1907	—	—
U.S. Weather Bureau, Washington	—	—	—	—	—	1908	—	—
gi. Canadian Dominion West.								
Alberta, Official Handbook ..	—	—	—	—	—	1906	—	—
Edmonton, Department of Agri- culture.	—	—	—	—	—	1906	—	—
Regina, Department of Agri- culture.	—	—	—	—	—	1905	—	—
gj. Canadian Dominion East: New- foundland, Labrador:—								
Toronto, Bureau of Industries ..	—	—	1904	—	—	—	—	—
Hebron, Nain, Deutsche Seewarte, Hamburg.	—	—	—	—	—	1907	—	—
St. Pierre and Miquelon, Bureau Central M ^t ., Paris.	—	1905	—	—	—	1902	—	—
St. Croix, Dansk Meteorologisk Institut, Copenhagen.	—	—	—	—	—	1907	—	—
gk. United States as a whole:—								
U.S. Weather Bureau, Depart- ment of Agriculture, Wash- ington.	—	—	1908	1906	1908	1908	1909	1908
gl. North-Eastern United States, East of Mississippi:—								
Cambridge (Mass.), Astronomical Observatory of Harvard Col- lege.	—	—	—	—	1905	—	—	—
New York, Meteorological Ob- servatory.	—	—	—	1909	—	—	—	—
Washington, United States Naval Observatory.	—	—	—	—	1902	—	—	—
gm. Western United States, West of Mississippi:—								
Colorado Springs, Colorado Col- lege, observatory.	—	—	—	—	1907	1907	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Re- ports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
g. NORTH AMERICA—cont.								
gl. Mexico:—								
Dirección General de Telégrafos Federales (Mexico).	—	—	—	—	—	—	1903	—
Observatorio Meteorológico Central (Mexico).	—	—	1903	1903	1903	—	—	1903
Guadalajara, Observatorio del Seminario Conciliar.	—	—	—	—	1906	—	—	—
Leon, Observatorio Meteorol- ógico.	—	—	—	—	1909	—	—	1909
Morelia, Observatorio Meteorol- ógico.	—	—	1909	—	1909	1909	—	—
Oaxaca (A. M. Dominguez) ..	—	1903	—	—	1907	—	—	1907
Oaxaca, Observatorio Meteorol- ógico.	—	—	—	—	1908	—	—	—
Puebla, Boletín de Estadística..	1908	—	—	—	1905	—	—	—
Saltillo, Observatorio Meteorol- ógico del Colegio de San Juan Nepomucino.	—	—	—	—	—	—	—	—
Tacubaya, Observatorio Astrón- omico Nacional.	—	—	1897	—	1897	1897	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	1908	—	—
Zacatecas, Observatorio ..	—	—	1908	—	1908	1908	—	—
h. CENTRAL AND SOUTH AMER- ICA AND WEST INDIES.								
hb. Central America, &c.:—								
Belize, Public Hospital ..	—	—	—	1908	—	1905	—	—
Costa Rica, U.S. Weather Bureau, Washington.	—	—	—	—	—	1902	—	—
San Salvador, Observatorio Meteorológico y Astronómico	—	—	—	—	1905	—	—	—
Tegucigalpa, Laboratorio Central	—	—	—	—	—	—	—	—
hc. West Indian Islands, Carib- bean Sea, Gulf of Mexico:—								
Antigua, Government Labora- tory.	—	1908	—	—	1907	1908	—	—
Bahamas (Colonial Reports) ..	—	—	—	—	1902	1905	—	—
Barbados, St. Lucia, Jamaica, Bermuda. Army Medical Dep., London.	—	—	—	—	—	1906	—	—
Dominica, Botanic Station ..	—	1907	—	—	1908	—	—	—
Grenada, Carriacou Observatory	—	1908	—	—	1909	—	—	—
Grenada, Richmond Hill Ob- servatory.	—	—	—	—	1906	1906	—	—
Guadeloupe, Haiti, Martinique. Bureau Central Met., Paris.	—	—	—	—	1908	—	—	—
Havana, Observatorio del Colegio de Belén.	—	—	—	—	1909	1909	—	—
Havana, Secretaria de Agricul- tura, &c.	1909	—	1909	—	—	—	—	1909
Jamaica, Government Labora- tory, Kingston.	—	1909	1909	—	—	—	—	—
Port-au-Prince, Haiti. K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	1907	—	1907	1907	—	—
St. Lucia, Agricultural Superin- tendent.	—	1909	—	—	—	—	—	—
St. Lucia Botanic Gardens ..	—	1908	—	—	—	1908	—	—
St. Lucia, Harbour Master ..	—	—	—	—	—	—	—	—
St. Vincent, Botanic Gardens ..	—	1907	1903	—	—	1908	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
h. CENTRAL AND SOUTH AMER- ICA AND WEST INDIES—cont.								
hd. Guiana—British, Dutch, and French; Venezuela; Trini- dad:—								
Cayenne, Bureau Central Mët., Paris.	—	—	—	—	1906	1906	—	—
Georgetown, Demerara, Botanic Gardens.	—	—	—	—	1909	1908	—	—
Paramaribo, K. Nederlandsch Meteorologisch Instituut, de Bilt.	—	—	—	—	1904	—	—	—
Trinidad, Royal Botanic Gardens	—	1908	1907	—	—	1908	—	—
he. Peru:—								
Astronomical Observatory of Har- vard College, Cambridge (Mass.).	—	—	—	1895	1895	—	—	—
Lima, Deutsche Seewarte, Hamb- urg.	—	—	—	—	—	1906	—	—
hg. Bolivia:—								
Madidi, Bureau Central Mët., Paris.	—	—	—	—	—	1903	—	—
hh. Brazil:—								
Ministerio de Marinha, Direc- toria de Meteorologia, Rio Janeiro.	—	—	1901	1904	1906	—	—	—
Cuyabá, Observatorio Meteor- ologico "D. Bosco."	—	—	—	—	1908	—	—	—
Para Prata, K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	—	—	1906	—	—	—
Rio Janeiro, Observatorio	—	—	1907	—	1907	1908	—	—
Sao Paulo, Secretaria da Agricul- tura, &c.	—	—	—	—	—	1905	—	—
Descalvados, Deutsche Seewarte, Hamburg.	—	—	—	1906	—	1906	—	—
hi. Argentina, Uruguay, and Paraguay:—								
Oficina Meteorológica Argentina (Buenos Aires).	—	—	—	—	—	—	1909	—
Dirección General del Servicio Meteorológico Nacional, Monte Video.	—	1905	—	—	—	1905	—	—
Dirección General de Estadística del Uruguay, Monte Video.	1906	—	—	—	—	1906	—	—
Frías Bentos, Deutsche Seewarte, Hamburg.	—	—	—	—	—	1893	—	—
Monte Video, Observatorio Nacional Físico-Climatológico.	—	—	—	1908	1908	—	—	1908
Villa Colón, Observatorio Meteorológico,	—	—	—	1902	1902	1906	—	1902

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
<i>h. CENTRAL AND SOUTH AMER- ICA AND WEST INDIES—cont.</i>								
<i>hh. Chili:—</i>								
Servicio Meteorológico de la Dirección del Territorio Marítimo (Valparaíso.)	—	—	—	—	1907	1907	—	—
Punta Arenas, Observatorio Meteorológico del Colegio Salesiano "S. José."	—	1902	1907	1907	1909	1907	—	—
Santiago, Observatorio Astro- nómico.	—	—	1906	—	—	1906	—	—
<i>i. AUSTRALASIA.</i>								
Sydney Observatory	—	—	—	—	—	—	1903	—
<i>ia. New Guinea:—</i>								
Papua (Government Gazette) ..	—	—	—	—	—	1908	—	—
<i>ib. Bismarck Archipelago:—</i>								
Nauru. <i>Deutsche Seewarte, Ham- burg.</i>	—	—	—	—	—	1906	—	—
<i>ic. Australia:—</i>								
Central Weather Bureau, Mel- bourne.	—	1908	—	—	—	—	1909	—
<i>id. Queensland:—</i>								
Brisbane, Government Statis- tician's Office.	1905	—	—	—	—	1905	—	—
Brisbane, Weather Bureau ..	—	—	—	—	—	1907	—	—
<i>ie. New South Wales:—</i>								
Sydney, Department of Public Instruction.	—	1902	—	—	1902	1902	—	—
Windsor (John Tebbutt)	—	—	—	—	—	1903	—	—
<i>ig. South Australia:—</i>								
Adelaide Observatory	—	1905	1905	—	1905	1905	—	—
<i>ih. West Australia:—</i>								
Perth, Observatory	—	1908	1906	—	1906	1906	—	1906
Perth, Government Statistician's Office.	—	1907	1907	—	—	1907	—	—
<i>ik. New Zealand:—</i>								
Wellington, Meteorological Office	—	1908	1908	—	1908	1908	1905	—
Wellington, Government Obser- vatory.	—	—	—	—	1904	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &C.	Climatology—Agricultural and Hygienic. 1710 & 1730.	Rainfall Tables. 1180.	Meteorological Observations —General. 1800.	Hourly Values. 1810.	Daily Values. 1820.	Monthly and Yearly Mean Values. 1825.	Daily Weather Reports and Charts. 1830.	Weekly or Monthly Weather Reports. 1840.
<i>i. AUSTRALASIA—cont.</i>								
<i>il. New Caledonia, New Hebrides, and Loyalty Islands:—</i>								
Noumea, Paita (N. Cal.), Port Vila (New Hebrides). <i>Bureau Central Mët., Paris.</i>	—	1906	—	—	—	1906	—	—
<i>k. ARCTIC.</i>								
<i>ka. Arctic Ocean:—</i>								
Ziegler Polar Expedition, 1903-5	—	—	—	—	1905	—	—	—
<i>kb. Greenland:—</i>								
<i>Dansk Meteorologisk Institut (Copenhagen).</i>	—	—	—	—	1907	1907	—	—
<i>kd. Islands north of Europe and Asia:—</i>								
Norwegian North Polar Expedition [H. Mohn].	—	—	1896	1896	1896	—	—	—
Spitzbergen (J. Westman)	—	—	—	1900	—	—	—	—
<i>l. ATLANTIC.</i>								
<i>lb. Azores, Canaries, Madeira, Cape Verde:—</i>								
Service Météorologique des Açores, Ponta Delgada.	—	—	1908	1908	—	1908	—	—
Las Palmas, <i>Instituto Central Meteorológico, Madrid.</i>	—	—	—	—	—	1908	—	—
Teneriffe, Las Palmas, <i>Observatorio Do Infante D. Luiz, Lisbon.</i>	—	—	—	—	—	1905	—	—
Teneriffe, Las Palmas. <i>Bureau Central Mët., Paris.</i>	—	—	—	—	—	1906	—	—
Teneriffe, La Paz Botanica. <i>Deutsche Seewarte, Hamburg.</i>	—	—	—	—	—	1907	—	—
<i>m. INDIAN OCEAN.</i>								
<i>ma. Ocean and Islands north of Equator:—</i>								
Amini Divi, Minicoy. <i>Meteorological Office, India (Simla).</i>	—	—	—	—	—	1908	—	—
<i>mb. Ocean and Islands south of Equator:—</i>								
Christmas Island. <i>Scottish Met. Soc., Edinburgh.</i>	—	—	—	—	—	1907	—	—
Christmas Island. <i>Straits Settlements Gazette.</i>	—	—	—	—	1908	—	—	—
Mauritius, Royal Alfred Observatory.	—	—	1908	1905	1906	—	—	—
Mauritius. <i>Army Medical Dep., London.</i>	—	—	—	—	—	1903	—	—
Mauritius, Seychelles, Diego Garcia. <i>Meteorological Office, India (Simla).</i>	—	—	—	—	—	1908	—	—
Réunion. <i>Bureau Central Mët., Paris.</i>	—	1906	—	—	—	1906	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	Climatology—Agri- cultural and Hy- gienic.	Rainfall Tables.	Meteorological Observations —General.	Hourly Values.	Daily Values.	Monthly and Yearly Mean Values.	Daily Weather Re- ports and Charts.	Weekly or Monthly Weather Reports.
	1710 & 1730.	1180.	1800.	1810.	1820.	1825.	1830.	1840.
n. PACIFIC.								
<i>nd, ne.</i> Pacific Islands North of Equator:—								
Honolulu (R. C. Lydecker) ..	—	—	—	—	1903	—	—	—
Honolulu. U.S. Weather Bureau, Washington.	—	—	—	—	1908	—	—	—
Caroline, Gilbert and Marshall Islands. Deutsche Seewarte, Hamburg.	—	—	—	1906	1906	1907	—	—
<i>nf, nh.</i> Pacific Islands South of Equator:—								
Samoa Observatory ..	—	—	1906	1906	—	1906	—	—
Samoa and Cook Islands. Deutsche Seewarte, Hamburg.	—	—	—	—	1906	1907	—	—
Suva, Department of Agriculture	—	—	—	—	—	1908	—	—
Suva, Fiji (J. D. W. Vaughan) ..	—	—	—	—	1905	—	—	—
Tahiti, Rikitea (Mangareva), Bureau Central Mët., Paris.	—	—	—	—	1904	1906	—	—
o. ANTARCTIC.								
<i>ob.</i> S. Georgia, and Islands S. of S. Atlantic:—								
Schwedische Südpolar Expedi- tion (Snow Hill).	—	—	1903	1903	—	—	—	—
<i>oc.</i> Islands South of Indian Ocean:—								
Deutsche Südpolar Expedition, Winterstation des "Gauss."	—	—	1903	1903	1903	—	—	—
<i>od.</i> Islands to Southward and South-East of New Zealand:—								
National Antarctic Expedition, 1901-1904.	—	—	1904	1904	1904	—	—	—

LIST OF CURRENT METEOROLOGICAL PERIODICALS AND
JOURNALS CONTAINING OCCASIONAL ARTICLES ON METE-
OROLOGICAL SUBJECTS RECEIVED FOR THE OFFICE
LIBRARY.

Annales de l'Observatoire Municipal, Paris.
Annales du Bureau Central Météorologique de France.
†Annalen der Hydrographie und maritimen Meteorologie.
Annali dell' Ufficio Centrale Meteorologico e Geodinamico Italiano.
Annuaire de la Société Météorologique de France.
†Annuaire Météorologique de l'Observatoire Royal de Belgique.
Aus dem Archiv der Deutschen Seewarte.
†Beiträge zur Physik der freien Atmosphäre.
Boletín mensual del Observatorio meteorológico central de Mexico
Bollettino bimensuale della Società Meteorologica Italiana.

†Bulletin de l'Institut Aerodynamique de Koutchino.
 †Ciel et Terre.
 Comptes rendus hebdomadaire des séances de l'Académie des Sciences, Paris.
 †Das Wetter.
 Geographical Journal.
 Globe (Le), Journal Géographique.
 Himmel und Erde.
 Indian Meteorological Memoirs.
 Jahrbuch der Astronomie und Geophysik (H. J. Klein).
 Journal of Balneology and Climatology.
 Journal of the Franklin Institute.
 Journal of the Meteorological Society of Japan.
 Journal of the Royal United Service Institution.
 Journal of the Scottish Meteorological Society.
 Journal of the Royal Society of Arts.
 London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
 Memoirs and Proceedings of the Manchester Literary and Philosophical Society.
 Memorias de Sociedad Científica "Antonio Alzate," Mexico.
 Meteorologische Zeitschrift.
 Mitteilungen aus dem Gebiete des Seewesens, Pola.
 Monthly Meteorological Bulletin of the Nicolas Central Physical Observatory.
 Monthly Notices of the Royal Astronomical Society.
 Monthly Weather Review of the U.S. Weather Bureau.
 Nature.
 Nature (La).
 Nautical Magazine.
 Oversigt over det Kongelige danske Videnskabernes Selskab Forhandlinger.
 Petermann's (Dr. A.) Mitteilungen aus Justus Perthes' Geographischer Anstalt.
 Proceedings of the American Philosophical Society.
 Proceedings of the Cambridge Philosophical Society.
 Proceedings of the Royal Institution.
 Proceedings of the Royal Irish Academy.
 Proceedings of the Royal Society of London.
 Quarterly Journal of the Royal Meteorological Society.
 Scientific Proceedings of the Royal Dublin Society.
 Scottish Geographical Magazine.
 Smithsonian Contributions to Knowledge.
 Smithsonian Miscellaneous Collections.
 Symons's Meteorological Magazine.
 Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap.

In addition to the works summarised in the above lists, a large number of books and pamphlets dealing with meteorological subjects have been received. Some of the more important are referred to on p. 36 of the Report.

The compilation of a complete bibliography of meteorological literature is included in the objects of the International Catalogue of Scientific Literature, and the necessity for the publication in full of the titles of all books and pamphlets received at the office is thereby obviated. It is intended to deal with the matter in due course in connexion with the catalogue of the Library.

APPENDIX VIII.

LIST of INSTITUTIONS receiving PUBLICATIONS issued by the COMMITTEE.

OBSERVERS contributing returns printed in one of the periodical publications receive a copy of the publication. The Committee request that the copies may be returned to the Office after the observer has no personal use for them, in cases where they are not filed in a public library or other institution where the public can consult them.

The *Daily Weather Report* is sent to seaports 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.

Periodical or occasional publications are sent to the institutions named in the following list, generally speaking, in exchange for publications received.

UNITED KINGDOM.		UNITED KINGDOM—cont.	
Public Offices:		Public Offices	
Aberdeen ...	B.T., Supt. M.M.O.	—cont.	
Aldershot ...	School of Ballooning. Balloon Factory (Col. Capper).	London ..	Board of Agriculture. *†Board of Education, Science Museum. — Solar Physics Ob- servatory. Board of Trade, Con- sultative Branch. — Fisheries and Har- bour Department. — Marine Depart- ment. — Standard Weights and Measures De- partment. — Supt. M.M.O. Dock Street. — Supt. M.M.O. Poplar. — Supt. M.M.O. Tilbury. — Supt. M.M.O. Victoria Docks. British Museum, Dept. of Printed Books. Chinese Maritime Cus- toms. General Post Office. General Register Office. *Imperial Institute. Local Government Board. National Physical Lab- oratory (Bushy House). — (Kew Obs.). — (Eskdalemuir). Trinity House. B.T., Supt. M.M.O. B.T., Supt. M.M.O.
Avonmouth	B.T., Supt. M.M.O.		
Barry ...	B.T. Surveyor.		
Belfast ...	B.T., Supt. M.M.O.		
Blyth ...	B.T., Supt. M.M.O.		
Bristol ...	B.T., Supt. M.M.O.		
Cardiff ...	B.T., Supt. M.M.O.		
Dartmouth	Admiralty, Royal Naval College. B.T., Supt. M.M.O.		
Dublin ...	Board of Agriculture and Technical In- struction. General Register Office. Ordnance Survey Office.		
Dundee ...	B.T., Supt. M.M.O.		
Edinburgh...	Board of Fisheries. General Register Office. Royal Observatory. *†Royal Scottish Museum.		
Glasgow ..	B.T., Supt. M.M.O.		
Gloucester	B.T., Supt. M.M.O.		
Greenock ...	B.T., Supt. M.M.O.		
Grimsby ...	B.T., Supt. M.M.O.		
Hartlepool	B.T., Supt. M.M.O.		
Hull ...	B.T., Supt. M.M.O.		
Leith ...	B.T., Supt. M.M.O.		
Liverpool ..	B.T., Supt. M.M.O.		
London ...	Admiralty, Hydro- grapher. — Librarian. *†— Royal Naval College. — Royal Observatory. Army Medical Depart- ment.	Manchester Middles- borough.	

* Receive all publications, including the *Daily Weather Report* in those cases which are also marked †.

LIST OF INSTITUTIONS receiving PUBLICATIONS—*cont.*

UNITED KINGDOM— <i>cont.</i>		UNITED KINGDOM— <i>cont.</i>	
Public Offices — <i>cont.</i>		Institutions— <i>cont.</i>	
Newcastle-on-Tyne.	B.T., Supt. M.M.O.	Hull ...	Shipmasters' Association.
Newport ...	B.T., Supt. M.M.O.	Jersey ...	St. Louis Observatory.
Plymouth ...	B.T., Supt. M.M.O.	Leeds ...	University.
Shields	B.T., Supt. M.M.O.	Leith ...	Nautical College.
North.		Liverpool ...	Free Public Library.
Shields	B.T., Supt. M.M.O.		Mercantile Marine Service Association.
South.			Nautical College.
Southampton.	B.T. Supt. M.M.O.		Richardson, Spence & Co.
Sunderland	B.T., Supt. M.M.O.		Underwriters' Rooms.
Swansea ...	B.T., Supt. M.M.O.		University, Physical Laboratory.
Institutions :		London ...	Aeronautical Society.
Aberdeen ...	Observatory.		British Association.
Aberystwyth	The University.		British Balneological and Climatological Society.
Alnwick ...	Duke of Northumberland's Observatory.		Eastern Telegraph Co.
Armagh ...	Observatory.		*Guildhall Library.
Aspatia ...	Royal Agricultural College.		Institution of Civil Engineers.
Belfast ...	Queen's College.		*†Lloyd's.
Bexley Heath	Editor, Findlay's Sailing Directions.		London Institution.
Bidston ...	Liverpool Observatory.		Metropolitan Water Board.
Birkenhead	"Conway" Training Ship.		*British Rainfall Organisation.
Birmingham	Central Free Library.		"Nature."
	Midland Institute.		Navigation School.
Birr Castle...	University, Librarian.		Royal Astronomical Society.
Cambridge...	Observatory.		Royal Botanic Society.
	Cavendish Laboratory.		Royal College of Science.
	Observatory.		Royal Geographical Society.
	Philosophical Society.		Royal Institution of Great Britain.
	Schuster Reader in Meteorology.		*†Royal Meteorological Society.
Cardiff ...	University College.		Royal National Lifeboat Institution.
Cirencester...	Royal Agricultural College.		Royal Society.
Dublin ...	Royal Dublin Society.		*Royal United Service Institution.
	Royal Irish Academy.		Sailors' Palace.
	Trinity College.		School of Economics.
Dundee ...	Brown, C. H. (Agent).		"Shipping Gazette."
	International Commission for Investigation of North Sea.		Society of Arts.
	University College.		University College.
Durham ...	Observatory.	Manchester	Philosophical Society.
Edinburgh...	Royal Scottish Geographical Society.		University, Meteorological Department.
	Royal Society.		
	*†Scottish Meteorological Society.	Markree ...	Observatory.
	University Library.	Northampton	Natural History Society.
Falmouth ...	Observatory.	Oxford ...	Clifton, Prof. R. B.
	Royal Cornwall Polytechnic Society.		Radcliffe Observatory.
Glasgow ...	"Nautical Magazine."		School of Geography.
	Observatory.	Plymouth ...	Incorporated Chamber of Commerce.
Greenhithe	"Worcester" Training Ship.		Marine Biological Laboratory.

* Receive all publications, including the Daily Weather Report in those cases which are also marked †.

LIST OF INSTITUTIONS receiving PUBLICATIONS --cont.

UNITED KINGDOM—cont.

Institutions— <i>cont.</i>	
Southampton	Forbes, Capt. (Agent).
Southport ...	Fernley Observatory.
South Shields.	Marine Schools.
Stamford ...	Free Library.
Stonyhurst	Observatory.
Torquay ...	Natural History Society.
Valencia ...	Observatory.
York ...	Philosophical Society.

BRITISH COLONIES AND DEPENDENCIES.

Australasia.

Adelaide ...	Commonwealth Bureau of Meteorology. Public Library.
Brisbane ...	Commonwealth Bureau of Meteorology. Public Library.
Hobart ...	Commonwealth Bureau of Meteorology.
Melbourne ...	*†Commonwealth Bureau of Meteorology. Commonwealth Statistical Bureau. Department of Agriculture. Observatory. Public Library.
Perth ...	Commonwealth Bureau of Meteorology.
Sydney ...	Commonwealth Bureau of Meteorology. Public Library. Royal Society of New South Wales.
Wellington ...	Colonial Museum.
Windsor ...	Observatory.

Canada.

Montreal ...	McGill University.
Toronto ...	*†Meteorological Office.
Victoria (B.C.)	Meteorological Office.

India and Eastern Asia.

Allahabad ...	Meteorological Reporter.
Bangalore ...	Meteorological Department.
Bombay ...	Observatory.
Calcutta ...	Director General of Observatories. Surveyor General.
Dehra Dun ...	Trigonometrical Survey.
Hong Kong ...	Observatory.
Kodaikanal ...	Observatory.
Simla ...	Director General of Observatories.
Singapore ...	Principal Civil Medical Officer.

BRITISH COLONIES AND DEPENDENCIES—cont.

Mediterranean.

Malta Observatory.
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South Africa.

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Cape Town ...	Observatory. Meteorological Commission.
Durban ...	Natal Observatory.
Johannesburg	Transvaal Meteorological Department.

Indian Ocean.

Mauritius Meteorological Society.
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West India Islands.

Jamaica Government Meteorologist.
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EUROPE.

Austria-Hungary.

Brünn ...	Natural History Society.
Buda-Pesth ...	Central Meteorological Institute. Observatory.
Cracow ...	Nautical Academy.
Fiume ...	Observatory.
Innsbruck ...	Observatory.
O'Gyalla ...	Hydrographic Office.
Pola ...	Hydrographic Office.
Prague ...	Observatory. Royal Society of Sciences.
Trieste ...	Observatory.
Vienna ...	Austrian Meteorological Society. Central Hydrographical Bureau. *†Central Meteorological Office. *Hann, Hofrath Dr. J.

Belgium.

Brussels ...	... | *†Observatory (Uccle).
Ostend Navigation School.

Bulgaria.

Sofia Central Meteorological Station.
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Denmark.

Copenhagen ...	Hydrographic Office. International Council for the Study of the Sea. Meteorological Institute. Society of Sciences.
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EUROPE— <i>cont.</i>		EUROPE— <i>cont.</i>	
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Bordeaux ...	Society of Oceanography of the Gulf of Gascony.	Athens ...	Observatory.
Lyons ...	Observatory.	<i>Italy.</i>	
Marseilles ...	Meteorological Commission.	Catania ...	Meteorological Observatory.
Paris ...	*†Central Meteorological Office.	Florence ...	Observatory.
	Hydrographic Office.	Milan ...	Observatory.
	Hydrometric Service.	Moncalieri ...	Observatory.
	Institute of France.	Naples ...	Observatory.
	Meteorological Society.	Palermo ...	Observatory.
	Municipal Observatory	Pesaro ...	Observatory.
Perpignan ...	Meteorological Commission.	Riposto ...	Observatory.
Puy-de-Dôme	Observatory.	Rome ...	Central Meteorological Office.
			International Agricultural Institute.
<i>Germany.</i>		Turin ...	Observatory.
Aachen ...	Meteorological Station.	Venice... ..	Hydrographical Office.
Berlin ...	Hydrographic Office.		Observatory.
	*†Meteorological Institute.	<i>Netherlands.</i>	
Bremen ...	Meteorological Observatory.	Amsterdam ...	Geographical Society.
Carlsruhe ...	Central Meteorological Office.		Meteorological Institute.
Darmstadt ...	Hydrographical Bureau.	Helder ...	Institute for the Study of the Sea.
Dresden ...	Meteorological Institute.	Utrecht, (De Bilt).	*†Royal Meteorological Institute.
Frankfort ...	Physical Society.	<i>Norway.</i>	
Gotha ...	M. Justus Perthes' Geographical Institute.	Christiania ...	Meteorological Institute.
Greifswald ...	Geographical Society.	<i>Portugal.</i>	
Halle ...	Leopold - Carolin Academy.	Coimbra ...	Observatory.
Hamburg ...	*†Deutsche Seewarte.	Lisbon ...	Observatory.
Kiel ...	Schück, Capt. A.	<i>Azores.</i>	
	Commission for the Exploration of the German Ocean.	Ponta Delgada	Observatory.
Leipzig ...	University Library.	<i>Roumania.</i>	
Lindenberg ...	Royal Prussian Aeronautical Observatory.	Bucharest ...	Meteorological Institute.
Magdeburg ...	Observatory.	<i>Russia.</i>	
Munich ...	Central Meteorological Office.	Dorpat ...	Observatory.
	Observatory.	Ekaterinburg	Observatory.
Neustadt ...	Forest Academy.	Helsingfors ...	Society of Sciences.
Potsdam ...	Observatory.	Kazan ...	Observatory.
Strassburg ...	Meteorological Agricultural Service.	Kieff ...	Observatory.
Stuttgart ...	Central Meteorological Office.	Koutchino ...	Aerodynamical Institute.
Wilhelmshaven	Observatory.	Moscow ...	Observatory.
		Nicolaieff ...	Hydrographic Office.
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		Pavlovsk ...	Observatory.

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Warsaw Meteorological Bureau.	Reno ...	Mount Rose Observatory.
<i>Serbia.</i>		Washington ...	Chief Signal Officer. Department of Agriculture. Department of Terrestrial Magnetism. Hydrographer's Office. Mount Weather Observatory. Naval Observatory. Smithsonian Institution. Surgeon General's Office. *†Weather Bureau.
Belgrade ...	Central Observatory.	<i>Mexico.</i>	
<i>Spain.</i>		Guanajuato ...	Observatory.
Barcelona ...	Experimental Farm.	Mexico ...	"Antonio Alzate" Scientific Society. Central Meteorological Observatory.
Granada ...	Cartuja Observatory.	Oaxaca ...	Observatory.
Guardia ...	Observatory.	Puebla ...	Boletín de Estadística.
Madrid ...	Central Meteorological Institute. Observatory. Observatory, Chamar-tín de la Rosa.	Saltillo ...	Observatory.
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San Fernando	Observatory.	Potosí.	
Tortosa ...	Ebro Observatory.	San Salvador	Observatory.
Vilafranca del Panades.	Observatory.	<i>Central America, West Indies.</i>	
<i>Sweden.</i>		Costa Rica ...	Meteorological Institute.
Stockholm ...	Central Meteorological Institute. Hydrographic Office. Nautical Meteorological Bureau. Royal Academy.	Guatemala ...	Central Laboratory.
Upsala ...	Meteorological Observatory.	Havana ...	Observatory. Central Meteorological Station.
<i>Switzerland.</i>		Porto Rico ...	Engineer in Chief.
Berne ...	Hydrometrical Bureau.	<i>Argentina.</i>	
Geneva ...	Geographical Society.	Buenos Aires..	Meteorological Office. Mons. Lasagna Observatory.
Mont Blanc ...	Observatory.	Cordoba ...	National Academy.
Neuchâtel ...	Observatory.	<i>Brazil.</i>	
Zürich... ..	Central Meteorological Office.	Porto Alegre...	Azambuja, Sr. G. A. de
<i>AFRICA.</i>		Rio de Janeiro	Meteorological Department, Ministry of Marine. Observatory. Secretary of Agriculture, &c.
Algiers ...	Meteorological Service.	<i>AMERICA.</i>	
Cairo ...	Sanitary Department. *†Survey Department.	<i>United States.</i>	
<i>AMERICA.</i>		Baltimore ...	Maryland Weather Service.
Cambridge, Mass.	Harvard College Observatory.		

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Quito...	Observatory.	Chemulpo ...	Observatory.
<i>Uruguay.</i>		Irkutsk ...	Observatory.
Monte Video ...	National Physical Institution.	Manila ...	Meteorological Observatory.
	Observatory, Villa	Tokio ...	Imperial Meteorological Observatory.
	Colon.	Zi-ka-wei ...	*Observatory.

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