



FIRST REPORT

OF THE

METEOROLOGICAL COMMITTEE

TO THE

LORDS COMMISSIONERS OF HIS MAJESTY'S
TREASURY,

For the Year ended 31st March, 1906.

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



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THE METEOROLOGICAL COMMITTEE, 1905-6.

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

Mr. W. N. SHAW, Sc.D., F.R.S., Director. *Chairman.*

Captain ARTHUR M. FIELD, R.N., F.R.S., Hydrographer to the
Navy.

Captain A. J. G. CHALMERS, Professional Officer of the Marine
Department, Board of Trade.

Mr. W. SOMERVILLE, Sc.D., Assistant Secretary of the Board of
Agriculture and Fisheries.

Sir GEORGE H. DARWIN, K.C.B., F.R.S., University of Cambridge.

Professor ARTHUR SCHUSTER, F.R.S., University of Manchester.

Mr. G. L. BARSTOW, nominated by the Treasury.

FIRST REPORT

OF THE

METEOROLOGICAL COMMITTEE

For the Year ended 31st of March, 1906.

MAY IT PLEASE YOUR LORDSHIPS,

IN accordance with Your Lordships' instructions, the Committee appointed by Treasury Minute dated 20th May, 1905, met on 31st May and took over the administration of the Parliamentary grant and the general control of the Office, the direction of which had been entrusted to Mr. W. N. Shaw by Your Lordships' letter of 8th April.

Constitution
of the
Committee.

Meetings were also held on 5th July, 1st November, 6th December, 1905, and 7th February, 1906.

As suggested by Sir G. H. Murray, in a letter dated 23rd May, 1905, transmitting a copy of the Minute referred to, the Committee considered the following points :—

- (1) Whether the Committee should continue to be registered under the Companies Acts, or whether some other constitution would be preferable?
- (2) The powers to be delegated to the Director, and
- (3) The arrangements to be made for the administration and audit of the Parliamentary grant.

The conclusions at which the Committee arrived on these points have already been reported to Your Lordships.

The Committee were of opinion that some form of incorporation was advisable, and were in favour of incorporation by Royal Charter, but pending the settlement of the question of permanent premises suitable for the work of the Office, it was agreed to request that the property held by the Meteorological Council should be vested in one of the permanent Secretaries of the Treasury and the Director of the Office for the time being as trustees, for the use of the Committee.

The arrangements for the transfer of the property in accordance with this request are in progress under the advice of the Solicitors' Department of the Treasury, but are not yet completed. In the

meantime the Meteorological Council, at a meeting held on 12th July, 1905, authorised two of their members—Sir G. Darwin and Mr. Shaw—to carry out on their behalf any transfer that might be required.

The Meteorological Council.

The Committee desire to recognise at the outset the appropriateness of the organisation established by the Council for the work of the Office, and they concur with pleasure in the desire expressed by Your Lordships that the work should proceed generally on the lines hitherto followed. They desire especially to place on record their appreciation of the services rendered in the administration of the Office by Sir R. Strachey, the Chairman of the Council for 22 years; by Sir William Wharton, who was for 20 years a member of the Council, *ex officio*, as Hydrographer of the Navy; by Mr. Francis Galton, who had so large a share in the foundation and the management of the Office under the control of the Royal Society; and by Dr. Buchan, who brought to the service of the Council an unique experience of meteorological work. They cannot omit a reference to the melancholy death of Sir William Wharton at Cape Town so shortly after his retirement from active service on the Council, nor can they fail to note that his last scientific contribution—the address to the Geographical Section of the British Association in South Africa—showed the same keen insight into meteorological problems that was characteristic of his work as a member of the Council. His name will remain associated with those of Henry Smith, Stokes, Richards, De la Rue, and Stone, men of the highest scientific distinction, who have in past years taken part in the management of the meteorological service of the country.

Sir William Wharton.

Finance.
Supply of
Instruments
for the Navy.

In accordance with the recommendations of Sir H. Maxwell's Committee, arrangement has been made under which the Committee continue to organise and carry out the supply of meteorological instruments to the Naval Depôts for the use of H.M. ships in the same way as heretofore, but the Lords Commissioners of the Admiralty reimburse the Committee to the extent of the cost of the instruments, and also contribute £100 for the departmental expenses incidental to the organisation and management of the supply. The Committee are also relieved of the responsibility of contributing towards the maintenance of the observatories on Ben Nevis and at Fort William, and these items, together with the economies resulting from the changes in the system of management, improve the financial position of the Committee as compared with that of the Council to the extent of £1,300. On the other hand, it must be noted that the statement of accounts presented by the Council for the year 1904–5 shows an expenditure out of accumulated balance, over and above the Parliamentary grant for the year, to the extent of £800. The Committee have made careful inquiry as to the grounds for this excess of expenditure over income, and they learn that, as regards £250, the deficit was anticipated because the grant to the Fort William Observatory was continued, under special circumstances, beyond the time originally fixed for its termination, and the rest was due partly to exceptional expenditure for instruments and partly to the increase of expenses incidental to a remarkable development of the ordinary work of the Office, particularly in the Marine Branch

and in the Branch which is concerned with the collection of observations from stations established by local authorities and private observers.

As these incidental expenses cannot be curtailed unless the work is restricted, and the necessary restriction cannot be undertaken without careful consideration, the sum immediately available for extension in other directions recommended by various authorities is considerably less than the total of the items enumerated as those upon which the financial position has been improved by the changes introduced into the constitution of the Office.

The Committee have therefore found it necessary to be cautious about embarking upon new developments involving fresh expenditure.

They have arranged that the annual payment made for many years past to Dr. Buchan as Inspector for Scotland, shall be continued to him for the time being in consideration of the work upon which he is engaged in connexion with the discussion of the results obtained at the Ben Nevis Observatories.

Commander Campbell Hepworth, C.B., R.N.R., continues as Marine Superintendent, and the clerical staff has also been continued upon the same terms as under the Council.

The Committee have deemed it desirable to place the statistical work of the Office and the charge of the Library, with which is associated the duty of making the vast accumulation of meteorological information from all parts of the world practically available for scientific and industrial purposes, in the hands of a Superintendent, and a new office has therefore been constituted with that object. Furthermore, the supply of instruments to the Navy and to Colonial Governments, as well as to the Mercantile Marine and the land stations in direct connexion with the Office, raises so many important questions that require special scientific knowledge that the Committee have decided to add to the staff of the Office a Superintendent of Instruments who should be a man of high scientific attainments competent to assist the Director with reference to those and other scientific questions.

New appointments.

To meet these requirements it has been necessary for the Director to forego the advantage of a private scientific assistant, an appointment which has been successfully filled for the past few years by Mr. R. G. K. Lempfert. Mr. Lempfert undertook, temporarily, the duties of Superintendent of Instruments from the beginning of October, and at the close of the year he was transferred to the post of Superintendent of Statistics. Mr. Ernest Gold, B.A., of St. John's College, Cambridge (Third Wrangler, 1903, and Natural Sciences Tripos, Part II., 1904), has been selected for the post of Superintendent of Instruments and will take up his duties in June. The Committee consider it undesirable that the post of private scientific assistant to the Director should remain permanently in abeyance, and they intend to revise the scheme of operations of the Office in such a way as to provide for the re-establishment of the post as soon as possible.

Investigation
of the upper
air.

The investigation of the upper air, which had been repeatedly pressed upon the Council, was brought before the Committee upon the consideration of the resolutions of the Fourth International Conference for Scientific Aeronautics forwarded by the Treasury with a note from the Russian Ambassador, at the request of His Imperial Highness the President of the Academy of Sciences of St. Petersburg, together with a report of the Director, as the representative of the Government, on the nomination of the Board of Education, at the above mentioned Fourth International Conference on Scientific Aeronautics held in St. Petersburg in September, 1904.

Upon the consideration of the report the Committee authorised the assignment of a sum of £500 per annum for the promotion of the investigations in co-operation with corresponding institutions on the Continent of Europe and elsewhere, including a contribution towards the publication of the results of the international observations of temperature, &c., in the upper air, as well as of auxiliary observations of clouds. They have been fortunate in securing the services of Mr. W. H. Dines, F.R.S., for the organisation and control of experiments with kites and, if practicable, with unmanned balloons. Mr. Dines' work in this direction, on land and from steam vessels, in connexion with a joint committee of the Royal Meteorological Society and the British Association has already been referred to, from time to time, in the Reports of the Meteorological Council.

The objects to be kept in view are as follows :—

- (1) The maintenance of a depôt for the construction and testing of apparatus.
- (2) The investigation of the upper air over the British Isles by a series of simultaneous ascents on the days of the international ascents (kites and unmanned balloons being used if practicable). Three stations for each day of ascent are to be arranged, if possible, within a range of 100 miles in the first instance, one of them being on the Coast. For the two of these ascents not at the depôt station, the central depôt would supply apparatus and instruct the observers, but would not be responsible for making any payment to the observers.
- (3) The supply of apparatus and instruments for the observations of the upper air, to vessels of the Navy or of the Mercantile Marine of which Officers might be willing to take charge of ascents, and the instruction of the observers.

The Committee are glad to note that the scheme of observations of the upper air is likely to be extended by other organisations. Mr. G. C. Simpson, who was acting as volunteer assistant to the Director and undertook at his recommendation some trial experiments on behalf of the joint committee already mentioned, from a trawler in the North Sea belonging to the Royal National Mission to Deep-Sea Fishermen, has now taken up his duties as Lecturer in Meteorology in the University of Manchester, and has made arrangements for kite ascents in Derbyshire.

The opportunities afforded for occasional observations of the upper air by the equipment of the balloon factory at Aldershot encourages the hope that valuable information may be obtained therefrom, especially for the days fixed by international agreement for co-operative work.

Moreover, the Aero Club has appointed a Meteorological Committee with a view to organising meteorological observations in connexion with the aeronautical expeditions of the club.

In order to promote effective co-operation in this important work it seems desirable that all experiments in this direction should be brought to the cognisance of some body representing the various organisations concerned therein. As already mentioned, the Royal Meteorological Society, the British Association, and the Aero Club have established committees, and the Meteorological Committee have appointed the Director and Professor Schuster as their representatives to co-operate with the representatives of the other bodies concerned in the work.

An endeavour has been made to enlist the co-operation of volunteer observers in this investigation, and has met with considerable success. Lieutenant the Hon. C. F. Cavendish, of H.M.S. "Suffolk," has expressed his willingness to make a trial of observations at sea, and Captain A. Simpson, of the steamship "Moravian," an observer for the Office of very long experience, has also undertaken to make a trial of this method of observation as soon as the necessary apparatus can be provided.

On land Mr. C. J. P. Cave, of Ditcham Park, Petersfield, who has already made some successful experiments with kites in Barbados, has provided himself with the necessary apparatus and has carried out a number of successful ascents.

A brief summary of the results of the observations for each week since January 1st, 1906, has been published in the Weekly Weather Report in order that those interested in the investigations may be able to refer the results for any particular day to the meteorological conditions prevailing at the time as represented in the daily maps which form part of the Weekly Report.

Mr. Dines has added to the apparatus a simple means of recording the wind force at the kite level by the trace of a pen which indicates the pull of a small celluloid ball attached to the indicator by a long cotton line. Although this arrangement gives a less delicate indication of the wind force than the small cup anemometer which is often employed for the purpose, it is free from the uncertainties which arise from the variation of the record of a cup anemometer with variation of the inclination of the spindle. It has already given some interesting results, and if corresponding values can be obtained from a few places at a suitable distance apart, very valuable information as to the pressure gradient at different levels and its relation to the wind direction and velocity will be secured by a combination of the results of the wind observations with those for the temperature of the air column over the places of observation.

Volunteer
observers.
Co-operation
with Meteorological
Societies.

The Committee have given special attention to the arrangements for the collection of observations from land stations in the British Isles maintained by local authorities or private persons. These observations are collected partly with a view to obtaining adequate information for the regular publications of the Office, and partly as forming a contribution to a body of meteorological data for the purposes of scientific investigations or the requirements of those interested in Agriculture, Sanitary Science, or the various industries which are affected by different conditions of weather.

In the earlier years of the existence of the Office, although it depended very largely upon the voluntary assistance of the officers of the Navy and the captains and officers of the Mercantile Marine for its marine information, there was no regular association with volunteer observers at land stations. Such observers were generally members of one or other of the two societies, the Royal Meteorological Society and the Scottish Meteorological Society, and contributed their observations to those societies for publication in their journals and for other purposes.

By degrees the practice of voluntary observers contributing observations to the Office, grew, and the encouragement of the practice, as well as that of assisting the societies which were already centres for the collection of such information, were among the recommendations contained in the report of Sir William Stirling Maxwell's Committee in 1877.

When the Meteorological Committee of the Royal Society desired to collect information from land stations in 1873 for the publication of an annual volume of observations at *Stations of the Second Order*, in response to an appeal from the International Congress at Vienna, they applied to the societies for copies of observations contributed by some of the voluntary observers in return for a money payment. Later on, when the Council wished for climatological information week by week from inland stations, to supplement that from the telegraphic reporting stations, for the Weekly Weather Report which was initiated in 1879, they appealed to the societies again and the original agreement was extended. In continuation of these arrangements the Council in the year ended 1904-5 obtained information for the annual volume for 1903, from 34 stations, and for the Weekly Weather Report from 17 stations, and in return made payments to the extent of about £235.

On the other hand a large number of observers desire that their observations should appear in the official publications, the daily, weekly, or monthly reports, or should be made as fully available for the use of the public as possible, and they are desirous of sending their observations to the Office under conditions appropriate for that purpose. As many of the stations in England are maintained by local authorities out of public funds, the Office is the most appropriate central depository for copies of the observations, which are of considerable public utility.

There are thus three bodies which collect and publish climatological data for various parts of the British Isles in addition to

the British Rainfall Organisation, now under the direction of Dr. H. R. Mill, which is the central institution for the collection of rainfall data.

The Office is the only institution of the three which issues a Daily or Weekly Weather Report, but as regards the monthly summaries there is a great deal of overlapping. At the same time no one of the three bodies makes or publishes a complete collection of climatological data, and any student of the climatology of the British Isles has a good deal of trouble in ascertaining the extent of the available material. The share which the Office takes in this incomplete system is incidentally a source of very considerable expense, and engages a great deal of the attention of the staff of the Statistical Branch which is unable to keep up with its work. The volume of observations at Stations of the Second Order is very much in arrear. The volume for 1902 is not yet issued, although in the course of the preparation of the returns for the Registrars-General of England and Ireland a good deal of the work for that and future volumes is already done. In various ways it would be advantageous if some of the work of the Statistical Branch could be applied in other directions, and the Committee have had to consider whether they should abandon the general collection of observations from land stations and restrict their attention for official purposes to a selected number of representative stations, or endeavour with the co-operation of the Societies to initiate a joint system for the collection and publication of the results which would be complete and would at the same time avoid the overlapping of publications.

The Committee are of opinion that the latter alternative is the more desirable if suitable provision can be made for the work which it entails.

They have invited the societies to send representatives to a Conference with representatives of the Committee. A first meeting of the Conference has already been held, and the Committee hope to be able to report by the end of the year effective progress in the organisation of voluntary observations in the British Isles, in conjunction with the societies, for the common advantage of all three institutions.

Conference.

The work of the Office has to be conducted without the special telegraphic facilities reserved for departments of State under the Telegraph Act, 1863 (26 & 27 Vic. c. 112, sec. 48) and subsequent Acts. The Committee have, however, had the advantage of the good offices of the Treasury in considering, with a representative of the Post Office, the various points raised by the Council in their memorandum presented to Sir Herbert Maxwell's Committee, with the object of placing the telegraphic service of the Office upon a better footing. As the service is maintained for the purpose of storm warnings and forecasts, the effective management of which is difficult under the most favourable circumstances, it seems to the Committee to be specially important that they should take full advantage of any opportunity afforded to them.

Telegraphic facilities.

They desire to acknowledge the assistance given by the Postmaster General and the value of an arrangement that has resulted

from the negotiations, under which the Post Office will be kept informed about the current details of the working of the service with a view to its improvement.

There are still some matters outstanding which cannot be adequately met.

The meteorological service relies upon telegraphic communication with a number of very remote offices, both for the collection of its information from the observing stations, and the transmission of warnings for the benefit of fishing and coasting vessels. From the nature of the service it is necessary to work close up to the margin of the ordinary hours of attendance at country post-offices, and in some cases it is desirable, both at the beginning and end of the day, to go beyond the limits. It is difficult to adjust the requirements of the service so that the provisions available for the use of the postal telegraphic service by the general public beyond the ordinary hours of attendance shall meet the case in a satisfactory manner. Under those provisions messages may be sent upon payment of a special fee if the attention of the operators can be obtained. There is on the one hand no security that the attention of the operator at a receiving office can be obtained for the reception of a storm warning telegram a few minutes after the ordinary hours for closing, and on the other hand the scale of payment authorised for an occasional message out of office hours when applied to a regular daily service, as of telegrams conveying daily observations, becomes extravagant as compared with the ordinary scale of remuneration for work undertaken for the Committee.

Special consideration is required for two points. First, the initiation of a service of telegrams from observing stations at 7 a.m. to bring the service of this country into line with the international system which has been already referred to on several occasions in the reports of the Meteorological Council; and secondly, the transmission of storm warnings in the evening and on Sundays.

Storm
warnings.

With regard to the latter, the Committee have followed out the suggestion of the Council and obtained more precise information about the working of the storm warning service by having the telegrams returned from the signal stations with the time of hoisting the signal endorsed upon the form. An examination of these returns shows that in many instances there is a wide discrepancy between the time of despatch of the telegrams from the Office and the time of hoisting the signal. In numerous instances this discrepancy extends to 14 or even to 24 hours. The delay is particularly evident with regard to warnings despatched on Sundays.

In order that warnings of dangerous storms may not be omitted, it has been the practice for two members of the staff of the Office to be on duty on Sunday mornings, and in order that there may be no delay they attend at the Central Telegraph Office instead of the Meteorological Office and receive there the morning observations from the reporting stations in the country and on the Continent, prepare the working chart, and issue warnings if

necessary. The chart cannot be completed, under ordinary circumstances, before 9.30 a.m., and to issue warnings without the fullest information is most undesirable. Consequently the warnings cannot be despatched before 9.30 or a few minutes later, and the post offices at the country stations where storm signals are exhibited, if open on Sunday at all, are as a rule closed at 10 a.m. for the day.

Very few of the Sunday morning messages reach their destination on the day of issue. The Sunday evening messages are many of them also addressed to closed offices and only delivered on the next morning, and the same is the case with a considerable number of the evening messages on week-days which are despatched about 7.30 p.m. and fail to reach on the same evening a number of country offices which close at 8 p.m.

It should be noticed here also that the practice of hoisting storm signals at night has fallen into disuse, and in some cases telegrams arrive when the official in charge of the station is not on duty. Both these causes combine with the absence of special telegraphic arrangements to produce a large number of instances of long delay in the hoisting of the signals after the warnings have been despatched from London.

The Committee feel that some action to remedy this state of affairs is urgently necessary, because the service of storm warnings, which is already extremely difficult on account of meteorological reasons, is not fairly represented by the hoisting of a signal at a long interval after the issue of the warning, when not improbably the danger which was anticipated is already past.

The representative of the Postmaster-General, who went into the matter very carefully, was only able to suggest that the meteorological service should be fixed for such hours as to allow an adequate margin for the occasional pressure of ordinary business and other causes of telegraphic delay, and thus secure that any telegrams despatched in the evening or on Sundays should be delivered on the same day.

The suggested course is by no means free from difficulty: the hours of observation are fixed by international agreement and are not easily changed. For the purpose of noting the development of the meteorological changes upon which warnings and forecasts are based an additional half-hour is not without its importance, and the sacrifice of half-an-hour every day to allow a margin for the transmission of telegrams in the case of contingencies which arise occasionally is at best a balance of disadvantages.

The Committee propose to give the matter further consideration in the current year. The Sunday service in particular, as at present arranged, entails considerable cost and is of little or no practical advantage for its primary purpose of affording warnings of approaching storms. At the same time, in the maintenance of a number of signal stations in direct communication with the Office for the purpose of distributing information about storms it is important that, so far as possible, no storm should be overlooked. If the Office used its discretion to disregard the existence

of a storm because it was improbable that communications would reach the signal stations in time for warning, serious misunderstanding might result; it is therefore doubtful whether the suspension of telegrams in those cases where it is known that the signal station cannot be reached would not lead to a worse result than the telegraphic delays which at present seem to be unavoidable.

Alterations
of the
regulations
for exhibi-
tion of
storm signals.

The Committee have sanctioned an alteration of the regulations for the exhibition of storm signals. Hitherto it has been the rule for the signal cone to remain up until the expiration of 48 hours from the time of despatch of the warning telegram from the Office, unless a special order to lower the cone is issued. The rule was adopted, although the forecasts of the Office are restricted to 24 hours and a gale would be expected to follow the warning within that period, because a second gale sometimes follows a first within 24 hours and there might not be time to repeat the warning within that period. Under the new rule the cone is to remain up until *the evening of the day following the issue of the warning from the Office.*

The duration of the warning is thus about 24 hours for evening messages and about 36 hours for morning messages. The course of the meteorological changes is watched in the Office by means of telegraphic observations at 8 a.m., 2 p.m., and 6 p.m., and therefore there is ample opportunity for renewing the warning, if necessary, for the second gale while the cone remains hoisted. On the other hand, there will be less probability of the signal flying for a considerable period after the anticipated disturbance is past.

Office
premises.

One of the points noted in connexion with the work of the Office by Sir Herbert Maxwell's Committee was the unsuitability of the present office premises. The Committee have taken the matter into consideration and have thought it desirable to raise the question of providing accommodation for the Office in premises to be erected on land at South Kensington in possession of H.M. Office of Works or of the Commissioners for the Exhibition of 1851. Accommodation in that position would enable the Committee to exhibit some of the more important results of meteorological work to the general public and would place the Office in close proximity to the Museums of Science and Art and to the University of London. These advantages outweigh in their opinion the drawback of the additional distance from the lithographers, the City, and the docks. They hope that it may be possible to find the accommodation they require in the same building with a post office.

The Committee have learned with satisfaction that Your Lordships view this proposal with approval and are willing to bear it in mind in considering the arrangements of the buildings to be erected on the site.

Colonial
observations.

With regard to other suggestions made in the Report of Sir Herbert Maxwell's Committee or elsewhere for the improvement or extension of the meteorological service, the Committee regret that they have been unable to arrange for the regular collection and publication of Colonial observations. The work of the Statistical and Library Branch is already too heavy to permit of

their undertaking further responsibility in that direction. The Director has undertaken to assist the Colonial Office by preparing suggestions for the organisation of meteorological observations and for their publication in a common form as nearly as possible in agreement with international forms.

A correspondence with reference to the proposed arrangements for compiling and publishing an annual volume of observations made in various Colonies and Dependencies is printed in Appendix I.

The issue of Monthly Meteorological Charts of the Indian Ocean and the Red Sea referred to in the last Report of the Council has been authorised, and the first number will be that for May, 1906. The charts will contain the results of the discussion of the winds of the Indian Ocean which has been in progress for some years. They will also give a reproduction on reduced scale of the charts of the cyclone tracks in the South Indian Ocean, prepared by the late C. Meldrum, C.M.G., M.A., F.R.S., of Mauritius, and issued as a publication of the Office in 1891. These charts are now out of print, and a new edition on the reduced scale is in preparation. It is hoped that they may be supplemented by additional information from the Royal Alfred Observatory.

Marine
observations.

It has been arranged to supply to the Meteorological Reporter to the Government of India daily observations from the Indian Ocean as received in the Office, and it is anticipated that the number of observations available for this purpose will be augmented considerably by the issue of the Monthly Charts, which will bring the Office into communication with a number of seamen navigating that ocean.

The Committee have received very valuable assistance from the Board of Agriculture in England, the Fishery Board for Scotland, and the Board of Agriculture and Technical Instruction for Ireland, with reference to the inspection and management of the barometers lent for the use of the seafaring communities at fishing villages and elsewhere on the coasts of the British Isles. The inquiries which have been made through the assistance of the bodies named have led to a considerable development of the organised use of the barometers for the purpose of anticipating important weather changes. The time has now arisen when a fresh edition of the Fishery Barometer Manual to be used with the barometers is called for. It is intended to include in the new edition some information with regard to gales on the British and Irish coasts which has been accumulated since the last edition of the manual was issued, and which should prove of considerable practical service.

Fishery
barometers.

The Committee regret that they are unable to meet all the demands for the loan of fishery barometers and at the same time to maintain those already lent in good working order and repair. They have found it necessary to limit the number which they are prepared to lend and maintain to 230.

Attention has been given to researches upon various subjects, and in connexion therewith a number of interesting points have been disclosed.

Special
researches.

Life history
of surface air
currents.

The work on the trajectories of air in travelling storms by the Director and Mr. Lempfert has been completed by a study of the changes which take place in pressure, wind velocity, and temperature of the air as it moves along its trajectory, or path, on the surface. These changes have been considered especially with regard to the weather experienced at the successive positions traversed by the air, and an endeavour has been made to trace a connexion between the conditions of weather and the ascent or descent of air as indicated by the convergence or divergence of the trajectories along which the air moves from different sides.

The changes indicated in the pressure and the associated changes in the temperature of air as it moves along its path on the surface are very remarkable. They lead to important conclusions with regard to the motion of air in relation to cyclonic and anticyclonic centres and the relation of depressions and anticyclones to the ascent of air from the surface and its descent thereto.

The results of the study have been embodied in an official publication with the title of "The Life-history of Surface Air Currents." The work is divided into four parts. The first gives a general discussion of the results and summarises the conclusions to be drawn from them; the second gives the details of the surface motion of air in eight typical cases in relation to travelling storms; the third gives the results of applying similar methods to the surface motion of air over the Atlantic Ocean as deduced from the synchronous charts for 1882-83 published by the Council in 1888; while the fourth part deals with the computation of the surface trajectories of air theoretically, and consists mainly of contributions by Mr. G. T. Bennett, of Emmanuel College, Cambridge, and Mr. W. H. H. Hudson, M.A., late Professor of Mathematics at King's College, London, to whom the Committee desire to express their thanks. The final proofs were passed for press at the beginning of March, but copies had not been received by the end of the official year.

Beaufort
scale of wind
force.

They also desire to record their obligation to Mr. G. C. Simpson, M.Sc., 1851-Exhibition Scholar of the University of Manchester, who acted as unpaid Assistant, first to the Secretary of the Council and subsequently to the Director, until he took up his duties as Lecturer on Meteorology in the University of Manchester in the autumn of 1905.

Mr. Simpson was principally engaged upon the re-determination of the velocity equivalents of the several numbers of the scale of wind force introduced in 1805 by Admiral Sir Francis Beaufort, Hydrographer of the Navy, for estimating wind at sea. The subject engaged the attention of the Meteorological Council for some years, and the discussion was nearly completed when the Committee was constituted. To recapitulate briefly the position of the subject, it may be said that the force of the wind and the effects it produces depend upon its velocity, and consequently any consistent scale of wind force, however empirical it may be, will have certain velocities corresponding with its successive numbers. Admiral Beaufort's scale is expressed by the series of numbers 0 to 12, ranging from a calm to a hurricane "which no canvas could withstand." The specification of the scale had no

direct reference to any measurements of the velocity of the wind, for which in 1805 there were indeed no satisfactory means available. The numbers were specified by the behaviour of a well-conditioned man-of-war of that time under the various winds, for the numbers 1 to 3 by the speed of the ship, and for higher numbers by the amount of sail she could carry.

Since 1805 circumstances have changed. Sailing ships have been very generally superseded by steamers, and the rig of those that remain no longer follows the lines of Admiral Beaufort's "well-conditioned man-of-war," but the tradition of the scale has been preserved, not only in the Navy but on ships of all kinds and at shore stations as well. Thus the Beaufort numbers are in constant use in nearly all parts of the world, and yet the means of identifying the specification of any particular number has been lost. There remain the brief verbal descriptions of the winds under the headings "Light airs" or "Moderate breezes," or gales of various descriptions, with storm and hurricane for the two highest numbers, but these descriptions are too vague to furnish an actual specification. The problem therefore was to find out first the velocities of the wind which correspond with the averages of the numbers used to identify the wind force in accordance with seamen's traditional practice, and then, if possible, devise a new specification that would tend to preserve the uniformity of the tradition and support the correspondence between the numbers and the selected average velocities.

The only method of dealing with the problem is to compare the estimates of observers thoroughly practised in the nautical method of estimating the wind, at one or more stations where there is a well exposed anemometer, with records of the velocity of the wind obtained independently of the observer's estimate. This method had been employed by Mr. Scott, the late Secretary of the Council, and by others; but here another difficulty arises. The methods of determining the actual velocity of the wind from its effect upon an anemometer have been modified and developed since the introduction of the Robinson anemometer, and the effect of these modifications is to alter the wind measurements in some cases by as much as 25 per cent.

A third difficulty arises from the process of taking averages. In finding the relation between two sets of numerical quantities, when a real numerical relation exists but when each set of measurements is liable to error, as all numerical measurements are, different results are obtained by different methods of grouping for the purpose of forming averages, and the third difficulty in the problem under consideration is to decide which method of grouping must be adopted in the case of the Beaufort numbers and corresponding wind velocities to give the most appropriate results.

In a report presented to the Director, Mr. Simpson has discussed the various points and particularly the last difficulty, and he has given a very clear statement of the results. He has made use of material specially prepared in the Office for the purpose, and also of a large number of data put together by Mr. R. H. Curtis for a paper presented to the Royal Meteorological Society in 1897. The

Committee have thus been enabled to issue as an official publication a report which it is believed will give a satisfactory table of equivalents of the average velocities of the winds corresponding with the Beaufort numbers.

A very curious and interesting result is derived from the investigation. The velocities arrived at empirically as the appropriate equivalents of the Beaufort numbers were plotted upon a diagram and a working curve drawn to represent them. The curve so drawn turns out to be very nearly identical with that represented by the algebraical equation

$$V = 1.87 B^{\frac{2}{3}} \text{ or } B = \frac{2}{3} V^{\frac{3}{2}},$$

where B is the Beaufort number and V is the hourly wind velocity in statute miles per hour. Adopting Mr. Dines's factor .003 for obtaining the wind pressure in pounds upon a square foot, it follows that the relation between the Beaufort numbers and the wind pressure (P) is expressed by the comparatively simple relation

$$P = .0105 B^3.$$

Thus, if all the steps in this intricate investigation have been accurately followed, there appears to be underlying Admiral Beaufort's original specification the simple relation that the numbers selected are proportional to the cube root of the wind pressure.

The diagram (Plate I) representing these relations has been plotted on paper divided according to a logarithmic scale (similar to the scale of an ordinary slide rule).

On such a diagram a straight line represents a relation between two quantities according to some simple power of one of them. The slope of the line indicates the power. Thus, if the slope is 3 to 1 as is the case with the red line, a cubic relation is indicated; if the slope is 3 to 2 as with the black line, a semi-cubical relation is shown.

Without entering into details, the fact that the straight line with the slope of 3 to 1 runs so close to all the points representing wind pressure for the various Beaufort numbers is good evidence that the Beaufort numbers may be related to the corresponding pressures by the cubic law $P = .0105 B^3$, and the similar correspondence for the Beaufort numbers and wind velocity with a straight line of slope 3 to 2, as shown by the black line, is equally in favour of representing the relation between the Beaufort numbers and wind velocity by the formula

$$B = \frac{2}{3} \sqrt[3]{V^2}$$

Of the points which are off the straight lines those for forces 1 and 2 are most conspicuous, for these a slight adjustment of the values within the limits of error of observation would bring them on to the line.

The remarkable fidelity with which the cubic curve represents the relation indicated by the empirical numbers is shown in the

To face p. 18.

ADMIRAL BEAUFORT'S NUMBERS FOR WIND FORCE & THEIR EQUIVALENTS.

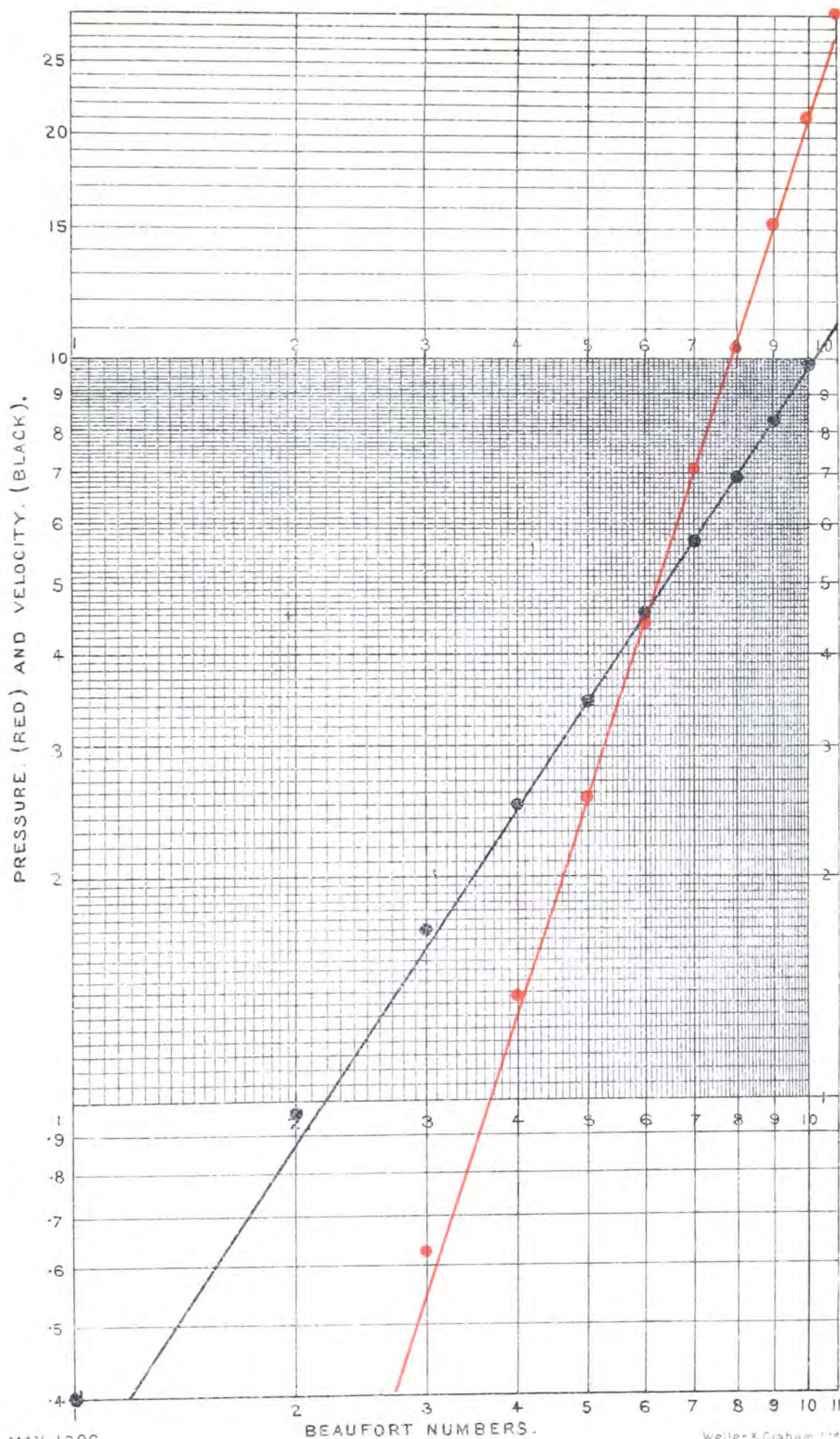
RESULTS PLOTTED ON LOGARITHMIC SCALE.

THE BLACK DOTS SHOW THE VELOCITY FOR EACH OF THE BEAUFORT NUMBERS TAKEN FROM THE BLACK CURVE OF THE ORIGINAL DIAGRAM

THE BLACK LINE REPRESENTS VARIATION PROPORTIONAL TO $B^{\frac{3}{2}}$

THE RED DOTS SHOW THE PRESSURE FOR EACH OF THE BEAUFORT NUMBERS TAKEN FROM THE ORIGINAL DIAGRAM

THE RED LINE REPRESENTS A VARIATION PROPORTIONAL TO B^3



FOR THE PURPOSE OF PLOTTING, THE VELOCITIES IN MILES PER HOUR HAVE BEEN DIVIDED BY SIX:
AND THE PRESSURES IN POUNDS PER SQUARE FOOT MULTIPLIED BY TWO.

diagram, in which the red dots represent the velocities as taken from the empirical working curve, and the red straight line represents the algebraical relation $P = .0105 B^3$. It will be noticed that it touches 7 out of the 9 dots representing the empirical relation.

The results deduced from this representation of the relation between the Beaufort numbers and the mean hourly velocity are as follows :—

Beaufort number...	...	0	1	2	3	4	5	6	7	8	9	10	11	12
Mean hourly wind velocity in statute miles per hour	...	0	2	5	10	15	21	27	35	42	50	59	68	75
Corresponding wind pressure in pounds per square foot	...	0	.01	.08	.28	.67	1.3	2.3	3.6	5.4	7.7	10.5	14.0	17

The simplicity of the relation between wind pressure and the Beaufort numbers suggests that there is something about the working of a sailing ship which depends upon the cube root of the wind force. It is known that the speed of a steam vessel depends upon the cube root of the power used to drive her, and the occurrence of the cube root in both these relations suggests an examination of the average relation between the speed of a sailing ship and the velocity of the wind. For the purpose of such an investigation Admiral Sir J. Dalrymple Hay, G.C.B., F.R.S., has been kind enough to lend a log kept by him on H.M.S. "Wolverine," 60 years ago, from which the speeds and wind estimates have been extracted. Taking the average speed for all points of sailing, it appears that up to force "7" the ship's speed was roughly proportional to the wind velocity, making 9 knots at that force. For higher forces the speed increases very little. Captain Creak, C.B., F.R.S., supplied a selection of observations from his log on board H.M.S. "Juno," in which the ship's speed running before high winds is given. In that case, roughly speaking, the proportionality between speed and wind force is carried to the higher forces, with a speed of 10.5 knots for force 10. There are obviously many circumstances which would interfere with any strict law of proportionality, and no doubt each ship would have its own curve of relation between speed and wind velocity depending upon her build and rig, but the results of the comparison are sufficiently instructive to enable the Committee to say that a study of the effect of wind upon the speed both of steamships and sailing ships promises to yield interesting and valuable results.

Mr. Simpson in his report develops a specification of the numbers of the Beaufort scale suitable for land stations and for coast uses. It is difficult to draw up a specification of all the separate numbers which shall be at once applicable on ocean going vessels using steam or sail. The Marine Superintendent in a memorandum suggests a grouping of the Beaufort numbers and a means of identifying certain points of the scale for the use of seamen. This is printed with the Director's Report, and with a note by Sir G. H. Darwin on the processes of obtaining averages for the velocity equivalents of the Beaufort numbers, and another by Mr. W. H. Dines, F.R.S., on the factor of the Kew pattern anemometer.

Yield of
wheat.

In the Report of the Council for 1904-5 reference was made in a remarkable reversal of the divergence from average of the yield of wheat per acre for the Eastern Counties of England, with reference to the epoch 1895-6, which was noticed in connexion with a paper communicated to the Royal Statistical Society. It was suggested that the relation "appears to indicate that the fluctuations in the yield of wheat can be represented by the sum of a series of periodic fluctuations, and that the curves for a number of these component periodic fluctuations have a common nodal point in the interval 1895-6." This subject has been pursued further with very remarkable results. On taking the average of consecutive years the curve of variation of the wheat crop becomes very much simplified, and the simplified curve for the interval 1885-1904 can be represented with a remarkable degree of accuracy by the corresponding points on a curve formed by the combination of the following pure sine-curve variations:—

11 years period with an amplitude of + 2·8 (bushels per acre).

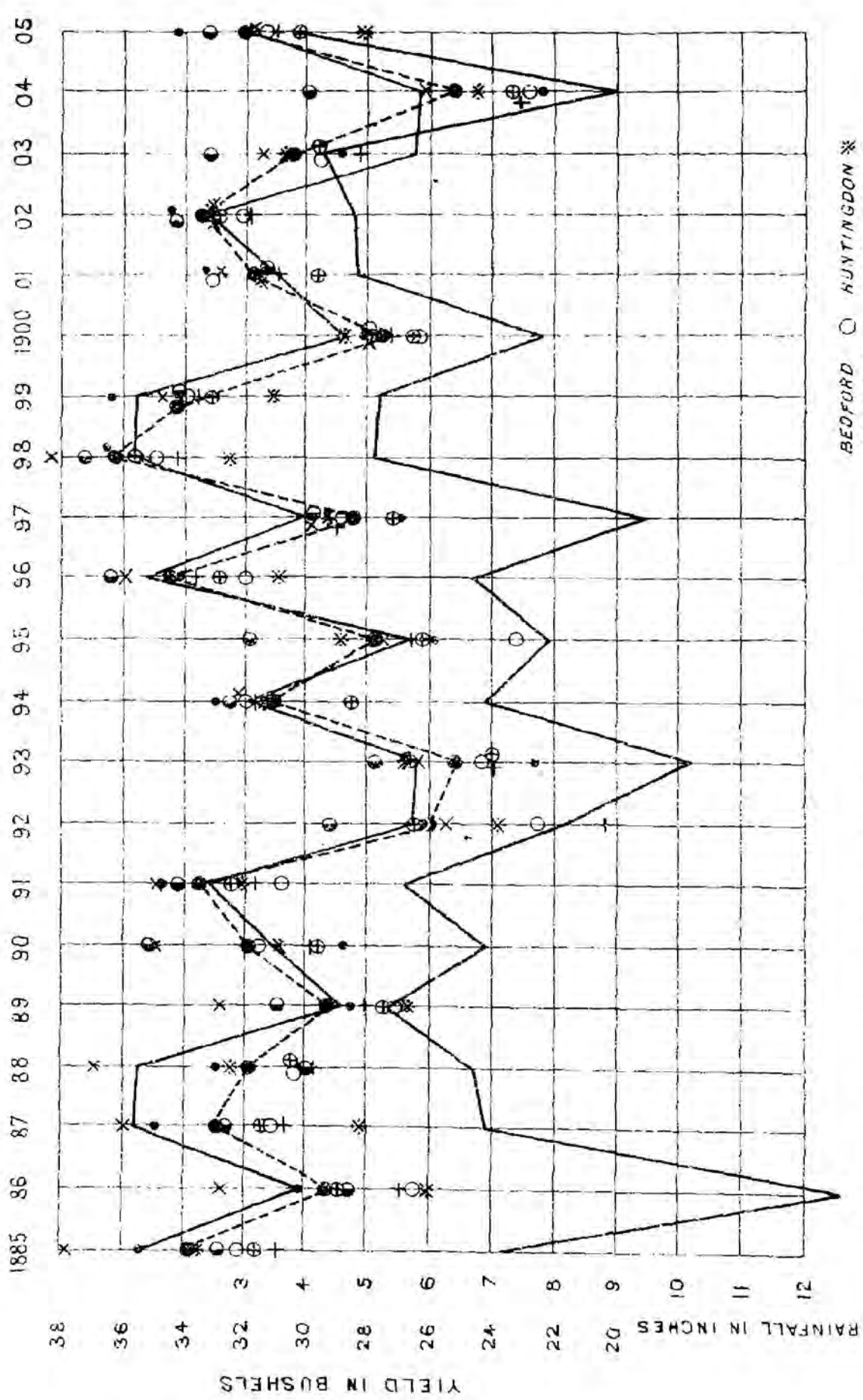
$\frac{11}{2}$	"	"	"	+ 0·4	"	"
$\frac{11}{3}$	"	"	"	— 1·2	"	"
$\frac{11}{4}$	"	"	"	+ 1·2	"	"

All these components concur in a node in 1895-6. The node is an ascending node for all but the third.

When the examination of the curve was begun it was supposed that the periodicity indicated by the reversal with regard to 1895-6 was made up of components without any harmonic relation to one another, and there was then no idea of a variation of 11 years period as a fundamental one. The numerical manipulation of the values showed however that there was a variation with an 11 years period, and when that was taken out it was found impossible to discriminate between the residual variation and the combination of two variations forming the third and fourth harmonic components of an 11 years period. The representation by an 11 years curve with its harmonic components was therefore accepted, and a paper pointing out this representation of the curve for wheat yield and its relation to the figures for the previous autumn rainfall was contributed to a volume in course of preparation by the Meteorological Societies of Austria and Germany as a memorial of Professor Hann's long connexion as Editor with the "*Meteorologische Zeitschrift*." There remained the fluctuation which had been smoothed out by taking the averages of consecutive years. It seemed probable that this fluctuation, which may be called in a somewhat vague sense a fluctuation with a two-year period, was really a combination of the fifth and sixth components of the fundamental 11-year period. These two components would have periods of eleven-fifths of a year and eleven-sixths of a year respectively, of which one is a little more than two years and the other a little less. In order to bring these into

YIELD OF WHEAT FOR EASTERN ENGLAND.

THE DOTTED LINE SHOWS THE ACTUAL AVERAGE YIELD FOR THE SEVEN COUNTIES NAMED BELOW
THE UPPER FULL LINE SHOWS YIELDS COMPUTED FROM THE HARMONIC COMPONENTS { PERIOD 11 1/2 3 1/4 1/5 1/6
THE LOWER FULL LINE SHOWS THE RAINFALL (INVERTED SCALE) FOR THE PREVIOUS AUTUMN OF EACH YEAR AMPLITUDE 2.9 0.5 1.8 2.8 1.0 1.0



THE YIELDS OF WHEAT FOR DIFFERENT COUNTIES ARE REPRESENTED AS FOLLOWS:-

To face p. 21.

account it was necessary to compute the magnitudes of the first four components in the original curve from those obtained for the smoothed curve. This was done, and when these components were removed from the original curves the residuals were examined for the magnitudes of the fifth and sixth components. Minute accuracy is out of the question, but two components with an amplitude of one bushel per acre each were selected, again with a node at 1895-6, and the six components were compiled. The result represents the fluctuations of the yield of wheat for the 21 years 1885-1905 in a very remarkable way, as will be understood from the diagram, plate II., in which the full line represents the actual yield and the dotted line the computed yield. The direction of change from year to year is represented in every case, and only in 1887, 1888, and 1903 are the residual differences between the actual yield and the computed yield really considerable. When these curves were constructed the yield for 1905 was unknown. The computed value, equal to that for 1894, was 31.9 bushels per acre; the actual yield as determined from the returns of the Board of Agriculture which have been issued since that time, is 32.0, so that the agreement is remarkably close. The component curves from which the computed yield is compiled have the following amplitudes :—

$$\begin{array}{l} \text{Period} \quad \dots \quad 11 \quad \frac{11}{2} \quad \frac{11}{3} \quad \frac{11}{4} \quad \frac{11}{5} \quad \frac{11}{6} \text{ years.} \\ \text{Amplitude} \quad + 2.9 \quad + 0.5 \quad - 1.8 \quad + 2.8 \quad + 1.0 \quad + 1.0 \end{array}$$

Each component curve starts from a node at 1895-6.

The determination of the amplitudes of the components which proceeded partly from the numerical manipulation of the values, and partly from the inspection of the original and residual curves, is an unconventional process, but it has some advantages over the method of dealing with the values by numerical process alone. For the latter method it is necessary to assume a knowledge of the fundamental period, which in this case might be taken as 11 years. The calculation of the components then proceeds by the arithmetical manipulation of the 12 values; the calculation of the components of smaller periods depends upon very few numbers and the result is liable to serious disturbance by incidental errors from which the original numbers cannot be supposed to be entirely free. In order to deal with the figures in accordance with more conventional methods, Mr. H. E. Wood analysed the curve harmonically, using the period 1891-1902 as the fundamental one. His values for the amplitudes are + 2.74, + 0.76, - 2.68, + 2.54 + 2.04, + 2.04. The nodes of all the components are not quite coincident. There are clearly some differences between these figures and those given above; his resultant curve is not so closely in agreement with the actual values as that obtained by the less regular method. His computed value for 1905 is 32.8 bushels per acre.

It is scarcely possible that the agreement between the calculated and the actual figures is fortuitous. It is true that any combination of 12 consecutive yearly values can be analysed into an 11-years periodic term with harmonic components, but that

the resultant curve so computed should be in reasonable agreement with the actual values for another 9 years some on either side of the original 12 selected, is beyond the probability of accident.

Mr. Wood also calculated the periodogram, according to Professor Schuster's method, for the 20 years, which gives indications, though not very prominent ones, of the existence of periodicities of 11 years and its sub-periods. A curious point in the periodogram is that a periodic variation of two years period is conspicuously absent. Its amplitude is shown as zero. In other words on the average of the 20 years the odd years and the even years are equally favourable. The original curve shows such marked fluctuations from one year to another that this result was at first surprising, but on further examination it is clear that it is precisely what is to be expected if the apparent two-year fluctuation is really the result of a combination of two equal periodic variations of $\frac{11}{5}$ years and $\frac{11}{6}$ years period respectively.

The two-year oscillation changes its phase in the course of the 20 years in such a way that the large oscillations in one part are the exact opposite of the similarly large oscillations of another part, and the net result for the whole interval is zero. Thus the disappearance of the two-year oscillation from the periodogram is a striking confirmation of the view that it results from the combination of two components of the fundamental 11-year period, each with a period of nearly two years.

Forecast
district
inquiry.

The inquiry into the weather characteristics experienced at individual stations with different types of pressure distribution, to which reference was made in the last annual report, has been continued upon broader lines. The daily observations made at the 27 Telegraphic Reporting Stations, and at the Second Order Stations (31 in number) furnishing reports for use in connexion with the Weekly Weather Report have been extracted and classified in accordance with the various types, and have also been arranged in periods. The types selected have been similar to those employed in the earlier inquiry. The periods of time, each of 6 or 7 weeks in duration, have been grouped round the solstices or equinoxes, or round the intermediate divisions of time. The systematic classification of weather changes has long been desired, and the inquiry now in progress is likely to yield results of considerable value.

St. Helena
wind records

The recording part of the anemometer at St. Helena which was out of order has been repaired and re-erected. The traces now being received are more satisfactory than any that have previously come from the island. Not much progress has been made with the preparation of the report on the meteorology of the Colony, but in the course of the year a comparison of the yearly wind velocities seemed to suggest that exceptional strength in the South-East trade wind at St. Helena was in some way associated with exceptional rainfall in England. The conclusion is not an unreasonable one, although the two countries are very remote and the Equator with its belt of calms is between them, so that the direct transference of air between the two is unlikely. An

increase in the strength of the trade wind may, however, be regarded as an increase in the activity of the general atmospheric circulation and is therefore quite likely to indicate a general increase in the intensity of meteorological phenomena in the various parts of the general circulation. It cannot be regarded as a merely local phenomenon without incidental consequences in other parts of the world, although the consequences are not yet known. Further inquiry disclosed other illustrations of a possible relationship between the St. Helena wind strength and rainfall in England, in particular a close parallelism between the average seasonal march of the velocity of the trade wind and the average rainfall in England south.

A short paper on the subject pointing out these curious correspondences was communicated to "Nature," and has attracted a good deal of attention. The subject was dealt with by Professor J. Hann, of Vienna, in the "Meteorologische Zeitschrift" for February of this year. While no final conclusions can be drawn from the correspondences cited, they are of sufficient interest and importance to indicate the advantage, and even the necessity, of taking up the discussion of meteorological subjects from the wider point of view of the general atmospheric circulation and the desirability of promoting the organisation of regular meteorological observations at points in the Northern Hemisphere and elsewhere, which, like St. Helena in the Southern Hemisphere, are in specially favourable positions for the study of the fluctuations in the general circulation.

Mr. Lempfert has completed the text of a new and abbreviated edition of the instructions for the use of meteorological instruments which is urgently required. The illustrations have to be prepared, and the work may then be sent to the press.

Instructions
for observers.

An International Conference of Directors of Meteorological Institutes and Observatories was held at Innsbruck in September, 1905. It was attended by representatives of meteorological establishments from nearly every part of the world. The Director attended as the representative of the Committee. About 40 questions concerning the organisation of international co-operation for official work and for research were discussed. A report of the proceedings will be published in due course. The most important topics so far as this country is concerned were those of wireless telegraphic reports for daily weather work, the investigation of line squalls, the reduction of barometric readings to sea-level, and the comparison of the standard barometers of the meteorological institutes of the various countries. The Director undertook to report upon the facilities afforded by the installation of wireless telegraphic apparatus upon ocean liners for extending the area of observation for the daily maps issued in North-West Europe, and the necessary cost of the messages. He also arranged to take part, with Professor Hildebrandsson and M. Durand Gréville, in the investigation of the special phenomena of line squalls, on the initiative of the last-named gentleman. The work is very closely associated with that upon the "Life History of Surface Air-Currents" already mentioned, and, in fact, the eighth selected

International
Conference.

example in the published work affords a very fine example of the sudden changes in the meteorological conditions which in one form or another are characteristic of the passage of line squalls over a district. M. Durand Gréville has given reasons for hoping that the investigation of these phenomena will lead to much greater precision in forecasting the incidence of thunder showers and similar phenomena. He has already achieved considerable success in that direction.

Educational.

A series of ten open meetings for the discussion of important contributions to meteorological literature, chiefly papers which have appeared in foreign periodical publications, was held at the Office in the course of the winter months. The meetings were well attended. Among those who took part in the discussions, in addition to members of the office staff, were Mr. W. W. Bryant of the Royal Observatory; Dr. Chree, of Kew Observatory; Captain E. W. Creak, C.B., F.R.S.; Mr. W. Ellis, F.R.S.; Dr. W. J. S. Lockyer of the Solar Physics Observatory; Mr. E. W. Maunder of the Royal Observatory; Mr. Marriott of the Royal Meteorological Society; Dr. H. R. Mill, Director of the British Rainfall Organisation; Mr. S. Skinner of the South-Western Polytechnic; Captain A. Thompson, C.B., of the Trinity House; Professor D'Arcy Thompson, C.B., North Sea Fishery Investigation; and Mr. H. E. Wood of Manchester University.

The Director, in accordance with an arrangement of long standing, gave a course of three lectures at the Cavendish Laboratory in the University of Cambridge in February. The subject of the lectures for the year was the "Life History of Surface Air-Currents." He has also undertaken to give a course of four lectures in the University of London, in the Month of May, on the "Atmospheric Circulation and its Relation to Weather."

The Committee have not seen their way to continue the offer of prizes for competition among the cadets of H.M.S. "Conway" and H.M.S. "Worcester," as a charge upon the funds of the Office. It is understood that the Director will himself take steps for the encouragement of the study of meteorology in those important institutions for the training of officers for the mercantile marine.

A number of applications have been received from time to time for charts for class use.

At the request of the Secretary of State for the Colonies the Director undertook the selection of a suitable candidate for appointment as Chief Assistant in the Meteorological Department of the Transvaal, and recommended Mr. H. E. Wood, M.Sc., Demonstrator and Lecturer in the Physical Laboratory of the University of Manchester, for the post. Mr. Wood subsequently attended at the Office for three months training before proceeding to take up his duties in South Africa.

By arrangement with the Colonial Office also, Mr. E. W. Davy undertook a short course of training as meteorological observer before taking up his appointment as Forester in the British Central African Service.

With the sanction of the India Office permission has been given for Mr. P. H. Dutt, of the Indian Educational Service and of Christ's College, Cambridge, to work in the Office for three months as a volunteer assistant.

Magnetic observations at Valencia have been continued in co-operation with the magnetic work of the National Physical Laboratory, at the request of a Committee of the Royal Dublin Society, consisting of Lord Rosse and Professor J. Joly.

Magnetic observations at Valencia.

The Committee desire to acknowledge the co-operation with the Office of a large number of public departments, local authorities, and private observers.

Acknowledgments.

They desire to refer specially to the valuable daily reports received from the Azores through the courtesy of Major Chaves, the Portuguese Government, and the Commercial Cable Company.

To the Eastern Telegraph Company also special acknowledgment is due for the transmission of reports from the Azores and the Spanish Peninsula, and to the Great Northern Telegraph Company for the free transmission of all cable messages between this country and the Scandinavian kingdoms.

The names of local authorities and private observers on sea and land who contribute observations are printed in the Appendices.

No change took place in the Office staff in the course of the year except that Mr. Lempfert, who has been employed for some years as private Assistant to the Secretary of the Council, took up temporarily the duties of Superintendent of Instruments. At the close of the year, however, various changes have been arranged.

Office Staff.

Mr. J. S. Harding, who has been connected with the Office since its commencement under Admiral FitzRoy in 1854, who was Private Secretary to Admiral FitzRoy, and for the past 32 years Chief Clerk and Cashier, retires on pension in accordance with the arrangements made by the Council. The Committee feel entitled to record not only their own appreciation but that of the Council for the services rendered by Mr. Harding during a full half-century. His retirement and the changes in the constitution of the governing body, furnish an occasion for various changes in the arrangement of the Office staff, which are indicated on pp. 7, 55.

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

I. THE MARINE BRANCH, which deals with ocean meteorology—the collection, tabulation and discussion of meteorological data for all parts of the ocean traversed by British ships: the preparation and issue of charts or other publications exhibiting the results obtained from the discussion of the observations.

II. THE TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH, which takes charge of the collection of daily telegraphic reports from stations in the United Kingdom, the Azores, and the Continent of Europe, and the preparation of reports, charts, forecasts, and storm warnings based upon them.

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

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

V. THE INSTRUMENTS BRANCH, which deals with questions arising out of the supply of meteorological instruments for the Navy, observers on ships of mercantile marine, Colonial Governments, and the stations of various kinds in connexion with the Office.

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

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

I.—MARINE BRANCH.

Collection of Information.

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

Information received.

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

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

The meteorological registers of all kinds, other than those from lighthouses, received by the Office during the year from Officers of the Navy or from the Mercantile Marine numbered 2,221. A list is given in Appendix IV.

Of the meteorological logs, 159 have been classed as "excellent" or "very good," as compared with 160 of the previous year.

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

North Atlantic	95	Eastern, viâ Suez Canal...	43
Baltic	3	Far Eastern, viâ Cape of	
Mediterranean	34	Good Hope	39
South America (East Coast)	22	Far Eastern, viâ Suez	
" " (West ")	6	Canal	27
South Africa	18	Pacific	40
Eastern, viâ Cape of Good		North Polar	4
Hope	16		

Appendix III. (p. 103) contains a list of the observers who, during the past year, have contributed logs classed as "excellent." Several of these observers have co-operated with the Office for many years. The names which appear in the list for the first time are as follows :—

Observer's Name.	Ship.
Castle, E. W.	S.S. "Miami."
Ellis, A. E.	S.S. "Alabama."
Falla, J. F.	S.S. "Gladiator."
Heron, A.	S.S. "Alva."
MacIntosh, C. F.	S.S. "Clan Ranald."
Mayoss, F., Lieut., R.N.R. ...	S.S. "Ruapehu."
McKellar, A. W., Lieut., R.N.R.	S.S. "Tongariro."
Monro, Comdr. C. E., R.N. ...	H.M.S. "Rambler."
Neale, H. H.	S.S. "Manistee."
Reside, D.	S.S. "Miami."
Robertson, J., Sub-Lieut., R.N.R.	S.S. "Goorkha."
Scudamore, J. H. H., Sub-Lieut., R.N.R.	S.S. "Manistee."
Sumner, H. N.	S.S. "Clan Colquhoun."
Tait, T. A.	S.S. "Wellington."
Weston T. S.	S.S. "Papanui."
White-Parsons, V.	S.S. "Wakanui."

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

Recognition
of "excellent"
observers.

The Committee note with regret the death of eight marine observers for the Office :—Captain H. Sibery, of S.S. "Clan Cameron," in July, 1905; Captain J. Wiggins, F.R.G.S., of S.S. "Diana," in September, 1905; Captain R. C. Keys, of S.S. "Sicily," in September, 1905; Captain W. R. Cato, Hon. Lieut. R.N.R., of S.S. "Scotia," in November, 1905; Captain H. Scougall, of barque "Closeburn," in December, 1905; Captain Sir Digby Murray, Professional Member of the Board of Trade, Conservator of the Thames, of S.S. "Baltic," in January, 1906; Captain Wm. Greenwood, F.R.A.S., of ship "Gareloch," in February, 1906; and Captain R. W. Trenaman, of S.S. "Romney," in February, 1906.

Obituary.

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

Supple-
mentary
Information.

information has thereby been collected, which is immediately utilised in the Monthly Pilot Charts of the North Atlantic and Mediterranean. The arrangements are indicated in Appendix IV., pp. 117-123.

Use of
Information
received.

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

Daily Charts of pressure over the North Atlantic showing the distribution of isobars were also prepared in the department until the end of May, 1905, in order to obtain the mean pressure values for the month. The monthly results for pressure are shown on the sea temperature charts, and the daily charts are occasionally reproduced to illustrate any prominent meteorological occurrence which has been noted.

For the discussion of the weather over the ocean south of 30° S. Lat., in connexion with recent Antarctic exploration, there were tabulated about 6,000 sets of observations, making in all 25,000, from ships taken at Greenwich Mean Noon, and about 6,700, making in all 13,700, from shore stations. Of these, about 6,500 and 3,400 sets respectively, have been plotted in geographical position on the working charts, making in all a total of 18,500 ships observations and 9,400 shore observations.

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

Information
supplied
for the
Admiralty.

Climatological tables have been compiled for various places in the Gulf of St. Lawrence, British Columbia, West Africa, and South Australia at the request of the Admiralty.

Hydrographic notices have been extracted from the meteorological logs and forwarded to the Admiralty. Among those sent during the year were soundings by Captain F. J. Bayldon, Sub-Lieut. R.N.R., S.S. "Induna," in the South Pacific Ocean.

II.—FORECAST AND STORM WARNING BRANCH.

Daily
Weather
Reports.

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 the same as in previous years.

Telegraphic
reporting
stations.

The stations from which telegraphic reports are received are shown in the lists given on pp. 72-92, and on the Map (Plate V.).

During the year several changes have taken place in the corps of observers at telegraphic reporting stations. At Donaghadee Mr. R. Damerell has succeeded Mr. J. Mahoney; at Dungeness Mr. W. Pender has been relieved by Mr. W. C. Lewis; at Portland Bill Mr. W. J. Batton retired and was succeeded by Mr. W. H. Taylor, and at Spurn Head Mr. A. S. Badcock succeeded Mr. W. Y. Counter on June 26th, 1905.

The stations indicated in the list in Appendix II., pp. 72-91 have been inspected during the year. The Reports of the Inspectors show that efficiency has been maintained. Inspection of the Stations

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. The Supplementary Chart IV., on page 2 of the Report, is still employed daily in illustration of the district values published in the Weekly Weather Report of the preceding week. Discussion of Information.

The information as to the weather in the British Islands has been supplemented by postal and telegraphic reports sent daily by volunteer observers. These details have proved a useful addition to the telegraphic reports of the first page.

The substance of the morning and afternoon reports received by telegraph as to the state of the weather at certain stations on the English and Welsh coasts, has been displayed on the balcony of the Office at 63, Victoria Street, S.W. Charts have been suspended in the portico of the street door exhibiting the latest information received from various portions of Western Europe, and the latest forecasts and storm warnings that have been issued. Similar information has also been posted up on a notice board close to the meteorological station in St. James's Park. Display of Weather Information.

The means adopted for the distribution of the forecasts drawn up in the Office have been continued during the past year. They are detailed in Appendix II., pp. 56-59. Weather Forecasts.

Copies of the 11 a.m. forecasts, based on the 8 a.m. observations, have been regularly called for by messengers from newspapers or news agencies, and printed or typed copies have been delivered, either by hand or through the post, to subscribers, and distributed for exhibition as follows: in the City, at the Mansion House, Lloyd's Rooms, Messrs. R. & J. Beck's, Cornhill, Messrs. Hawes, 79, Leadenhall Street, and Messrs. Watson, 313, High Holborn; in the West End, in the Libraries of the House of Lords and the House of Commons; at Messrs. Elliott's, Leicester Square; Messrs. Stanford's, Charing Cross; Messrs. Negretti & Zambra's, Regent Street; Messrs. Hawes, 49, New Cavendish Street; Messrs. Webster Bros., 4, Porchester Road, W.; and at various Clubs.

Forecasts have been supplied occasionally to His Majesty's Yacht as requested by the Commadore. At the request of the Admiralty, forecasts for the S.W. of England and the Bay of Biscay have Forecasts for H.M. Ships.

been regularly supplied to the Commander-in-Chief, Devonport. Arrangement has also been made with the Admiralty for the supply of forecasts to a number of H.M. ships as occasion requires.

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 2 p.m. were obtained for this purpose. These forecasts are sent by telegraph at 3.30 p.m. to those who express a wish to receive them regularly, and who defray the cost of the telegrams.

In the course of the four months, June to September, the forecasts were sent, for varying periods of time, to 43 individuals, as compared with 39 in the preceding year.

Of these 43 recipients :—

5 received forecasts for District 3 (England, E.), 8 for District 4 (Midland Counties), 16 for District 5 (England, S.), 5 for District 6 (Scotland, W.), 4 for District 7 (England, N.W.), 3 for District 8 (England, S.W.), 1 for District 9 (Ireland, N.), and 1 for District 10 (Ireland, S.).

No applications were received from District 0 (Scotland, N.), District 1 (Scotland, E.), or District 2 (England, N.E.). As regards District 6 (Scotland, W.), a portion of the country recently unrepresented in this service, an application was received last year from the Earl of Galloway for the dispatch of the forecasts to five different centres.

In 19 places out of the total of 43 to which the forecasts were sent the telegrams were required only for a limited time, *i.e.* during the progress of the hay or corn harvest. In 17 cases they were received during the entire period covered by both, while in 7 cases they were required for the whole four months.

The special Saturday evening forecasts, giving a general idea of the weather anticipated during the whole of the two succeeding days, were in increased demand; 17 of the 43 recipients applied for these special forecasts *in lieu* of the ordinary Saturday afternoon forecasts, while 12 applied for the special forecasts to be sent *in addition* to the ordinary ones. In response to an application from Captain Hobart, of Shipley Place, Horsham, special 48 hour forecasts for agricultural purposes were also sent each morning to that locality for a period of four weeks, commencing with June 19.

Returns, giving a daily record of the weather actually experienced during the time the forecasts were sent were received from 20 persons, representing five districts of the eight included in the year's service. The results of a comparison made in the Office between the forecasts issued and the subsequent weather, as entered on these returns, shows that for the country generally 51 per cent. of the forecasts were completely successful, and 38 per cent. partially so, giving a total of 89 per cent. of forecasts which may be regarded as sufficiently correct to have been of practical value to the agriculturist. 10 per cent. were, upon the other hand, classed as partial failures, and 1 per cent. as complete

failures. Owing, in all probability, to the absence of any settled type of weather in the latter half of the summer, the result is scarcely so favourable as in 1904, when the combined percentage of complete and partial successes was as high as 92. As compared with the previous year the percentage of complete successes showed a decline from 58 to 51, but the percentage of partial successes increased from 34 to 38. The general result of the year's service compared favourably with that for 1903, and was in almost complete agreement with that for 1902.

Of the five districts from which returns were received the best result was attained in England, E., where 55 per cent. of the forecasts were completely successful, and 36 per cent. partially so. Next to England, E. the highest proportion of success was reached in England, S., where 50 per cent. of the forecasts were completely successful, and 40 per cent. partially so. At the one station in Ireland, S., to which the forecasts were sent, and from which returns were received, only 39 per cent. were completely successful, but 50 per cent. were partially so.

Testimony as to the practical value of the forecasts was borne by Mr. T. G. Binney, of Tolleshunt D'Arcy (England, E.), who wrote: "The forecasts have saved me leaving stacks open several times"; and by Mr. Jesse Norris, of Staplehurst (England, S.), who wrote: "I thank you for the correctness of the telegram weather forecasts. I have found them most useful in my farm work. Many times there has been all the appearance of a wet day, and the telegram said fine, and it turned out to be so."

The number of inquiries for forecasts by telegraph was 184.

Telegraphic inquiries for forecasts.

Special charts, transcripts of observations, or summaries, have been supplied to various newspapers, as in previous years.

Transcripts of observations.

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.

Results of Forecasts.

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 1905 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 1905.

(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 ...	51	65	58	34	30	32	14	4	9	1	1	1	90
February ...	51	63	57	31	32	32	17	4	10	1	1	1	89
March ...	33	66	50	45	28	36	20	5	13	2	1	1	86
April ...	41	63	52	33	29	31	21	6	14	5	2	3	83
May ...	55	61	58	33	34	34	10	5	7	2	0	1	92
June ...	63	63	63	28	30	29	8	6	7	1	1	1	92
July ...	56	54	55	31	34	33	11	10	10	2	2	2	88
August ...	44	63	54	35	29	32	19	6	12	2	2	2	86
September ...	36	66	51	42	29	36	20	4	12	2	1	1	87
October ...	50	68	59	32	26	29	15	6	11	3	0	1	88
November ...	37	62	50	38	32	35	21	5	13	4	1	2	85
December ...	43	67	55	38	26	32	16	5	11	3	2	2	87
The entire Year	47	63	55	35	30	33	16	6	11	2	1	2	88

(b.) Results for the various Districts.

Districts.	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.	
Scotland, N. ...	47	69	58	36	25	31	15	5	10	2	1	1	89
" E. ...	41	64	53	36	28	32	20	7	14	3	1	1	85
England, N.E. ...	52	65	59	36	29	33	11	5	8	1	1	0	92
" E. ...	51	65	59	38	29	33	10	5	7	1	1	1	92
Midland Counties.	45	61	53	31	34	33	22	4	13	2	1	1	86
England, S. ...	63	58	61	27	35	31	9	5	7	1	2	1	92
Scotland, W. ...	50	67	59	33	28	30	13	4	9	4	1	2	89
England, N.W. ...	42	60	51	38	32	35	18	6	12	2	2	2	86
" S.W. ...	45	57	51	37	35	36	16	6	11	2	2	2	87
Ireland, N. ...	43	68	56	34	25	29	18	6	12	5	1	3	85
" S. ...	36	63	50	36	29	32	23	6	15	5	2	3	82
Summary ...	47	63	55	35	30	33	16	6	11	2	1	2	88

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 1896–1905 the percentages of complete and partial successes of the Forecasts issued at 8.30 p.m. In the reports for previous years the annual period included was that for the 12 months ending with March. The results for 1905, given below, are for the calendar year. The sum of successes (complete and partial) in 1905 was as high as in 1904–05, and was considerably above the average for the whole 10 years.

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

Year.	Complete Success.	Partial Success.	Sum of Successes, Complete and Partial.
1896-97	54	27	81
1897-98	55	26	81
1898-99	55	28	83
1899-1900	55	27	82
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
Average	55.6	28.9	84.5

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. Storm Warnings

A list of the stations at which the signals are exhibited is given in Appendix II., pp. 59, 60. At the end of March, 1906, there were 240, of which 131 were in England and Wales, 70 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 under which they occurred.

COMPARISON between the WARNINGS and the subsequent WEATHER in each half of the Year 1905.

Coasts.	Total No. of Warnings.	Warnings justified by subsequent Gales. Force 8 and upwards.	Warnings justified by subsequent strong Winds. Forces 6 & 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two Stations before issue.	Warnings partially late. Force 9 reached at one Station before issue.	Warnings issued in consequence of telegraphic errors.	Storms for which no Warning was issued.
Scotland, N.E. ... {	20 25	11 12	7 12	1 —	— 1	1 —	—	Feb. 10-11. Oct. 13; 30-31; Nov. 10-11.
.. E. ... {	16 16	8 1	5 13	3 2	— —	— —	—	
.. N.W. ... {	27 24	11 10	11 10	3 3	— 1	2 —	—	
.. W. ... {	25 22	12 8	10 12	3 1	— —	— 1	—	
Ireland, S. ... {	25 28	17 20	7 6	1 2	— —	— —	—	
.. N. ... {	28 29	16 17	10 9	2 2	— —	— 1	—	Aug. 19-20.
Irish Sea ... {	24 26	17 16	5 7	1 2	1 —	— 1	—	April 5.
St. George's Channel ... {	23 25	12 12	8 10	3 3	— —	— —	—	Aug. 19-20.
Bristol Channel ... {	24 27	14 18	9 6	1 1	— —	— 2	—	
England, S.W. ... {	19 28	14 13	3 11	2 4	— —	— —	—	Oct. 30; Nov. 19.
.. S. ... {	18 25	12 14	2 8	4 3	— —	— —	—	Oct. 30.
.. S.E. ... {	18 22	8 9	7 10	3 3	— —	— —	—	
.. E. ... {	17 17	8 6	7 8	2 2	— —	— 1	—	Oct. 30-31.
.. N.E. ... {	17 17	12 4	4 10	— 3	— —	1 —	—	Jan. 30-31. Oct. 13.
Totals { Jan.-June	301	172	95	29	1	4	—	
.. { July-Dec.	331	160	132	31	2	6	—	
Percentages {	—	57.2	31.6	9.6	0.3	1.3	—	
.. {	—	48.3	39.9	9.4	0.6	1.8	—	
For the whole year { Totals...	632	332	227	60	3	10	—	
.. { Per-centages	—	52.5	35.9	9.5	0.5	1.6	—	

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 1905—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 1905 for which no WARNINGS were issued.

These were, as a rule, confined to limited portions of our coasts. They occurred on the following dates :—

- (1.) *January 30th. A Westerly Gale in England, North-East.*—Warnings were on this occasion issued to all our western and northern coasts. The gale extended along our north-east coasts further south than was anticipated.
- (2.) *February 10th–11th. A North-Westerly to Northerly Gale in Scotland, North-East.*—This gale was caused by a large depression which travelled south-eastwards across Scandinavia. The disturbance did not appear likely to affect any part of our own coasts.
- (3.) *April 5th. A North-Westerly to Northerly Gale in the Irish Sea.*—In this case, as in the former, a deep depression moved south-eastwards across Scandinavia. The gale which occurred in the Irish Sea, and blew, very sporadically, in some other districts, was due apparently to the movement of small secondary disturbances, not clearly shown on the weather maps for the day.
- (4.) *August 19th–20th. A Westerly Gale in Ireland, North and the Irish Sea.*—Caused by secondary disturbances which appeared in the rear of a depression moving north-eastwards along our extreme western and northern coasts. Strong breezes were forecasted, but it was not anticipated that the wind would blow with the force of a gale.
- (5.) *October 13th. A Northerly Gale in Scotland, North-East and England, North-East.*—Due to the appearance of a large depression over Scandinavia, and to a simultaneous increase of pressure in these Islands. At 6 p.m. on the 12th the conditions did not appear sufficiently threatening to justify the issue of warnings; next morning the slight gale which had then set in on our northern coasts was not expected to continue or extend.
- (6.) *October 30th–31st. An Easterly to South-Easterly Gale in Scotland, North-East, and a South-Westerly to Westerly Gale on several parts of our South and South-West Coasts.*—Caused by a depression which moved very slowly eastwards across the country. Warnings were issued on the morning or afternoon of the 28th, and were justified by a gale which commenced on the 28th or 29th, and which appeared to end on the morning of the 30th. The renewal of the gale on the night of the 30th was not anticipated.
- (7.) *November 10th–11th. A South-Easterly Gale in Scotland, North-East,* felt, quite sporadically, on many other parts of our coasts. Caused by a depression which spread

in from the Atlantic. The fall of the barometer on the evening of the 10th was not regarded as sufficiently serious to justify the issue of warnings.

- (8.) *November 19th. A Gale from East or North-East in the Bristol Channel.*—The English Channel was duly warned, but the gale extended slightly further north than was anticipated, and affected a portion of the Bristol Channel.

Comparison
of results for
1905 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 1896–1905 :—

Years.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1896 ...	467	67·7	23·8	91·5	5·6
1897 ...	596	60·1	31·7	91·8	4·5
1898 ...	581	59·8	27·5	87·3	8·2
1899 ...	504	59·3	31·9	91·2	4·8
1900 ...	512	66·2	25·8	92·0	6·3
1901 ...	498	62·3	26·1	88·4	7·4
1902 ...	535	55·5	32·0	87·5	9·0
1903 ...	757	62·6	27·3	89·9	7·3
1904 ...	539	59·4	30·4	89·8	6·7
1905 ...	632	52·5	35·9	88·4	9·5
1896–1905	562	60·5	29·2	89·8	6·9

Averages.

The corresponding figures for the average of three previous decades are as follows :—

Decade.	Total No. of Warnings issued.	Warnings justified by subsequent Gales.	Warnings justified by subsequent strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
		p.c.	p.c.	p.c.	p.c.
1875–84...	440	56·9	23·0	79·9	16·9
1885–94...	503	58·3	27·0	85·3	12·0
1895–1904	551	61·5	28·4	89·9	6·8

III.—STATISTICS AND LIBRARY BRANCH.

(a) CLIMATOLOGY OF THE BRITISH ISLES.

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. 72–93.

Clarendon type has been used for the names of stations which have been added to the list since the commencement of the year under review, and *italic* type for those which have been discontinued.

The stations from which returns have been received may be summarised as follows :—

Observatories * (first order stations)	...	...	...	6
Sunshine stations (including observatories)	...	...	...	118
Additional anemograph stations	...	...	...	14
" barograph stations	...	...	...	25
" thermograph stations	...	...	...	4
" autographic raingauge stations	...	...	...	10
Hydrograph station	...	...	...	1
Normal climatological stations (second order stations)	...	...	...	86
Auxiliary climatological stations (third order stations)	...	...	...	87
Telegraphic reporting stations (British)	...	...	...	27
Additional rainfall stations	...	...	...	86
Sea temperature stations	...	...	...	60

Daily reports are also received by telegraph from 31 foreign stations (*see* p. 92).

Definitions of the various designations used above are given on p. 69.

OBSERVATORIES; RECORDS OF AUTOGRAPHIC INSTRUMENTS, INCLUDING SUNSHINE RECORDERS.

These returns are dealt with in the Observatory branch, *see* p. 12. The returns have been utilised in the preparation of climatological reports and in answering inquiries.

CLIMATOLOGICAL STATIONS.—The climatological stations as well as most of the additional sunshine stations are maintained by private individuals or by public bodies or institutions, who provide their own instruments in all but a few exceptional cases. The arrangement with the Royal Meteorological Society and the Scottish Meteorological Society, under which, for a certain payment, the Societies forward to the Office returns already prepared for publication, as well as returns for incorporation in the Weekly Weather Report, has been continued. The returns received in form for publication are of two kinds: (1) daily observations at 9 a.m. and 9 p.m., of pressure, temperature, humidity, vapour pressure, amount of cloud, and wind direction and force, together with daily amounts of rainfall and extremes of temperature, entered on a form (A) adopted for international use by the Meteorological Congress which met in Rome in 1879; (2) monthly summaries of the above observations entered on a form (B), adopted by the same authority. The weekly forms give daily extremes of temperature, amounts of rainfall and, in

* In addition there are five observatories in connexion with the Office from which full records are not regularly received. They have been most courteously supplied when required for special investigations.

some cases, duration of bright sunshine. Under the arrangement, the Royal Meteorological Society has supplied returns from three stations on the form A, from 12 stations on the form B, and from ten stations on the weekly form. The Scottish Meteorological Society has supplied returns from three stations on the form A, from 15 stations on the form B, and from seven stations on the weekly form.

The geographical distribution of the climatological and additional rainfall stations and of the sunshine stations enumerated in the list on p. 72, is as follows :—

District.	Normal Climatological.	Auxiliary Climatological.	Additional Rainfall.	Sunshine.
Scotland, N.	6	1	3	5
" E.	9	0	0	5
England, N.E.	12	5	10	11
" E.	10	10	6	12
" Midlands	12	18	15	14
London County	2	1	1*	5
England, S.	5	21	15	21
Scotland, W.	7	1	1	3
England, N.W. and N. Wales ...	8	9	4	16
" S.W. and S. Wales ...	4	10	15	15
Ireland, N.	4	2	4	2
" S.	6	8	12	6
Channel Islands	1	1	0	3

Among the stations which have been discontinued in the course of, or at the end of the year, are Braemar, Wessington Court, and the London station at Brixton. In the Weekly Weather Report, Balmoral has been substituted for Braemar, and Dumfries has been included in district 6 in place of Aspatria, which is now included in district 7. At Fort William a climatological station has been started in connexion with the Scottish Meteorological Society since the discontinuance of the observatory there. Five other climatological stations have been added to the list in the course of the year.

Obituary.

The Committee note with regret the death of Mr. C. W. Curtis, J.P., who took observations of rainfall at Kearsney Abbey from 1892 to 1905.

Checking Returns.

The returns from the climatological stations are examined and filed in a convenient form for reference. When they are prepared for press they are carefully checked by comparison with the returns from neighbouring stations.

Telegraphic Reporting Stations.

TELEGRAPHIC REPORTING STATIONS.—The returns from these stations are dealt with in the first instance in the forecast and storm warning branch. The comparison of the telegraphic

* In addition there are six autographic rain gauges in the London County area.

messages with the MS. sheets sent in each month by the observers, and the computation of monthly means and of average values for the months has, as before, devolved on the Statistical Branch. The results have been used in the preparation of climatological returns.

SEA TEMPERATURE STATIONS.—The list has been extended by the addition of three stations. The returns are dealt with by the Marine Branch. Sea Temperature Stations.

ADDITIONAL RAINFALL STATIONS.—The returns from these stations are for the most part not published, except in such occasional publications as the Rainfall Tables of the British Isles. Copies of some of the returns have been supplied to Dr. H. R. Mill for the use of the British Rainfall Organisation. They are used in answering inquiries and in special investigations. Additional Rainfall Stations.

INSPECTION OF STATIONS.—In order to secure uniformity of method and to guard against instrumental errors, the stations in connexion with the Office are inspected from time to time. The stations in connexion with the Royal Meteorological Society are visited by an Inspector appointed by the Society. In accordance with the recommendation of the Treasury Committee (1877), a contribution towards the cost of this inspection is made by the Office. Inspections.

A list of the stations visited during the year 1905 is given in Appendix VI., p. 126.

PUBLICATIONS PREPARED.

WEEKLY WEATHER REPORT.—The returns received have been used for the preparation of the statistical tables of the Weekly Weather Report. At the commencement of January 1906 the following changes were introduced into the report. (1) Statistical tables giving cumulative values for the season have been included on the front page. (2) The grouping of the stations in the districts has been revised, and in some cases a subdivision of the districts has been indicated in order to facilitate the computation of values for the divisions adopted by the Board of Agriculture. (3) Observations of the temperature, humidity, and direction and force of the wind in the upper atmosphere, taken by means of kites, have been added. Weekly Weather Report.

The monthly and annual summaries and appendices of the report have been prepared as heretofore. The quinquennial appendix, giving for each district, average cumulative values of rainfall, accumulated temperature, and bright sunshine, to the end of each week in the year for the lustrum 1901–1905, and for the period 1881–1905 has been prepared.

At the close of the year the monthly summary contained full summaries in a form similar to the form B referred to above, for 55 stations, and abridged summaries for 102 stations.

METEOROLOGICAL OBSERVATIONS AT STATIONS OF THE SECOND ORDER.—The twenty-sixth volume of this publication Second Order Stations.

containing the observations for the year 1901, was prepared and carried through the press. It gives detailed daily observations in the international form A referred to above, for 21 stations, and monthly summaries in the form B for these stations and for 54 additional ones.

QUARTERLY RETURNS FOR THE REGISTRARS GENERAL.—Weekly summaries for 17 stations, and monthly and quarterly summaries for 58 stations have been prepared for the reports of the Registrar General of Births, Deaths, and Marriages for England and Wales and for Ireland.

(b.) CLIMATOLOGY. FOREIGN AND COLONIAL STATIONS.

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. 94.

Of these stations, one, St. Helena, has an anemograph in addition to the usual climatological instruments. Six are in Cyprus and have been in operation since 1881. Eight are in the West Indies, of which 6 are in the Bahamas. Five of the Bahamas returns are lighthouse registers. Nine stations are in West Africa, 12 in Central Africa, and one in British East Africa. Six are on the Mediterranean Coast. Two are in Central or South America, two in the Falkland Islands, one (Mauritius) in the Indian Ocean, and one in the Pacific. The observations from the six stations in Cyprus are prepared in the Office for publication in the Cyprus Blue Book.

(c.) ISSUE OF PUBLICATIONS.

Issue of
Publications.

Applications from the Hydrographical Bureau, Darmstadt; Transvaal Meteorological Department, Johannesburg; Aerodynamical Institute, Koutchino; Royal Prussian Aeronautical Observatory, Lindenberg; Messina Observatory; Wetterbureau, Berlin; Observatoire de l'Ébre, Tortosa; and Public Free Libraries at Fulham and Stamford, for free copies of one or more of the current publications of the Office, have been granted.

The following publications have been issued:—i. The Daily Weather Report (*see* p. 56); ii. The Weekly Weather Report (*see* pp. 39, 61), with monthly, quarterly, and annual supplements; iii. Monthly Pilot Chart of the Atlantic and Mediterranean; iv. Hourly Readings at four observatories, 1902, 1903; v. "Charts showing the Surface Temperature over the Atlantic, Indian and Pacific Oceans" (2nd edition); vi. "Barometer Manual for the use of Seamen" (5th edition); vii. The relation between Pressure, Temperature and Air circulation over the South Atlantic Ocean.

A complete list of the publications which have been issued by the Office is given in Appendix II., p. 97, and in Appendix XI., p. 184, of the Report of 1903-04, is given a list of important contributions to meteorology, which have not been issued as separate publications, but have been included in various Reports issued by the Office since 1866.

(d.) INQUIRIES.

The inquiries dealt with in the Statistics and Library Branch Inquiries. during the year were 759 in number, of which 160 were by letter and the rest personal inquiries. The whole number may be classified as follows :—Inquiries for scientific and industrial purposes, 293 ; for evidence in legal proceedings, 99 ; for forecasts of weather, 77 ; from newspaper correspondents for special weather information, 206 ; miscellaneous, 84.

Among the special inquiries dealt with during the year the following may be mentioned :—

- (1.) From Dr. von Rijckevorsel, for daily barometer readings at stations south of latitude 20° S.

(e.) LIBRARY.

The main part of the Library consists of weather maps and Library. other publications of the Weather Offices of different countries, and meteorological reports and publications received from all quarters of the globe. Most of these are presented or obtained by way of exchange, but a few standard works and serial publications are purchased. The Library consists at present of about 19,000 volumes and pamphlets ; of which about 600 were received during the past year.

In Appendix VII., p. 129, will be found (1) a list of persons and institutions from whom publications containing meteorological data have been received during the last three 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 M. G. Eiffel's Discussion of Observations at Beaulieu, Sèvres and Vacquey ; the Results of the Voyage of the S.S. "Belgica," in connexion with the Belgian Antarctic Expedition ; Meteorological Observations during the Norwegian North Polar Expedition in 1893-96, by H. Mohn ; Part 3 of the Meteorology of the Ben Nevis Observatories, by A. Buchan and R. T. Omond ; and a new edition of Börnstein's "Leitfaden der Wetterkunde." Among those acquired by purchase have been "Two years in the Antarctic," by A. B. Armitage ; "The Siege of the South Pole," by H. R. Mill ; "Cloud Studies," by A. W. Clayden ; "Lehrbuch der Meteorologie" (2nd edition), by J. Hann ; "Modern Lightning Conductors," by Killingworth Hedges ; "Meteorologie und Klimatologie," by W. Trabert ; 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.—OBSERVATORY BRANCH.

Observa-
tories.

STATIONS OF THE FIRST ORDER: OBSERVATORIES.—The Committee have continued to maintain the Observatory at Valencia (Cahirciveen), and have also continued their contributions to the maintenance of the meteorological observatories at Kew, Falmouth and Aberdeen, at which the self-recording instruments belonging to the Committee are under the management of the National Physical Laboratory, the Royal Cornwall Polytechnic Society and the University of Aberdeen, respectively. The arrangement with the observatories at Glasgow and Stonyhurst, under which copies of the records of the self-recording instruments are supplied to the Office, have been likewise continued.

The curves received from the observatories and the tabulations of readings at each hour made by the observers up to the close of the year, have been carefully examined.

The form now adopted for the publication of these observations was first used for the data for the year 1900.

Three volumes of the new series giving hourly readings have been published, and the volume for 1903 was almost ready for issue at the close of the year. They contain readings for each hour of barometric pressure, temperature of the dry and wet bulbs, wind direction and velocity, rainfall and sunshine, with the hourly means for the month and for a long series of years.

Anemograph
Stations.

ANEMOGRAPH STATIONS.—By the courtesy of the Cork Harbour Commissioners, Roche's Point has been added to the list of anemograph stations in connexion with the Office.

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

Sunshine
stations.

SUNSHINE STATIONS.—These are now all provided with instruments of the Campbell-Stokes design. At the close of the year original cards were being received from 100 stations, 98 of which are in the British Isles, one at the Falkland Isles, and one in China. The cards, after examination, are stored in the Office for reference.

In addition to the cards, tabulations of the daily amount of sunshine have been received from 16 other stations for insertion in the Weekly Weather Report, &c. The geographical distribution of all the British stations sending in sunshine returns is shown in the small table in Section III., p. 38.

Additional
stations
desired.

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

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

The supervision of the anemometric experiments at Holyhead and the discussion of the records of the St. Helena anemometer, also devolve upon the Observatory Branch.

The reduction and tabulation of the land observations of the National Antarctic expedition is being carried out by this Branch. At the close of the year the preparation for the press of the Journal of Observations at the winter quarters and on the sledge journeys was completed.

V.—INSTRUMENTS BRANCH.

During the year 1,018 instruments of various kinds have been supplied for the use of H.M. ships as compared with 1,733 in the previous year.

The total number of instruments issued to the mercantile marine in the past year was 747, as compared with 1,058 in the previous year. Details are given in Appendix V. The approximate number of ships employing instruments belonging to the Office for observations during the year was 210, as compared with 193. Mercantile Marine.

The instruments at the telegraphic reporting stations have been maintained in proper order and replaced when necessary. Stations.

During the year arrangements have been made with the Fisheries Board for Scotland, the Department of Agriculture in Ireland, and the Board of Agriculture and Fisheries in England and Wales, whereby the Inspectors of these departments examine and report upon the Fishery Barometers belonging to this Office, situated in their respective districts. Fishery Barometers, Inspections.

During the year a mercurial barometer has been supplied to Pwllheli, N. Wales, and a barograph to Rosbeg, Co. Donegal; the instruments at West Mersea and Exmouth have been renewed; whilst those at Felixstowe, Boscastle, and Nevin, have been returned and the stations discontinued.

There are now 232 stations on the coast of the British Isles supplied by the Committee with barometers for the benefit of sailors and fishermen. Of these, 65 stations are in England, 7 in Wales, 66 in Ireland, 89 in Scotland, 4 in the Isle of Man, and 1 in Jersey. A list of the stations is given in Appendix II.

With the assistance of the above-mentioned departments the list of fishery barometer stations is in course of revision.

Instruments have again been lent for a winter station at Southampton Island (Hudson's Bay).

A considerable number of instruments have been supplied upon repayment to Colonial Governments and local authorities or to observers, including the following :— Observers.

Agent-General, New South Wales.
Leeds University.

Borough of Folkestone.
 House of Commons Ventilation Committee.
 Captain Tamplin, Chin-Kiang.
 Borough of East Ham.
 Batavia Observatory.
 C. F. Mott, Esq., Giggleswick.
 J. Smith, Esq., Crathes.
 Whitworth Park Observatory, Manchester.
 Towyn Urban District Council.
 Meteor. Centralstadt, Helsingfors.
 R. A. Easton, Esq., Winslow.
 A. Henderson Bishop, Esq., Lanarkshire.
 J. Firth, Esq., Huddersfield.
 T. L. Hutchins, Esq., M.A., Kirton, Boston.
 Hon. C. Brand, J.P., Little Dene, Lewes.

New sunshine recorders have been supplied to Folkestone, Llangammarch Wells, Haverfordwest, Margate, Carnforth and Huddersfield.

The following have been supplied for the Crown Agents for the Colonies :—

23 Mercury Barometers.	5 Aneroids.
1 Barograph.	1 Evaporation Gauge.
107 Ordinary Thermometers.	1 Cloud Camera.
77 Max. do.	3 Cameras and supply of photographic materials.
51 Min. do.	1 Halliwell's Recording Rain-gauge.
36 Solar do.	2 Hypsometers.
47 Grass Min. do.	2 Prismatic Compasses.
5 Screens and Cages.	2 Standard Thermometers.
53 Raingauges and glasses.	1 Wolken Spiegel.
174 Additional Glasses.	Repairs to 3 Barometers.
3 Sunshine Recorders.	„ 1 Barograph.
8 Earth Thermometers.	„ 4 Aneroids.
11 Hygrometers.	7,000 Charts for Recording Instruments.
1 Anemometer.	
1 Wind Vane.	
3 Boxes Ozone papers.	

Various other instruments have been supplied for use at stations, including a set of marine instruments lent to the Royal Naval Hospital School, Greenwich.

VI.—CORRESPONDENCE AND ACCOUNTS BRANCH.

Appendix IX., p. 149, shows the receipts and payments during the year ending 31st March, 1906. The amount voted by Parliament was £15,300, as in the previous year, and the miscellaneous receipts amounted to £3,412 11s. 7d.

The following abstract shows approximately the net payments of this and the preceding year, together with the increase or decrease in 1905-6, as compared with the previous year :—

NET EXPENDITURE.	1904-5.	1905-6.	Increase.	Decrease.
GENERAL ADMINISTRATION :	£	£	£	£
<i>Council and Secretary ...</i>	1,464	—	}	423
<i>Director and Committee ...</i>	—	1,041		
Office :				
<i>Correspondence and</i>				
<i>Accounts Branch ...</i>	1,087	1,109	22	—
<i>Rent, Fuel, and Lighting</i>	724	719	—	5
<i>Alterations to premises</i>				
<i>and contingencies ...</i>	573	384	—	189
<i>Expenses incidental to</i>				
<i>International Meteorological Congress ...</i>	29	21	—	8
SPECIAL RESEARCHES ...	858	380	—	478
LAND METEOROLOGY ...	4,078	4,006	—	72
WEATHER INFORMATION ...	2,785	2,777	—	8
INSPECTIONS ...	432	403	—	29
OCEAN METEOROLOGY ...	1,502	1,820	318	—
INSTRUMENTS ...	952	608	—	344
SUPERANNUATION ACCOUNT	1,247	483	—	764
Total £	15,731	13,751	340	2,320

The following notes explain the chief causes of variation in the year 1905-6 :—

The only payment on behalf of the Committee was for travelling expenses.

Under alterations to premises and contingencies some special items of expense were brought to account in 1904-5.

The decrease under Special Researches is due partly to the transfer of the salaries of a portion of the staff to Ocean Meteorology, or to Instruments.

The increase under Ocean Meteorology is chiefly due to the transfer of salaries previously charged under Special Researches.

The decrease under Instruments is due to repayment for instruments supplied to the Royal Navy ; there was an increase in the net cost of instruments.

Under Superannuation no addition to the Investment was made in the year 1905-6.

£1,535 was paid to the Post Office during the year 1905-6 on account of inland and foreign telegrams, allowances to telegraph clerks, rental of private wires, &c.

W. N. SHAW,
Chairman.

July 26th, 1906.

APPENDIX.

APPENDIX I.

CORRESPONDENCE WITH H.M. TREASURY.

1.—CONSTITUTION OF THE METEOROLOGICAL COMMITTEE.

Letter from the Secretary of the Treasury.

M.O. 1264.

Treasury Chambers,
23rd May, 1905.

SIR,

I AM directed by the Lords Commissioners of His Majesty's Treasury to transmit, for your information and guidance, a copy of a Minute by this Board dealing with the future constitution of the Meteorological Office.

It is Their Lordships' desire that, subject to the changes indicated in the Minute and to any others which the Committee may see fit to adopt hereafter, the work of the Office should proceed generally on the lines hitherto followed; and in nominating you to be Chairman of the new Committee, My Lords feel that They have taken the best security for the promotion of the interests of Meteorological Science and the successful working of the institution.

I am to suggest that a meeting of the Committee should be summoned for an early date, and that they should be requested to consider the following points:—

- (1.) Whether the Committee should continue to be registered under the Companies Acts, or whether some other constitution would be preferable.
- (2.) The powers to be delegated to the Director; and
- (3.) The arrangements to be made for the administration and audit of the Parliamentary Grant.

My Lords would be glad to learn the conclusions at which the Committee arrive on these points.

I am, &c.,

G. H. MURRAY.

Dr. Shaw, F.R.S.,
Meteorological Office.

Treasury Minute, dated 20th May, 1905.

My Lords resume consideration of the Report of the Committee presided over by Sir Herbert Maxwell on the administration of the Meteorological Office.

Since the issue of the Report My Lords have been in communication with the Royal Society, the Board of Admiralty, the Board of Trade, and the Board of Agriculture and Fisheries, and They are now in a position to place on record the conclusions at which they have arrived.

1. The Meteorological Office will, as from the 1st April, 1905, be placed under the management of a Committee constituted as follows :—

The Director of the Meteorological Office.

Two members nominated by the Royal Society.

The Hydrographer of the Navy.

One member nominated by the Board of Trade.

One member nominated by the Board of Agriculture and Fisheries.

One member nominated by the Treasury.

The members of the Committee will be appointed by the Treasury, and, subject to the discretion of the authorities by which they are respectively nominated, will hold office for a period not exceeding five years; but will be eligible for re-appointment.

2. The Director will be appointed by the Treasury, and will receive out of the grant in aid a salary of £800, rising after five years to £1,000 per annum, without a title to pension. He will hold office for a period of five years, but, like the other members of the Committee, will be eligible for reappointment until he attains the age of 65. The present Director will receive the maximum of the scale, namely, £1,000 per annum, from the 1st April, 1905.

3. Subject to the general control of the Committee and to such regulations as may be laid down by the Treasury, the Director will be responsible for the administration of the Office.

4. The Director will act as Chairman of the Committee, and will summon it at such times as he considers desirable; but four meetings at least shall be held during the year.

5. The members of the Committee will not receive remuneration for their services, but travelling and subsistence expenses will be allowed in the case of members not residing in the Metropolis.

6. My Lords will ask Parliament annually to vote a grant in aid of the expenses of the Office. For the present this grant is fixed at £15,300.

7. The grant will be administered by the Committee, who may with the consent of the Treasury, delegate to the Director such powers of expenditure as they consider proper. All cheques will be signed by the Director and countersigned by a member of the Committee.

8. The Committee will make an annual report for presentation to Parliament, and will at the same time transmit to the Treasury a statement of their accounts in such form as may be prescribed.

In December of each year the Committee will submit a statement showing the manner in which it is proposed to apply the grant for the ensuing financial year

9. The staff will be appointed, and their salaries fixed, by the Committee on the recommendation of the Director.

10. In the absence of the Director, the Committee may appoint one of its members to act as interim Director.

11. My Lords are pleased to appoint the following gentlemen to be members of the Committee :—

Mr. W. N. Shaw, Sc.D., F.R.S., Director.

Captain Arthur M. Field, R.N., Hydrographer to the Navy.

Captain A. J. G. Chalmers, Professional Officer of the Marine Department, Board of Trade.

Mr. W. Somerville, Sc.D., Assistant Secretary of the Board of Agriculture and Fisheries.

Professor G. H. Darwin, F.R.S., University of Cambridge.

Professor Arthur Schuster, F.R.S., University of Manchester.

Mr. G. L. Barstow, nominated by the Treasury.

II.—OBSERVATIONS IN THE COLONIES.

Letter from the Secretary of the Treasury, with enclosure.

M.O. 2030.

SIR,

Treasury Chambers,
26th August, 1905.

I AM directed by the Lords Commissioners of His Majesty's Treasury to transmit to you herewith (in original and to be returned) the accompanying letter from the Colonial Office (with enclosures), dated the 5th instant, relative to the collection of Meteorological Returns from the Colonies, and to say that My Lords would be glad to be favoured with the observations of the Meteorological Committee upon the questions raised therein.

I am, &c.,

The Director,
Meteorological Office.

G. H. MURRAY.

SIR,

Downing Street,
5th August, 1905.

I AM directed by Mr. Secretary Lyttelton to request you to inform the Lords Commissioners of the Treasury that as the result of an enquiry from the United States Weather Bureau for meteorological information with regard to Weihaiwei, he has had his attention drawn to the absence of any organisation for the collection and publication of Meteorological Returns from the

Colonies generally, and for affording information to persons making enquiries as to climatic conditions in various parts of the British Empire.

It would appear that to a great extent in response to a circular of the 27th of July, 1895, the Meteorological Office receive a considerable amount of information, as shown in the enclosed print, which could with a little trouble be largely increased. Owing, however, to the want of the necessary clerical assistance most of these valuable returns serve no useful purpose, although occasionally tables have been prepared by voluntary assistants, as in the case of the observations for Tropical Africa recently classified by Mr. E. G. Ravenstein and officially published for the Meteorological Council.

I am to enclose for their Lordships' information a copy of the correspondence which has taken place on this subject, from which it would appear that the necessary collection and collation of returns, &c., could be done by a clerk at from £150 to £200 per annum under the supervision of the Meteorological Council. Mr. Lyttelton understands that the cost of printing and publication would amount to about the same sum, so that the total cost should not be more than from £300 to £400 per annum. This does not seem to be an excessive amount for the performance of work of such importance, both from an economic and from a purely scientific point of view. Mr. Lyttelton would therefore be glad if their Lordships could see their way to sanction the provision on the Estimates for 1906-7 of a sum of money for this purpose.

I am to add that Mr. Lyttelton has been approached by the British Association with a proposal for a large scheme involving the creation of a separate Office, but after due consideration he has decided that the proposal is not one that he can recommend to their Lordships.

I am, &c.,

The Secretary to the Treasury.

C. P. LUCAS.

From the Committee to the Treasury, in reply.

Meteorological Office,
63, Victoria St., London, S.W.,
7th December, 1905.

SIR,

WITH reference to Sir G. H. Murray's letter of the 26th August last (No. 1479/05), enclosing correspondence between the Colonial Office and the Meteorological Council, I am authorised by the Meteorological Committee to say that they concur in the opinion expressed by the Council and supported by the Secretary of State, that it is desirable to place upon an organised footing the collection and publication of Meteorological statistics of those Colonies and Dependencies which have no separate meteorological organisations.

They further agree that the simplest method of dealing with the question would be for the Meteorological Office to be definitely charged with the duty of preparing for official publication an annual volume of Meteorological Statistics for the Crown Colonies and Dependencies, with such information about the publications of the Meteorological Organisations of India, Canada, Australia and South Africa as would enable a reader to find his way to any information that is available about climatic conditions in various parts of the Empire.

The cost to the Office involved in carrying out this suggestion would be represented by an appropriation of about £200 for clerical work, on the understanding that the general direction and supervision could be accepted without special provision. The cost of the printing, which does not fall upon the Office Grant, would be in addition to that sum. The cost of the recently published volume of Observations in Tropical Africa referred to in the letter from the Secretary of State for the Colonies is reported by the Stationery Office to have been nearly £46.

The Committee have carefully considered the allocation of the Meteorological Grant in order to see whether, under the new conditions, they could find the means for this work, but they find that the maintenance of the work which the Office has in hand already will absorb the funds at the disposal of the Committee, so that the additional work could only be undertaken if some of the existing work were abandoned. Having regard to the various public interests involved, the Committee do not see their way to any immediate modification of the general scheme of operations of the Office, and they desire me to express their regret that they have been unable to set aside the necessary sum for the clerical work required for dealing with Colonial Meteorology in the Estimates for the ensuing year.

The enclosures in your letter under reference are herewith returned.

I have, &c.,
W. N. SHAW.

The Secretary to the Treasury.

Letter from the Secretary of the Treasury, with enclosure.

M.O. 3069.

SIR,

Treasury Chambers,
22nd December, 1905.

WITH reference to your letter of the 7th instant, I am directed by the Lords Commissioners of His Majesty's Treasury to transmit herewith, for your information, a copy of a letter of even date which They have addressed to the Colonial Office on the subject of the collection and publication of meteorological returns relating to the Colonies.

The Director
of the Meteorological Office.

I am, &c.,
G. H. MURRAY.

From the Treasury to the Colonial Office.

SIR,

Treasury Chambers,
22nd December, 1905.

I HAVE laid before the Lords Commissioners of His Majesty's Treasury, Mr. Lucas' letter (19,653/1905) of the 5th August last, in which attention is called to the desirability of improving the collection, &c., of meteorological returns from the Colonies generally, and it is suggested that arrangements should be made for the preparation and publication of a comprehensive volume of such statistics by the Meteorological Office from information supplied by the Colonies.

In reply I am directed to request you to inform the Secretary of State that the Meteorological Committee, on being consulted, have expressed their inability to undertake the additional work entailed by the proposed arrangement within the limits of their present resources; and that my Lords, on giving the matter their most careful consideration, do not feel able, in present circumstances, to authorise an addition for the purpose in question to the Grant-in-Aid now payable to the Committee. On the other hand, their Lordships believe that the requirements of the case could be substantially met by the improvement of the meteorological information contained in the various Colonial Reports. They would, therefore, suggest that the several Colonies and Dependencies should be requested to supply such information on a common (and extended) form in their periodical reports; and they have reason to believe that the Director of the Meteorological Office would be willing to co-operate to this end by suggesting improvements in the form in which these statistics are at present supplied.

I am, &c.,

(Sd.) G. H. MURRAY.

The Under Secretary of State,
Colonial Office.

From the Colonial Office.

M.O. 55.

SIR,

Downing Street,
4th January, 1906.

WITH reference to your letter (M.O. 919) of the 6th of June last respecting the desirability of affording better facilities for the collection and collation of meteorological records from the Colonies, I am directed by the Earl of Elgin to transmit for your information a copy of correspondence with the Treasury from which you will learn that the Lords Commissioners of the Treasury do not feel able to authorize an addition for this purpose to the grant-in-aid payable to the Meteorological Committee.

I am to state that Lord Elgin would be glad to receive your observations on the suggestion made by the Treasury at the end of their letter.

I am, &c.,
C. P. LUCAS.

The Secretary,
Meteorological Office.

III.—OFFICE PREMISES.

From the Committee to the Treasury.

Meteorological Office,
9th February, 1906.

SIR,

I AM desired by the Meteorological Committee to ask you to bring to the notice of the Lords Commissioners of H.M. Treasury the question of new premises for the Meteorological Office.

2. The question was originally raised by Sir Herbert Maxwell's Committee and has already been referred to by their Lordships in the correspondence with the Royal Society which followed the report of the Committee.

3. In considering the question the Meteorological Committee have taken into account the various requirements of the current work of the Office and the modifications which these requirements have undergone since the occupation of the present premises commenced in 1868. They desire me to note three points.

4. The necessity of being in close connexion with the Telegraph Service has become more urgent, and if the Office could be accommodated in the same building as a Post Office the Committee see their way to some economy in the expense of working, as well as increased efficiency.

5. The Office has now been in existence for upwards of 50 years, and its work has represented the expenditure of a large sum of money. Through its operations in conjunction with those of other countries, many important meteorological results have been obtained, and the position of the science of meteorology is in consequence different from that of 50 years ago. The Committee are of opinion that account ought to be taken of these facts in considering the question of new premises, and that provision should be made for the presentation of the more important meteorological results in a form which will interest and inform the general public, and be accessible in the same way as the scientific museums, and available like them for educational purposes.

6. The further progress of the science of meteorology would be greatly helped by the development of interest in the subject among students, as in the case of other sciences. Such development requires facilities for study which do not at present exist in

this country. The Meteorological Office has an abundance of material which is essential for the prosecution of meteorological researches, but it is not readily accessible for students. To develop in an effective manner the facilities which it can offer, the Office should be in juxta-position with a university so that the subject may have an opportunity of claiming the attention of students.

7. The Committee have considered whether any available site in London would satisfy these conditions without interfering with the ordinary work of the Office. I was requested to make inquiry with regard to the land under the control of the Commissioners for the Exhibition of 1851, which is appropriated in a special manner to the encouragement of science and art, and I have learned from the Secretary of the Office of Works that the erection of a Post Office on a site at South Kensington is under consideration.

8. Such an occasion seems to the Committee to offer an almost unique opportunity for satisfying the three requirements which have been mentioned, without sacrificing the facilities for the current work of the Office. Accommodation for the Office might be provided on the upper floors of a Post Office building; it would be in the immediate neighbourhood of the Science and Art Museums and accessible as they are for individual students, school classes and the general public; and being close to the headquarters of the University of London, it would open up the possibility of developing meteorology as a subject of academic study under most favourable conditions.

9. I am, therefore, to ask that their Lordships will take steps to ascertain whether accommodation for the Office could be provided on the Kensington Gore site in the manner indicated herein.

10. The accommodation in the present Office extends to 8,500 square feet. The area of floor space estimated to be necessary to give the accommodation required for the Meteorological Office is 10,000 square feet.

11. In respect of funds, the rental of the present premises (including rates and taxes) is £635 per annum. The Committee could not spend more in rent without trenching upon funds which are already employed in other directions, but they desire me to say that they regard the provision of suitable premises as a question of fundamental importance.

12. If the suggestion of the Committee meets with Their Lordships' approval, the Committee would desire to consult the Commissioners of the 1851 Exhibition and the authorities of the University before arranging details. The Committee have not felt themselves at liberty to approach either of these bodies formally before bringing the matter to their Lordships' notice, but they have reason to think from informal inquiries that the proposal would not be unacceptable.

I am, &c.,

W. N. SHAW.

The Secretary of the Treasury,
Whitehall.

From the Secretary of the Treasury.

M.O. 965.

Treasury Chambers,
9th April, 1906.

SIR,

THE Lords Commissioners of His Majesty's Treasury have had before them your letter of the 9th February last respecting the provision of accommodation for the Meteorological Office.

In reply, I am to state that My Lords are favourably disposed to the proposal that premises shall be constructed for the Meteorological Office in a block of buildings to be erected at South Kensington to contain a post office; and My Lords, on present information, believe that the rent payable by the Committee for such a building would not exceed by any considerable sum the amount expended by the Committee on the rent of their present premises.

Until it is known, however, what has to be provided for on the remainder of the site it is hardly possible to design a building of which the Meteorological Office would form a part, as such a design should be prepared as a whole, and so as to accord with the other buildings to be erected on the site.

My Lords must therefore request that they should not be regarded as definitely committed to the scheme for the erection of an office for the Meteorological Office in Exhibition Road; but the proposal will be borne in mind, and My Lords hope that it may prove feasible to carry it into effect.

I am, &c.,
G. H. MURRAY.

The Director,
Meteorological Office,
63, Victoria Street, S.W.

APPENDIX II.

STATEMENT OF PROVISIONS FOR THE SUPPLY OF INFORMATION TO THE PUBLIC, 1906-7.

THE METEOROLOGICAL OFFICE.

Established in 1854 as a department of the Board of Trade. From 1866 to 1877, with a Parliamentary Grant in aid, under the management of a Committee, and from 1877 to 1905 under a Council appointed by the Royal Society, and now under the control of a Director and Committee appointed by H.M. Treasury.

Director :

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

Marine Superintendent :

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

Superintendent of Statistics :

R. G. K. LEMPFERT, M.A.

Superintendent of Instruments :

ERNEST GOLD, B.A.

Chief Clerk and Cashier :

JOHN A. CURTIS.

OFFICE PREMISES.

63, Victoria Street, S.W.

Telegraphic address—"Weather, London."

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

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

A.—TELEGRAPHIC INFORMATION.

DAILY WEATHER REPORTS. FORECASTS AND STORM WARNINGS.

Daily
information
received.

Between 8 a.m. and 10 a.m. telegraphic messages are received daily, reporting meteorological observations at 27 stations (marked T in list of stations, pp. 72-91) in the British Isles, chiefly on the coast, and at 29 stations (p. 92) on the Continent of Europe. The observations in the British Isles are made at 8 a.m., and on the Continent partly at 7 a.m. and partly at 8 a.m. A certain number of stations report evening observations (6 p.m.), also by telegram, and those that do not report in the evening include the evening observations with the following morning reports, so that a complete schedule of morning and evening observations is drawn up daily. The information refers to the readings of the barometer, dry and wet bulb thermometers, maximum and minimum thermometers, rainfall, and in some cases, sunshine, with estimates of the direction and force of the wind, and reports of the weather and state of the sea.

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

The telegraphic information is tabulated and charted by about 10 a.m. for the morning observations, and 7 p.m. for the evening ones. A general report is then drawn up, and forecasts of the weather for the twenty-four hours following the next noon, or midnight, as the case may be, are formulated.

Daily
Weather
Report.

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

Subscrip-
tions.

The Daily Weather Report may be obtained on payment at the Meteorological Office of a subscription in advance (for not less than a quarter of a year ending at the official quarter days, *e.g.*, March 31, June 30, &c.) at the rate of £1 per annum for delivery by book post, £2 for delivery, where feasible, by hand. Single copies, price 1*d.* each, can be obtained after 3 p.m. on the day of issue at the

Office, and at the railway bookstalls at the following terminus stations :—Victoria (L. B. S. C., and S. E. and C. Railways), Charing Cross, King's Cross, St. Pancras, Euston.

Special advance copies of the descriptive remarks on the state of the weather and forecasts, based upon the morning or evening observations, are prepared at 11 a.m. and 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.

Special Reports for the Press.

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

Typewritten copies of the morning forecasts for all districts are ready at 11 a.m., and are distributed by hand to clubs and societies situated in or near Pall Mall at a charge of 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.

Printed forecasts.

For the purposes of the forecasts of weather the British Isles are divided into eleven districts, as indicated in the accompanying maps. 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 be obtained in like manner. The latest reports, with a map, are exhibited as early as possible for the information of the public at the entrance to the Office, and, by the courtesy of H.M. Office of Works, in Saint James's Park, opposite the Horse Guards, and abbreviated reports for a few coast stations are displayed in the street, on the balcony of the Office.

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

FORECAST DISTRICTS.*



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

* For the grouping of the counties to represent approximately the forecast districts, see Lists of Stations, pp. 72 to 91.

Inquiries by
telegraph.

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

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

To "Weather, London."

Latest Information from [Straits of Dover].

or,

Latest Forecast for [Forfarshire].

or,

Next Forecast for [Dublin].

From

(Name),

(Address)

Inquiries by
post.

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

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

Harvest
forecasts.

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

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

Transcripts
of the
observations.

As far as practicable the 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.

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.

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

The following is a LIST of STATIONS to which STORM-WARNING telegrams are sent :—

NORTHERN.

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

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, Lamlash, 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 Swilly L.H., Rathmullen, Malin Head, Portrush, Port Ballintrae, Ballycastle.

Irish Sea.—†Belfast, *Donaghadee, Burr Point, 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, Hoylake, New Brighton, 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, *Boscastle, Port Isaac, Newquay, Godrevy L.H., Hayle, St. Ives, St. Sennen, Newlyn West, Penzance.

SOUTHERN.

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

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

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

EASTERN.

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

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

* Telegrams only exhibited.

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

B.—INFORMATION RECEIVED WEEKLY.

METEOROLOGICAL STATISTICS FOR AGRICULTURAL AND
SANITARY PURPOSES.

WEEKLY WEATHER REPORT, WITH MONTHLY AND ANNUAL
APPENDICES.

The Weekly Weather Report, which has been continued in its present form since 1890, is published on Thursdays, and gives, for the week ended on the preceding Saturday, a summary of temperature, rainfall, and duration of bright sunshine in the United Kingdom, for agricultural and sanitary purposes. To this is added a series of maps showing the distribution of pressure and wind over the whole of Europe at 8 a.m. and 6 p.m. on each day, and the temperature, weather, and sea disturbance at 8 a.m. each day. The maps for each day are accompanied by a brief account of the distribution of weather for that day and the changes that have taken place. Since the beginning of January, 1906, a table has been included giving the results of observations of the upper air taken by means of kites. These results include particulars as to temperature, humidity, and wind (direction and velocity) at various levels.*

Weekly
Weather
Report.

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

For the statistical summaries, the information from the 27 telegraphic reporting stations in the British Isles is supplemented by returns of daily observations supplied by volunteer observers from about 94 other stations. Of these 32 supply only the daily amounts of bright sunshine. The summaries refer to districts which are identical with the forecast districts of the Daily Weather Report, and they are grouped into extreme northern, eastern (wheat-producing), western (grazing), and extreme southern (Channel Islands) districts.

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

The tables of Accumulated Temperature are designed to give persons engaged in agriculture better means for estimating the manner in which vegetation is affected by temperature than that afforded by the more usual methods of treating the readings of the thermometer. They show for each week, and for the whole period from the beginning of the year, the weekly and progressive values

Tables of
Accumulated
Temperature.

* Information concerning minimum temperature on the grass and temperature in the ground has been added since the beginning of May, 1906.

respectively of the combined amount and duration of the excess or defect of the air temperature, above or below a suitably fixed standard, or *base temperature*. The base value adopted is 42° Fahr.

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

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

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

(a). A *Monthly Supplement* giving (1) a general account of the weather for the month under the headings—Pressure, Depressions, Anticyclones, Winds, Temperature, Rainfall, Bright Sunshine, and Observations in the Upper Air; (2) a complete summary of the observations at the Telegraphic Reporting Stations, and at certain of the Normal Climatological Stations; (3) a summary of maximum and minimum temperature, rainfall, and sunshine at the additional stations which furnish weekly returns, and at certain other 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 rainfall.

Beginning with January, 1902, this Monthly Summary has been enlarged, and the number for March, 1906, contains tables of results for 157 stations, namely:—27 telegraphic stations and 28 selected normal climatological stations, together with a summary of temperature, rainfall and sunshine, or one or more of these elements, at 102 other stations.

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

(b). An *Appendix*, issued quarterly and annually, containing—

- (1) *Quarterly and annual summaries of the rainfall and mean temperature* of each district compared with the corresponding quarter, or the whole year, for each of the last 15 years, and with each of the corresponding five-yearly means for thirty-five years;
- (2) A table of the *driest and wettest the coldest and warmest* corresponding quarters and years since 1866;
- (3) The *totals for periods of four weeks and five weeks* of rainfall, accumulated temperature and sunshine, together with the progressive totals for each period of the quarter.

* A full explanation of the principles on which the rules for computing accumulated temperature are based will be found in Appendix II. to the Quarterly Weather Report for 1878. See also Journal Royal Statistical Society, Vol. LXVIII., Part II.

(c). 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.

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

(e). An *Appendix* appearing every fifth year, giving for each district a comparison of the mean of the *average temperature of successive weeks for the preceding five years* with the corresponding value for the whole period defined above.

(f). 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.

(g). A special wind-force supplement (published separately), giving the readings of anemometers amounting to, or exceeding, a velocity of 44 statute miles per hour, as recorded on the "Dines" pressure tube anemometer, or upon the "Robinson" anemometer, with the factor adjusted to give the corresponding result.

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

Advance copy for the use of newspapers.

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

Copies of the Report 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 (Secondary Branch); Institution of Civil Engineers; Local Government Board; Board of Trade; Board of Agriculture and Fisheries; The Admiralty; British Balneological and Climatological Society;

and also to a number of provincial libraries.

C.—OTHER INFORMATION FROM STATIONS IN THE BRITISH ISLES.

Observatories
with self-
recording
instruments.

The Committee maintain a fully equipped meteorological Observatory at Valencia (Cahirciveen), Co. Kerry, Ireland. They have also established instruments and subsidised the observatories at Kew, Falmouth, and Aberdeen. They receive in return curves and hourly tabulations of pressure, dry bulb temperature, wet bulb temperature, rainfall, direction and velocity of the wind, and sunshine, together with regular observations of the character and movement of the clouds and the state of the weather.

An annual volume embodying the results of the observations at the four Observatories is issued in the usual way. That for 1903 has recently been issued, price 6*d.* per month each station.

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

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

The stations from which continuous records of bright sunshine, pressure, temperature, rainfall, and relative humidity are received, are indicated in the list which follows by the symbols described on pp. 70, 71.

Normal
Climato-
logical
Stations.

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

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

Twice daily (at 9 a.m. and 9 p.m.).						Once daily.			
Barometer.	Temp.	Humidity.	Wind.	Cloud.	Weather	Rain.	Temp.	Additional Observations.	
Attached Thermometer.									
Uncorrected.		Corrected.							
Corrected and reduced to 30° Fahr. at mean sea level.									
Dry bulb.									
Wet bulb.									
Dew point.									
Vapour Pressure									
Percentage.									
Direction.									
Force (0-12).									
Amount (0-10).									
Form.									
Direction of lower Stratum, whence comes.									
At time of Observation.									
Since last Observation									
At 9 a.m.									
Estimated duration.									
Corrected readings at 9 p.m.									
Max.	Min.								
Duration of Bright Sunshine.									
Weather Symbols.									
Remarks.									
Earth Temp. 1 ft.									
Earth Temp. 4 ft.									

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

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

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

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

An annual volume embodying the results of these observations is published; that for 1901 has been issued, price 22s. 6d.

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

The names of all the stations in the British Isles from which information of any kind is received, and a statement of the order of the stations and the publication for which the returns are prepared, are given in the lists appended hereto, pp. 69 to 96.

The returns thus collected, whether published in the manner described or in manuscript, may be consulted or copied at the Office between 10 a.m. and 4 p.m., by any person, by permission of the 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. Supply of information and charges.

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 £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.

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

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

A list of the stations, stating the character of the observations taken, is given on pp. 94 to 96.

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

E.—THE 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. Library.

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

publications are available, free of charge, for the purposes of study and research, upon application at the Office, between the hours of 10 a.m. and 4 p.m.

F.—MARINE OBSERVATIONS.

The information as to the meteorology of the sea collected by the Office since 1855, is contained in a large number of logs kept by the officers of the Royal Navy, or of the Mercantile Marine, and forwarded to the Office. The information is regularly discussed and arranged according to the squares of latitude and longitude, embracing 10 degrees in each direction, and again sub-divided according to one degree squares. The information is then compiled statistically, and is represented by a series of publications, of which a list is appended. *See pp. 100 and 101.*

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

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

G.—SUPPLY OF INSTRUMENTS TO OBSERVERS.

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.
- (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.

* The issue of a similar series of charts for the Indian Ocean was commenced in May, 1906.

- (5.) To a limited number of fishing communities in various districts of the British Isles, which are supplied on certain conditions with suitable mercury barometers.

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

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

Mercantile
Marine
agents.

Cardiff—Mr. T. L. Ainsley, Bute Dock.

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

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

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

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

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

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

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

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

The Office possesses a number of Barometers which it is willing to lend 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. 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 :—

Fishery
barometers

LIST of STATIONS supplied with FISHERY BAROMETERS.

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

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

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

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

England, South coast.—*Bognor, *Ryde, *Bembridge, *Brixton, *Atherfield, *Ventnor, *Yarmouth (Isle of Wight), Gorey (Jersey), *Haslar Hospital, *Poole, *Weymouth, *Portland.

England, South-West coast.—*Budleigh Salterton, *Exmouth, *Cawsand, *Mevagissey, *Gorranhaven, *Devoran, *Portscatho, *Penryn, *Durgan, *Porthallow, *Falmouth, *Coverack, *Newlyn (2), *Mousehole, *Penberth Cove, *Porth Guarra, *St. Ives, *Hayle, *Port Isaac, *Bideford, Burnham, Highbridge, Weston-super-Mare.

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

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

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

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

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

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

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

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

REPORT OF METEOROLOGICAL COMMITTEE 1905-1906.

MAP SHOWING THE POSITIONS OF THE CLIMATOLOGICAL AND RAINFALL STATIONS.



The Stations in the County of London are not all shown. For complete list see p. 80.

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 supply, free of cost, blank registers for the returns of the observations and, subject to certain conditions, forms for anemographs and sunshine recorders, and will, if desired, give advice about the site and exposure of the instruments.

Supply of instruments on commission for observers at Land Stations.

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

H.—LIST of STATIONS in the BRITISH ISLES in connexion with the METEOROLOGICAL OFFICE.

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

The list shows the order 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. The returns received have in general 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 this respect. The symbols used may be explained as follows :—

- I. 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 "Continuous records."
- II. Normal Climatological Station : Station of the Second Order.—Daily observations at 9 a.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.
- 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 8 a.m. and 6 p.m. G.M.T. (and in some cases also at 2 p.m.), similar in general character to those taken at Normal Climatological Stations, reported to the Office each day by telegraph.

●. (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.

●. (Self-recording.) Additional Autographic Raingauge 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.

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 total of bright sunshine only, published in the "Weekly Weather Report."

M. Full monthly summary in the international form published in the Monthly Summary to the "Weekly Weather Report."

m. Abridged monthly summary published in the Monthly Summary to the "Weekly Weather Report."

(m.) Monthly totals of bright sunshine only, published in the Monthly Summary to the "Weekly Weather Report."

S. Daily values published in "Meteorological Observations at Stations of the Second Order" (1901).

NOTE The divisions shown on the map are lines drawn along boundaries of administrative counties to represent as nearly as possible the division into districts for the purposes of daily forecasts.

The names of Observatories are printed in capitals; at other stations the kind of instrument in use is indicated thus:-

- ☉ Sunshine Recorder
- B Barograph
- ⌘ Anemograph
- Autographic rain gauge
- H Hygograph
- ⊕ Thermograph

3237.06. Waller & Graham Ltd. Litho. London.

The Stations in the County of London are not all shown.

- s. Monthly summaries published in "Meteorological Observations at Stations of the Second Order" (1901).
- 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.

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.

* * * From a number of stations in the British Isles printed summaries of observations are received. These have been included on p. 132 in the Geographical list of Institutions, &c., which issue publications.

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.

Southport.—Fernley Observatory.

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

County and Station	Lat.	Long.	Height in feet above M.S.L.	Order of Station.		Publication.	Year of last Inspection.	Observer.
				Eye Obs.	Self-recording.			
0. SCOTLAND, NORTH.								
Cairness :—	58 34	3 48 W.	55	●	—	—	—	D. Macanlay.
Reay.								
Wick ...	58 27	3 6 W.	80	T	—	D.W.M.	05	Miss Sinclair, for M.O.
Strathpeffer Spa	57 37	4 28 W.	253	II	⊙	w.M.s	05	J. McLean, for R. Fortescue Fox, M.D.
Inverness :—	57 8	4 40 W.	68	II	⊙	W.m.s.	04	Rev. C. von Dieckhoff.
Fort Augustus	56 49	5 7 W.	175	III	—	W.m.s.	04	W. T. Kilgour.
Fort William ...	58 56	2 45 W.	160	II	☉	w.M.S.	05	M. Spence.
Deerness ...	57 45	4 21 W.	449	●	—	—	—	W. Minty.
Ardrross Castle	57 30	5 14 W.	489	II	—	W.m.s.	03	D. D. Munro, for Lord MacLaren.
Glencarron ...	57 36	5 24 W.	—	●	—	—	—	A. McLennan, for Hon. W. Peel, M.P.
Kinlochewe ...								
Stornoway ...	58 11	6 22 W.	40	T	B ⊙	D.W.M.	05	J. Mackenzie, Lloyd's Agent, for M.O.
Shetlands :—	59 51	1 17 W.	112	T	B	D.W.M.	04	Rev. W. Brand, for M.O.
Head.								
Sutherland :—	57 59	3 56 W.	12	II	—	S.	05	D. Melville, for the Duke of Sutherland, K.G.
Castle								
Laing ...	58 2	4 24 W.	387	II	—	W.m.s.	05	Rev. John K. Maclean, M.A.

1. SCOTLAND, EAST.									
Aberdeen :—	Aberdeen Ob- servatory.	57 10	2 6 W.	46	I, T	1, B	D.W.M.s.	05	Professor C. Niven, F.R.S., and G. A. Clarke, for M.O.
§ Balmoral ...	...	57 2	3 12 W.	920	II	—	W.m.	—	J. Michie, M.V.O., and John M. Troup.
§ Braemar ...	...	57 0	3 24 W.	1,111	II	—	W.m.S. s.	05	J. Aitken, J.P.
§ Gordon Castle	...	57 37	3 5 W.	101	II	—	W.m.s.	03	C. Webster, for the Duke of Richmond and Gordon, K.G.
Banff :—	...	55 44	2 25 W.	498	II	⊙	(m.)	02	J. A. Wood, for Sir H. P. Camp- bell, Bart.
Berwick :—	§ Marchmont ...	55 37	3 12 W.	253	—	⊙	D.W.M.	—	The Regius Keeper, Royal Botanic Garden.
Clackmannan :—	No station.	55 58	3 10 W.	18	T	—	(m.)	05	D. Drummond, Post Office, for M.O.
Edinburgh :—	Leith ...	56 23	2 56 W.	160	II	—	S. s.	05	J. Carnochan.
Elgin :—	No station.	56 45	3 7 W.	719	II	—	w.m.	03	W. Morrison, for P. Stormonth Darling.
Fife :—	§ Dundee ...	57 3	2 25 W.	140	II	⊙ 4	D.W.M.	04	J. Smith.
Forfar :—	§ Lednathie ...	57 36	3 52 W.	82	T	—	W.m.	05	Miss Penny, for M.O.
Haddington :—	No station.	56 24	3 53 W.	296	II	—	w. (m.) s.	05	Alex. Hendry.
Kincardine :—	Crathes ...	56 21	3 29 W.	175	—	B ●	—	—	C. L. Wood.
Kinross :—	No station.	56 29	3 8 W.	276	—	⊙	—	04	G. Davie, for J. White.
Linlithgow :—	No station.	55 23	2 39 W.	587	II	—	—	05	Thos. Arthur, for Major Elliot.
Nairn :—	§ Clathick ...	...	...	...	...	...	...	...	...
Peebles :—	§ Clathick ...	...	...	...	...	...	...	...	...
Perth :—	Forquhenny ...	...	...	...	...	...	...	...	...
Roxburgh :—	Balruidery ...	...	...	...	...	...	...	...	...
Selkirk :—	§ Wolfelee ...	...	...	...	...	...	...	...	...
	No station.	...	...	...	...	...	...	...	...

The names of Stations added to the list since April, 1905, are printed in clarendon type : those of Stations now discontinued are printed in italic type.

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.	Self-recording.			
2. ENGLAND, NORTH EAST.								
Durham :—								
Durham ...	54 46	1 35 W.	336	II	☉	W.M.s.R.	03	Prof. R. A. Sampson. M.A., F.R.S.
Seaham Har- bour.	54 50	1 19 W.	139	II	—	m.s.	05	G. H. Aird.
Lincolnshire :—								
Caistor ...	53 30	0 20 W.	266	●	—	—	04	Thos. Ford.
Fulbeck ...	53 3	0 37 W.	180	II	B	W.m.	04	Rev. Vere F. Willson, M.A.
Lincoln ...	53 14	0 33 W.	58	II	—	W.M.	05	S. R. Moss, for the Corporation.
Mareham - le - Fen.	53 8	0 5 W.	10	●	—	—	01	Mrs. G. L. Kime.
Rauceby Hall ...	53 0	0 29 W.	124	III	☉	w.m.	03	J. Hope, for General Sir M. Willson, K.C.B.
Skegness ...	53 9	0 21 E.	12	III	☉	d.w.m.	04	S. Coetmore Jones, for the Dis- trict Council.
Tealby ...	53 24	0 16 W.	251	II	—	s R.	03	Rev. S. Lewin, B.A.
Temple Bruer ...	53 4	0 30 W.	—	●	—	—	03	Miss Alice S. Morley.
Northumber- land :—								
Alnwick Castle	55 25	1 43 W.	210	III	☉	W.m.	03	Robert Kyle, for the Duke of Northumberland, K.G.
Cockle Park, Morpeth.	55 13	1 41 W.	324	II	☉	w.M.S.R.	04	A. G. Birt, for the Northumber- land County Council.
Font Watershed—								
Chertners ...	55 16	2 0 W.	1,000	●	—	—	—	Francis R. Hull, C.E.
Dam Site ...	55 14	1 54 W.	620	●	—	—	—	"
Fallowleea ...	55 15	1 57 W.	850	●	—	—	—	"
Red Path ...	55 13	2 0 W.	850	●	—	—	—	"
Tod Crag ...	55 15	2 1 W.	1,000	●	—	—	—	"
Newcastle - on - Tyne.	54 59	1 36 W.	152	III	☉	w.m.	03	N. H. Martin, F.R.S.E, F.C.S.

Yorkshire, N. Riding:—	North Shields High Lighthouse.	55 0 55 0	1 27 W. 1 27 W.	26 —	T —	— —	D.W.M.R.c. —	05 05	R. Moat, Post Office, for M.O. Capt. T. Robson, for M.O.
	Ampleforth ...	54 12	1 6 W.	349	II	—	m.	03	Rev. J. B. McLaughlin, B.A., O.S.B.
	Hovingham Hall	54 10	0 59 W.	120	●	—	—	—	Bingley Day, for Sir W. H. A. Worsley, Bart.
	Rounton ...	54 24	1 18 W.	242	II	—	s.	05	Sir Hugh Bell, Bart.
	Salburn - by - the-Sea.	54 35	0 58 W.	116	III	⊙	w.m.	05	J. Allan Bennett, M.D.
	Scarborough ...	54 18	0 24 W.	62	II	⊙	d.W.m.S.	05	W. W. Larkin, for the Corporation.
	Whitby ...	54 29	0 37 W.	88	II	⊙	M.	05	Thos. Newbitt.
	York. Deighton Grove.	53 54	1 3 W.	38	●	—	—	05	Miss M. L. Whitehead.
	" The Mount.	53 57	1 5 W.	56	II	—	W.M.s.R.	05	Oxley Grabham, M.A.
	" Bootham	53 57	1 5 W.	105	—	⊙	w.(m.)R.	05	Hugh Richardson, M.A.
Yorkshire, E. Riding:—	" The Mount	53 56	1 5 W.	—	—	⊙	—	—	R. Thompson.
	Hall ...	53 45	0 16 W.	0	II	⊙	R.r.	04	H. B. Witty, for the Corporation.
	Spurn Head ...	53 34	0 7 E.	26	T	—	D.W.M.R.	05	A. S. Badcock and W. J. Counter, for M.O.
3. ENGLAND, EAST.									
Bedford:—	Aspley Guise ...	52 1	0 38 W.	410	—	⊙	—	—	Mrs. Dymond.
	Woburn, Ridgmont.	52 1	0 36 W.	291	II	—	M.s.	05	H. M. Freear, F.C.S., for the Royal Agricultural Society.
Cambridge:—	Cambridge Bot. Gardens.	52 12	0 8 E.	41	II	⊙	W.M.S.R.	03	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.

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

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.	Self-recording.			
3. ENGLAND, EAST— <i>cont.</i>								
Cambridge								
— <i>cont.</i>								
Cambridge, Newn- ham Coll.	52° 13'	0° 5' E.	—	III	H	—	05	Miss Stephen.
Essex :—								
Clacton-on-Sea...	51° 47'	1° 9' E.	54	T, II	⊙	D.W.M.R.	04	A. W. Shadick, for Urban Dis- trict Council.
Dunmow ...	51° 53'	0° 23' E.	297	II	⊙	w.M.R.	04	Thos. Hacking, for the Countess of Warwick's Agricultural School.
East Ham ...	51° 32'	0° 3' E.	12	III	●	—	—	J. Banks, for the Corporation.
Shoeburyness ...	51° 32'	0° 47' E.	13*	III	☞	W.m.	04	The Superintendent of Experi- ments.
Southend - on - Sea.	51° 32'	0° 43' E.	100	III	⊙	w.m.	—	E. J. Elford, for the Corporation.
" Waterworks	51° 32'	0° 43' E.	110	●	—	—	—	C. S. Bilham.
Bennington ...	51° 54'	0° 5' W.	407	II	—	s.R.	03	Rev. J. Dunne Parker, LL.D.
Berkhamsted ...	51° 46'	0° 34' W.	400	II	⊙ (I)	s.R.	03	E. Mawley.
Buntingford ...	51° 56'	0° 0' W.	314	III	—	m.	05	Dr. G. M. Smith.
Rothamsted ...	51° 48'	0° 22' W.	424	III	⊙	W.m.	02	A. D. Hall, M.A., for the Lawes Agricultural Trust.
Huntingdon :—								
No station.								
Middlesex :—								
Barnet ...	51° 39'	0° 10' W.	211	III	—	R.	05	T. H. Martin, A.M.I.C.E.
Harefield ...	51° 36'	0° 29' W.	337	●	—	—	—	G. Eland.
Isleworth ...	51° 29'	0° 20' W.	24	III	⊖	—	—	A. Worsley.
Cromer ...	52° 56'	1° 17' E.	196	II	⊙	w.m.	02	W. H. Archer, for Urban District Council.
Norfolk :—								
East Dereham ...	52° 41'	0° 57' E.	158	●	—	—	—	G. H. Cooper.
Geldeston ...	52° 28'	1° 31' E.	37	II	⊙ (B ⊕)	W.m.s.	04	E. T. Dowson.
Hillingdon ...	52° 48'	0° 33' E.	88	II	⊙	W.m.S.R.	05	Rev. H. E. B. Ffolkes, M.A.

Hunstanton ...	52 57	0 51 E.	29	●	—	—	—	C. Ernest Gray.
Norwich ...	52 37	1 17 E.	93	III	—	R.r.	03	A. W. Preston.
Thetford ...	52 25	0 45 E.	169	●	—	—	—	E. S. Greenwood.
Yarmouth ...	52 37	1 43 E.	9	T	B	D.W.M.	04	G. T. Watson, Sailors' Home, for M.O.
Brandon ...	52 27	0 37 E.	48†	●	—	—	—	Lt.-Col. B. Spragge, D.S.O.
Felixstowe ...	51 58	1 22 E.	10	III	⊙	W.m.	05	J. Mills, for the Corporation, and S. Alexander.
Lowestoft ...	52 29	1 45 E.	84	II	⊙	w.m.s.R.	05	C. W. Edwards, for the Corporation.
4. MIDLAND COUNTIES.								
Buckingham :— Winslow ...	51 57	0 53 W.	379	III	—	—	—	R. A. Easton.
Derby :— Buxton ...	53 14	1 54 W.	987	II	—	s.R.	05	W. Pilkington.
Chatsworth ...	53 14	1 37 W.	—	III	B θ	—	02	The Duke of Devonshire, K.G.
Gloucester :— Bristol, Over Court Park.	51 32	2 35 W.	147	III	—	r.	04	R. C. Cann Lippincott.
Clifton College.	51 27	2 37 W.	229	III	—	W R.m.	05	D. Rintoul, M.A.
Cheltenham ...	51 54	2 3 W.	184	II	—	s.R.	04	A. C. Saxby, for the Corporation.
Cirencester ...	51 43	1 57 W.	446	III	⊙	W.m.	05	Profs. G. T. Locke and P. G. Gundry, Ph.D., for the Royal Agricultural College.
Dursley ...	51 41	2 21 W.	256	●	—	—	96	J. Richards.
Forest of Dean :—								
Blakeney Hill ...	51 46	2 30 W.	500†	●	—	—	—	J. Tyler, for Philip Baylis, Esq.
Bracefield ...	51 49	2 38 W.	500	●	—	—	—	E. A. 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	Kate Roberts
Worcester Lodge ...	51 48	2 35 W.	550	●	—	—	—	Fred Morris
Hidcote ...	52 5	1 46 W.	524	●	—	—	97	Major W. Wright, R.A.

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* 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.	Self-recording.			
4. MIDLAND COUNTIES— <i>cont.</i>								
Hereford:—	52° 5'	2° 45' W.	291	III	—	W.m.	04	Rev. F. B. Harrington, O.S.B.
Wessington Court	52° 1'	2° 35' W.	439	II	—	M.s.	03	S. Lomas, for Miss L. Grafton.
Leicester:—	52° 54'	0° 47' W.	259	II	☉	R.s.	02	W. H. Divers, for the Duke of Rutland, K.G.
Syston ...	52° 43'	1° 5' W.	178	●	—	—	95	S. K. Daniels.
Northampton:—	52° 37'	0° 31' W.	281	III	—	W.m.	04	Miss A. Tasker.
Colly Weston	52° 16'	0° 50' W.	273	●	—	—	—	Rev. G. H. Mullins, M.A.
Great Billing	52° 29'	0° 28' W.	144	III	☉	w.m.	04	J. O. Morris and W. T. Kitching, for F. W. Sanderson, M.A., Headmaster.
Oundle (The School).	52° 29'	0° 28' W.	146	●	—	—	04	N. E. Dixon, C.E.
"	53° 27'	1° 4' W.	65	III	—	W.m.	04	B. I. Whitaker, J.P.
Nottingham:—	52° 51'	1° 14' W.	125	III	—	—	—	Fred Wakerly.
Bawtry, Hesley Hall.	52° 57'	1° 9' W.	192	III	—	—	05	Arthur Brown, M.Inst.C.E., and Philip Boobyer, for the Corporation.
Kingston-on-Soar.	52° 56'	1° 9' W.	82	T	☉ (B●)	{ D.W.M.R.r. }	05	" "
Nottingham, The Castle.	53° 22'	1° 16' W.	56	—	☉ (B●)		96	H. Mellish, J.P.
The Pumping Station.	51° 46'	1° 16' W.	208	L, T	—	w(m.) D.W.M.R.	05	Dr. A. A. Rambaut, M.A., F.R.S.; W. Wickham, for M.O.
Oxford:—								

Watlington	51 38	1 1 W.	749	●	—	—	G. H. Bonner.
Park.							
Rutland :—	52 37	0 45 W.	522	●	—	—	N. W. Wortley.
Shropshire :—	52 43	2 45 W.	191	II	—	—	Capt. W. E. Manser, R.E.
	52 26	2 52 W.	370	II	—	W.M.R.	Rev. W. M. D. La Touche, B.A.
Stafford :—	52 53	1 57 W.	646	II	—	W.m.s.	J. C. Philips.
	52 48	1 49 W.	396	●	—	—	F. W. Lycett.
Warwick :—	52 28	1 56 W.	535	II	⊙	d.W.M.s.R.r.	Alfred Cresswell, for the Midland Institute.
	52 25	1 30 W.	270	III	⊙	R.	E. Hugh Snell, M.D., for the Corporation.
	52 22	1 15 W.	379	III	—	m.	O. M. Samson, M.A.
Worcester :—	52 18	2 36 W.	315	●	B	—	Rev. John Tomson.
Yorkshire,							
W. Riding :—	53 39	1 20 W.	120	II	—	—	E. B. Ludlam, M.Sc.
	53 48	1 45 W.	330	III	⊙	r.	H. A. Johnson, M.Inst. C.F.
	53 48	1 22 W.	195	II	⊙	M.	Prof. Fenton, B.Sc., for the University of Leeds.
	54 4	2 17 W.	500?	III	(B)	—	C. F. Mott, M.A.
Giggleswick	54 0	1 33 W.	476	III	⊙	d.W.m.	G. Paul, for the Corporation.
Harrogate	53 39	1 47 W.	409	III	⊙	r.	J. Firth, Registrar.
Huddersfield	53 48	1 33 W.	132	III	(B)	r.	H. Crowther.
Leeds	53 23	1 29 W.	429	II	⊙	W.M.s.R.	E. Howarth, F.R.A.S.
Sheffield	53 24	1 25 W.	—	—	⊙	—	J. Robertson, M.D., B.Sc., for the Corporation.
" Attercliffe.							A. Clyde.
Wakefield	53 41	1 30 W.	96	II	—	s.R.	

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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 inspec- tion.	Observer.
				Eye Obs.	Self-recording.			
London								
County:— <i>Brixton</i> ...	51° 27'	0° 8' W.	77	III	—	W.M.R.	02	F. Gaster, for M.O.
<i>Camberwell</i> —								
<i>The Green</i> ...	51° 28'	0° 5' W.	17	—	●	—	03	W. Oxtoby, M.I.C.E., for the Camberwell Borough Council.
<i>Dulwich</i> ...	51° 27'	0° 5' W.	58	—	●	—	—	
<i>Forest Hill</i> ..	51° 26'	0° 4' W.	160	—	●	—	03	
<i>Leyton Square</i>	51° 29'	0° 4' W.	14	—	●	—	03	
<i>Peckham Rd.</i>	51° 28'	0° 5' W.	21	—	●	—	—	H. Robert Mill, D.Sc., LL.D. T. W. E. Higgins, C.E., for the Chelsea Borough Council.
<i>Camden Square</i>	51° 33'	0° 8' W.	110	II	⊙ (B ●)	R.	—	
<i>Chelsea</i> ...	51° 29'	0° 10' W.	24	●	—	—	—	Messrs. De la Rue. The Astronomer Royal. H. R. Beeton. Athenaeum Club. W. Marriott (Asst. Sec., Royal Met. Soc.). J. G. Waller. The Staff of the Meteorological Office. J. H. Cowham.
<i>City</i> ...	51° 31'	0° 5' W.	80	—	⊙	w.(m.)	—	J. W. Harris, for A. W. Sutton. G. H. Palmer.
<i>Greenwich</i> ...	51° 28'	0° 0'	155	I	I	R.R.	—	
<i>Hampstead</i> ...	51° 34'	0° 10' W.	—	—	B	—	—	
<i>Pall Mall</i> ...	51° 30'	0° 7' W.	—	—	B	—	—	
<i>St. Norwood</i> ...	51° 26'	0° 6' W.	220	II	—	s.R.	03	
<i>Plumstead</i> ...	51° 29'	0° 6' E.	300	—	⊙	—	01	
<i>Westminster</i> ...	51° 30'	0° 8' W.	27	T	● B ⊙	D.W.M.R.	05	
" <i>Training Coll.</i>	51° 30'	0° 8' W.	107	—	⊙			
5. ENGLAND, SOUTH, AND ENGLISH CHANNEL.								
<i>Berkshire</i> — <i>Bucklebury</i>	51° 26'	1° 24' W.	409	III	—	—	05	
<i>Place.</i>								
<i>Maidenhead</i> ...	51° 30'	0° 43' W.	99	III	—	m.	04	

Dorset :—	Reading	51 26	0 57 W.	264	III	—	m.	04	J. Ridges, M.A.
	Wokingham, Sanatorium.	51 23	0 48 W.	216	III	—	m.	03	The Medical Superintendent.
	Parkstone	50 43	1 56 W.	197	●	—	—	00	C. Mabey.
Hampshire :—	Portland Bill	50 32	2 27 W.	19	T	—	D.W.M.R.	05	W. J. Batton and W. H. Taylor, Lightkeepers, for M.O.
	Shaftesbury	51 1	2 12 W.	722	III	—	W.m.	04	Rev. F. Ehlers.
	Bournemouth	50 43	1 53 W.	140 ?	III	⊙	d.w.m.	02	C. Dales, for Town Council.
	Portsmouth	50 48	1 6 W.	11	III	⊙	R.r.	05	A. Mearns Fraser, M.D., for the Corporation.
	Southampton	50 55	1 24 W.	78	II	⊙	W.M.S.R.	04	A. Vaughan, for Director-General of Ordnance Survey.
Kent :—	Swarraton	51 8	1 11 W.	310	III	—	W.m.	03	Rev. W. L. W. Eyre, M.A.
	Totland Bay	50 41	1 33 W.	84	III	⊙	m.	04	J. Dover, M.A.
	Ventnor	50 36	1 13 W.	80	III	⊙	w.m.R.	04	Miss M. Gibson, for Royal National Hospital for Consumption.
	Broadstairs	51 21	1 26 E.	140	●	⊙	d.(m.)	—	W. H. White and Rev. H. C. V. Snowdon, for District Council.
	Canterbury	51 17	1 5 E.	39	II	⊙	R.	05	A. Lander.
	Dover	51 7	1 18 E.	198	●	—	—	96	H. E. Stilgoe, C.E.
	Dungeness	50 55	0 58 E.	21	T	—	D.W.M.	05	W. Pender and W. C. Lewis, Lightkeepers, for M.O.
	Folkestone	51 5	1 11 E.	121	III	⊙ (●)	d.m.	05	A. E. Nichols, M.Inst.C.E., for the Corporation.
	Hildenborough	51 13	0 15 E.	160	●	—	—	—	Charles H. Scott.
	Kearsney Abbey	51 8	1 17 E.	100 ?	●	—	—	96	The late C. W. Curtis, J.P., and Mrs. Curtis.
	Chilton Farm.	51 8	1 17 E.	125	●	—	—	—	H. E. Stilgoe, C.E.
Margate Ramsgate	Littlestone-on- Sea.	50 59	0 59 E.	—	—	⊙	d.w.(m.)	05	H. T. Tubbs.
	Margate	51 24	1 24 E.	83	III	⊙	d.w.m.	03	J. Stokes, J.P.
	Ramsgate	51 20	1 25 E.	—	—	⊙	w.(m.)	04	T. G. Taylor, C.E., for the Cor- poration.

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

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				Eye Obs.	Self-recording.			
5. ENGLAND, SOUTH, AND ENGLISH CHANNEL—cont.								
Kent—cont.								
Sandgate	51° 4'	1° 9' E.	50	●	—	—	99	A. Robert Bowles, C.E.
Sandwich	51° 17'	1° 20' E.	6	●	—	—	03	Royal St. George's Golf Club.
St. Tunbridge Wells	51° 8'	0° 16' E.	421	III	⊙	W.m.	—	F. G. Smart, M.B.
Caterham	51° 17'	0° 5' W.	606	III	—	—	03	P. E. Campbell, M.B.
Epsom	51° 20'	0° 17' W.	160	III	—	m.	—	S. C. Russell.
Kew	51° 28'	0° 19' W.	18	I	I	w.m.s.R.	05	C. Chree, Sc.D., F.R.S., Superintendent of the Observatory Department, National Physical Laboratory, for the Meteorological Office.
					(B) —	—	—	W. H. Dines, B.A., F.R.S.
Oxshott	51° 20'	0° 15' W.	200	—	—	—	—	R. H. Curtis.
Warlingham	51° 18'	0° 3' W.	609	●	—	—	—	The Superintendent, for the Royal Horticultural Society.
Wisley	51° 17'	0° 26' W.	150	III	⊙	W.m.	03	H. C. L. Morris, M.B., and A. G. Thompson.
Bognor	50° 47'	0° 40' W.	20	III	⊙	d.w.m.	—	A. Newsholme, M.D., for the Corporation.
Brighton	50° 49'	0° 8' W.	31	III	⊙	d.w.m.R.r.	03	John Howe.
Cuckfield	51° 1'	0° 9' W.	389	●	—	—	97	R. Sheward, and S. R. Henderson, for the Medical Officer of Health.
Eastbourne	50° 46'	0° 17' E.	39	II	⊙	d.w.m.s.R.	05	Rt. Hon. J. Bryce, D.C.L., M.P.
Forest Row	51° 7'	0° 2' E.	619	●	—	—	—	Rev. H. H. Breton, M.A.
Hastings	50° 51'	0° 34' E.	99	●	—	—	00	Walter Field.
Cemetery	50° 52'	0° 34' E.	499	●	—	—	—	
Sussex:—								

Hastings Water-works.	50 51	0 34 E.	270	—	⊙	d.w.(m.)	03	— Farnham, for the Corporation.
Lewes...	50 52	0 1 E.	57	●	+	—	—	C. Brand.
St. Leonards ...	50 51	0 33 E.	178	II	—	W.m.s.	03	H. Colborne, M.R.C.S., for the Corporation.
West Marina.	50 51	0 32 E.	207	III	—	—	03	T. Eldridge, for the Corporation.
Watergate Park	50 56	0 55 W.	239	●	—	—	99	W.M. Christy.
Westbourne ...	50 52	0 55 W.	30	—	⊙	(m.)	99	Rev. L. P. Birkett.
Worthing ...	50 49	0 22 W.	33	III	⊙	d.w.m.	04	Frank Roberts, A.M.I.C.E., for the Corporation.
Wilts:—								
Marlborough ...	51 25	1 44 W.	424	III	⊙	w.m.	—	J. C. Alsop.
Salisbury ...	51 4	1 51 W.	180	II	—	R.	04	Thos. Challis, for the Earl of Pembroke, G.C.V.O.
Channel Islands:—								
Guernsey, Villa Carey.	49 27	2 32 W.	180	III	⊙	W.m.	04	F. E. Carey, M.D.
" Brooklyn	49 27	2 31 W.	297	II	⊙ (B θ)	m.R.	04	Adolphus Collenette.
Jersey, St. Aubin's.	49 12	2 11 W.	25	T	—	D.W.M.R.	04	J. Fisher, for M.O.
" St. Helier's.	49 11	2 6 W.	—	—	⊙	d.w.(m.)R.	04	Signal Officer, Fort Regent, for M.O.
6. SCOTLAND, WEST, AND ISLE OF MAN.								
Argyleshire:— Gruline, Isle of Mull.	56 30	6 0 W.	100	●	—	—	—	J. W. Melles.
Laudale ...	56 41	5 41 W.	14	II	—	W.M.S.	04	J. A. Fletcher, for T. H. G. Newton, M.A.
Poltalloch ...	56 8	5 30 W.	132	II	—	s.	05	D. S. Melville, for Lord Malcolm.

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				Eye Obs.	Self-recording.			
6. SCOTLAND, WEST AND ISLE OF MAN—cont.								
Ayr:— No station.	55° 50'	5° 4' W.	115	II	—	s.	05	Robert Henderson.
Bute:— *Rothesay ..	55° 4'	3° 36' W.	70	II	—	W.	—	Rev. W. Anderson.
Dumbarton:— No station.	54° 52'	4° 12' W.	120	II	—	W.M.S.	05	W. Thomson, for H. G. Murray Stewart.
Dumfries:— *Dumfries...	55° 2'	3° 37' W.	72	II	—	s.	04	A. Peacock.
Kirkcudbright:— *Cally ..	55° 53'	4° 18' W.	180	I	I	W.M.S.	05	Prof. L. Becker, Ph.D., for the Meteorological Office.
Lanark:— *Cargen ... Glasgow ...	55° 46'	4° 15' W.	440	III	⊙	—	—	John Wilson, for A. Henderson Bishop.
Renfrew:— No station.	54° 10'	4° 29' W.	137	II	⊙ B	W.M.S.	04	A. W. Moore, M.A., J.P., C.V.O.
Stirling:— No station.								
Wigton:— No station.								
Isle of Man:— Cronkbourne								
7. ENGLAND, NORTH WEST, AND NORTH WALES.								
Cheshire:— Bidston ...	53° 24'	3° 4' W.	188	I, T	(I) †	D.W.M.s.R r.	04	W. E. Plummer, M.A., F.R.A.S., for the Mersey Docks and Har- bour Board.

Chester (Hawarden Bridge).	53 12	3 1 W.	22	III	—	W.m.	04	F. B. Summers.
Chester (Rutland Cottage).	53 12	2 54 W.	59	III	—	—	—	Rev. J. Cairns Mitchell, B.D.
Hoylake ...	53 23	3 12 W.	30†	III	⊙	w.m.	02	Tom Robinson, for Urban District Council.
Aspatria ...	54 46	3 21 W.	250	II	⊙ (س)	W.m.R.	04	J. Smith Hill, B.Sc., Agricultural College.
Carlisle ...	54 53	2 57 W.	111	II	—	R.	04	Studholme Cartmell, for the Corporation.
Newton Rigg	54 40	2 49 W.	559	II	⊙	W.M.	05	W. T. Laurence, for the Cumberland County Council.
Uldale (Chapel House Reservoir).	54 43	3 9 W.	509	●	—	—	—	T. Strong, for Aspatria and Silloth Water Board.
Lancashire:—Blackpool ...	53 48	3 3 W.	66	III	B ⊙ (س ●)	d W.m.	05	F. J. H. Coutts, M.D., for the Corporation.
Carnforth (Over Kellet).	54 8	2 44 W.	174	III	⊙	m.	05	W. Farrer.
Darwen ...	53 41	2 28 W.	710	III	⊙	d.	05	G. Mainland, for the Corporation.
Fleetwood ...	53 56	3 1 W.	—	—	س	—	05	The Urban District Council, for the Meteorological Office.
Rossall ...	53 55	3 2 W.	—	—	B	—	—	T. G. Benn.
Manchester (Oldham Road).	53 29	2 13 W.	190	II	⊙	s.R.	04	J. Niven, M.A., M.B., for the Corporation.
" (Whitworth Park).	53 28	2 14 W.	125	II	⊙ (B س)	d.M.	04	Prof. Schuster, Sc.D., F.R.S.

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				Eye Obs.	Self-recording.			
7. ENGLAND, NORTH WEST, AND NORTH WALES—cont.								
Lancashire—cont. Manchester (Prestwich).	53 32	2 17 W.	320	II	☉	W.m.s.r.	04	T. R. H. Clunn, M.D.
Preston ...	53 46	2 42 W.	148	III	—	r.	04	H. O. Pilkington, M.R.C.S., for the Corporation.
Southport ...	53 39	2 59 W.	37	I	(I) ☉	d.w.m.	03	J. Baxendell, for the Corporation.
Stonyhurst ...	53 51	2 28 W.	375	I	I	W.M.S.R.	05	Rev. W. Sidgreaves, S.J., for M.O.
Westmorland:—Kirkby Lons- dale.	54 12	2 36 W.	304	●	—	—	—	R. A. Clarke.
Anglesey:—Holyhead(Har- bour Office).	53 18	4 39 W.	57	—	☼	—	05	F. M. Cotton, C.E., for M.O.
“(Sailor’s Home). ”	53 18	4 39 W.	48	T	—	D.W.M.	05	T. Chope. Sailors’ Home, for M.O.
Carnarvon:—Llandudno ...	53 21	3 50 W.	71	II	☉	d.W.m s.R.	04	William Little, for the Town Council.
P e n r h y n Quarry.	53 10	4 6 W.	527	●	—	—	01	W. G. Griffith, for E. A. Young
Bettws-y-Coed	53 7	3 53 W.	101	II	☉	d.W.M.	04	Dr. H. W. Fox.
Llanbedr Hall (Ruthin).	53 8	3 17 W.	449	●	—	—	—	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.	05	A. A. Goodall, for District Council.
Aberdovey ...	52 33	4 4 W.	—	—	☉	w.m.	05	W. J. Eves.
Towyn ...	52 35	4 5 W.	10	III	☉	d.m.	05	E. Lewys Lloyd, M.D.
Montgomery:—No station.								

8. SOUTH WALES AND ENGLAND, SOUTH WEST.					
Brecknock :—	Llangammarch Wells.	52 7	3 32 W.	550	III
Cardigan :—	Aberystwyth...	52 25	4 4 W.	59	III
Carmarthen :—	Llandovery	51 59	3 48 W.	248	●
Glamorgan :—	Cardiff ...	51 28	3 10 W.	50	III
Pembroke :—	Port Talbot ...	51 34	3 45 W.	179	●
	Haverfordwest.	51 48	4 58 W.	93	(II)
	St. Ann's Head	51 41	5 11 W.	149	T
	Tenby ...	51 41	4 42 W.	79	—
Radnor :—	Disserth ...	52 13	3 24 W.	711	●
	Rhayader Watershed:	52 18	3 29 W.		
	Nantgwillt	—	—	767	●
	"	—	—	753	●
	Abergwngy...	—	—	1,199	●
	Bwlch y Rhendre.	—	—	1,584	●
	Claerwen ...	—	—	1,249	●
	Nant-y-car ...	—	—	1,544	●
	Pryddellau ...	—	—	1,709	●
	Tremynydd ..	—	—	831	●
Cornwall :—	Falmouth ...	50 9	5 4 W.	167	I
	" Pen-dennis Castle.	50 8	5 3 W.	—	—

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				Eye Obs.	Self-recording.			
8. SOUTH WALES AND ENGLAND, SOUTH WEST—cont.								
Cornwall—cont. Newquay ...	50° 25'	5° 4' W.	250?	III	☉	W.(m.)	04	C. C. Vigurs, B.A., M.D., for Urban District Council.
Devonshire:—								
Scilly ...	49° 56'	6° 18' W.	131	T	B	D.W.M.R.	05	A. Hicks, for M.O.
Arlington Court ...	51° 8'	3° 58' W.	613	III	—	W.m.	04	Lady Chichester.
Barnstaple ...	51° 5'	4° 3' W.	24	III	—	R.	04	Thos. Wainwright, for the North Devon Athenæum.
Cullompton ...	50° 51'	3° 23' W.	202	III	☉	W.m.	04	T. Turner, J.P.
Plymouth ...	50° 22'	4° 8' W.	116	II	☉ (B)	d.W.M.S.R.r.	04	H. Victor Prigg, A.M.I.C.E., for the Corporation.
Rousdon ...	50° 43'	3° 0' W.	515	II	(B)	s.	04	C. Grover, for The Hon. Lady Peck.
Salcombe ...	50° 14'	3° 46' W.	300	—	☉	(m.)	04	W. Barrington Prowse, M.D.
Torquay ...	50° 28'	3° 31' W.	286	III	☉	d.w.(m.)	00	F. March, for the Corporation.
Whitchurch ...	50° 32'	4° 6' W.	593	II	—	s.	04	E. E. Glyde.
Woolacombe ...	51° 10'	4° 12' W.	59	II	☉	S.R.	04	B. Fanshawe.
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.
Pant-yr-eos ...	51° 38'	3° 4' W.	449	●	—	—	00	
Ynys-y-fro ...	51° 38'	3° 3' W.	151	●	—	—	00	
Bath ...	51° 23'	2° 21' W.	66	T, III	(B) ☉	D.W.M.R.	04	W. H. Symons, M.D., for the Corporation.
Monmouth:—								
Somerset:—								

9. IRELAND, NORTH.									
Antrim :—	Belfast ...	...	54 35	5 56 W.	61	II	—	R.	03
	Glenarm ...	...	54 58	5 56 W.	41	●	—	—	—
	Larne Harbour	...	54 51	5 49 W.	—	—	B	—	—
Armagh :—	Armagh ...	...	54 21	6 39 W.	196	II	☉	W.M.S.R.	05
Cavan :—	No station.	...							
Donegal :—	Dunfanaghy ...	...	55 11	7 58 W.	54	III	—	—	—
	Malin Head ...	...	55 23	7 24 W.	230	T	B	D.W.M.R.r.	05
	Rosbeg	...	54 50	8 30 W.	—	—	B	—	05
	(Narin).	...							
Down :—	Donaghadee ...	...	54 38	5 32 W.	40	T	—	D.W.M.R.r.	05
Fermanagh :—	No station.	...							
Galway :—	Ardfry ...	...	53 19	9 0 W.	—	—	B	—	—
	Recess ...	...	53 28	9 44 W.	89	●	—	—	—
Leitrim :—	Carrigallen ...	...	53 58	7 38 W.	350?	●	—	—	—
Londonderry :—	No station.	...							
Longford :—	No station.	...							
Louth :—	No station.	...							
Mayo :—	Blacksod Point	...	54 6	10 4 W.	37	T	—	D.W.M.R.r.	05
	Mallaranny ...	...	53 55	9 40 W.	119	●	—	—	02
Meath :—	No station.	...							
Monaghan :—	No station.	...							
Roscommon :—	No station.	...							
Sligo :—	Markree Castle	...	54 11	8 27 W.	122	II	☉	W.M.S.R.	03
Tyrone :—	Edenfel, Omagh	...	54 36	7 19 W.	300	III	—	W.m.	03
	Lissan ...	...	54 41	6 45 W.	300	II	—	s.	—
Westmeath :—	No station.	...							

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

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 inspec- tion.	Observer.
				Eye Obs.	Self-recording.			
10. IRELAND, SOUTH.								
Carlow :— Clare :—	52 51 52 57 52 48 52 56 52 53 52 46	8 59 W. 9 17 W. 8 38 W. 9 21 W. 9 16 W. 8 53 W.	38 130 157 52 479 85	● ● ● ● ● ●	— — — — — —	— — — — — —	— — — 99 98 98	Miss A. L. Scott. Rev. C. W. McDowell, M.A. Lt.-Col. W. O. Bentley, R.A. Miss I. F. K. Bowes. Lt.-Col. Tottenham. Alfred Barker, for W. W. A. Fitzgerald.
Cork :—	51 52 52 13 51 47	8 10 W. 8 34 W. 8 15 W.	24 266 32	III ● T	⊙ — —	w.m. — D.W.M.R.r.	04 — 05	John H. Bennett. Capt. J. W. Evans, J.P. M. FitzMahoney, Post Office, for M.O.
Dublin :—	51 47 53 20 53 22 53 23 53 21 53 16 53 16 53 17 53 17	8 15 W. 6 15 W 6 21 W. 6 16 W. 6 16 W. 6 14 W. 6 7 W. 6 8 W. 6 8 W.	— 47 155 67 12 200 249 42 —	— II II II II III ● III —	☞ B ⊙ — ⊙ — — ⊙ ☞	— W.m.s.R. w.M.S. m.s. M. (R.) — — m. —	— 03 05 04 04 — — 03 05	Captain G. Usborne, for Cork Harbour Commissioners. Sir John W. Moore, M.D., D.Sc. Col. A. D. Meeres, R.E., and Major R. W. H. Buckland, R.E., Ordnance Survey Office. F. W. Moore, M.R.I.A. M. S. Moore and T. H. Hill. Dr. Arthur S. Goff. R. O'Brien Furlong, C.B. Dr. J. B. Power, for the Corporation. Robert Gray, C.E., for H.M. Office of Works.

Kerry:—	Castle Gregory ...	52 15	10 1 W.	34	●	—	—	—	Admiral E. F. Jeffreys, C.V.O.
	Killarney ...	52 4	9 30 W.	174	III	—	W.m.R.	03	E. W. Griffin, M.D.
	Valencia... ..	51 56	10 15 W.	30	I	I, B	D.W.M.s.R.r.	05	J. E. Cullum, for M.O.
	" Glanleam	51 56	10 20 W.	—	●	(B θ)	m.	01	A. O'Donoghue.
Kildare:—	Clongowes Wood	53 19	6 41 W.	237 ?	III	—	—	05	Rev. W. P. Hackett, S.J., and A. E. Coulthard, B.Sc.
	College.								H. Carlton, for the Marquis of Ormonde, K.P.
Kilkenny:—	Kilkenny	52 39	7 14 W.	212	III	B	W.m.	02	W. J. Roe and J. H. Skerritt, for the Earl of Rosse, K.P.
King's Co.:—	Birr Castle	53 6	7 55 W.	175	II, T	○	D.W.M.S.R.r.	05	Poole Gabbett.
Limerick:—	Corbally...	52 39	8 36 W.	59	●	—	—	02	J. J. Alcorn, for Lord Monteagle, K.P.
	Foynes ...	52 37	9 7 W.	108	III	—	W.m.	02	A. W. Shaw.
	Roxborough	52 35	8 36 W.	107	●	—	—	02	Harbour Authorities. J. N. White.
Queen's Co.:—	No station.				—	B	—	02	B. H. Steede, M.A., M.D.
Tipperary:—	No station.	52 16	7 7 W.	—	III	—	W.m.R.	—	
Waterford:—	Waterford	52 16	7 7 W.	207	—	—	—	02	
Wexford:—	No station.				II	—	—		
Wicklow:—	Newcastle	53 5	6 6 W.	256	—	—	—		

The names of Stations added to the list since April, 1905, are printed in clarendon type; those of Stations now discontinued are printed in italic type.

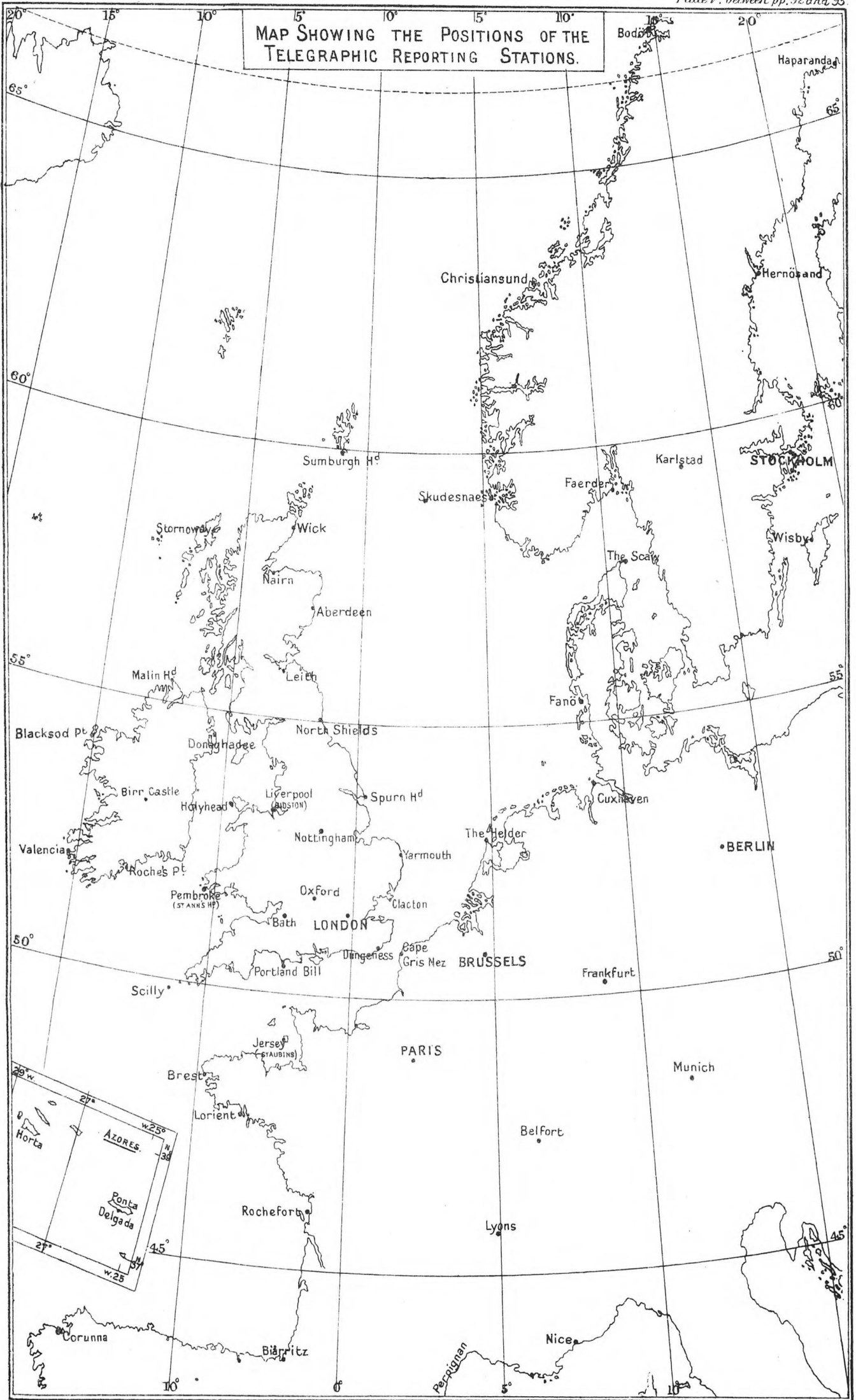
LIST OF FOREIGN STATIONS FROM WHICH REPORTS ARE
RECEIVED DAILY BY TELEGRAPH. See PAGE 56.

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

Note.—The stations marked (¹) report also at 2h. p.m., and those marked (²) at 6h. p.m.
Lisbon reports at 4h. p.m. instead of 6h. p.m., and Ponta Delgada at 3h. p.m.
No reports are received from the Helder at 6 p.m. on Sundays.

LIST OF RECIPIENTS OF HARVEST FORECASTS (see p. 30) who have kept and returned to the Office a daily record of weather experienced, for the purpose of an independent checking of the forecasts as issued.

M. R. Pryor, Weston Hall, Stevenage, Herts.
T. G. Binney, Guisnes Court, Tolleshunt D'Arcy.
F. Stacey, Wickham Hall, Bishops Stortford.
E. S. Hawkins, Halstead, Essex.
J. Durrant, Westbury, Hitchin, Herts.
G. Wallace Willows, Orton Manor, Kettering.
R. C. Warner, Oaksey, nr. Malmesbury, Wilts.
H. V. Legh, Chyknell, Bridgnorth.
J. Norris, Pagehurst, Staplehurst.
W. Nye, Horsham.
F. R. Allen, Addlestone.
J. S. Kerr, Cholderton, Salisbury.
A. C. Young, Bulford, Wilts.
W. B. Gauntlett, Collingbourne, Kingston, Marlborough, Wilts.
G. Willis, Wroughton, Swindon.
E. L. Clare, Brinscall, Chorley.
G. J. B. Lees, Woodhill, Oswestry.
W. Little, Llandudno.
J. C. Darby, Leap Castle, Roscrea, Ireland.



LIST OF SEA TEMPERATURE STATIONS.

*Aberdeen, Cove Bay.	*Liscannor, Co. Clare.
*Arran, North, Galway.	†Morecambe Bay Lightship.
†Bahama Bank Lightship.	†Newarp Lightship.
*Ballantrae, Ayrshire.	*Newquay, Cornwall.
*Ballydonegan, Co. Cork.	†North Arklow Lightship.
*Ballyglass, Co. Mayo.	†North-West Lightship.
†Barrels Rock Lightship.	†Outer Dowsing Lightship.
*Blacksod Point, Co. Mayo.	†Owers Lightship.
† Blackwater Bank Lightship.	*Pennan Bay, Aberdour.
*Burnmouth, Ayton, Berwick.	*Port Erin.
*Burntisland.	*Portrush.
†Caernarvon Bay Lightship.	†Royal Sovereign Lightship.
†Cardigan Bay Lightship.	†St. Ann's Head, Pembroke.
*Cleggan, Co. Galway.	*Salcombe, Devon.
†Coningbeg Lightship.	*Scarborough.
*Cromarty.	*Scilly Islands, St. Mary's.
†Daunts Rock Lightship.	*Seafeld, Co. Clare.
¹ Eastbourne.	†Seven Stones Lightship.
†East Goodwin Lightship.	†Shambles Lightship.
†English and Welsh Grounds Lightship.	*Sheephaven, Dunfanaghy.
† Fastnet Rock Lighthouse.	†Shipwash Lightship.
² Holyhead Harbour Office.	†Skulmartin Lightship.
*Kilcredane, Co. Clare.	†Solway Lightship.
³ Kingstown, Sandy Cove.	† South Arklow Lightship.
*Kirkwall.	†South Rock Lightship.
†Kish Bank Lightship.	†Spurn Lightship.
*Lamlash, Isle of Arran.	*Stornoway.
†Leman and Ower Lightship.	*Sunderland.
*Lerwick.	*Teelin, Co. Donegal.
	*Uzon, Montrose.
	*Wick.

The names of Stations added to the list since last Report are printed in clarendon type.

The observers are indicated thus :—* Coastguard, † Lightkeepers, ¹ S. R. Henderson, ² F. M. Cotton, C.E., ³ A. Carson, ⁴ A. Hicks.

LIST OF STATIONS in the COLONIES and DEPENDENCIES and in FOREIGN COUNTRIES from which RETURNS are received in MANUSCRIPT.

NOTE.—Returns received in printed form are included in Appendix VII.

Station.	Latitude.	Longitude.	Height in Feet above M.S.L.	Order of Station. (See p. .)	Year of Commencement of Observations.	Observer.
MEDITERRANEAN.						
Cyprus, †Famagusta ...	35 7 N.	33 57 E.	34	II	1881	L. Bérand, for Dr. Heidenstam, C.M.O.
" †Kyrenia ...	35 21 N.	33 19 E.	54	II	1881	P. Michaelide " "
" †Larnaca... ..	34 55 N.	33 37 E.	19	II	1881	P. Nicopoulos " "
" †Limassol	34 40 N.	33 1 E.	26	II	1881	M. Theodorides and J. Josif, for Dr. Heidenstam, C.M.O.
" †Nicosia... ..	35 11 N.	33 22 E.	493	II	1881	J. Samaras and T. G. Farhat, for Dr. Heidenstam, C.M.O.
" †Papho	34 46 N.	32 25 E.	202	I	1881	Y. V. Zachariades, for Dr. Heidenstam, C.M.O.
Gibraltar	30 6 N.	5 21 W.	48	II	1883	Sergt. M. Davis, for Col. J. McNamara, M.D., C.M.O.
Morocco, †Cape Spartel ...	35 47 N.	5 55 W.	191	II	1893	Edwin C. Hathaway, for Lloyds.
" Casablanca	†33 37 N.	7 34 W.	4	●	1896	G. H. Lerman.
" Mogador	31 30 N.	9 42 W.	19	●	1903	A. M. Madden, H.B.M. Vice-Consul.
" Safi	†32 17 N.	9 8 W.	40	●	1905	John Aussi.
Syria, Beyrout	33 54 N.	35 28 E.	172	II	1883	Robt. H. West, M.A.
AFRICA.						
East :—						
Upper Sheikh	9 56 N.	45 11 E.	4,595	III	1903	Dr. R. E. Drake Brockman.
Central :—						
Eastern Sudan, Wadelai ...	†2 40 N.	31 35 E.	2,200	III	1901	F. N. Dias.
Uganda, Butiaba	—	—	—	●	1904	R. K. Mitter.
" Bugala, Serre Island ...	—	—	—	●	1904	Rev. H. T. C. Weatherhead.
" Entebbe	0 4 S.	32 30 E.	3,906	III	1896	T. Remedios and E. Brown.
" Fort Portal	†0 40 N.	30 20 E.	5,299	III	1901	E. Coutinho.
" Gondokoro	†4 54 N.	31 44 E.	1,500	III	1901	J. R. M. Silva.

Jinja ...	...	0	24 N	33	13 E.	3,650	III	1901	W. A. Densham and S. M. Inudalia.
Lumbuyu Hill	...	—	—	—	—	—	●	1896	A. Watson.
Masaka	...	+0	20 S.	31	50 E.	—	III	1902	C. G. Dislei.
Mbarara	...	+0	39 S.	30	49 E.	4,500	III	1901	J. J. de Sousa.
Nimule	...	3	38 N.	32	11 E.	2,083	III	1903	A. S. Pinto and E. Gracias.
West Central :—	...	0	34 N.	25	1 E.	—	III	1905	S. Osborne Kempton.
Upper Congo, Yakusu	...	—	—	—	—	—	—	—	—
West :—	...	—	—	—	—	—	—	—	—
Gold Coast, Aburi	...	+5	35 N.	0	6 W.	—	III	1893	E. C. Andrews, for Director of Agriculture.
" Accra	...	+4	50 N.	2	12 W.	—	III	1893	Dr. R. H. Kennan and Dr. C. H. D. Ralph.
" Axim	...	+5	15 N.	0	30 W.	—	III	1895	Dr. A. Macqueen and Dr. A. E. Horn.
" Cape Coast Castle	...	+10	31 N.	0	26 W.	—	III	1895	Dr. W. W. Claridge and Dr. H. T. Cookman.
" Gambaga	...	+6	50 N.	2	16 W.	—	III	1899	Dr. G. L. Barker and Dr. C. V. Le Fanu.
" Kumasi	...	+5	59 N.	0	59 E.	—	III	1895	Dr. G. J. Rutherford.
" Kwitta	...	5	0 N.	1	40 W.	—	III	1904	Dr. F. S. Harper and Dr. D. Cowin.
" Sekondi	...	8	30 N.	13	9 W.	179	II	1895	Dr. E. L. Hunt, C.M.G., and F. Mayer.
Sierra Leone	...	—	—	—	—	—	—	—	Dr. H. S. Taylor, Capt. R.A.M.C., and Dr. H. Hurrick, Capt. R.A.M.C.
WEST INDIES.	...	—	—	—	—	—	—	—	—
Bahamas, † Abaco	...	25	52 N.	77	11 W.	70	II	1859	J. W. Roberts.
" † Cay Lobos	...	22	33 N.	77	36 W.	15	II	1877	C. S. E. Lotmore and S. W. Roberts.
" † Cay Sal	...	23	42 N.	80	25 W.	30	II	1859	Lightkeepers.
" † Inagua	...	21	21 N.	73	1 W.	21	II	1871	J. A. Williams.
" Nassau	...	+25	2 N.	77	25 W.	—	III	1895	P. H. Burns, Supt. Bahamas Cable.
" † Watling's Island	...	23	57 N.	74	28 W.	60	II	1889	T. R. Thompson, sear.
Barbados	...	+13	12 N.	59	35 W.	181	II	1895	John R. Bovill.
† Sombbrero	...	18	36 N.	63	28 W.	30	II	1867	J. A. Richardson and A. L. Richardson.

* 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.

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. (See p. .)	Year of Commencement of Observations.	Observer.
AMERICA.						
Central :—						
†Panama, Colon ...	9° 23' N.	79° 23' W.	—	II	1897	The Ven. Archdeacon S. P. Hendrick.
South :—						
British Guiana, Georgetown...	6° 49' N.	56° 10' W.	0	⊙	1887	E. S. Christiani.
ATLANTIC.						
South :—						
Falkland Islands :—						
*Cape Pembroke ...	51° 41' S.	57° 42' W.	70	II ⊙	1859	J. Pearce.
†Stanley ...	—	—	—	⊙	—	His Excellency W. L. Allardyne.
†St. Helena, St. Matthew's Vicarage.	16° 0' S.	5° 40' W.	1,887	II nd	1885	A. L. C. Hands.
" Central, Oak Bank	—	—	1,696	●	1902	J. Homagee.
" St. Paul's Vicarage	—	—	1,694	●	1905	Alfred Porter.
INDIAN AND PACIFIC OCEANS, &c.						
China :—						
Chinkiang ...	32° 10' N.	119° 40' E.	36	II ⊙	1903	Capt. Louis H. Tamplin.
Mauritius, Royal Alfred Observatory.	20° 6' S.	57° 31' E.	181	(I)	1901	T. F. Claxton.
†Ocean Island ...	0° 52' S.	169° 35' E.	100	II B.	1905	J. G. Talbot and J. H. Laugley, for the Pacific Phosphate Company.

* 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.

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

1. Periodical Publications.

Daily Weather Reports. Subscription, 5s. per quarter.

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

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

1889-1906. Vols. VI.-XXIII. 6d. per week. Annual subscription, including Supplements and Appendices, 30s.

Monthly Meteorological Charts of the North Atlantic and Mediterranean and of the Indian Ocean. See Marine Meteorology.

Monthly Weather Reports :—

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

Quarterly Weather Reports :—

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.

Annual Volumes :—

Reports of the *Meteorological Committee* of the Royal Society :—

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

Reports of the *Meteorological Council* :—

1878-1905. At prices varying from 5d. to 1s. 2d., except 1884-5, 4s.

Report of the *Meteorological Committee* :—

1905-06. Price .

* These 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 Booksellers; Pilot Charts and Charts published by the Admiralty, by Messrs. J. D. Potter & Co.

† These have from time to time contained Tables of Mean Values and papers on various Meteorological Investigations. A List of the more important of these contributions to Meteorological knowledge will be found in Appendix XI. of the Report for 1903-04.

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

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

1. Periodical Publications—continued.*Observatories and Stations.*

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

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

1900 to 1903. 25*s.* each, or 6*d.* per month each station. 1904 in the Press.

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

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

Meteorological Observations at Stations of the Second Order :—

†1876–1901. At prices varying from 20*s.* to 35*s.*

2. Occasional Publications and Reports.**ATLAS :—**

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

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

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

Vienna. 1873. (Official, No. 21.) 1*s.*

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

London. 1874. Maritime Meteorology. (Official, No. 23.) 2*s.*

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

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

Rome. 1879. (Official, No. 36.) 1*s.* 6*d.*

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

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

Paris. 1885. (Non-Official, No. 16.) 1*s.*

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

Munich. 1891. (Official, No. 102.) 1*s.* 6*d.*

Upsala. 1891. (Official, No. 115.) 1*s.*

Paris. 1896. (Official, No. 127.) 1*s.*

St. Petersburg. 1899. (Official, No. 148.) 2*s.*

Southport. 1903. (Official, No. 164.) 2*s.*

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

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

Fog :—

London Fog Inquiry, 1901–03. (Official, No. 160. 1904) :—

Report of the Council, with Report by R. G. K. Lempfert, M.A. (1904). 2*s.* 6*d.*

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

FOREIGN AND COLONIAL STATIONS :—

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

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

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

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

2. Occasional Publications and Reports—*continued.*

FOREIGN AND COLONIAL STATIONS—*continued.*

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

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

Climatological Observations at Colonial and Foreign Stations:—

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

RAINFALL:—

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

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

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

SUNSHINE:—

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

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

TEMPERATURE:—

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

WIND.

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. (Official, No. 180. 1906.) 1s. 6d.

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

Barometer Manual for the Use of Seamen. With an Appendix on the Thermometer, Hygrometer, and Hydrometer. Fifth Edition, extensively Revised. 1905. (Official, No. 61.) 3d.

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

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

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

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

FORECASTING:—

Aids to the Study and Forecast of Weather.—By W. Clement Ley, M.A. (Official, 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. (Official, No. 60.) [Out of Print.]

4. Marine Meteorology.**CHARTS :—***Arabian Sea :—*

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

Atlantic :—

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

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

Atlantic (North) :—

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

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

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

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

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

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

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

Atlantic (South) :—

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

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

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

The relation between Pressure, Temperature, and Air Circulation over the South Atlantic Ocean. (Official, No. 177. 1905.) 9d.

Atlantic, Indian, and Pacific Oceans :—

Charts showing the Surface Temperature of the Atlantic, Indian, and Pacific Oceans. (Official, No. 59. Second Edition, 1903.) 4s. 6d.

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

4. Marine Meteorology—continued.

CHARTS—continued.

Indian Ocean:—

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

Monthly Meteorological Charts of the Indian Ocean. (Official, No. 181.)

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

Indian Ocean (South):—

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

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

Pacific Ocean:—

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

Red Sea:—

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

Southern Ocean:—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (Official, No. 123. 1899.) [Out of print. New Edition in preparation.]

OTHER PUBLICATIONS ON MARINE METEOROLOGY:—

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

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

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

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

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

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

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

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

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

5. Miscellaneous Publications.

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

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

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

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

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. (Official, No. 174. 1906.) 7*s* 6*d*.

APPENDIX III.

LIST of CAPTAINS who have sent in Logs classed as "Excellent" during the year ending March 31, 1906. 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.
Anderssen, C. B.	2	S.S. Italian Prince.
Bayldon, F. J., Sub-Lieut., R.N.R.	2	S.S. Induna.
Bennett, C. D., Commr., R.N.R.	3	S.S. Macedonia.
Castle, E. W.	1	S.S. Miami.
Eagleton, H. A., Lieut., R.N.R.	2	S.S. Napolitan Prince.
Ellis, A. E.	1	S.S. Alabama.
Falla, J. F.	1	S.S. Gladiator.
Heron, A.	1	S.S. Alva.
MacIntosh, C. F.	1	S.S. Clan Ranald.
Mayoss, F., Lieut., R.N.R. ...	1	S.S. Ruapehu.
McKellar, A. W.	1	S.S. Tongariro.
Millican, J. W.	26	S.S. Greta Holme.
Monro, Commr. C. E., R.N. ...	1	H.M.S. Rambler.
Mullan, F. C., F.R.G.S. ...	18	S.S. Ramsay.
Neale, H. H.	1	S.S. Manistee.
Reside, D.	1	S.S. Miami.
Robertson, J., Sub-Lieut., R.N.R.	1	S.S. Goorkha.
Robinson, J. C.	7	S.S. Armadale Castle.
Scudamore, J. H. H., Sub- Lieut., R.N.R.	1	S.S. Manistee.
Simpson, A.	41	S.S. Moravian.
Squares De Carteret, W. G. ...	23	S.S. Minia.
Sumner, H. N.	1	S.S. Clan Colquhoun.
Tait, T. A.	1	S.S. Wellington.
Webster, G. S., Lieut., R.N.R.	5	S.S. Lake Michigan.
Weston, T. S.	1	S.S. Papanui.
White-Parsons, V.	1	S.S. Wakanui.

APPENDIX IV.

METEOROLOGICAL REGISTERS received during the Year 1905-06.

(1.)—From the ROYAL NAVY.—*Meteorological Logs* (13).

H.M.S. Ship.	Commanding Officer.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Egeria" ...	J. F. Parry (Captain) ... F. C. Learmonth (Captain).	Lieutenant J. H. Nankivell ... Assistant Paymaster R. Sydney Smith; Lieutenant F. A. Reyne; and Sub-Lieutenant C. H. Jones.	1 2*	Mths. Days. 8 0 7 29	Off Vancouver Island. <i>Surveying.</i> Between Gibraltar and Sierra Leone. <i>Surveying.</i>
"Goldfinch" ...	F. H. Walter (Commander). Colin Keppel, C.B., D.S.O. (Captain). G. E. Patey, M.V.O. (Captain). C. H. Simpson (Captain)	Sub-Lieutenant C. H. Jones ... Commander C. W. C. Strickland, assisted by the Midshipmen.	1 1*	4 1 4 4	" " " In the Mediterranean.
"Implacable"	G. E. Patey, M.V.O. (Captain).	Lieutenant Kenelm E. L. Crighton, and Petty Officers J. Gallagher; O. Smith; — Yates; — Howland; and — Ellinor.	2*	8 8	In the Mediterranean and Straits.
"Penguin" ...	C. H. Simpson (Captain)	Sub-Lieutenant C. R. Dare ...	1	4 0	Off Coast of Queensland. <i>Surveying.</i>
"Rambler" ...	C. E. Monro (Commander).	Lieutenant Kenelm E. L. Crighton, and Petty Officers J. Gallagher; O. Smith; — Yates; — Howland; and — Ellinor.	2	8 4	Off Coast of Borneo. <i>Surveying.</i>
"Waterwitch"	E. C. Hardy (Captain) ... R. W. Glennie (Captain)	Lieutenant P. R. Stevens ...	1 2	2 17 9 0	Off Coast of China near Hong Kong. <i>Surveying.</i>
(2.)—SPECIAL SERVICE.—Uncommissioned Ships (4).					
"Conway," School Ship.	H. W. Broadbent, Lieut., R.N.R.	The Cadets...	1	1 25	At Birkenhead.
"Maine," Hospital Ship.	F. J. Langedoc ...	H. A. Lloyd; S. S. Allen; W. R. Tilling.	1	3 25	In the Mediterranean and to Portsmouth.

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Richmond," Light-house Tender.	F. J. Lobb, Commr., R.N.	F. W. Holden ...	1	12 0	At Nassau and ports in the West Indies.
"Worcester," Training Ship.	D. Wilson Barker, Commr., R.N.R.	The Cadets ...	1	4 2	At Greenhithe.
(3.)—From the MERCANTILE MARINE.—Meteorological Logs (254).					
"Ailsawald," S.S. ...	M. T. Hardy ...	C. Vickers ...	3	6 14 {	To Rio Janeiro, &c. To the Black Sea. To New York <i>via</i> Lisbon. Between U.S. ports and West Indies.
"Alatama," S.S. ...	A. E. Ellis ...	E. E. Scott; A. G. M. Phillips; A. E. Ellis.	2	7 13 {	From Philadelphia to Japan. To South American ports. To South Russian ports.
"Alva," S.S. ...	A. Heron ...	J. L. Vaughan; J. H. Gaskell ...	3	6 27 {	To New York, Hong Kong (<i>via</i> Cape of Good Hope) Calcutta, West Coast of South America and home.
"Anglo-Australian," S.S.	O. H. Lewis ...	W. Hansard; R. Pugh; G. Laing; G. Wylie	2	10 1 {	To Iquique <i>via</i> ports. Between British Columbia and Australia.
"Aorangi," R.M.S. ...	J. D. Sydney Phillips ...	S. Mortimer; E. C. Mason; P. W. Grierson; H. Jarvis. F. H. Swain; W. B. Davis; H. A. Deane.	2	7 3 {	To West Indies.
"Appomattox," S.S. {	E. W. Castle ... J. H. H. Scudamore, Sub-Lieut., R.N.R. B. G. Drake, Sub-Lieut., R.N.R.	F. H. Swain; W. B. Davis; B. Hope	1	0 27 { 2 14 { 3 4 {	

* And Aneroidograms.

METEOROLOGICAL REGISTERS received during the Year 1905-06—continued.

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

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Armada de Larra," S.S.	J. C. Robinson ...	D. E. Easton ; D. Hoskins ; B. Parkinson ; J. Robertson.	2	Mths. Days. 7 3	To Cape Town.
"Assyria," S.S.	F. Blight ...	A. H. Brown ; T. Richmond ; D. Munro	2	4 8	To Calcutta, From Buenos Ayres to Iquique and home.
"Asuncion de Larra," S.S.	H. C. Kramer ...	J. Duncan ; H. Naligan ; R. A. Ferns	2	6 10	To Galveston, To New Zealand.
"Athenic," R.M.S.	C. H. Kempson, Lieut. R.N.R.	G. A. Alcock, Lieut., R.N.R. ; V. W. Hickson, Lieut., R.N.R. ; H. J. Learmouth ; W. B. Starr ; J. A. Alcock ; J. L. Jones.	2	5 24	To West Indies and Central America.
"Atrato," R.M.S.	R. H. Stranger ...	E. Clarke ; W. Kennett ; J. Coppin ; J. Day ; G. S. Walker ; E. Balding ; T. R. Miles ; J. Watts ; H. M. Williams.	2	6 39	To Buenos Ayres and Bahia Blanca.
"Austriana," S.S.	H. F. Harrison ...	—, Michelson ; —, Stead ; —, Bailey	1	2 4	To Rangoon <i>via</i> Cape of Good Hope returning <i>via</i> Suez.
"Barton," S.S.	B. Maughan ...	G. Worley ; W. H. Richardson ; H. J. Dickinson ; I. J. Lewis ; H. S. Parkins.	4	7 24	To Black Sea, To Newport News, To Monte Video.
"Bellarden," S.S.	P. MacLachlan ...	L. Petterson ; H. J. Sinclair...	1	2 0	To Calcutta.
"Ben Nevis," S.S.	P. W. S. Pritchard ...	N. Gray ; A. S. Mackay ; E. Walters	1	5 7	To Bombay.
"Bombay," S.S.	H. A. Vicary ...	J. Bain ; H. McMullan ; R. Collins...	1	5 8	From Calcutta to Saigon, Madagascar returning to Calcutta and home.

"Brooklyn City," S.S.	J. J. Bailey, Sub-Lieut. R.N.R.	A. E. Athersuch ; H. Davidson	2	6	20	To New York.
"Cairndon," S.S.	Chris. Hawick	...	1	1	16	To Savannah.
"Caledonia," S.S.	W. Mallett	A. Jensen	2	4	29	To Kurrachee. To Monte Video.
"Campania," S.S.	J. Pritchard	E. A. Woodward ; G. S. Horsburgh ; C. D. Cay.	1	3	3	To New York.
"Carisbrook Castle," R.M.S.	R. F. Harries	F. Tynbridge ; H. E. Weller ; E. A. Comley.	1	2	12	To Cape Town.
"Cayo Soto," S.S.	E. C. Redder	G. H. Ellis ; R. Newlands ; T. Beer...	1	1	23	From Newport News to West Indies and back, thence to London.
"Cevic," S.S. ...	W. H. Clarke	E. Jones ; F. Brown ; G. Shaw ; M. Owen ; J. Fayster ; H. W. A. Staley.	1	3	27	To New York.
"Chickahominy," { S.S.	H. Halpin J. H. H. Scudamore, Sub- Lieut. R.N.R.	H. Phillips ; E. P. Green ; A. D. R. Risely ; Geo. Taylor.	2	2	16 { 3 6 }	To West Indies.
"China," R.M.S. (P. & O.).	G. K. Wright, Com. R.N.R.	A. V. Worthington ; J. McGregor ; J. Plumptre ; V. C. Bowles ; A. Maskell ; C. H. Druce ; R. G. Pearce ; C. J. H. Good.	3	6	16 {	To Sydney (2). To Bombay (1).
"Clan Chattan," S.S.	S. de B. Lockyer, Commr. R.N.R.	R. C. Warden, Sub-Lieut. R.N.R. ; A. Maskell ; J. McGregor ; J. Plumptre ; R. H. Gill.	1	2	20	To Sydney.
"Clan Colquhoun," S.S.	A. Weir ... H. N. Sumner	A. Scotland ; R. Swan ; F. Hawley ... G. Scott ; A. Thomson ; W. Smith ; C. L. Matthews.	1 1	2 2	7 11	To Bombay. To Calcutta.
"Clan Cumming," S.S.	F. W. T. Barber	W. L. Anderson ; T. Brocklebank ; D. Muirhead.	2	5	23 {	To Delagoa Bay <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.
"Clan MacIntyre," S.S.	H. G. Fishenden, Lieut. R.N.R.	R. Pell ; J. Mackenzie ; F. S. Piper ; E. Davies ; J. B. Gourlay.	2	6	3	To Chittagong.
"Clan MacKinnou," { S.S.	C. Jones ... D. S. Smith	J. E. McLean ; W. F. West ; G. L. Kemp ; C. T. C. Barker.	2	4	8 { 2 7 }	To India <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.
"Clan MacNab," S.S.	E. H. Howell, Lieut. R.N.R.	A. B. Lyall ; A. D. Turton ; E. R. C. Nanson.	2	5	7	To India. To Natal and India.

METEOROLOGICAL REGISTERS received during the Year 1905-06—continued.

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

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Clan MacNeil," S.S.	Samuel Beer ...	L. G. Openshaw ; R. M. Robertson ; A. McKinlay ; D. McBain.	1	Mths. Days. 3 3	To India <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.
"Clan Monroe," S.S.	T. A. Brown, Lieut. R.N.R.	A. M. Haldane ; T. A. Ensor ; H. E. Cross ; A. W. Adcock.	1	3 2	To India <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.
"Clan Ranald," S.S. ...	C. F. MacIntosh ...	C. Henderson ; D. McKinnon ; R. M. Logan ; E. S. A. Boddington ; A. W. Bigsworth, Mid. R.N.R.	1	0 26	To Ceylon (outward passage only).
"Clan Urquhart," S.S.	J. A. McPherson ...	...	3	6 18	To India.
"Corinthic," R.M.S. ...	H. F. David, Lieut. R.N.R.	C. C. Cartwright ...	1	2 29	To New Zealand.
"Crown of Navarre," S.S.	G. Grindlay ...	— Bird ; — Herschell ; — Howston ; D. Nash ; T. Jones ; D. Mack ; R. Moffatt ; R. Liddell ; G. M. Storm ; Sept. Barlow.	1	1 15	To West Indies.
"Dalegarth," S.S. ...	R. E. Page ...	...	4	7 24	To the Eastern Mediterranean and Black Sea.
"Danube," R.M.S. ...	S. R. Dickinson ...	D. McFarlane ; L. A. Steele ; D. J. Browning ; R. A. G. H. de Caen, Mid. R.N.R. ; Julian Moffatt, G. Moodie ; E. Twiddle ; J. W. Compton.	1	2 19	To the Baltic.
"Den of Ogil," S.S. ...	H. Hemming ...	...	2	4 24	To Calcutta.
"Diana," S.S. ...	A. Low ...	...	1	1 10	To Davis's Straits.
"Dilwara," S.S. ...	H. Mackay ...	...	3	6 13	To Cape Town, Durban, and home <i>via</i> Suez.
"Dilwara," S.S. ...	A. W. Mann ...	...	3	7 15	To Cape Town, Durban, and home <i>via</i> Suez.
"Druidstone," S.S. ...	S. W. Decent ...	S. J. Lyberg ; J. R. McClurry ; J. Wood	2	4 29	To Black Sea and Norway.
"Dunbarmoor," S.S. ...	Wm. Boag Barton ...	R. Smith ; R. M. Martin, Sub-Lieut. R.N.R.	1	2 29	To Monte Video, returning <i>via</i> West Indies and United States.
"Durham Castle," S.S.	F. J. Moseley, Lieut. R.N.R.	A. H. B. Blackman ...	1	1 28	To Cape Town and Durban.

"East Point," S.S. ...	L. R. W. Beavis	G. R. Parker	3	8	1	To Philadelphia.
"Eclipse," S.S. ...	W. Milne	...	1	6	29	To Davis's Straits.
"Edendale," S.S. ...	T. McDonald	...	2	5	26	To Baltic and Mediterranean.
"Egypt," S.S. (P. & O.).	J. R. London	F. Higgins; G. Say; P. Rolf; H. E. Smith; G. W. Taylor; F. M. Moore; R. H. Gill.	{ 2 }	{ 5 }	{ 9 }	To Bombay.
"Egyptian Prince," S.S.	E. R. Dowell	F. Snowden; J. Bowman	1	1	9	From New York to Kurrachee <i>via</i> Cape of Good Hope, and home <i>via</i> Suez.
"Empress of China," R.M.S.	A. McMillan	G. E. Bridge, Lieut. R.N.R.; J. Smith; W. O. C. Whell, Lieut. R.N.R.	*1	3	21	Between Vancouver and Japanese and Chinese ports.
"Empress of India," R.M.S.	O. P. Marshall, Lieut. R.N.R.	R. L. Fortier, Sub-Lieut. R.N.R.	2	1	14	
"Empress of Japan," R.M.S.	E. Beetham, Lieut. R.N.R. H. Pybus, Commr. R.N.R.	W. R. Jeffcott, Lieut. R.N.R. A. H. Reade, Sub-Lieut. R.N.R.; J. Stewart; A. Hosken, Sub-Lieut. R.N.R.	1	{ 6 }	{ 0 }	
"Erne," Ship...	G. F. Dann	...	1	5	4	Rangoon to Queenstown.
"Eva Montgomery," Ship.	Hugh Dockerty	S. M. Sherwen	1	10	13	To San Francisco.
"Gaekwar," S.S. ...	H. C. Norris	N. J. Breen; and H. Speakman	1	2	16	To Calcutta.
"Gladiator," S.S. ...	J. F. Falla	C. F. Melling; W. H. Dawson; C. W. Jones; G. A. Turner; T. Froggatt; E. J. Williams.	3	4	21	To Port Elizabeth (S.A.), Buenos Aires, and home.
"Goorkha," S.S. ...	I. Kerr, Lieut. R.N.R.	F. D. McArthur; H. Borders; H. W. Matthews.	1	2	7	To Pernambuco.
"Greenbrier," S.S. ...	J. Robertson, Sub-Lieut. R.N.R.	F. D. McArthur; H. Borders; G. A. Spedding.	1	2	0	To Calcutta.
"Greta Holme," S.S.	D. Reside	C. Hudson	2	7	28	From Suez to Calcutta and London.
"Hostilius," S.S. ...	J. W. Millican	T. Stark; W. E. Parkes	1	3	15	To Central America and West Indies.
	H. R. C. Lockyer	T. Jones; E. Kinley; J. Ross	1	3	23	To Brazil, Durban, Angra Pequena and Buenos Aires.
						To Cape Town, Monte Video, and New York, thence to Monte Video, returning to Para.

* And Aneroidograms.

METEOROLOGICAL REGISTERS received during the Year 1905-06—continued.

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

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"India," S.S. (P. & O.)	F. W. Vibert, Commr. R.N.R.	H. W. A. Clark; C. D. Forbes; F. H. Ayres; F. Groome; H. E. Bickley; R. C. Dyne; R. C. Deal; A. O. Trefell; G. U. Shaw; —, Powell, C. G. Byron; W. Bain.	3	Mths. Days. 8 3	To Sydney.
"Ionic," R.M.S. ...	(W. S. Atkin, Commr. R.N.R. J. O. Carter, Lieut. R.N.R.	S. Crosthwaite; W. Paul ...	1 2	3 0 6 2	To New Zealand.
"Italian Prince," S.S. ...	C. B. Andersen ...	F. G. Pooley ...	1	3 23	To New York, Buenos Aires, &c.
"Jason," S.S. ...	T. G. Steeves ...	S. J. Phillips; T. W. Phillips. ...	2	7 1	To China, Japan, and British Columbia.
"Kaikoura," S.S. ...	R. C. Clifford ...	J. B. Makepeace; H. Wynyard; A. L. Rose.	1	3 3	To New Zealand.
"Kaipara," S.S. ...	H. C. Kiddle ...	A. L. Rose; W. B. Holdstock ...	2	6 7	To New Zealand <i>via</i> Cape of Good Hope returning <i>via</i> Cape Horn.
"Kilbrennan," S.S. ...	J. K. Wilson ...	D. Macfarlane; A. Richmond; A. S. Marshall.	1	4 10	To Mauritius, Calcutta, and Kurrachee.
"Kilbride," S.S. ...	T. Smith ...	W. Lane; W. C. C. Plage; A. C. Dalby.	2	6 6	To Rangoon, Calcutta, &c.
"Kildonan Castle," R.M.S. ...	J. Tyson ...	(T. A. Jones; S. Symons; W. McClure Lunt; R. D. Maxwell; A. G. Lingard.	1	3 9 { 0 24	To Cape Town.
"Kincraig," S.S. ...	R. E. H. Becker... D. Campbell ...	J. Miller; W. Blakey; D. McIntosh.	1	3 17	To Zanzibar and Calcutta <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.

"Knight of the Thistle," S.S.	G. S. Baker	...	H. N. Black; R. M. Brown; G. P. Hall.	1	4	22	To Calcutta.
"Kumara," S.S.	W. Scotland	...	W. Culbert; H. Adkins; F. Elliott; —, Levack.	2	6	11	To New Zealand.
"Lake Michigan," S.S.	G. S. Webster, Lieut. R.N.R.	...	J. A. Howard ...	2	4	0	To Canada.
"La Plata," R.M.S.	W. J. Dagnell	...	R. A. G. H. de Caen, Mid. R.N.R.; F. W. Kirby; H. Bennett; S. Braithwaite; F. R. Miles; E. A. Turner.	2	6	28	To Central America, <i>via</i> ports.
"Leopoldville," S.S.	R. Bower...	...	G. Puxley; T. E. Jones; L. de Bruges.	2	7	11	To the Congo.
"Loch Katrina," Barque.	G. B. Sparrow ... Wm. Anderson ...	...	Andrew Duncan ...	1	1	9	To Port Adelaide.
"Loch Tay," S.S.	Jas. Stephen	...	H. F. Hay; W. H. Trevan; W. Yule; —, Stewart; W. Holland.	3	7	29	To India.
"Lord Roberts," S.S.	T. C. Martin ... J. B. Boal ...	...	A. Topp ... W. L. Clibborne; J. Adams; R. L. Hatton; J. Owers.	2	5	13	To Australia.
"Lothian," S.S.	J. C. Williamson	...	R. Tannoek; W. Jenkins; W. Riddle; C. Moersch.	1	6	4	To Ports in South of U.S.A.
"Macedonia," S.S. (P. & O.).	C. D. Bennett, Commr. R.N.R.	...	B. Ohlson; P. O. Britten; W. C. Smith; F. Sudell.	1	1	12	To Durban, China and Japan.
"Manchester Shipper," S.S.	A. T. Haworth	...	A. B. Armitage; H. E. Taylor W. P. Humphreys; H. H. Heraud; H. Mackinnon.	2	5	15	To Bombay.
"Manistee," S.S.	H. H. Neale ... J. H. H. Scudamore, Sub-Lieut. R.N.R.	...	R. S. Osborn; R. Lloyd; W. J. Swords; E. P. Green; R. Lloyd; H. Deane.	2	7	17	To Sydney.
"Maori," S.S.	T. H. Chudley, Sub-Lieut. R.N.R.	...	—, Charman; F. E. Lambert; L. B. Gillman; S. F. Newman, Mid. R.N.R.	1	5	26	To Pensacola.
"Matina," S.S.	G. Nicole	...	F. J. Downes ...	1	1	8	To Montreal.
"Meinwen," Barque...	H. Halpin	...	J. Gough; T. J. Rae; D. Romney ...	1	3	12	To Port Limon.
"Merionethshire," S.S.	R. H. Potter ... C. H. Burch ...	...	—, Churchill; —, Hopkins; —, Smithers, —, Peake; —, Lewis.	1	4	4	To Port Limon.
		...		2	6	20	To Melbourne.
		...			7	14	To China and Japan.

"Ophir," R.M.S.	...	F. W. Kershaw, Lieut. R.N.R.	D. Dowdy, Sub-Lieut. R.N.R.; H. Seale; H. C. Brewster, Lieut. R.N.R.; D. R. W. Parsons; F. E. B. Owen; J. Avern.	2	5	6	To Australia and Tasmania.
"Oracabessa," S.S.	{	W. Long ...	{ A. E. Castle; F. E. Tordiffe; C. Morris; W. Owen.	2	{ 2 20		To West Indies and ports.
"Orcadian," S.S.	...	J. Clarke ...	A. Reedy; D. McQueen ...	2	{ 5 9		To Buenos Aires and Quebec.
"Ormuz," R.M.S.	...	Geo. Caie ...	P. N. Layton, Lieut. R.N.R.; H. S. Seale; C. Matheson, Sub-Lieut. R.N.R.; W. Seymour; A. H. Fraser, Sub-Lieut. R.N.R.	2	5 26		To Australia.
"Orontes," R.M.S.	...	A. J. Coad, Lieut. R.N.R.	J. F. H. Healey, Lieut. R.N.R.; W. T. Cox, Lieut. R.N.R.; J. Avern; R. W. I. Marshall, Sub-Lieut. R.N.R.; W. de M. Baynham; J. Withers.	3	7	4	To Australia.
"Papanui," R.M.S.	...	J. F. Ruthven ...	W. Olphert; G. F. C. Worthington; R. Male; G. Plummer; —, Simons.	2	4	25	To New Zealand <i>via</i> Cape of Good Hope, returning <i>via</i> Cape Horn.
"Paparua," S.S.	...	T. S. Weston ...	N. E. Bower; C. J. Tonge; M. Paramor; P. G. Hyde; —, Mead; —, Huntriss; —, Easty.	2	6	9	To New Zealand and Tasmania.
"Persia," S.S.	...	Russell Jaggard	G. K. Wilson; F. Howard ...	3	7	20	To Calcutta and Bombay.
"Port Antonio," S.S.	...	Geo. Mitchell ...	G. S. Doorly; F. A. Griffiths ...	2	6	16	To West Indies.
"Port Kingston," R.M.S.	...	W. R. Rowe ...	A. Morrison; H. S. Porter; Leslie Lawlor.	2	6	10	" "
"Port Maria," S.S.	...	J. G. Parsons ...	A. M. Turner ...	2	4	19	" "
"Port Royal," R.M.S.	{	S. H. Simmons ...	G. A. Griffin; G. S. Doorly ...	2	3	28	" "
"Potomac," S.S.	...	W. R. Rowe ...	F. M. R. Carter ...	2	6	14	" "
"Radiance," S.S.	...	Owen Jones ...	W. L. Williams; R. L. Smith; J. T. Jones.	1	1	29	To Buenos Aires.
"Ramsay," S.S.	...	A. L. Paterson ...	J. Robinson ...	1	0	9	To Genoa (outward passage only).
"Ranza," S.S.	...	W. D. Jones ...	R. Bailey; C. B. Matthews; W. Withe	2	6	16	To Florida, Natal, Japan, and home <i>via</i> Suez.
	...	F. C. Mullan ...	...	1	4	17	To India; thence to Philadelphia.
	...	G. H. Arnot, Lieut. R.N.R.	...	...	...	...

METEOROLOGICAL REGISTERS received during the Year 1905-06—continued.

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

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
				Mths. Days.	
"Reynolds," S.S. ...	T. A. French ...	R. H. Thurger; W. J. Evans; G. W. Martin; W. S. Tansley.	3	8 16	To Kurrachee <i>via</i> Cape of Good Hope, returning <i>via</i> Suez.
"Ribera," S.S. ...	R. Hurford ...	M. Clifford; F. C. Harris; C. Hawick	2	5 28	To Black Sea. To Virginia (U.S.A.) <i>via</i> Spain.
"Rimutaka," R.M.S. ...	H. E. Greenstreet ...	J. H. Squires; C. Milner; H. A. Dillner; P. H. Levisted.	3	8 28	To China <i>via</i> Cape of Good Hope, and home <i>via</i> Suez.
"Romney," S.S. ...	R. W. Trenaman ...	J. Clubb; T. H. Wake; F. Taylor ...	2	4 23	To New Zealand.
"Ruapehu," S.S. ...	F. Mayoss. Lieut. R.N.R. ...	A. Ford; L. Martin; R. Huntriss; M. Paramor; F. S. Martin; A. G. Barneth.	2	6 6	To Buenos Aires. To New Zealand.
"Saba," S.S. ...	H. E. Holliday ...	L. Holt; C. W. Mairy; H. Skellom; A. G. Maskell; P. T. Lynch.	3	6 12	To Central America.
"Sicily," S.S. ...	—, Scott ...	... ..	1	1 15	To British North America.
"Silverton," S.S. ...	S. P. Lister, Lieut. R.N.R. ...	A. R. Rust; J. Ericson	1	3 22	To Eastern Mediterranean ports.
"South America," S.S. ...	J. Watson ...	—, Day; C. McLean; —, Jenkins; J. Williams, —, Richardson.	2	7 7	To Iquique and Valparaiso.
"Tagus," S.S. ...	H. E. Rudge ...	C. Taylor; C. Loriard; F. Bateman	2	6 17	To West Indies and Central America.
"Tongariro," S.S. ...	J. A. Sutcliffe ...	E. B. Thornker; A. F. Beaton; W. B. Holdstock; R. R. Neale; M. Downton	2	5 27	To New Zealand.
	A. W. McKellar, Lieut. R.N.R. ...	R. R. Neale; E. E. Kettle; A. F. Beaton.	1	2 27	
"Travancore," Ship ...	Wm. Chamberlin ...	... ..	1	5 5	To Hong Kong (outward passage only).

"Tudor Prince," S.S.	J. E. Curtis	...	G. Williams; R. Macdonald	...	2	7	2	To New York, Port Natal, Bahia Blanca, and home.
"Urmston Grange," S.S.	W. Keslake	...	Officers	...	1	3	29	To New York, Cape Town, India, and home.
"Valentia," S.S.	Owen Richards	...	R. Gray; C. S. Watson; J. L. Pennock,	...	2	9	16	To Punta Arenas. To Monte Video. To Iquique. To Monte Video, Baltimore, and home.
"Vectis," S.S.	{ F. C. A. Lyon F. Fox A. Thompson	{	{ W. W. Warren; L. Bedwell; W. Shaw; W. Wood; C. McCoy; J. B. Browning; H. Goodier; W. Watson; S. C. Patterson; H. J. Norris, Sub-Lieut. R.N.R.	{	{ 5 5 5	{ 2 0 5	{ 0 12 11	To Madeira, Mediterranean, and Spitzbergen (Yachting).
"Victoria," R.M.S. (P. & O.).	R. L. Haddock, Commr. R.N.R.	...	S. Finch; E. H. Orchard; H. B. Northcote; A. L. Macintosh; S. Appleyard; C. Dickenson; H. Edwards.	...	2	8	2	To Sydney.
"Waimate," S.S.	J. D. Forsdick	...	C. W. Clement; S. J. Plummer; J. Scott.	...	1	4	2	To Australia and New Zealand.
"Wakanui," S.S.	Vivian White-Parsons	...	P. P. Crawford; P. T. Perkins; P. H. Suisted; —. Whitehead; —. Tonge; —. Rose.	...	2	7	5	To New Zealand.
"Wellington," S.S.	T. A. Tait	...	D. Thomas; W. Donovan	...	2	6	21	To Eastern Mediterranean. To the Baltic.
"Whakatane," S.S.	L. G. Silba	...	A. Smith; R. K. Dodwell	...	1	5	1	To Australia and New Zealand.
"Winkfield," S.S.	T. Atkinson	...	W. R. Smith; D. Owen; E. M. Smith.	...	2	6	2	To Chile. To Mediterranean, Galveston, and home.
"Wooda," S.S.	H. H. Godwin	...	G. Evans; D. Harris; J. Shorton	...	2	6	0	To Black Sea <i>via</i> ports.
"Yucatan," S.S.	W. Harrocks	...	W. H. Atkinson; W. P. Evans	...	2	4	27	To West Indies and Central America.
"Zent," S.S.	E. H. Jones	...	W. McClay	...	1	3	13	To Port Limon.

(4.)—Abbreviated Meteorological Registers.

(a.) From the Royal Navy (—).

METEOROLOGICAL REGISTERS received during the Year 1905-06—continued.

(4.)—Abbreviated Meteorological Registers—continued.

(b.) From the Mercantile Marine (20).

Ship.	Captain.	Officers Observing.	No. of Registers received.	Duration of Observations.	Voyage.
"Arana," S.S. ...	R. Walton ...	A. Newton Mell ...	5	Mths. Days. 4 10	To the Mediterranean (4). To Monte Video. To River Plate. To Mediterranean Ports.
"Foylemore," S.S. ...	E. Ellis ...	G. Holmes ...	2	3 4	In New Zealand waters. Between Sydney (N.S.W.) and New Hebrides.
"Hinemoa," S.S. ...	... ..	... ..	1	11 28	In New Zealand waters.
"Induna," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ..	3	5 3	Between Sydney (N.S.W.) and New Hebrides.
"Kamona," S.S. ...	C. Suffern ...	... ..	1	16 6	In New Zealand waters.
"Malaita," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ..	2	2 22	Between Sydney (N.S.W.) and New Hebrides.
"Oro," S.S. ...	W. Ransom Coleman ...	J. P. Allix ...	1	2 5	To China and Japan (outward passage).
"Rakanoa," S.S. ...	G. Holford ...	... ..	1	0 21	Between New Zealand, Fiji, and Australia.
"Tambo," S.S. ...	F. J. Bayldon, Sub-Lieut. R.N.R.	... ..	1	1 11	Between Sydney (N.S.W.) and New Hebrides.
"Tutanekai," S.S. ...	... ..	... ..	1	17 26	In New Zealand waters.
"Waikato," S.S. ...	H. C. Kiddle ...	... ..	1	0 23	New Zealand to Cape Horn.
"Zealandia," S.S.	1	1 25	Between Australia and New Zealand.

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—NORTH ATLANTIC REGISTERS—FORM NO. 51 (1926).

Line.	Ship.	Captain.	No. of Registers.
Aberdeen ...	Damascus ...	R. V. B. McKilliam ...	2
"Agincourt" S.S. Co.	Agincourt ...	S. H. Worsnop ...	1
Allan ...	Bavarian ...	J. Brown ...	8
	Buenos Ayrean...	J. T. Gambell ...	13
	Carthaginian ...	T. Pickering ...	10
		J. S. Hamilton ...	
	Corean ...	B. Henry ...	6
	Corinthian ...	E. Pitts, Commr. R.N.R.	12
		T. Pickering ...	
	Hibernian ...	H. Imrie... ...	2
	Hungarian ...	W. Wallace ...	16
	Ionian ...	J. W. Nunan ...	8
		A. G. Stewart ...	
	Laurentian ...	J. Donald ...	18
		E. Pitts, Commr. R.N.R.	
	Livonian ...	J. Hamilton ...	2
	Mongolian ...	M. Stirrat ...	2
	Monte Videan ...	R. Bamber ...	8
	Numidian ...	W. S. Main ...	17
	Ontarian ...	J. Williams ...	12
	Orcadian ...	G. Caie ...	2
	Parisian ...	J. M. Johnston ...	1
	Pomeranian ...	J. Harrison ...	8
	Pretorian ...	E. Outram ...	17
	Sardinian ...	T. Moar ...	10
	Sarmatian ...	A. Rennie ...	17
		E. Outram ...	8
	Siberian ...	B. T. Eastaway ...	
	Sicilian ...	J. A. Fairfull ...	6
	Sicily ...	— Keys ...	5
	Tunisian... ...	A. G. Braes ...	20
	Ulunda ...	T. W. Chambers ...	1
	Victorian ...	A. Macnicol ...	6
	Virginian ...	A. H. Vipond ...	17
American ...	Friesland ...	C. J. Rogers ...	8
	Haverford ...	H. O. Nielsen ...	17
		J. Dann ...	12
	Merion ...	J. B. Hill ...	
	New York ...	W. J. Roberts ...	11
	Noordland ...	T. Deans... ...	16
	Philadelphia ...	A. R. Mills ...	16
	St. Louis ...	J. C. Jamison ...	11
	St. Paul ...	F. M. Passow ...	11
	Westernland ...	W. Turner ...	12
Anchor ...	Astoria ...	J. Lumsdane ...	24
"Arana" S.S. Co.	Arana ...	R. Waiton ...	14
"Armenia" S.S. Co.	Armenia ...	E. B. Mackness... ...	3
Atlantic Trans- port.	America... ...	G. T. Goudie ...	2
		C. H. Stapleton, Lieut. R.N.R.	

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
Atlantic Trans- port—cont.	Mackinaw ...	W. H. Whittle, Sub-Lieut. R.N.R.	15
	Manhattan ...	E. G. Cannons ...	6
	Maryland ...	W. H. Whittle, Sub-Lieut. R.N.R.	14
	Menominee ...	J. T. J. Wylie ...	
	Mesaba ...	O. P. Clarke ...	9
	Minneapolis ...	C. H. Stapleton, Lieut. R.N.R.	14
	Minnehaha ...	F. W. Tubb ...	24
	Minnesota ...	T. F. Gates ...	21
	Minnetonka ...	J. Robinson ...	14
	Montana... ...	W. T. J. Wylie ...	
		P. Laverock ...	24
		S. Layland ...	13
		W. Johnston ...	
"Bellailsa" S.S. Co.	Bellailsa... ...	J. McMath ...	
"Bellona" S.S. Co.	Bellona ...	O. O. Aagaard ...	7
Blue Anchor ...	Wilcannia ...	F. Rollo ...	5
Booth S.S. Co. ...	Boniface... ...	W. G. Lingham ...	3
	Dominic... ...	G. B. Westray ...	1
		W. Smale ...	7
Bowring, C. T. & Co.	Roda ...	W. R. Bennett ...	1
Bristol "City" ...	Chicago City ...	W. M. Hunter ...	1
	Jersey City ...	R. Frankland ...	1
Buenos Ayres and Great Southern Railway Co.	Frank Parish ...	... ..	2
Canadian - Pacific Railway Co.	Lake Erie ...	F. Carey ...	22
	Lake Manitoba... ..	J. A. Murray ...	19
	Lake Michigan... ..	G. S. Webster, Lieut. R.N.R.	13
	Milwaukee ...	J. H. Moore ...	10
	Monmouth ...	C. E. Birchman... ..	13
	Montcalm ...	H. G. Potter ...	
	Monteagle ...	E. Hodder ...	18
	Montfort ...	H. Parry... ..	9
		A. E. Evans ...	4
Chesapeake and Ohio S.S. Co.	Powhatan ...	E. Trinick ...	8
Clan ...	Clan McLeod ...	W. J. Lennox ...	3
	Clan Macneil ...	S. Beer ...	2
	Clan McPherson ...	S. Beer ...	1
	Clan Stuart ...	W. J. Lennox ...	14

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
Compagnie Générale Transatlantique.	La Lorraine	A. Alix	10
	La Touraine	—, Fajolle	8
"Crown" S.S. Co.	Crown of Navarre	G. Grindlay	5
Cuban S.S. Co. ...	Cayo Soto	E. C. Radder	2
Cunard	Campania	J. Pritchard	12
	Carmania	R. C. Warr	8
	Caronia	J. Pritchard	19
	Caronia	R. C. Warr	19
	Carpathia	J. C. Barr	10
	Carpathia	E. Pentecost	10
	Cypria	J. Barlow	8
	Etruria	T. Potter	14
	Ivernia	W. Turner	26
	Lucania	J. B. Watt	8
	Pannonia	H. M. Benison, Lieut. R.N.R.	10
	Pavia	C. A. Smith, Lieut. R.N.R.	10
	Saxonia	D. Dow	19
	Saxonia	J. T. W. Charles, Lieut. R.N.R.	19
	Slavonia	J. T. W. Charles, Lieut. R.N.R.	9
	Sylvania... ..	W. B. Cresser	8
	Tyria	J. S. Carbines	13
	Umbria	T. Stephens	13
	Veria	D. Dow	4
"Devona" S.S. Co.	Devona	T. Hewitson	15
Dominion ...	Canada	D. R. Murray	15
	Canada	R. O. Jones	18
	Cornishman	J. H. Kay	16
	Irishman	J. H. A. Thornton	8
	Kensington	W. Roberts	9
	Kensington	M. H. Morle	9
	Kensington	R. O. Jones	7
Elder, Dempster	Norseman	J. Evans	10
	Southwark	J. O. Williams	1
	Vancouver	J. Evans	2
	Addah	W. E. Potter	2
	Egwanga	J. C. Hannay	15
	Port Antonio	W. R. Rowe	3
	Port Maria	S. H. Simmons	2
	Port Morant	O. Jones	18
	Port Royal	O. Jones	2
	Sobo	H. A. Yardley	2
	Sokoto	A. Lobb	4
	Zaria	R. Roberts	4

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
Elders & Fyffes...	Chickahominy ...	J. H. H. Scudamore, Sub-Lient. R.N.R.	4
	Greenbrier ...	D. Reside ...	6
	Manistee... ..	H. Neale... ..	16
		J. H. H. Scudamore, Sub-Lient. R.N.R.	
	Matina	H. Halpin	7
		E. W. Castle	
	Miami	D. Reside	5
	Nicoya	W. Long... ..	10
	Zent	E. H. Jones	8
Ellerman ...	City of Khios ...	D. Cruickshank ...	5
English & American Shipping Co.	Mokta	E. E. Cooper	5
European Petroleum Co.	Baku Standard... ..	H. Tucker	1
	Broadmayne	H. A. Hayns	9
Fargrove Steam Navigation Co.	Caldy	W. C. Davison	1
(Foreign) ...	Canadia	E. Horn	3
	Dania	P. Paulsen	8
		A. Hansen	
Furness, Sir C. ...	Cynthiana	E. Evans... ..	2
Glynn, J. ...	Albiana	E. Trinick	2
Gulf Transport...	Imani	T. B. Peabody	10
	Indore	C. Mytton	14
	Irada	A. W. Roberts, Lieut. R.N.R.	15
	Irak	A. Delargy	9
	Iran	C. M. M. Jacob	1
	Istrar	G. F. Perks	8
		C. M. M. Jacob	
Harrison ...	Colonial	C. S. Rhodes	9
	Counsellor	D. G. Cownie	2
	Historian	J. Valiant	5
	Logician... ..	R. Owen... ..	3
	Musician	G. B. Woolfenden ...	5
Holman, R. H. ...	Archtor	H. Sydney	6
Houston	Hostilius	H. R. C. Lockyer ...	5
"Hurona" S.S. Co.	Hurona	J. Dorward	16
"Jacob Bright" S.S. Co.	Jacob Bright ...	L. Anderson	2

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
"Jacona" S.S. Co.	Jacona	W. Lindsay	5
Johnston ...	Foylemore	E. Ellis	4
	Rowanmore	I. Jones	4
	Vedamore	W. Henry	10
"La Veloce" ...	Centro America	C. Domenico	6
	Citta di Torino	E. Fulle	2
	Nord-America	R. Raffo	16
		G. B. Debarbieri	
Leyland	Asian	J. E. Bartlett	4
	Cuban	T. W. Lofthouse	10
	Darlen	C. E. Shacklock	8
		T. Chadwick	
	Devonian	R. Ridley	16
	Jamaican	J. Robb	7
	Lancastrian	W. F. Wood	15
	Michigan	C. H. Stapleton, Lieut. R.N.R.	2
	Winifredian	F. Shepherd	16
	Yucatan... ..	W. Harrocks	5
"Lobelia" S.S. Co.	Lobelia	F. H. Watson	1
Manchester ...	Manchester Corporation	P. J. Heath	16
Mediterranean & New York.	Pawnee	J. E. Cartwright	1
Northfield S.S. Co.	Nessfield... ..	G. Watt	4
Peninsular and Oriental.	Egypt	J. R. Lendon	14
	Himalaya	W. L. Broun, Lieut. R.N.R.	7
		E. Street... ..	
	Japan	E. P. Martin, Lieut. R.N.R.	4
	Mooltan	G. C. Henning	3
	Sunda	G. Montford	1
Philadelphia and Transatlantic.	North Point	— Bovey	2
Prince	Black Prince	A. B. W. Sheppard, Lieut. R.N.R.	3
	Georgian Prince	W. Anderson	1
	Italian Prince	C. B. Anderson	1
	Moorish Prince... ..	W. Barrett	7
	Napolitan Prince	H. A. Eagleton, Lieut. R.N.R.	16
	Norman Prince... ..	W. Gill	4
	Ocean Prince	R. Kirkwood	20
	Sicilian Prince	H. J. Claridge	14

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
Pyman S.S. Co. ..	Rokeby	H. Wheatley	2
	Waverley	H. Wheatley	6
Red Star... ..	Vaderland	R. C. Ehoff	19
Ropner	Kirkby	O. N. Pettersson	10
Royal Mail Steam Packet Co.	Atrato	R. H. Stranger	9
	Danube	L. R. Dickinson	1
	Dee	F. H. M. Custance, Lieut. R.N.R.	1
	La Plata	W. J. Dagnall	4
	Magdalena	J. Pope	14
		A. P. Dix	
	Orinoco	C. E. Down	11
	Thames	H. E. Rudge	11
	Trent	A. C. Farmer	12
		J. Pope	
Toronto Trading Co.	Cameron	T. Foley	1
Ulster S.S. Co. ...	Carrigan Head	S. Orr	11
Union-Castle ...	Braemar Castle... ..	D. Wallace	4
		S. Henderson, Lieut. R.N.R.	
	Briton	J. W. Creaghe	12
	Carisbrook Castle	T. J. Bremner	1
	Galeka	T. H. Wilford	7
	Guelph	R. Walls... ..	8
		L. W. Bayldon, Commr. R.N.R.	
	Kildonan Castle	J. Tyson	8
White Star ...	Arabic	W. S. Atkin	4
	Armenian	F. B. Howarth	13
		F. E. Beadnell	
		J. B. Kelk	
	Baltic	E. C. Roberts	12
		E. J. Smith, Commr. R.N.R.	
	Bovic	D. Kerr	13
	Canopic	I. Sealby, Lieut. R.N.R.	12
	Cedric	H. J. Haddock, C.B., Commr. R.N.R.	22
		J. G. Cameron	
	Celtic	J. B. Ranson, Lieut. R.N.R.	19
	Cevic	W. H. Clarke	18
	Cretic	J. Kelk	3
	Cymric	F. E. Beadnell	11
	Georgic	F. R. Clarke, Lieut. R.N.R.	10
	Majestic	B. F. Hayes, Lieut. R.N.R.	22
	Oceanic	J. G. Cameron, Lieut. R.N.R.	10

METEOROLOGICAL REGISTERS received during the year 1905-06
—continued.

(5.)—North Atlantic Registers (Form No. 51)—continued.

Line.	Ship.	Captain.	No. of Registers.
White Star—cont.	Republic	J. McAuley	18
	Runic	D. Thomas	5
	Teutonic... ..	J. B. Ranson, Lieut. R.N.R.	16
	Victorian	T. P. Thompson	
		F. Hart, Lieut. R.N.R. ...	11
Westall, J. ...	Virent	G. Alexander	2
Wilsons & Furness-Leyland.	Cambrian	J. O. Williams	9
	Georgian	E. C. Hiscoe	
		B. Farrington	13

APPENDIX V.

INSTRUMENTS supplied, &c., to MERCANTILE MARINE.

Particulars.	Baro- meters.	Ther- mometers.	Hydro- meters.	Screens.
April 1st, 1905, afloat	183	1,303	756	212
Issued since	62	425	214	46
Returned since	245 53	1,728 282	970 135	258 32
Written off as broken or lost since 1900.	192 24	1,446 385	835 164	226 51
April 1st, 1906, afloat	168	1,061	671	175

DISPOSITION of MERCANTILE MARINE INSTRUMENTS,
April 1st, 1906.

Particulars.	Baro- meters.	Ther- mometers.	Hydro- meters.	Screens.
In merchant ships	168	1,061	671	175
„ store at M.O.	1	24	3	12
At Liverpool Agency	3	25	28	—
„ Glasgow	4	6	20	4
„ Dundee	5	14	9	3
„ Hull	6	32	19	6
„ Cardiff	6	49	27	7
„ Southampton	3	18	11	5
„ Sunderland	2	18	9	3
Total April 1st, 1906	198	1,247	797	215
Under repair, April 1st, 1906 ...	1	—	—	—

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

(a.) THERMOMETERS AND SCREENS.

—	Thermometers.					Screens.
	Ordin- ary.	Maxi- mum.	Mini- mum.	Solar.	Grass Mini- mum.	
April 1st, 1905, in use ...	419	72	80	11	11	116
Issued since	31	6	7	1	2	3
Returned since	450 13	78 6	87 6	12 —	13 3	119 —
Written off as broken or lost since 1900.	86	—	13	—	—	—
April 1st, 1906, in use ...	361	72	68	12	10	119

(b.) OTHER INSTRUMENTS.

	Baro- meters.	Aneroids and Baro- graphs.	Sun- shine Re- corders.	Rain Gauges.	Anemo- meters.	Storm Signal Cones.
April 1st, 1905, in use ...	335	23	34	97	31	220
Issued since	4	3	—	1	—	18
Returned since ...	339	25	34	98	31	238
Written off as broken or lost since 1900.	9	1	1	2	—	—
	—	—	—	—	—	17
April 1st, 1906, in use ...	*330	25	33	96	31	221

* Of these barometers, 232 are lent for use of seafaring communities at fishing villages and ports.

APPENDIX VI.

REPORT ON THE INSPECTION OF STATIONS IN CONNEXION
WITH THE OFFICE IN 1905.

The Inspectors were as follows :—

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

Mr. G. C. Simpson inspected some of the telegraphic reporting stations, which he visited for the purpose of collecting material for his report on the Beaufort scale of wind force.

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 was also examined.

The Reports show that efficiency has been maintained as a 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.

The following is a list of stations inspected and approved :—

OBSERVATORIES.

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

ADDITIONAL ANEMOGRAPH STATIONS.

Deerness.	Holyhead.
Dublin (Phoenix Park).	Kingstown.
Fleetwood.	North Shields.
Falmouth (Pendennis Castle.)	Scilly.

HYGROGRAPH STATION.

Cambridge (Newnham College).

NORMAL CLIMATOLOGICAL STATIONS.

Armagh.	Lairg.
Birmingham.	Lincoln.
Birr Castle.	Lowestoft.
Braemar.	Newton Rigg.
Buxton.	Poltalloch.
Cally.	Ridgmont (Woburn).
Canterbury.	Rothsay.
Cheadle (Staffs.).	Rounton.
Clathick.	Scarborough.
Clongowes Wood.	Seaham.
Deerness.	Stokesay.
Dublin.	Stonyhurst.
Dundee (Phoenix Park).	Strathpeffer Spa.
Dunrobin Castle.	Wakefield.
Eastbourne.	Whitby.
Glasgow.	Wolfelee.
Hillington.	York.

AUXILIARY CLIMATOLOGICAL STATIONS.

Aberdovey (sunshine only).	Llangammarch Wells.
Aberystwyth.	Littlestone-on-Sea.
Barnet.	Nottingham Castle.
Blackpool.	Portsmouth.
Bucklebury Place (Herts).	Rhyl.
Buntingford.	Ruardean Hill, Forest of Dean
Carnforth.	(rainfall only).
Cirencester.	Saltburn-by-the-Sea.
Clifton.	Towyn.
Darwen.	Whitmead Park, Forest of Dean
Felixstowe.	(rainfall only).
Folkestone.	York, Deighton Grove (rainfall
Giggleswick.	only).
Huddersfield.	„ Bootham (sunshine only).

TELEGRAPHIC REPORTING STATIONS.

Aberdeen.	Pembroke.
Birr Castle.	Portland Bill.
Blacksod Point.	Roche's Point.
Donaghadee.	Scilly.
Dungeness.	Shields, North.
Holyhead.	Spurn Head.
Leith.	Stornoway.
Malin Head.	Valencia.
Nairn.	Wick.
Nottingham.	

SPECIAL REPORT OF THE INSPECTION OF THE SCOTTISH
STATIONS.

By Dr. BUCHAN.

Barometers.—The barometers at the stations were compared with inspector's standard No. 690, which continued to be in good order during the inspection as compared with the standard barometer in Edinburgh before and after the inspections. The observers continue to read carefully and correctly.

Thermometers.—As usual, these instruments were read twice, first by the observer and inspector as they hang in the screen, and then by the inspector after being in water for the time specified in the table. The minimum thermometer at Nairn was much out of order. It went out of order the day before my visit, but nothing was done with it till my arrival, when Miss Penny set it right at once. The maximum thermometer was very slightly out of order, but was put right. Otherwise the thermometers at the other stations were in good order.

Hygrometers.—From the readings on immediately opening the screen it was plain that these instruments were in good order at all stations. Some of the observers are carefully noting the cases where the wet bulb is the higher of the two, occurring in cases when temperature is falling rapidly.

APPENDIX VII.

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

The list is arranged in accordance with the 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 latest 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 Registers—General.
- 1810. Hourly Values.
- 1820. Daily Values.
- 1830. Daily Weather Reports.
- 1840. Weather Reports other than Daily.
- 1870. Meteorological Charts.

It should be understood that Meteorological Registers—General (1800) are usually in the form of Monthly Summaries.

GEOGRAPHICAL LIST OF INSTITUTIONS AND PERSONS
SUPPLYING PUBLISHED METEOROLOGICAL DATA

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports other than Daily.	1870. Meteorological Charts.
GENERAL.								
International Committee for Scientific Aeronautics, Strassburg.	—	—	1905	—	—	—	—	—
Board of Trade, London—Commercial, Labour, and Statistical Department.	—	—	1902	—	—	—	—	—
d. EUROPE AND MEDITERR- ANEAN ISLANDS.								
da. Scandinavia: Sweden, Norway, Denmark:—								
Dansk Meteorologisk Institut (Copenhagen).	—	—	1905	—	1905	1905	1905	—
Norsk Meteorologisk Institut (Christiana).	—	1904	1904	1904	1904	—	1904	—
Svensk Meteorologisk Institut (Stockholm).	—	—	—	—	—	—	1905	—
Stockholm, K. Svenska Vetenskaps- Akademie.	—	—	1904	—	1904	—	—	—
Upsala, Observatoire Météorologique de l'Université.	—	—	1904	1904	1904	—	—	—
db. Russia in Europe:—								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1902	1902	1902	1905	1904	—
Finland, Institut Météorologique Central de la Société des Sciences (Helsingfors).	—	—	—	1900	1874	—	—	—
Kaiserliche Livländische Gemeinnützige u. Ökonomische Sozietät. Dorpat (Jurjel).	—	1900	—	—	—	—	—	—
Dorpat, Meteorologisches Observatorium.	—	—	1903	1903	1903	—	—	—
Dorpat, Station Météorologique de l'Ecole Reale.	—	—	—	—	1905	—	—	—
Kazan, Observatoire Météorologique.	—	—	—	—	1902	—	—	—
Kieff, Observatoire Météorologique.	—	—	—	—	1904	—	—	—
Moscow (E. Leyst)	—	—	1903	—	—	—	—	—
Moscow, Meteorologisches Observatorium der K. Universität.	—	—	—	1902	1902	—	—	—
Odessa, Observatoire Météorologique et Magnétique de l'Université Impériale.	—	1902	—	—	1903	—	—	—
St. Petersburg, Observatoire Météorologique de l'Institut Forestier Impériale.	—	—	—	—	1904	—	—	—
Tiflis, Physical Observatory	—	—	—	—	—	—	1904	—
Warsaw, Station Centrale Météorologique du Musée de l'Industrie et de l'Agriculture.	—	—	1900	—	1900	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d. EUROPE AND MEDITERR- ANEAN ISLANDS—cont.								
dc. German Empire:—								
Deutsche Seewarte (Hamburg)	—	—	1904	1904	1904	1905	1905	—
Prussia, K. Meteorologisches Institut (Berlin).	—	1901	1901	1901	1901	—	1905	—
Alsace-Lorraine, Meteorolo- gischer Landesdienst (Strass- burg).	—	—	1901	1901	1901	—	1905	—
Berlin, Central Bureau für Meteorologie und Hydro- graphie (Carlsruhe).	—	1905	1905	—	1904	—	1905	—
Bavaria, K. Meteorologische Central Station (Munich).	—	—	—	—	—	1905	—	—
Hessen, G. Hydrographisches Bureau (Darmstadt).	—	1904	1904	1904	1904	—	1905	—
Saxony, K. Meteorologisches Institut (Dresden).	—	—	1901	1901	1901	1905	1904	—
Württemberg, K. Statistisches Landesamt und Meteorolo- gische Central Station (Stutt- gart).	—	—	1905	1900	1901	—	1905	—
Anchen, Meteorologisches Obser- vatorium.	—	—	1904	1904	1904	1905	—	—
Berlin, Wetter Bureau	—	—	—	—	—	1905	—	—
Bremen, Meteorologische Station	—	—	—	1904	—	—	—	—
Eberswalde, Meteorologische Station.	—	—	—	—	—	—	1903	—
Emden, Naturforschende Gesell- schaft.	—	—	1903	—	—	—	—	—
Frankfurt am Main, Physika- lischer Verein.	—	—	—	—	1903	—	—	—
dd. Holland; Belgium; Luxem- burg:—								
K. Nederlandsch Meteorologisch Institut (de Bilt).	—	—	1903	1903	1903	1905	1905	—
Observatoire Royal, Uccle, Brus- sels.	—	—	—	—	—	1905	—	—
de. British Islands:—								
Meteorological Office (London)	—	—	—	1902	1900	1905	1905	—
British Rainfall (H. R. Mill) ..	—	1904	—	—	—	—	—	—
R. Meteorological Society (Lon- don).	—	—	1904	—	1904	—	1904	—
Scottish Meteorological Society (Edinburgh).	—	1903	1903	—	—	—	—	—
Royal Society of Edinburgh [Fort William and Ben Nevis].	—	—	—	1897	—	—	—	—
Royal Observatory, Greenwich	—	—	1903	1903	1903	—	—	—
General Register Office, London	1905	—	—	—	—	—	—	—
General Register Office, Dublin	1905	—	—	—	—	—	—	—
Registrar General's Office, Edin- burgh.	1905	—	—	—	—	—	—	—
Board of Agriculture and Fisheries, London.	—	—	—	—	—	—	—	—
Bath, Medical Officer of Health	1904	—	—	—	—	—	—	—
Blackpool, Public Health Office	1904	—	—	—	—	—	—	—

GEOGRAPHICAL LIST—continued

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1830. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
<i>d. EUROPE AND MEDITERR- ANEAN ISLANDS—cont.</i>								
<i>de. British Islands—cont.</i>								
Bognor, Climatological Society	—	—	1904	—	—	—	—	—
Bolton, The Museums and Meteorological Observatory.	—	—	1905	—	—	—	1905	—
Brighton, Medical Officer of Health.	1902	—	—	—	—	—	—	—
Canterbury (A. Lander)	—	—	1904	—	—	—	—	—
Cardiff, Naturalists' Society ..	—	1904	1904	—	—	—	—	—
Cardiff, Waterworks Engineer's Office.	—	1905	1905	—	—	—	—	—
Chester (J. C. Mitchell)	—	—	1903	—	—	—	—	—
Coventry, Medical Officer of Health.	1904	—	—	—	—	—	—	—
Croydon, Natural History and Scientific Society.	—	1904	—	—	1904	—	—	—
Devon, North (T. Wainwright)..	—	—	—	—	—	—	1905	—
Dorset (H. S. Eaton)	—	1903	—	—	—	—	—	—
Eastbourne, Borough Meteorol- ogist.	—	—	1904	—	—	—	—	—
Falmouth, R. Cornwall Poly- technic Society.	—	—	1904	—	—	—	—	—
Great Central Railway	—	1905	—	—	—	—	—	—
Guernsey (A. Collenette)	—	1904	—	—	—	—	—	—
Hastings, Borough Meteorologist.	—	—	1904	—	—	—	—	—
Hertfordshire (J. Hopkinson) ..	—	1904	1904	—	—	—	—	—
Hoylake and West Kirby, Urban District Council.	—	—	1905	—	—	—	—	—
Isle of Man (A. W. Moore)	—	—	—	—	—	—	1904	—
Jersey, Observatoire St. Louis ..	—	—	—	1905	1905	—	—	—
Liverpool Observatory, Bidston.	—	—	—	—	1904	—	—	—
Lowestoft, Medical Officer of Health.	1904	—	—	—	—	—	—	—
Manchester, Public Health Office	1904	—	—	—	—	—	—	—
Margate, Medical Officer of Health.	1904	—	—	—	—	—	—	—
[Netley.] Army Medical Depart- ment, London.	—	—	1903	—	—	—	—	—
Northampton, Natural History Society.	—	1904	1904	—	—	—	—	—
Norwich (A. W. Preston)	—	—	1904	—	—	—	—	—
Nottingham (A. Brown and P. Boobbyer).	—	1905	1905	—	—	—	—	—
Nottingham, Rural District Council of Basford.	1903	—	1903	—	—	—	—	—
Rousdon Observatory	—	—	1903	—	—	—	—	—
Rugby School Natural History Society.	—	—	1905	—	—	—	—	—
Sevenoaks (W. W. Wagstaffe) ..	—	—	1905	—	—	—	—	—
Southport, Fernley Observatory	—	—	1904	—	1905	—	—	—
Stonyhurst College Observatory	—	—	1904	—	—	—	—	—
Throcking (C. W. Harvey)	—	—	1904	—	—	—	—	—
Totland Bay, Isle of Wight (J. Dover).	—	—	1905	—	—	—	—	—
Truro, Cornwall County Council, Sanitary Committee.	1905	—	1905	—	—	—	—	—
Waterford (C. E. Perceval Bolton).	—	—	—	—	—	—	1905	—
Whitechurch (E. E. Glyde)	—	—	1904	—	—	—	—	—
Workop (H. Mellish)	—	—	1905	—	—	—	—	—
York, Yorkshire Philosophical Society.	—	—	1904	—	—	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d. EUROPE AND MEDITERRANEAN ISLANDS—cont.								
df. France and Corsica:—								
Bureau Central Météorologique de France (Paris).	—	1903	1902	1902	1902	1905	1905	—
Avignon, Commission Météorologique du Département de Vaucluse.	—	—	1903	—	—	—	—	—
Beaulieu, Sévres et Vaucluse (G. Eiffel).	—	—	1903	—	1905	—	—	—
Bordeaux, Commission Météorologique de la Gironde.	—	1905	—	—	1905	—	—	—
Lyons, Commission départementale de Météorologie du Rhône.	—	1899	—	—	—	—	—	—
Marseilles, Commission de Météorologie du Département des Bouches-du-Rhône.	—	—	1904	—	1904	—	—	—
Paris, Observatoire Municipal (Observatoire de Montsouris).	—	—	—	—	1903	—	—	—
Paris, Service Hydrométrique du Bassin de la Seine.	—	1903	—	—	—	—	—	—
Perpignan, Commission Météorologique.	—	1900	—	—	1903	—	—	—
dg. Spain and Portugal:—								
Instituto Central Meteorológico (Madrid).	—	—	—	—	—	1905	—	—
Observatorio Do Infante D. Luiz (Lisbon).	—	—	1900	—	1903	1905	—	—
Coimbra, Observatorio Meteorológico e Magnético da Universidade.	—	—	—	1901	1901	—	—	—
Gibraltar, Army Medical Dep., London.	—	—	1903	—	—	—	—	—
Llana, Observatorio Belloch ..	—	—	1903	—	—	—	—	—
Madrid, Observatorio ..	—	—	—	—	1901	—	—	—
Madrid, Chamartin de la Rosa, Observatorio Meteorológico del Colegio de Nuestra Señora del Recuerdo.	—	—	—	—	1905	—	—	—
Oña, Observatorio ..	—	—	1905	—	—	—	—	—
Oporto, Observatorio Meteorológico da Princesa D. Amelia.	—	—	—	1904	—	—	—	—
San Fernando, Instituto y Observatorio de Marina.	—	—	—	—	—	—	—	—
dh. Italy: Sicily and Sardinia:—								
Ufficio Centrale Meteorologico e Geodinamico Italiano (Rome).	1905	—	1892	—	—	1905	—	—
Bologna, Osservatorio della R. Università.	—	—	—	—	1903	—	—	—
Catania (A. Riccò e L. Mendola)	—	—	1904	—	—	—	—	—
Florence, R. Museo di Fisica e Storia Naturale.	—	—	—	—	1903	—	—	—
Messina, Osservatorio ..	—	—	—	—	1904	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d. EUROPE AND MEDITERR- ANEAN ISLANDS—cont.								
dh. Italy: Sicily and Sardinia—cont.								
Milan, R. Osservatorio Astrono- mico di Brera.	—	—	—	—	1904	—	—	—
Naples, R. Osservatorio di Capo- dimonte.	—	—	—	—	1905	—	—	—
Riposto, Osservatorio Meteorol- ogico del R. Istituto Nautico.	—	—	—	—	1905	—	—	—
Rome, Specola Vaticana ..	—	—	—	—	1905	—	—	—
Turin, Osservatorio della R. Uni- versità.	—	—	—	—	1904	—	—	—
Venice, Osservatorio Meteorol- ogico del Seminario Patri- arcale.	—	—	—	—	1904	—	—	—
di. Switzerland:—								
Schweizerische Meteorologische Central Anstalt (Zürich).	—	1903	1903	1903	1903	1905	—	—
Berne, Eidgenössisches Ober- bauinspectorat, Hydromet- rische Abteilung.	—	1903	1903	—	—	—	—	—
Davos Traffic Association ..	—	—	—	—	1905	—	1904	—
Genève et le Grande St. Bernard (R. Gautier).	—	—	—	—	1904	—	—	—
Lausanne, Institut Agricole ..	—	—	—	—	1904	—	—	—
St. Moritz (R. Gautier et H. Ducloux).	—	—	—	—	1903	—	—	—
dk. Austria-Hungary, with Bosnia and Herzegovina:—								
K. K. Central Anstalt für Meteor- ologie und Erdmagnetismus (Vienna).	—	—	1903	1903	1904	1905	—	—
K. K. Hydrographischer Dienst in Österreich (Vienna).	—	—	—	—	1902	—	1905	1905
Hydrographisches Amt der K. K. Kriegs-Marine (Pola).	—	—	1904	1904	1905	—	—	—
K. Ung. Reichs-Anstalt für Meteor. und Erdmagn. (Buda- pest).	—	1901	1901	1901	1901	—	—	—
Boenisch-Hercegovinische Lan- desregierung (Sarajevo).	—	—	1901	1901	1901	—	—	—
Agram, Meteorologisches Obser- vatorium.	—	—	1902	1902	1902	—	—	—
Budapest, Magyar Kir. Országos Meteor. Intézet.	—	—	—	—	1905	1905	—	—
Cracow, C. K. Akademii Umiejet- nosci u. Krakowie.	—	—	—	—	1902	—	—	—
Cracow, K. K. Sternwarte ..	—	—	—	—	1905	—	—	—
Cracow, Observatorium ..	—	—	1904	—	—	—	—	—
Pinné, K. K. Marine-Akademie ..	—	—	—	—	1905	—	—	—
Innsbruck, Meteorologisches Observatorium.	—	—	1902	—	—	—	—	—
Klagenfurt (F. Jäger) ..	—	—	—	—	1903	—	—	—
Kremsmünster, Sternwarte ..	—	—	1904	1904	—	—	—	—
Prague, K. K. Sternwarte ..	—	—	—	—	1904	—	—	—
Trieste, [I.R.] Osservatorio Astro- nomico-Meteorologico.	—	—	1902	1902	1902	—	—	—
Vienna, K. K. Sternwarte ..	—	—	—	—	1903	—	—	—

GEOGRAPHICAL LIST—continued.

NAME OF INSTITUTION, &c.	1710 & 1730. Clima- tology—Agricultural and Hygienic.	1180. Rainfall Tables.	1800. Meteorological Registers—General.	1810. Hourly Values.	1820. Daily Values.	1830. Daily Weather Reports.	1840. Weather Reports, other than Daily.	1870. Meteorological Charts.
d. EUROPE AND MEDITERR- ANEAN ISLANDS—cont.								
dl. Balkan Peninsula:—								
Institutul Meteorologic al Ro- maniei (Bucharest).	1905	1905	—	—	—	1905	1905	—
Belgrade, Observatoire Central	—	1903	—	—	—	—	1903	—
Monastir. <i>Bureau Central Mët., Paris.</i>	—	—	1902	—	—	—	—	—
Roumania (S.C. Hepites) ..	—	1903	—	—	—	—	—	—
Salonika. <i>K. K. Central-Anstalt für Meteorologie, Vienna.</i>	—	1903	—	—	—	—	—	—
Sofia, Station Centrale Météorol- ogique de Bulgarie.	—	—	—	—	—	—	1904	—
dm. Mediterranean and Islands:—								
Cyprus Public Works Depart- ment (Nicosia).	—	1905	1902	—	—	—	1905	—
<i>Meteorological Office, London</i> ..	—	—	—	—	—	—	—	1905
Malta and Cyprus. <i>Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
Minorca and Malta. <i>Bureau Central Mët., Paris.</i>	—	—	1902	—	—	—	—	—
e. ASIA AND MALAY ARCHI- PELAGO.								
ea. Asiatic Russia:—								
Observatoire Physique Central Nicolas (St. Petersburg).	—	—	1902	1902	1902	—	—	—
eb. China and Dependencies: Tibet, Corea:—								
Hong-Kong. Observatory ..	—	—	1904	1904	1905	—	—	—
Hong-Kong and Wei-hai-wei. <i>Army Medical Dep., London.</i>	—	—	1904	—	—	—	—	—
Ou-tochang. <i>K. K. Central-Ans- talt für Meteorologie, Vienna.</i>	—	—	1903	—	—	—	—	—
Peking, Inspectorate General of Customs.	1904	—	—	—	—	—	—	—
Tsingtau (Shantung). <i>Deutsche Seewarte, Hamburg.</i>	—	—	—	—	1901	—	—	—
Yunnan-Sen. <i>Bureau Central Mët., Paris.</i>	—	—	1902	—	—	—	—	—
Zikawei, Observatoire Mag- nétique et Météorologique.	—	—	—	1902	—	—	—	—
ec. Japanese Islands, Formosa:—								
Central Meteorological Observa- tory (Tokio).	—	—	1904	1904	1904	1905	—	—
Mizusawa, International Lati- tude Observatory.	—	—	1904	—	—	—	—	—
ed, ee. Cochin China: Tonquin, Annam, Siam:—								
<i>Bureau Central Mët., Paris</i> ..	—	1902	1902	—	1902	—	—	—

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c. ASIA AND MALAY ARCHI- PELAGO—cont.								
ef. British India: Himalaya, Bur- mah, Ceylon:—								
Meteorological Office, India, (Calcutta).	—	1905	1905	—	1905	1905	1905	—
Allahabad, Meteorological Office	—	1901	1901	—	—	—	1901	—
Bangalore, Mysore Government Meteorological Department.	—	1901	—	—	1901	—	—	—
Calcutta, Meteorological Office, Bengal.	—	1904	1904	—	—	1905	1905	—
Ceylon, Royal Botanic Gardens	—	1903	—	—	—	—	—	—
Colombo, Surveyor General's Office.	—	—	1904	—	—	—	1904	—
Kodaikanal, Observatory	—	—	1904	—	—	—	—	—
Lahore, Meteorological Reporter to Government, Punjab.	—	—	—	—	—	—	1905	—
eo. Malay Peninsula and Archi- pelago, Philippines, &c.:—								
Royal Magnetical and Meteoro- logical Observatory (Batavia).	—	1904	1904	1903	—	—	—	—
Philippine Weather Bureau, Manila Central Observatory.	—	—	1902	1903	1904	—	1904	—
Buitenzorg, Institut Botanique de l'Etat.	—	—	—	—	1902	—	—	—
Pnom-Penh (Cambodia), Bureau Central Mët., Paris.	—	—	1902	—	—	—	—	—
Singapore, Army Medical Dep., London.	—	—	1903	—	—	—	—	—
Singapore, Principal Civil Medi- cal Officer, Straits Settlements.	—	—	—	—	1904	—	—	—
Taiping, State Surgeon's Office..	—	—	1904	—	—	—	—	—
ei. Asiatic Turkey, Arabia, Syria:—								
Beyrout, Jerusalem, and other stations. K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	1903	—	1903	—	—	—
Hebron. Scottish Met. Soc., Edin- burgh.	—	—	1903	—	—	—	—	—
Le Krey (Syria) and other stations. Bureau Central Mët., Paris.	—	—	1902	—	1902	—	—	—
Scutari. Army Medical Dep., London.	—	—	1903	—	—	—	—	—
f. AFRICA AND MADAGASCAR.								
fa. Mediterranean States: Moroc- co, Algiers, Tunis, Tripoli:—								
Service Météorologique du Gouvernement Général de l'Algérie.	—	—	—	—	—	1905	—	—
Algeria and Tunis, Benghazi (Tripoli). Tangier. Bureau Central Mët., Paris.	—	—	1902	—	1902	—	—	—

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f. AFRICA AND MADAGASCAR -cont.								
fb. North-east Africa: Egypt, Nile Valley to 10° N., Abyssinia:—								
Survey Department, Cairo ..	—	1904	1902	1902	1904	1905	1905	—
Sanitary Department, Cairo ..	1905	—	—	—	1905	—	—	—
Egyptian Sudan. <i>Meteorological Office, London.</i>	—	—	1902	—	—	—	—	—
Khartoum. <i>Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
Ismailia, Port Said, Suez, Harar (Abyssinia). <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	1902	—	—	—
fc. Sahara and the French Sudan, &c.:—								
Timbuctu and other stations. <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	1902	—	—	—
fd. West Africa from Morocco to the Congo:—								
Lagos, Government Gazette ..	—	—	1905	—	—	—	—	—
Sierra Leone Observatory ..	—	1903	—	—	—	—	—	—
Sierra Leone, Accra, Cape Coast, Kumasi. <i>Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
Saint-Louis (Senegal), Port Novo (Dahomey), and other stations. <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	1902	—	—	—
fe. Congo State and Angola:—								
Libreville and other stations. <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	1902	—	—	—
ff. East Africa from the Southern border of fb to the Zam- besi:—								
British East Africa ..	{	—	1902	—	—	—	—	—
British Central Africa ..		—	1902	—	—	—	—	—
Rhodesia ..		—	1902	—	—	—	—	—
Uganda ..		—	1902	—	—	—	—	—
German East Africa. <i>Deutsche Seevarte, Hamburg.</i>	—	—	—	1902	1902	—	—	—
Mombasa. <i>Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
Nairobi, Agricultural Depart- ment.	—	—	1904	—	—	—	1905	—
Zomba, Scientific Department ..	—	1903	1903	—	1905	—	—	—
fg. South Africa South of the Zambesi:—								
Meteorological Commission (Cape Town).	—	—	1904	1902	—	—	—	—
Transvaal Meteorological De- partment (Johannesburg).	—	1905	1904	—	—	1905	1905	—

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f. AFRICA AND MADAGASCAR —cont.								
fg. South Africa South of the Zambesi—cont.								
Durban, Natal Observatory ..	—	1902	—	—	1904	—	—	—
Southern Rhodesia, &c. <i>Metro- logical Office, London.</i>	—	—	1902	—	—	—	—	—
Fort Napier (Natal), Pretoria. <i>Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
fh. Madagascar and Comoro Group:—								
<i>Bureau Central Mët., Paris</i> ..	—	1902	1902	—	1902	—	—	—
fi. Red Sea and Islands:—								
<i>K. Akademie der Wissenschaften, Vienna.</i>	—	—	—	[1903]	[1903]	—	—	—
g. NORTH AMERICA.								
gb. Canada as a whole:—								
Meteorological Service, Dominion of Canada (Toronto).	—	—	—	—	—	1905	1905	—
Ottawa, Department of Marine and Fisheries.	—	—	1904	1903	—	—	—	—
gd. Canadian Dominion East: New- foundland:—								
Toronto, Bureau of Industries ..	—	—	1904	—	—	—	—	—
ge. The Laurentian Lakes:—								
<i>U.S. Weather Bureau, Department of Agriculture, Washington.</i>	—	—	—	—	—	—	—	1903
gf. United States as a whole:—								
<i>U.S. Weather Bureau, Depart- ment of Agriculture, Wash- ington.</i>	—	—	1904	1903	1904	1905	1904	—
gg. North-Eastern United States, East of Mississippi:—								
Cambridge (Mass.), Astronomical Observatory of Harvard Col- lege.	—	—	—	—	1902	—	—	—
New York, Meteorological Ob- servatory.	—	—	—	1905	—	—	—	—
Washington, United States Naval Observatory.	—	—	—	—	1902	—	—	—

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g. NORTH AMERICA—cont.								
gi. Western United States, West of Mississippi:—								
Colorado Springs, Colorado Col- lege Observatory.	—	—	—	—	1904	—	—	—
h. CENTRAL AND SOUTH AMER- ICA AND WEST INDIES.								
ha. Mexico:—								
Leon, Observatorio Meteorol- ógico.	—	—	—	—	1905	—	1905	—
Mexico, Dirección General de Telégrafos Federales.	—	—	—	—	—	1903	—	—
Oaxaca (A. M. Domínguez) ..	—	1903	—	—	—	—	—	—
Oaxaca, Observatorio Meteorol- ógico.	—	—	—	—	1915	—	1905	—
Saltillo, Observatorio Meteorol- ógico del Colegio de San Juan Nepomucino.	—	—	—	—	1904	—	—	—
Tacubaya, Observatorio Astró- nómico Nacional.	—	—	—	—	1896	—	—	—
hb. British Honduras, &c.:—								
Belize, Public Hospital ..	—	—	—	—	1914	—	—	—
hc. West Indian Islands, Carib- bean Sea, Gulf of Mexico:—								
Antigua, Government Labora- tory.	—	—	—	—	1905	—	—	—
Bahamas ..	—	—	—	—	1902	—	—	—
Barbados, St. Lucia, Jamaica, Bermuda. Army Medical Dep., London.	—	—	1903	—	—	—	—	—
Grenada, Richmond Hill Ob- servatory.	—	1905	—	—	1905	—	—	—
Guadeloupe, Martinique and other stations. Bureau Cen- tral Mété. Paris.	—	—	1902	—	1902	—	—	—
Havana, Estación Central Me- teorológica, Climatológica y de Cosechas.	—	—	—	—	—	—	1904	—
Havana, Observatorio del Colegio de Belén.	—	—	—	—	1904	—	—	—
Kingston, Government Labora- tory.	—	1905	—	—	—	—	1905	—
Port-au-Prince, Haiti. K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	1903	—	1903	—	—	—
St. Lucia, Botanic Gardens ..	—	—	1904	—	—	—	—	—
St. Lucia, Harbour Master ..	—	—	—	—	1905	—	—	—
St. Vincent, Botanic Gardens ..	—	—	1903	—	—	—	—	—
U.S. Weather Bureau, Washington.	—	—	—	—	—	—	1904	—
hd. Guiana—British, Dutch, and French; Venezuela; Trini- dad:—								
Cayenne and other stations. Bureau Central Mété. Paris.	—	—	1902	—	1902	—	—	—
Georgetown, Demerara, Botanic Gardens.	—	—	1904	—	1904	—	—	—
Paramaribo. K. Nederlandsch Meteorologisch Instituut de Bilt.	—	—	—	—	1903	—	—	—
Trinidad, Royal Botanic Gardens	—	1904	1904	—	—	—	—	—

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h. CENTRAL AND SOUTH AMER- ICA AND WEST INDIES—cont								
hh. Brazil:—								
Ministerio de Marinha, Direc- toria de Meteorologia, Rio Janeiro.	—	—	1904	1904	1904	—	—	—
Cuyabá, Observatorio Meteor- ologico "D. Bosco."	—	—	1904	—	1904	—	—	—
Cuyabá (Revista Matto Grosso)	—	—	—	—	1905	—	—	—
Para. K. K. Central-Anstalt für Meteorologie, Vienna.	—	—	—	—	1903	—	—	—
Rio Janeiro, Observatorio	—	—	1903	—	1903	—	—	—
Sao Paulo, Commissão Geo- graphica e Geologica, Serviço Meteorológico.	—	—	1902	—	—	—	—	—
hi. Argentina, Uruguay, and Paraguay:—								
Oficina Meteorológica Argentina (Buenos Aires).	—	—	—	—	—	1905	—	—
Dirección General del Servicio Meteorológico Nacional, Monte Video.	—	1905	1905	—	—	—	—	—
Monte Video, Observatorio Meteorológico Municipal.	—	—	—	1904	1903	—	1904	—
Villa Colón, Observatorio Meteorológico.	—	—	—	1902	1902	—	1902	—
hk. Chili:—								
Servicio Meteorológico de la Dirección del Territorio Marítimo (Valparaíso.)	—	—	—	—	1903	—	—	—
Punta Arenas, Observatorio Meteorológico del Colegio Salesiano "S. José."	—	1902	—	1902	—	—	—	—
Santiago, Observatorio Astro- nómico.	—	—	1904	—	—	—	—	—
l. AUSTRALASIA.								
Sydney Observatory	—	—	—	—	—	1905	—	—
ia. New Guinea:—								
British New Guinea (Govern- ment Gazette).	—	—	1904	—	—	—	—	—
Kissidougou, Labé and Siarrhéa. Bureau Central Mété., Paris.	—	—	1902	—	—	—	—	—
id. Queensland:—								
Brisbane, Government Statis- tician's Office.	1904	—	—	—	—	—	—	—

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L. AUSTRALASIA—cont.								
<i>ie.</i> New South Wales:—								
Sydney, Department of Public Instruction.	—	1902	1902	—	1902	—	—	—
Windsor (John Tebbutt)	—	—	1903	—	—	—	—	—
<i>ig.</i> South Australia:—								
Adelaide Observatory	—	1903	1903	—	1903	—	—	—
<i>ih.</i> West Australia:—								
Perth Observatory	—	1905	1903	—	1903	—	1905	—
<i>ik.</i> New Zealand:—								
Wellington, Meteorological De- partment.	—	1903	1903	—	—	—	—	—
Wellington, Government Obser- vatory.	—	—	—	—	1904	—	—	—
<i>il.</i> New Caledonia, New Hebrides, and Loyalty Islands:—								
Noumea (N. Cal.), <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	—	—	—	—
K. ARCTIC.								
<i>kb.</i> Greenland:—								
Commission Danoise des Ex- plorations Géographiques et Géologiques du Groenland (Copenhagen).	—	—	—	1899	—	—	—	—
<i>kd.</i> Islands north of Europe and Asia:—								
Norwegian North Polar Expedi- tion [H. Mohn].	—	—	1896	1896	1896	—	—	—
Spitzbergen (J. Westman) ..	—	—	—	1900	—	—	—	—
L. ATLANTIC.								
<i>a.</i> North Atlantic Ocean:—								
<i>Deutsche Seewarte, Hamburg</i> ..	—	—	—	—	—	—	—	1906
<i>Hydrographic Office, Washington</i> ..	—	—	—	—	—	—	—	1905
<i>Meteorological Office, London</i> ..	—	—	—	—	—	—	—	1905
<i>b.</i> Azores, Canaries, Madeira, Cape Verde:—								
Service Météorologique des Açores, Ponta Delgada.	—	—	1905	1905	—	—	—	—
Observatorio Do Infante D. Luiz, Lisbon.	—	—	1900	—	—	—	—	—
Teneriffe, Las Palmas. <i>Bureau Central Mét., Paris.</i>	—	—	1902	—	—	—	—	—

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m. INDIAN OCEAN.								
ma. Ocean and Islands north of Equator:—								
<i>Meteorological Office, Calcutta ..</i>	—	—	—	—	—	—	—	1905
mb. Ocean and Islands south of Equator:—								
<i>Mauritius, Royal Alfred Obser- vatory.</i>	—	—	1904	1901	1901	—	—	—
<i>Mauritius. Army Medical Dep., London.</i>	—	—	1903	—	—	—	—	—
<i>Réunion. Bureau Central Mété., Paris.</i>	—	—	1902	—	—	—	—	—
n. PACIFIC.								
na. North Pacific Ocean north of Equator:—								
<i>Hydrographic Office, Washington..</i>	—	—	—	—	—	—	—	1905
nd, ne. Pacific Islands North of Equator:—								
<i>Christmas Island. Scottish Met. Soc., Edinburgh.</i>	—	—	1903	—	—	—	—	—
<i>Honolulu (R. C. Lydecker) ..</i>	—	—	—	—	1903	—	—	—
<i>Marshall Islands. Deutsche See- warte, Hamburg.</i>	—	—	—	—	1893	—	—	—
nf, nh. Pacific Islands South of Equator:—								
<i>Samoa and Cook Islands. Deutsche Seewarte, Hamburg.</i>	—	—	—	—	1899	—	—	—
<i>Tahiti, Rikitea (Mangareva), Bureau Central Mété., Paris.</i>	—	—	1902	—	—	—	—	—

LIST OF CURRENT METEOROLOGICAL PERIODICALS AND JOUR-
NALS CONTAINING OCCASIONAL ARTICLES ON METEORO-
LOGICAL 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.
 Ciel et Terre.

Comptes rendus hebdomadaires 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 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 Society of Arts.
 London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
 Memoirs and Proceedings of the Manchester Literary and Philosophical Society.
 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.
 Nature.
 Nature (La).
 Nautical Magazine.
 Oversigt over det Kongelige danske Videnskabernes Selskab Forhandlingar.
 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 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. 41.

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 and PERSONS receiving PUBLICATIONS
issued by the COMMITTEE.

OBSERVERS contributing returns printed in one of the periodical publications receive a copy of the publication.

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. It is also sent to certain Professors at British Universities and Colleges, and to Agricultural Colleges.

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

UNITED KINGDOM.

Public Offices:		Admiralty:—	
Edinburgh	Board of Fisheries.	Dartmouth	Royal Naval College.
	*Royal Scottish Museum.	Greenwich	*Royal Naval College.
	*Royal Observatory.		*Royal Observatory.
London ...	Army Medical Department.	London ...	Hydrographer.
	Board of Agriculture (Dr. Somerville).		Librarian.
	*Board of Education, Secondary Branch.	Portsmouth	Royal Naval College.
	— Solar Physics Observatory.	R.N.R.	H.M.S. "Briton" (Inverness).
	Board of Trade.	Drill Ships	" "Clyde" (Aberdeen).
	— Superintendents of the M.M.O. at various seaports.		" "Daedalus" (Bristol).
	— Consultative Branch.		" "Durham" (Leith).
	— Fisheries and Harbour Department.		" "Eagle" (Liverpool).
	— Marine Department (Capt. Chalmers).		" "President" (W. I. Dock).
	— Standard Weights and Measures Department.		" "Unicorn" (Dundee).
	Chinese Maritime Customs.		
	General Post Office		
	*Imperial Institute.		
	Registrar General.		
	Trinity House.		

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

BRITISH COLONIES AND DEPENDENCIES— <i>cont.</i>		EUROPE— <i>cont.</i>	
<i>Australasia—cont.</i>		<i>AUSTRIA-HUNGARY—cont.</i>	
Sydney ...	*Observatory. Royal Society of New South Wales.	Prague ...	Hydrographic Office. *Observatory. Royal Society of Sciences.
Wellington ...	*Colonial Museum.	Trieste ...	Observatory.
Windsor ...	Observatory.	Vienna ...	Austrian Meteorological Society. Central Hydrographical Bureau. *Central Meteorological Office. *Hann, Hofrath Dr. J. Ministry of Agriculture.
<i>Canada.</i>			
Montreal ...	McGill University.		
Toronto ...	*Meteorological Office.		
<i>Falkland Islands.</i>			
Cape Pembroke	Lighthouse Keeper.		
<i>India and Eastern Asia.</i>		<i>BELGIUM.</i>	
Allahabad ...	Meteorological Reporter.	Brussels (Uccle) ...	*Observatory. Meteorological Service. Navigation School.
Bangalore ...	Meteorological Department.	Ostend ...	
Bombay ...	Observatory.	<i>BULGARIA.</i>	
Calcutta ...	*Meteorological Reporter. (Alipore.) Surveyor General.	Sofia ...	Central Meteorological Station.
Dehra Dun ...	Trigonometrical Survey	<i>DENMARK.</i>	
Hong Kong ...	*Observatory.	Copenhagen ...	Hydrographic Office. International Council for the Study of the Sea. *Meteorological Institute. *Society of Sciences.
Kodaikanal ...	Observatory.		
Simla ...	Meteorological Reporter.		
Singapore ...	Principal Civil Medical Officer.		
<i>Mediterranean.</i>		<i>FRANCE.</i>	
Malta ...	Observatory.	Bordeaux ...	Society of Oceanography of the Gulf of Gascony.
<i>South Africa.</i>		Lyons ...	Observatory.
Bloemfontein.	Grey College.	Marseilles ...	Meteorological Commission.
Cape Town ...	Observatory. Meteorological Commission.	Paris ...	*Central Meteorological Office. *Hydrographic Office. Hydrometric Service. *Institute of France. *Meteorological Society.
Durban ...	Natal Observatory.	Perpignan ...	Meteorological Commission.
Johannesburg	Transvaal Meteorological Department.	Puy-de-Dôme.	Observatory.
<i>Indian Ocean.</i>		<i>GERMANY.</i>	
Manritius ...	*Meteorological Society.	Aachen ...	Meteorological Station.
<i>EUROPE.</i>		Berlin ...	Hydrographic Office. *Meteorological Institute. Wetterbureau.
<i>AUSTRIA-HUNGARY.</i>			
Cracow ...	Observatory.		
Fiume ...	Nautical Academy.		
Innsbrück ...	Observatory.		
O'Gyalla ...	Observatory.		
Pesth... ...	*Central Meteorological Institute.		
Pola ...	*Hydrographic Office.		

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

GERMANY— <i>continued.</i>		NETHERLANDS.	
Bremen ...	Meteorological Observatory.	Amsterdam ...	*Geographical Society. Meteorological Institute.
Carlsruhe ...	Central Meteorological Office.	De Bilt, Utrecht.	*Royal Meteorological Institute.
Darmstadt ...	Hydrographical Bureau.	NORWAY.	
Dresden ...	*Meteorological Institute.	Christiania ...	*Meteorological Institute.
Frankfort ...	Physical Society.	PORTUGAL	
Gotha ...	M. Justus Perthes' Geographical Institute.	Coimbra ...	Observatory.
Greifswald ...	Geographical Society.	Lisbon ...	Observatory.
Halle... ...	Leopold-Carolin Academy.	Azores.	
Hamburg ...	*Deutsche Seewarte. Schück, Capt. A.	Ponta Delgada	Observatory.
Kiel	Commission for the Exploration of the German Ocean.	ROUMANIA.	
Leipzig ...	University Library.	Bucharest ...	Meteorological Institute.
Lindenberg ...	Royal Prussian Aeronautical Observatory.	RUSSIA.	
Magdeburg ...	Observatory.	Dorpat ...	Observatory.
Munich ...	*Central Meteorological Office.	Helsingfors...	Society of Sciences.
Neustadt ...	Observatory.	Kazan ...	Observatory.
Neustadt an der Haardt.	Forest Academy.	Koutchino ...	Aerodynamical Institute.
Potsdam ...	Wirkl. Geh. Rath Dr. G. von Neumayer.	Moscow ...	Observatory.
Strassburg ...	*Observatory.	Nicolaieff ...	Hydrographic Office.
Stuttgart ...	Meteorological Agricultural Service.	Odessa ...	Observatory.
Wilhelms-haven.	Central Meteorological Office.	Pavlovsk ...	Observatory.
	Observatory.	St. Petersburg	*Central Physical Observatory. Hydrographic Department. Woeikof, A.
GREECE.		Tiflis ...	*Observatory.
Athens ...	Observatory.	Warsaw ...	Meteorological Bureau.
ITALY.		SERVIA.	
Catania ...	Meteorological Observatory.	Belgrade ...	Central Observatory.
Florence ...	Observatory.	SPAIN.	
Messina ...	Observatory.	Guardia ...	Observatory.
Milan ...	Observatory.	Madrid ...	Central Meteorological Institute.
Moncalieri ...	*Observatory.		*Observatory.
Naples ...	*Observatory.		Observatory, Chamar-tin de la Rosa.
Palermo ...	Observatory.	Malaga ...	Society of Sciences.
Pesaro ...	Observatory.	San Fernando	*Observatory.
Riposto ...	Observatory.	Tortosa ...	Ebro Observatory.
Rome ...	Central Meteorological Office.	Vilafranca del Panades.	Observatory.
Turin ...	Vatican Observatory.		
Venice ...	*Observatory.		
	Observatory.		

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

LIST OF INSTITUTIONS, &c., receiving PUBLICATIONS—*cont.*

SWEDEN.		AMERICA— <i>continued.</i>	
Stockholm ...	*Central Meteorological Institute.	Monte Video...	Meteorological Society. Observatory, Villa Colon.
	Nautical Meteorological Bureau.	New York ...	American Geographical Society.
Upsala ...	Royal Academy.		*Central Park Observatory.
	Meteorological Observatory.		*State Library.
SWITZERLAND.		Oaxaca ...	Observatory.
Berne ...	Hydrometrical Bureau.	Philadelphia ..	*American Philosophical Society.
Geneva ...	Geographical Society.		*Franklin Institute.
Mont Blanc ...	Observatory.	Porto Alegre..	Azambuja, Sr. G. A. de
Neuchâtel ...	Observatory.	Porto Rico ...	Engineer in Chief.
Zürich ...	Central Meteorological Office.	Quito... ..	Observatory.
		Rio Janeiro ...	Meteorological Department, Ministry of Marine.
AFRICA.			Observatory.
Algiers ...	Meteorological Service.	Saltillo ...	Observatory.
Cairo... ..	Sanitary Department.	San Luis	Observatory.
	Survey Department.	Potosi.	
AMERICA.		San Salvador	Observatory.
Buenos Aires..	Mons. Lasagna Observatory.	Valparaiso ...	*Meteorological Service.
Cambridge, Mass.	*Harvard College Observatory.	Washington...	Chief Signal Officer.
Cordoba ...	Meteorological Office.		Department of Agriculture.
	*National Academy.		Hydrographic Office.
Costa Rica ...	Meteorological Institute.		*Naval Observatory.
Guatemala ...	Central Laboratory.		*Smithsonian Institution.
Havana ...	Observatory.		*Surgeon General's Office.
	Central Meteorological Station.		*Weather Bureau.
Mexico ...	"Antonio Alzate" Scientific Society.	ASIA.	
	Central Meteorological Observatory.	Batavia ...	*Observatory.
		Beyrout ...	Lee Observatory.
		Irkutsk ...	Observatory.
		Manila ...	Meteorological Observatory.
		Tokio ...	*Imperial Meteorological Observatory.
		Zi-ka-wei ...	Observatory.

* Receive all publications (Daily Weather Report and Monthly Marine Charts not necessarily included).

APPENDIX IX.

ACCOUNT of RECEIPTS and PAYMENTS for the year ended 31st March, 1906 :—

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance from year 1904-1905	—	1,010 4 9	ADMINISTRATION:		
Parliamentary vote ..	—	15,300 0 0	Committee (Travelling)	41 8 0	
Repayment for forms, incidental items, &c. ..	—	53 9 10	Director	1,000 0 0	1,041 8 0
SPECIAL RESEARCHES ..	—	3 8 0	Salaries and wages ..	1,108 19 0	
SUPPLY OF INFORMATION:			Rent, fuel, and lighting	719 7 4	
Weather Forecasts, Reports, &c. ..	630 19 1		Incidental and contingent expenses ..	324 17 5	
Telegrams sent abroad	457 19 3	1,088 18 4	Furniture, fittings, &c. ..	73 13 10	
SUPPLY OF INSTRUMENTS, &c.:			Expenses incidental to International Meteorological Congress ..	20 11 9	2,247 9 4
Repayment of cost of supply of instruments to Royal Navy..	701 7 10		SPECIAL RESEARCHES:		
Repayment of cost of instruments by Colonial Governments, observers, &c. ..	890 16 7		Salaries and other charges	—	353 11 10
Charges for Commission	28 13 2	1,620 17 7	LAND METEOROLOGY:		
ANTARCTIC METEOROLOGY	—	300 0 0	Observatories and stations, including remuneration of observers, &c. ..	2,089 3 1	
SUPERANNUATION ACCOUNT:			Salaries:— Discussion and reduction of observations, &c. ..	1,955 13 9	4,044 16 10
Annuities	285 0 0		WEATHER INFORMATION AND FORECASTS:		
Interest on Investment	53 4 7		Telegraphic reports and storm warnings, remuneration of observers, &c. ..	2,463 19 9	
Repayment of Income Tax	7 13 3	345 17 10	Salaries:— Preparation and issue of reports and forecasts ..	1,402 5 7	3,866 5 4
			INSPECTIONS:		
			Salaries and travelling expenses	—	402 13 2
			OCEAN METEOROLOGY:		
			Salaries:— Discussion and reduction of observations	1,703 0 3	
			Agents' fees, &c.	117 0 2	1,820 0 5
			INSTRUMENTS:		
			Royal Navy	601 7 10	
			Do. Proportion of salaries ..	100 0 0	
			Mercantile Marine, Stations, Colonial Governments, &c. ..	1,281 19 3	
			Do. Proportion of salaries ..	246 0 0	2,229 7 0
			ANTARCTIC METEOROLOGY:—		
			Salaries and other charges	—	236 9 2
			SUPERANNUATION:		
			Pensions and Allowances	—	829 0 0
			BALANCE:		
			Cash at Bank	2,578 16 8	
			" at Office	42 18 7	2,621 15 3
		£19,722 16 4			£19,722 16 4

NOTE.—On March 31st the amount of 2½ per cent Annuities held for the provision of Superannuation Annuities was £2,156 4s. 1d.

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