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# MINUTES OF THE PROCEEDINGS

OF THE

# METEOROLOGICAL COUNCIL

1900-1901.



LONDON:  
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Office

# MINUTES OF THE PROCEEDINGS OF THE METEOROLOGICAL COUNCIL.

1900-1901.

63, Victoria Street, April 11, 1900.

PRESENT :

SIR R. STRACHEY IN THE CHAIR.

PROFESSOR DARWIN.

THE HYDROGRAPHER.

MR. SHAW. (Secretary).

1. The Minutes of the last meeting (March 28) were read and confirmed.
2. Submitted—the following correspondence :—

War Office,  
9th April, 1900.

SIR,  
I AM directed by the Marquess of Lansdowne to acquaint you, for the information of the Meteorological Council, that correspondence (of which copies are enclosed) has taken place between this department and the Treasury, in regard to the grant of leave to Volunteers in Government employ in order to enable them to attend Camps of exercise this summer. His Lordship now proposes, in order to carry the proposed arrangements into effect, to issue a memorandum to the War Department, of which a copy is enclosed, and would be glad to have the Council's observations thereon as early as possible, to enable him to promulgate it within the next few days, and with the view of a corresponding memorandum being issued to your department. When the necessary steps are taken to do this Lord Lansdowne proposes to communicate the memorandum to the press.

I am, &c.,  
G. FLEETWOOD WILSON.

The Secretary, Meteorological Council.

M.O. 626.

[Copy.]

No. 7968  
8495

War Office, Pall Mall, S.W.,  
19th March, 1900.

SIR,  
I AM directed by the Marquess of Lansdowne to acquaint you, for the information of the Lords Commissioners of H.M. Treasury, that he has had under his consideration the question of allowing members of Volunteer Corps who are serving in Government Departments, special facilities to enable them to attend the proposed Camps in the ensuing summer.

The Marquess of Lansdowne considers that in the special circumstances under which it has been determined to call upon the auxiliary forces for a lengthened period of exercise this year, the Government should take the lead in offering the necessary facilities to members of the various Corps

in its service, and he accordingly proposes that in all cases where it is possible for men to be spared from duty they shall be granted special leave with full pay for the period of their absence at the Camp of the unit to which they belong.

I am to request that their Lordships' approval of this proposal may be communicated at the earliest possible date.

I am, &c.,  
FRANK T. MARZIALS.

The Secretary to the Treasury.

M.O. 626.

[Copy.]

5183  
1900

Treasury Chambers,  
27th March, 1900.

SIR,

THE Lords Commissioners of Her Majesty's Treasury have had under Their consideration Mr. Marzials' letter ( $\frac{4252}{3493}$ ) of the 17th instant, relative to affording facilities to Volunteers in Government employ for attending the proposed Camps next summer.

The Marquess of Lansdowne proposes that, in all cases where it is possible for such men to be spared from their civil duties, they should be granted special leave with full pay during their absence at Camp.

In reply, I am to request you to state to his Lordship that My Lords are not in a position to lay down a general rule binding on all Departments of State. As regards the Treasury and its subordinate Departments, My Lords are prepared, so far as the requirements of the service will allow, to permit any Volunteer who desires to attend Camp this year to take his annual vacation during the period of exercise; and, in the case of any man whose balance of leave then due is not sufficient, Their Lordships will be prepared to allow the necessary extension of leave on full pay.

A copy of this letter is being sent to the Departments subordinate to the Treasury.

I am, &c.,  
FRANCIS MOWATT.

The Financial Secretary,  
War Office.

M.O. 626.

In order to enable Volunteers in Government employ to attend Volunteer Camps during this summer, Volunteers will be allowed to take such annual leave as they may be entitled to under the regulations applicable to them, during the period of exercise of the Corps to which they belong, unless there are urgent reasons to the contrary.

Those whose balance of leave due at the time of the exercise is insufficient to cover the period of exercise, will be granted an extension of leave on full pay.

The Secretary was instructed to return the following reply :—

Meteorological Office,  
11th April, 1900.

SIR,

Referring to your letter  $\frac{7968}{3507}$  dated 9th April, 1900, I am directed by the Meteorological Council to state that the Council are prepared, so far as the requirements of the Meteorological Office will allow, to permit any Volunteer who desires to attend Camp this year to take his annual vacation during the period of exercise, and in the case of any man whose balance of leave is not sufficient the Council will be prepared to allow the necessary extension of leave on full pay.

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

The Under Secretary of State,  
War Office, Pall Mall.

3. Superannuation.—The Secretary was directed to write to Mr. Strachan, informing him of the steps to be taken to obtain the annuity authorised by Minute 3 of March 28, 1900 (Minutes, p. 194), and enclosing the form furnished by the National Debt Commissioners for the purpose.

4. The draft scheme of superannuation of Classified Clerks was considered, revised, and approved in the following form :—

#### REGULATIONS FOR SUPERANNUATION ALLOWANCES FOR CLASSIFIED CLERKS.

Subject to the continuance of the Parliamentary grant now made, the Meteorological Council will make provision for superannuation allowances for Classified Clerks on the following basis :—

1. Every clerk will be retired on his attaining the age of 65 years unless his service be specially extended by the Council. On being so retired he will receive a yearly allowance not exceeding one-half of his average salary during the last three years of his service. Provided that the maximum allowance will be at the rate of £150 per annum, after approved service of not less than 30 years.

2. For the purpose of these regulations, regular payments authorised by the Council for attendance in the evenings and on Sundays will be reckoned in computing the annual salary, but no other allowances beyond the normal annual salary, fixed under the regulations of the Council from time to time will be so reckoned.
3. The provision made by the Council for superannuation allowances under Regulation 1, will be based upon the assumption that such superannuations will not take place oftener than at the rate of one in every two years.
4. Should the services of any clerk be dispensed with by the Council before he reaches the age of 65 years, on reduction of establishment, on account of ill-health, or for any other reason except for misconduct or incapacity (as to which causes of disqualification the decision of the Council shall be final), the Council will take into consideration the length of service of the clerk whose services are dispensed with, and will make such retiring allowance as they may think fit at the time, but in no case will the allowance exceed an annual payment of ten-sixtieths of the clerk's average salary during the last three years of his service, in respect of the first twenty years of approved service, together with one additional sixtieth of such salary for each additional year of service after the twentieth.
5. In all cases, for the purposes of these regulations, service under the Council shall be only reckoned after the age of 25 years.
6. Retiring allowances will be paid quarterly, and the payments will be subject to such regulations as the Council may prescribe as to furnishing life certificates, or the like.
7. The Council will recognise no alienation or assignment of any retiring allowance granted under these rules, and they reserve the right to cancel any retiring allowance in the event of the insolvency of the person to whom it was granted, or of any flagrant misconduct on his part.
8. The customary right of the Council to dispense with the services of persons in their employment, after due notice, at their discretion, shall not be affected by these regulations.
9. Voluntary retirements from the service of the Council will give no claim to superannuation or retiring allowances.
10. These rules are subject to alteration from time to time by the Council, and no claim or vested interest shall be created by these or any similar rules having been in force at any time during the period of service of any clerk.

The Secretary was directed to forward a copy to the Royal Society for communication to the Treasury if thought necessary.

5. The following increments to the Office Staff were allowed (Minutes, 1899-1900, p. 6):—

—	Salary in 1899-1900.	Proposed for 1900-1901.
	ANNUAL.	
	£ s. d.	£ s. d.
CLASS IV.—MAXIMUM 110 <i>l</i> .		
C. A. Bracey (Minutes, 1890-1, p. 76) ... ..	100 0 0	105 0 0
E. J. Hood ( " 1892-3, p. 66) ... ..	90 0 0	95 0 0
J. T. Williams ( " 1896-7, p. 3) ... ..	75 0 0	80 0 0
	WEEKLY.	
FEMALE CLERKS.—MAXIMUM 1 <i>l</i> . 10 <i>s</i> .		
B. M. Smith (Minutes, 1895-6, p. 22) ... ..	1 8 0	1 10 0
BOY CLERKS.—MAXIMUM 1 <i>l</i> .		
A. T. Bench (Minutes, 1897-8, p. 77) ... ..	0 15 6	0 17 0

The salary of A. G. Goad (Messenger) was raised from 14*s*. to 15*s*. 6*d*. a week (Minutes, 1898-9, p. 93).

6. Special applications from members of the Staff for promotion to higher grades were read and considered, and were deferred for further consideration.

7. The Secretary was authorised to advance a sum necessary to provide efficient instruction of a member of the Staff in shorthand and typewriting, and to make arrangements for its repayment in such manner as he thinks fit, and to report to the Council thereupon.

## 8. Submitted—the following letter :—

General Post Office, London,  
5th April, 1900.

SIR,

As you are aware, a fee of one shilling is collected by the Post Office from persons telegraphing to the Meteorological Office for information as to the weather in any particular district of the United Kingdom. Of this sum eightpence is accounted for to the Meteorological Office, fourpence being retained by the Post Office to cover the cost of collection and account keeping. The Postmaster General finds that the number of Forecasts applied for in this way is very small, there having been only 92 during the year ended the 28th February last, and it has occurred to him that, if the charge could be reduced greater advantage would probably be taken by the public of the arrangement.

I am, therefore, to ask whether, if this Department could see its way to forego any charge for account keeping, the Meteorological Council would be prepared to give up twopence per Forecast, so that the amount chargeable to the public might be reduced to 6d., the whole of which would be handed over to the Council.

I am, &c.,

J. H. MURRAY.

The Secretary, Meteorological Office.

The Secretary was authorised to reply (P.C. 773) assenting to the suggestion, and thanking the Postmaster General for his assistance in increasing the public facilities for obtaining weather information.

9. Wirral Railway Bill.—In reply to an inquiry from Messrs. W. and W. M. Bell, Parliamentary Agents, respecting the attitude of the Council with regard to the omission from the Wirral Railway Bill of a clause safeguarding apparatus and instruments from electrical disturbance, the Secretary was authorised to say that the Council were not in a position to object to the removal of the clause, because any apparatus or instruments in the district, that might possibly be affected, were not, strictly speaking, under the control of the Council; and to add that it was desirable that the authorities of Bidston Observatory should have the opportunity of expressing an opinion upon the matter.

10. The Secretary was instructed to report to the next meeting upon the modifications of existing arrangements that would be necessary, in order that the returns from stations of the Royal Meteorological Society, and the Scottish Meteorological Society, might be sent directly to the printers.

11. The Secretary reported that proofs of two Cloud pictures, out of the ten ordered from the Polygraphisches Institut at Zurich (P.C. 193-1899), had been received.

It was agreed to obtain a complete set of proofs of Cloud pictures for the "Instructions" as soon as possible without waiting for the remainder of the proofs from the Zurich Institute.

12. Read—a Memorandum from the Marine Superintendent, stating that since the last meeting seven logs had been received, two of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

13. Resolved—that the publication of the Wind and Weather Charts for the South Atlantic be carried out by the Hydrographic Office, as proposed by the Hydrographer.

14. Resolved—that the portable aneroids asked for by the Hydrographer be supplied in accordance with his request.

15. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 2 days, the total number of districts warned being 10. In 5 districts the warnings were justified, but in 5 they were not required.

GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

16. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of March 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Per-centages.			Per-centage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	52	55	54	81
"	b	22	32	27	
"	c	13	10	11	
"	d	13	3	8	
Scotland, E.	a	39	48	44	79
"	b	32	39	35	
"	c	16	10	13	
"	d	13	3	8	
England, N.E.	a	55	61	58	87
"	b	35	23	29	
"	c	10	13	12	
"	d	0	3	1	
England, E.	a	39	68	54	81
"	b	32	23	27	
"	c	19	6	13	
"	d	10	3	6	
Midland Counties	a	52	58	55	88
"	b	29	36	33	
"	c	19	3	11	
"	d	0	3	1	
England, S.	a	49	71	60	88
"	b	35	20	28	
"	c	16	6	11	
"	d	0	3	1	
Scotland, W.	a	29	68	49	73
"	b	29	19	24	
"	c	29	10	19	
"	d	13	3	8	
England, N.W.	a	61	61	61	76
"	b	13	16	15	
"	c	20	20	20	
"	d	6	3	4	
England, S.W.	a	55	65	60	85
"	b	26	23	25	
"	c	10	9	9	
"	d	9	3	6	
Ireland, N.	a	42	42	42	76
"	b	29	39	34	
"	c	19	13	16	
"	d	10	6	8	
Ireland, S.	a	52	48	50	79
"	b	19	39	29	
"	c	19	3	11	
"	d	10	10	10	
SUMMARY.					
British Islands	a	48	59	54	81
"	b	27	28	27	
"	c	17	9	13	
"	d	8	4	6	

17. Submitted—The following reports of work during the month of March, 1900 :—

MARINE BRANCH.

Examined 11 new logs and four lighthouse registers.

Making progress with the discussion of the meteorology of the region southward from the equator, between the West Coast of Africa and the longitude of 90° W. Obtaining results of wind, barometer, and air and sea temperature observations in areas of 5° square, and along the American coasts in smaller spaces. A specimen wind chart for the month of August in preparation.

A few logs lent by the Pacific Steam Navigation Company have been used for results now under discussion on the West Coast of South America.

Examining revised proofs of the North Atlantic Weather Charts for the winter of 1898–99.

10th April, 1900.

CHAS. HARDING.

TELEGRAPHIC BRANCH.

*Weekly Weather Report*, 1900.—All individual numbers have been issued promptly. Summaries—*February*, went finally for press on March 29, copies not yet delivered—delay is inexplicable. *March* is in course of preparation.

*Quarterly Summary*.—Part I. (January to March) gone to printer, for proof.

*Daily Weather Report*, 1900.—All numbers issued promptly to date. *Monthly Correction and Addition Sheet* for February issued, March in progress.

*Checking of Daily Forecasts* (8.30 p.m.) completed to end of March.

*Primary Checking of Storm Warnings*, 1900, done to date.

*Final Checking of Storm Warnings*, 1899, done to middle of October. There has been some necessary delay owing to non-arrival of lighthouse documents, and owing to circumstances attending the death of Mr. Brodie's father, and his own subsequent sickness (four days in all).

*Preparation of Monthly Averages* for Daily and Weekly Weather Report Stations :—

(1) Rainfall, amount in inches... ..	35 years, 1868–1900.
(2) Rain Days ... ..	30 „ 1871–1900.
(3) Pressure at 8 a.m. ... ..	30 „ 1871–1900.
(4) Temperature (8 a.m., Daily Weather Report only) ...	30 „ 1871–1900.
Temperature—Mean of Daily <i>Maxima</i> ... ..	30 „ 1871–1900.
Temperature—Mean Daily <i>Minima</i> ... ..	30 „ 1871–1900.
Temperature—Mean Daily <i>Average</i> ... ..	30 „ 1871–1900.
(5) Temperature—Values and Data of <i>extremes</i> in the period	30 „ 1871–1900.
(6) Bright Sunshine—Mean Number of Hours and Percentages of Possible duration ... ..	20 „ 1881–1900.

For month of *January* only ; (February, &c., in progress).

Enquiry as to Pembroke Weather in 1895 and 1896, done for private inquirer.

11th April, 1900.

FREDC. GASTER.

PANTAGRAPH ROOM.

*Hourly Means* for 1897.—The calculation of mean results for this year is still in progress, and the position of the work up to date is as follows :—

The whole of the Means required for the thirteen different tables in which they are given are calculated and checked for the Valencia, Fort William, Aberdeen and Falmouth Observatories.

For Kew Observatory the Daily Means and the Hourly Means for five-day periods are completed ; these results form Tables I. to V of the volume.

The Monthly Means required for Tables VI. to XIII., are in hand, but are not much advanced.

The results for 50 pp. of type have been copied upon the final forms and forwarded to the printer for Valencia and Fort William Observatories ; those for Aberdeen are being copied.

First and second proof sheets of the first 16 pp. of the volume have been received, read, and passed for press. The delivery of proof by the printer is extremely slow :—16 pp. in two months.

For the year 1898 the hourly tabulations of the curves are being examined for lacunæ in order to make them good by interpolation, &c.; the year has been about half completed.

2nd April, 1900.

R. H. CURTIS.

EXAMINATION BRANCH.

*Examinations.*

*November and December*, 1898.—Completed.

*January–March*, 1899.—Proceeded with.

*January and February*, 1900.—Valencia work proceeded with.

Weekly examinations (on receipt) of Curves and Documents from all Observatories.

*Reports.*

*July–December*, 1898.—Report on work of all Observatories to Council.

*November and December*, 1898.—Copies of “Notes of Errors” to Aberdeen, Armagh, Falmouth and Fort William.

2nd April, 1900.

T. E. ALLEN.

## 18. Submitted—The following statement of accounts :—

Cash balance on 27th March	...	...	...	£5,951	9	1
Receipts from 28th March to 10th April	...	...	...	3,653	16	9
				9,605	5	10
Cheques drawn from 28th March to 10th April	...	...	...	2,447	0	0
Cash balance on 10th April	...	...	...	£7,158	5	10

## 19. Submitted—The following list of publications which had been received since the last meeting :—

*Augustin, F.*—Die Temperaturverhältnisse der Sudetenländer.

*Cambridge (Mass.), Astronomical Observatory of Harvard College.*—Annals. Vol. 42, Part 2. Observations made at the Blue Hill Meteorological Observatory, Mass., U.S.A., in the years 1897 and 1898. Under the direction of A. L. Rotch. With an appendix containing the international cloud measurements during 1896–97.

*Chemnitz, K. Sächsisches Meteorologisches Institut.*—Decaden-Monatsberichte. 1898, Jahrg. 1.

*Chemnitz, K. Sächsisches Meteorologisches Institut.*—Jahrbuch . . . 1896, 1897. Jahrg. 14–15 der neuen Reihe. Zugleich Deutsches meteorologisches Jahrbuch für 1896–97. Beobachtungssystem des Königreiches Sachsen.

*Copenhagen, Dansk Meteorologisk Institut.*—Nautisk-meteorologisk Aarbog, 1899.

*Harrington, M. W.*—About the weather.

*London, Admiralty, Hydrographical Department.*—Sailing directions for the West Coasts of France, Spain and Portugal, from Ushant to Gibraltar, including Gibraltar Strait, and the African Coast from Ceuta to Mogador. 6th edition.

*London, General Register Office.*—Annual Report of the Registrar General of Births, Deaths, and Marriages in England. 60th and 61st. 1897, 1898. 2 vols.

*London, Meteorological Office.*—A barometer manual for the use of seamen; with an appendix on the thermometer, hygrometer, and hydrometer. Fourth edition, extensively revised.

*Southport, Fernley Observatory.*—Report and results of observations, for the year 1899. By J. Baxendell.

*Vienna, K. K. Central-Anstalt für Meteorologie und Erdmagnetismus.*—Jahrbücher. Jahrg. 1897. Neue Folge, 34. Bd.

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63, Victoria Street, April 25, 1900.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.

MR. SHAW (Secretary).

1. The minutes of the last meeting (April 11) were read and confirmed.

2. The Secretary reported that the cost of instruction in shorthand and type writing, authorised under minute 7 (p. 3), was £5 15s. 6d., and that he had arranged that £5 of the sum should be refunded within a year after satisfactory proficiency had been acquired.

Approved.

3. Instructions were given for a draft of the Annual Report to be prepared in the usual form.

4. The Secretary was authorised to arrange for the employment of an additional boy-clerk to take the observations at the office and help in the Instruments and Marine Branch.

Authority was given, subject to a satisfactory arrangement of the work being made, for the increase of A. E. Pycock's wages from £1 to £1 2s. 6d. per week.

The consideration of other applications was again deferred.

5. The Secretary reported that he had given directions for copies of the 6 p.m. observations to be supplied to the "Daily Express" at the same rate and under the same conditions as those supplied to the "Daily Mail," in pursuance of the instructions of 19th July, 1899 (Minutes, p. 30).

Approved.

6. The question of drawing up a weekly report of the weather over Europe, suitable for transmission to the United States for the use of newspapers, was deferred for consideration in conjunction with changes in the Daily and Weekly Weather Reports.

7. The Secretary submitted a draft form of the Daily Weather Report altered so as to exhibit the latest information in the office concerning the weather at certain continental stations as suggested in a correspondence with Sir W. Harcourt (M.O. 635, 663), and with other modifications.

Resolved—that specimens of the Report in the proposed form be obtained and submitted.

8. The Secretary was instructed to report upon the steps to be taken in connexion with arrangements for the issue of Hay Harvest forecasts in the current year.

9. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

#### WARNINGS ISSUED.

The signals were hoisted on 3 days, the total number of districts warned being 16. In each district the warning was justified.

#### GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

A strong W. gale in the east of Scotland on April 15th, caused by a depression which appeared in the extreme north in the morning, and which afterwards moved N.E. At 8 a.m. the appearance was not sufficiently threatening to justify the issue of warnings. By 6 p.m. the gale, which was brief, and to some extent local, had subsided.

FREDC. GASTER.

10. Read—A memorandum from the Marine Superintendent stating that since the last meeting one log had been received.

11. The Secretary submitted copies of monthly charts of mean sea temperature for the years 1896 and 1897, prepared by Mr. H. N. Dickson, who wished them to be brought before the notice of the Council with a view to corresponding charts being prepared in the Office and issued periodically.

He also read a letter (M.O. 683) from the Director of the Royal Alfred Observatory, Mauritius, with reference to the proposed publication of synoptic charts for the South Indian Ocean (*see* Minutes, 25th October, 1899, p. 33).

The further consideration of these matters was postponed.

12. Authority was given to order the instruments for "M.O." stock, referred to in Minute 14 (1899-1900), p. 108.

13. Submitted—A memorandum from Mr. J. A. Curtis in pursuance of Minute 10, of April 11th, respecting the returns from the Royal Meteorological and Scottish Meteorological Societies' stations.

Resolved—That inquiry be made as to whether the Societies would be willing to make the returns in a form suitable for sending directly to the Printers.

14. Submitted—The following Statement of Accounts for the year ending 31st March, 1900 :—

RECEIPTS.			PAYMENTS.				
	£	s. d.	£	s. d.	£	s. d.	
Balance from year 1898-99 ...	—	—	2,267	15 7	ADMINISTRATION :	£	s. d.
Parliamentary vote ...	—	—	15,300	0 0	Council ...	925	10 6
Repayment of expenses charged under—					Secretary ...	795	16 8
(1.) Incidental expenses	9	12 3			Salaries and wages ...	909	13 6
(2.) Observatories ...	28	11 0			Rent, fuel, and lighting	731	12 10
(3.) Inspections ...	2	0 0			Incidental and contingent expenses ...	200	14 1
			40	3 3	Furniture and fittings	78	7 11
SPECIAL RESEARCHES :					Expenses incidental to International Meteorological Congress...	3	5 0
Grant for investigation on atmospheric electricity ...	—	—	100	0 0	Pensions ...	177	6 8
							3,822 7 2
SUPPLY OF INFORMATION :					SPECIAL RESEARCHES :		
Daily Weather Charts and Forecasts ...	291	3 2			Salaries and other charges ...	700	12 10
6 p.m. Charts ...	25	0 0			Investigation on Atmospheric Electricity	200	0 0
Reports for Press Agencies, &c. ...	106	11 4					900 12 10
Telegrams sent abroad	270	13 2			LAND METEOROLOGY :		
			693	7 8	Observatories and stations, including remuneration of observers	2,220	14 5*
SALE OF INSTRUMENTS, &c. :					Salaries :— Discussion and reduction of observations, &c. ...	1,191	16 8
Royal Navy account	4	18 2					3,412 11 1
Mercantile Marine account ...	35	9 0			WEATHER INFORMATION AND FORECASTS :		
"M.O." (Stations) account ...	94	12 8			Telegraphic reports and storm warnings, remuneration of observers, &c. ...	2,337	7 8
			134	19 10	Salaries :— Preparation and issue of reports and forecasts ...	1,888	5 6
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	—					4,225 13 2
					INSPECTIONS :		
Commission charged on work done for Colonies, &c. ...	—	—			Salaries and travelling expenses ...	—	—
							436 11 4
					OCEAN METEOROLOGY :		
					Salaries :— Discussion and reduction of observations...	1,200	18 2
					Expenses incidental to the supply of instruments :—		
					Proportion for care and issue of instruments	440	7 8
					Royal Navy ...	319	18 0
					Mercantile Marine	154	11 5
					Distant island and coast stations ...	13	17 7
							2,129 12 10
					Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	—
							77 4 7
					BALANCE :		
					Cash at Bank ...	3,643	19 11
					" at Office ...	58	12 0
							3,702 11 11
			£18,707	4 11			£18,707 4 11

LIABILITIES.			ASSETS.		
	£	s. d.		£	s. d.
To Post Office (partly estimated) ...	268	14 9	By cash at Bank ...	3,643	19 11
" sundry creditors ...	477	11 5	" " at Office ...	58	12 0
" balance ...	3,121	4 4	" sundry debtors ...	164	18 7
	£3,867	10 6		£3,867	10 6

\* Some expenses at Valencia Observatory not yet brought to account.

## 15. Submitted—The following statement of accounts :—

Cash balance on 10th April	...	...	...	£7,158	5	10
Receipts from 11th to 24th April	...	...	...	3	4	7
				<hr/>		
				7,161	10	5
Cheques drawn from 11th to 24th April	...	...	...	28	0	6
				<hr/>		
Cash balance on 24th April	...	...	...	£7,133	9	11
				<hr/> <hr/>		

## 16. Submitted—The following list of publications which had been received since the last meeting :—

- Athens, Observatoire National.*—Annales . . . publiées par D. Eginitis. Tome 2.  
*Bathurst, Gambia.*—Comparative rainfall, Colony of the Gambia, 1895–1899, and Meteorological Observations, 1899.  
*Brussels, Observatoire Royal.*—Annuaire. 1898 and Supplement, 1899–1900. 4 vols.  
*Bucharest, Institutul Meteorologic al Romaniei.*—Analele . . . de S. C. Hepites. Tom. 14. 1898.  
*Dorpat, Kaiserliche livländische gemeinnützige und ökonomische Sozietät.*—Bericht über die Ergebnisse der Beobachtungen an den Regenstationen, 1898.  
*London, Army Medical Department.*—Annual abstract of meteorological observations taken at Netley and stations abroad in the year 1898.  
*Readville, Blue Hill Meteorological Observatory.*—Bulletin No. 1, 1900. Third year, whole No. 7. Studies of cyclonic and anticyclonic phenomena with kites. Second memoir. By H. H. Clayton.  
*Washington, Department of Agriculture, Weather Bureau.*—Bulletin No. 28. W. B., No. 211. The climate of San Francisco, California. Prepared . . . by A. G. McAdie and G. H. Willson.

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63, Victoria Street, May 9, 1900.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.  
THE HYDROGRAPHER.

MR. BUCHAN.  
MR. SHAW (*Secretary*).

- The Minutes of the last meeting (April 25) were read and confirmed.
- Read—Letter (M.O. 764) from Mr. Strachan, and a draft of a letter in reply. The Secretary was instructed to send the reply as drafted (P.C. 969).
- In compliance with an invitation (M.O. 784) received from the Commission on means for improving weather telegraphy, appointed at the St. Petersburg meeting of the International Meteorological Committee (1899), Mr. Shaw was authorised to become a member of the Commission, and to attend the meeting proposed to be held in Paris in September, 1900, on the terms allowed hitherto in similar cases.
- Read—A memorandum from the Marine Superintendent stating that since the last meeting seven logs had been received, two of them being excellent. The Secretary was directed to return the best thanks of the Council to the observers.
- Submitted—Five specimen proofs of reproductions of cloud photographs (*see* Minute 11, of March 14, 1900).

Approved.

6. With reference to the suggestion as to preparing and issuing monthly sea temperature charts for the Atlantic (Minute 11, April 25, 1900), it was resolved that the Marine Superintendent make inquiries with regard to Atlantic pilot charts, after consultation with the Hydrographer.

7. The proposal for publication of Synoptic charts for the South Indian Ocean (Minute 11, April 25, 1900), was referred to the Hydrographer.

8. Lettering of Instruments.—It was resolved that in future all instruments purchased for the office be marked "M.O.," that those intended for use in the Royal Navy be marked "A" in addition, and that instruments purchased on commission be marked "C" only.

9. Submitted—The following application referred to the office by the Agent-General for Queensland (M.O. 768).

Government Secretary's Office, Port Moresby, British New Guinea,  
9th February, 1900.

SIR,

I AM directed by His Excellency the Lieutenant Government to ask you if you would be good enough to apply to the Royal Meteorological Society for six (6) sets of instruments to be lent to this Government.

Careful observations will be recorded at various stations in the Possession and the results regularly sent to the Society.

I have, &c.,

O. BALLANTINE,

Acting Government Secretary.

The Agent General for Queensland,  
1, Victoria Street, S.W.

The Secretary reported that three sets of instruments had been already sent to British New Guinea (*see* Minutes, 1889-90, p. 51), but that up to the present time no returns of observations had been received.

He was instructed to make inquiry upon the point.

10. The Secretary reported that the arrangements for the transmission by telegraph to the Deutsche Seewarte, of observations taken at 7 a.m. at Blacksod, Stornoway, North Shields, and Scilly (Minutes, October 25, 1899), had been completed, and that the service commenced on May 1.

11. The Secretary reported that Mr. Vahland had given up the shop at Plymouth at which the daily weather charts and storm warning signals have been exhibited, and that, after inquiry (P.C. 830), he had arranged for the information to be exhibited at Mr. J. Blowey's shop, 23, Southside Street, Plymouth.

He further reported that he had learned from Mr. H. V. Prigg that the copy of the daily weather report sent to Messrs. W. Heath & Co. was not exhibited, and that after communicating with Messrs. Heath (M.O. 744), he had given directions for the copy to be sent to Mr. Prigg for exhibition on Plymouth Hoe.

Approved.

12. Submitted—The following as the result of the Primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 6 days, the total number of Districts warned being 21.  
In 15 Districts the warnings were justified, but in 6 Districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER

13. Hay Harvest Forecasts—The Secretary was instructed to issue a circular similar to the one issued last year stating the terms upon which Hay Harvest Forecasts could be supplied.

14. Foreign and Colonial Stations—The Secretary was authorised to proceed with the publication of the Reports from Foreign and Colonial Stations (*see* Annual Report, 1899, page 19).

15. Submitted—The following reports of work during the month of April, 1900 :—

MARINE BRANCH.

May 8th, 1900.

Examined twelve new logs.

Discussion of the meteorology of the Ocean region southward from the Equator, between the west coast of Africa and longitude 90° W. Tabulating winds and obtaining means of barometer and air and sea temperature observations in various spaces up to five-degrees squares; drawing wind-roses; preparing specimen forms of charts, and extracting from recently received office logs further observations in the space between 70° and 90° W.

Examining revised proofs of the charts for the upper portion of the North Atlantic, showing the stormy conditions of the winter of 1898-99.

Arranging photographs of clouds to be reproduced by photography for publication in the new issue of "Instructions for Keeping the Meteorological Log."

Obtaining for the Hydrographic Department of the Admiralty information bearing on the climatic conditions of the shores of the Red Sea and Gulf of Aden, for the revised edition of the Sailing Directions.

CHAS. HARDING.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 9th May, 1900.)

*Weekly Weather Report*, 1900.—All numbers issued promptly, Appendix I., part 1 issued. *Monthly Summaries* issued up to March; Tables for April well in hand. The new contract has now come in force and copies are arriving promptly.

*Daily Weather Report*.—All numbers issued promptly; monthly *correction and addition* sheets issued to March.

*Checking of 8.30 p.m. Forecasts*, 1900.—Done to end of April.

*Temporary Checking of Storm Warnings*, 1900.—Done to date.

*Final Checking of Storm Warnings*, 1899.—Nearly complete; results have yet to be summarised. The mean values for Temperature, Rain, &c., mentioned in the last report, have now been completed for *February*; *March* values are in hand. The *Mean Daily Temperature* maps have been drawn. There have been numerous inquiries as to weather at different periods.

FREDC. GASTER.

PANTAGRAPH ROOM.

May 1st, 1900.

*Hourly Means for 1897*.—The calculation of the remaining mean values required to complete this volume is now practically finished, and in the course of a few days all the "copy" will be in the hands of the printer.

Proof has been received and read up to page 48, but the last 4 pages have not yet been passed for press.

*Miscellaneous*.—The Harmonic Analyser was uncovered and thoroughly cleaned and overhauled, and carefully repacked.

R. H. CURTIS.

EXAMINATION BRANCH.

1st May, 1900.

*Examinations.*

*January-April*, 1899.—Proceeded with.

*January-March*, 1900.—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports.*

*January-March*, 1900.—Copies of "Notes of Errors" to Valencia.

*Miscellaneous.*

Sun-printing copies of photographic curves and tracing and printing Anemograph and Rain Curves.

T. E. ALLEN.

## 16. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 24th April ... ..	7,133	9	11
Receipts from 24th April to 18th May ...	87	18	0
	<hr/>		
Cheques drawn from 24th April to 8th May ...	7,221	7	11
	1,149	16	6
	<hr/>		
Cash balance on 8th May ... ..	£6,071	11	5

## 17. Submitted—The following list of publications which had been received since the last meeting :—

- [*Batavia, Observatorium*].—Regenwaarnemingen in Nederlandsch-Indië. 20. Jahrg., 1898.  
*Batavia, Royal Magnetical and Meteorological Observatory*.—Observations. Vol. 21, 1898.  
*Batavia, Royal Magnetical and Meteorological Observatory*.—Die Abweichung der Magnetnadel ; Beobachtungen, Säcular-Variation, Wert-und Isogonensysteme bis zur Mitte des xviii<sup>ten</sup> Jahrhunderts von W. van Bemmelen. Supplement to vol. 21 of the observations.  
*Christiania, Norwegisches Meteorologisches Institut*.—Jahrbuch . . . für 1899. Herausgegeben von H. Mohn.  
*Dechevrens, M.*—Méthode simplifiée dite des facteurs pour le calcul des séries de Fourier et de Bessel appliquées à la météorologie.  
*Guatemala, Laboratorio Químico Central*.—Observaciones meteorológicas. 1899.  
*Klossovsky, A.*—Matériaux pour la climatologie du Sud-Ouest de la Russie. With volume of charts. 2 vols.  
*Odessa, Observatoire Magnétique et Météorologique de l'Université Impériale*.—Annales. 1898–1899. 2 vols.  
*Peking, Inspectorate General of Customs*.—Medical reports for the half-year ended 30th September, 1899. 58th Issue.  
*St. Petersburg*.—Rapport du Comité Météorologique International. Réunion de Saint-Petersbourg, 1899. Publié par le Bureau Central Météor. de France.  
*Upsala, Observatoire Météorologique de l'Université*.—Bulletin mensuel. 31, 1899.

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63, Victoria Street, May 22nd, 1900.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.

THE HYDROGRAPHER.

MR. SHAW (Secretary).

1. The Minutes of the last meeting (May 9th) were read and confirmed.
2. Read—A communication from Professor Hergesell, of Strassburg University, addressed to Mr. Scott, inviting him to take part in the work of the Sub-Committee of the International Meteorological Conference for Scientific Aeronautics, and remarks by Mr. Scott thereupon.  
The Secretary was directed to acknowledge the communication.
3. Submitted—Circulars forwarded from the Foreign Office with reference to the meeting of the open Congress on Meteorology, to be held in Paris, September 10th to 16th, 1900.

Mr. Shaw was authorised to attend the Conference on behalf of the Office.

4. Read—Letter from Mr. Strachan (M.O. 812) respecting an application to the Treasury for a Civil Service Pension.

The Secretary was directed to forward the letter to the Treasury with a covering letter (P.C. 1069) as follows :—

SIR,

29th May 1900

I AM directed by the Meteorological Council to forward, for the consideration of the Lords Commissioners of H.M. Treasury, a letter from Mr. R. Strachan, lately a Clerk in the Meteorological Office, representing that he considers himself to be entitled to a Civil Service pension.

Mr. Strachan states that he was for some years, between 1850 and 1867, employed in various positions under the Admiralty and the Board of Trade, and that in the last-named year he was transferred to the Meteorological Office, then constituted, under the management of a Committee of Fellows of the Royal Society, with the designation of the "Meteorological Committee." Of the services of Mr. Strachan anterior to 1867 the Meteorological Council have no knowledge other than that supplied by his letter.

Since 1867 Mr. Strachan has served in the Meteorological Office, until 1876 under the Meteorological Committee, and after that time under the Meteorological Council, which was constituted in its present form in that year. Mr. Strachan's salary during the last three years of his service was £333 6s. 8d. per annum.

The Meteorological Council, after giving Mr. Strachan due notice, resolved to call upon him to retire from the 1st April 1900, and in accordance with the Superannuation Rules lately adopted, they assigned to him a retiring allowance of £150 per annum, and he has left the Meteorological Office from that date. He has, however, declined to comply with the requirements of the Council under which this annuity would be paid to him, and has advanced the present claim for the grant of a pension under the Civil Service Regulations.

On the formation of the Meteorological Committee in 1867 it was distinctly intimated by the Board of Trade to the Committee that the persons employed under it would not be considered entitled to Government pensions, and that provision for retiring allowances must be provided from the funds placed at the disposal of the Meteorological Committee; and similar declarations have been made on more than one occasion subsequently. Extracts from correspondence referring to these points are enclosed herewith.

Whether when Mr. Strachan accepted employment under the Meteorological Committee in 1867 this point was specifically brought to his notice it is impossible for the Council to affirm, but in their opinion there has been no real doubt in the office on this subject.

It is therefore only as regards his services before 1867 that the Meteorological Council are in a position to support Mr. Strachan's request, and they will be pleased to hear that their Lordships are in a position to recognise those services by the grant of some addition to the retiring allowance assigned to him by the Council.

I am to add that as there are some other Clerks in this Office who have claims similar to those put forward by Mr. Strachan, it may be convenient that a list of them should be forwarded with the present application, for the information of H.M. Treasury.

I am, Sir,  
Your obedient Servant,  
W. N. SHAW,  
Secretary.

The Secretary to the Treasury.

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ENCLOSURES.

LETTER FROM MR. STRACHAN,

M.O. 812.

11, Offord Road, N.,  
May 17th, 1900.

DEAR SIR,

WITH reference to your letter (M. O. 764), I beg to avail myself of the offer made by the Council to forward my application for a Civil Service pension to the Lords Commissioners of H.M.'s Treasury.

My claim is based upon continuous service in the public pay for fifty years and three months. The following is a brief statement of my services :

1850, January 4th.—Indentured to the Admiralty as Pupil Teacher in the Royal Hospital Schools, Greenwich.

1855, August.—Transferred to the Board of Trade as Teacher of Navigation after obtaining the highest grade certificates by a four days' examination by the Board.

1857, April.—Appointed to charge of Chronometer Office, under the Registrar General of Seamen.

1858, August.—On the abolition of that office, transferred to the Meteorological Department, at the request of Admiral FitzRoy.

1863, December.—By direction of the Board of Trade obtained certificate from the Civil Service Commissioners.

1867.—Transferred to the Royal Society for continuance of duties at the Meteorological Office, where I remained until dismissed, April 1st, 1900.

No intimation was given me that the transfer of the Meteorological Office from the Board of Trade to the Royal Society would make any difference to my position as a Civil Servant, but it was impressed upon me that it was absolutely necessary that the clerks should continue their duties, and I was given to understand that service previous to the date of the Civil Service Certificate would be taken into consideration when the time for a pension arrived.

I am, &c.,

RICHARD STRACHAN.

To the Secretary,  
Meteorological Office.

#### LIST OF CLERKS CLAIMING FOR ANTERIOR SERVICE.

J. S. Harding,                      F. Gaster,                      C. Harding,                      R. H. Curtis.

#### EXTRACTS FROM THE MINUTES OF THE METEOROLOGICAL COMMITTEE.

(1.) January 3rd, 1867.

Mr. Scott presented the following memorandum with regard to a pension :—

To the Committee of the Royal Society,  
Meteorological Department,  
January 3rd, 1867.

MR. CHAIRMAN AND GENTLEMEN,

WHILE I feel most deeply the honour which your Committee have been pleased to confer on me, in nominating me for the post of Director of the Meteorological Department of the Board of Trade, I beg most humbly to bring under your notice the following considerations :—

My letter to the President of the Royal Society, dated October 29, 1866, in which the amount of salary was named at eight hundred pounds, was written on the understanding, conveyed to me orally by the President, that in framing my estimate I should take into consideration that the acceptance of such an office would not invalidate my claim to a pension as a Civil Servant.

I therefore request the Committee to take this into their consideration, noting the fact that the salaries of all officers on the Civil List are included in the annual Estimates, and yet that these officers are entitled to pensions according to the regular scale.

My own appointment in the Royal Dublin Society is one of a nature similar to that which is now proposed for me, and in virtue of holding it, which is an annual office, I am entitled to a pension.

I should accordingly request that the Committee would ascertain this point before the appointment is definitely made.

I have the honour to be, &c.,  
ROBERT H. SCOTT.

Resolved—That General Sabine and the Hydrographer (Capt. Richards) communicate regarding it with the Board of Trade.

(2.) January 8, 1867.

The Hydrographer reported a conversation he had with Mr. Farrer, on the subject of Mr. Scott's letter to the Committee of January 3 (see Minutes of Committee for January 3), the substance of which is embodied in the following letter :—

January 4, 1867.

MY DEAR CAPT. RICHARDS,

WITH reference to our conversation to-day, I have been thinking the subject over, and I feel more and more satisfied that we could not recommend and that the Treasury could not agree to any

proposal for placing the officers appointed by the Meteorological Committee on the footing of permanent Civil Servants. The vote is an experimental one. If the work done is what we hope and expect, there is no fear of its non-continuance. But the very object of the whole scheme is to place the matter from year to year in the hands of the Scientific Committee, unfettered by vested interests or by that fixity of tenure in their servants which is so fatal when the Government undertake a matter of this kind. Their object will be frustrated if their officers become Civil Servants. They (the Committee) will no longer have the power of dismissing them; that power must rest with the Treasury; and the Treasury having to pay compensation, will never exercise it, even if the Committee brought themselves to advise them to do so. You will be the servants, and your officers will practically be your masters; nor could it be heard of at the Treasury that the Government should place the patronage in the hands of the Committee and then treat the nominees of the Committee as Civil Servants. Really and truly a good servant, who has faith in himself and in his work, is much better off under the free system than under the fixity of tenure system. I am quite sure neither the Board of Trade nor Treasury would listen to the suggestion.

Believe me very truly yours,

T. H. FARRER.

Capt. Richards, R.N.

EXTRACTS FROM CORRESPONDENCE BETWEEN THE CHAIRMAN OF THE METEOROLOGICAL COUNCIL AND THE ROYAL SOCIETY.

(1.)

From letter of Professor H. J. S. Smith, Chairman of the Meteorological Council, to the President of the Royal Society, dated December 14th, 1881. (Minutes 1881-2, p. 89.)

"None of the employes in the office have at present any claim to superannuation allowances, and the position of the office is such that as the matters now stand this could not be remedied. The Meteorological Council consider that this is a serious disadvantage; and though they are aware that the question is not exempt from difficulties arising from the peculiar circumstances of the office, they hope that the Government may be able to deal with it in a satisfactory manner. Much of the business of the office can only be transacted by a permanent staff, the adequate performance of whose duties requires special qualifications, as computers, draughtsmen, and the like, with, in some cases, considerable scientific knowledge, and long continued experience in their respective departments. It appears to the Council that in the case of such persons the introduction of a system of superannuation is recommended by the same considerations of fairness and public utility, which have led to its adoption in the Civil Service generally. To enable an estimate to be formed of the charge which would have to be undertaken by the Government, if the proposal now made were carried into effect, a list (B) is annexed, including the names of the persons who would probably be affected by the arrangement, and showing the length of time for which each of them have served."

(2.)

Extract from a letter from the Secretary of the Treasury to the President of the Royal Society, communicated to the Meteorological Council, dated December 31st, 1881.

(Minutes 1881-2, p. 130.)

"The question of superannuation for the employes of the Meteorological Council is, as you justly observe, surrounded with many difficulties. My lords would be extremely unwilling to take any step which would tend to convert the Council into a department of the civil service, for reasons which have been frequently stated.

"My lords are not aware that any of the gentlemen employed by the Council accepted service on the terms that they were to receive superannuation allowances, and my lords cannot recognise them as having any right to them. They are not prepared to say more than that the Council must judge, for the time being, how best to apply the fund placed at its disposal; and that if cases should arise in which, in their judgement, it was proper to make some allowance to gentlemen who had long and faithfully served them, but were no longer able to perform their duties, they must reckon, like other employers, what they can afford to do. My lords are not prepared to recognise any direct relation between the officers of the Council and the Government."

5. The Secretary reported that pursuant to Minute 4 of April 25th, he had arranged to appoint Wilfrid Eldridge as boy-clerk, as from Monday, May 28th, at a salary of 12s. 6d. per week.

Approved.

6. Proposed publication of Daily Charts for the South Indian Ocean—It was agreed to return the following reply (P.C. 1056) to Mr. Claxton's letter of March 22nd, 1900, in accordance with a memorandum by the Hydrographer, dated 11th May, 1900.

(See Minutes 11 of April 25th, and 7 of May 9th.)

Meteorological Office,  
25th May, 1900.

SIR,

REFERRING to your letter of March 22nd, 1900, in further explanation of the suggestion to publish the results obtained from collecting log books of ships at Mauritius for the past 50 years in

the form of daily charts of the South Indian Ocean. I am directed by the Meteorological Council to inform you that, while recognising the value of the material collected, and the importance of making the results which can be deduced from it available for the use of those who are interested in the meteorology of the Indian Ocean, they are of opinion that it would not be advisable to publish the results which have been obtained in the form suggested.

The uneven distribution of the data obtained over the different squares, the want of uniformity of meteorological conditions on corresponding days in successive years, and the size of the publication, if it were completed, are among the important considerations which have led the Council to this opinion.

The Council hope in the near future to take up the preparation of monthly oceanic charts which will embrace the area referred to, and for that purpose the information which has been collected at Mauritius would be of the greatest possible value, and they will be glad to consider any steps that can be taken at the present time with a view to some arrangement for obtaining the information when the Council have an opportunity of taking up the preparation of the charts.

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

T. F. Claxton, Esq.,  
Superintendent of the Royal Alfred Observatory,  
Mauritius.

7. Read—A memorandum from the Marine Superintendent stating that since the last meeting three logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

8. Read—The following letter (M.O. 781). See Minute 8 of April 11th, 1900.

General Post Office, London  
9th May, 1900.

SIR,

WITH reference to your letter of the 12th ultimo, I am directed by the Postmaster-General to state, for the information of the Meteorological Council, that he sees no objection to the arrangement for the reduction from 1s. to 6d. of the fee charged to the public for information regarding the weather being brought into operation at once, and that he will be glad to arrange for the distribution of a notice on the subject, as on the previous occasion referred to in your letter, if you will be so good as to forward a draft of the proposed notice to this Office as suggested.

I am, Sir,  
Your obedient servant,  
JOHN MASON.

The Secretary, Meteorological Office.

The Secretary was instructed to arrange for the issue of a notice to be exhibited in Post Offices.

9. Submitted—Specimens of Daily Weather Reports in accordance with Minute 7 of April 25th.

It was resolved that the preparation of the charts containing three small maps (Barometer and Wind at 8 a.m. yesterday, Mean Daily Maxima or Minima for the month, and Mean Daily Temperature at 8 a.m. for the month, or for two months) be proceeded with, with the view of introducing the changes in the new volume commencing on July 1st, 1900.

10. The Secretary was authorised to send free forecasts to the Agricultural Show at York, as usual, and to prepare a form upon which the telegram should be exhibited.

11. It was resolved to resume the two o'clock service of telegraphic reports so far as might be necessary for the issue of Harvest Forecasts.

12. Read—Letter (M.O. 819) from the Danish Meteorological Institute, with respect to the 2 o'clock summer service of telegrams to Copenhagen from Stornoway, Valencia, Yarmouth, Sumburgh Head, and Scilly. The Secretary was directed to reply (P.C. 1042) to the effect that at the present time special arrangements would be required for transmitting the telegrams from Yarmouth, Sumburgh Head, and Scilly, but that they could be sent in the ordinary course as soon as the harvest service is established.

13. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

## WARNINGS ISSUED.

The signals were hoisted on 1 day, and in 4 districts.  
In 3 districts the warnings were justified, but in 1 district they were not required.

## GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

14. Read—A letter from Lieutenant A. W. Howe, R.N., Inspecting Officer of Coast Guard at Rosses Point, Sligo, asking for a copy of the Daily Weather Chart to be forwarded to him for purposes of observation and study.

Resolved—That a copy be sent in weekly parcels for six months, and that for the continuation of the arrangement for a further period a further application must be made.

15. Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 8th May ... ..	6,071	11	5
Receipts from 9th to 21st May ... ..	16	5	1
	<hr/>		
	6,087	16	6
Cheques drawn from 9th to 21st May ...	32	12	3
	<hr/>		
Cash balance on 21st May ... ..	£6,055	4	3

16. Submitted—The following list of publications, which had been received since the last meeting:—

*Bergholz, P.*—Die Ergebnisse der Beobachtungen der Wolken in Manila in dem internationalen Wolkenjahre.

*Bergholz, P.*—Ueber Bildungsstätten, Bahnen und Zonen der Orkane des "Fernen Ostens."

*Coventry, Medical Officer of Health.*—Annual report on the health of the City, by E. H. Snell, 1899.

*Elster, J., und Geitel, H.*—Beiträge zur Kenntniss der atmosphärischen Elektrizität.

*Falmouth Observatory.*—Meteorological and magnetical tables and reports for the year 1899, by W. L. Fox and E. Kitto.

*Hamburg, Deutsche Seewarte.*—Aus dem Archiv der Deutschen Seewarte, 22. Jahrg, 1899.

*Hamburg, Deutsche Seewarte.*—Vierteljahrs-Wetter-Rundschau an der Hand der täglichen synoptischen Wetterkarten für den Nordatlantischen Ocean des Dänischen Meteorologischen Instituts und der Deutschen Seewarte. Bd. x., 1892-93.

*Hastings.*—Annual report of meteorological observations for the year 1899. H. Colborne, Borough Meteorologist.

*Russell, H. C.*—Current papers, No. 4.

*Toronto, Magnetical Observatory.*—General meteorological register for the year 1899.

*Turin, Società Meteorologica Italiana.*—Atti del iv. Congresso Meteorologico Italiano promosso dalla Società Meteorologica Italiana tenuto a Torino dal 12. al 15. Settembre 1898.

*Woeikof, A.*—Climat des hauteurs de l'Europe occidentale.

*Woeikof, A.*—Mitteltemperaturen von Ostsibirien.

63, Victoria Street, June 6, 1900.

PRESENT :

SIR R. STRACHEY IN THE CHAIR.

MR. BUCHAN.  
PROFESSOR DARWIN.MR GALTON.  
THE HYDROGRAPHER.

MR. SHAW (Secretary).

1. The Minutes of the last meeting (May 22) were read and confirmed.

2. The Secretary reported the receipt of a letter of thanks from Vice Admiral Sir J. R. T. Fullerton, K.C.V.O., for information and forecasts supplied at his request on the occasion of the Queen's crossings to and from Ireland.

3. Resolved :—(1) That the appointment of Mr. R. F. Wallace to take charge of instruments, under the supervision of the Marine Superintendent, be confirmed (*see* Minute 4 of March 28, 1900), and that Mr. Wallace be promoted to Class III. of the classified list of clerks.

(2) That no appointment be made to the first-class clerkship vacated by Mr. Strachan's retirement.

4. The Secretary was authorised to obtain on approval a "Comptometer" calculating machine for use in the office.

5. The question of granting additional leave for military duty to volunteers in the employ of the office, in view of the exceptional circumstances of the current year, was left to the discretion of the Secretary.

6. The Secretary reported the receipt of a letter from the Royal Society intimating that, in response to their application for a grant of £100 (*see* Minutes 1899–1900, p. 80), £80 had been placed at the disposal of the Council, on the recommendation of the Government Grant Committee, for the continuation of researches in atmospheric electricity.

7. Read—the following memorandum from Capt. Hepworth :—

There being a general wish on the part of the Mercantile Marine of this country, for the publication monthly of inexpensive Meteorological Charts of the North Atlantic Ocean, a rough specimen sheet is hereby submitted to the Council, drafted somewhat on the lines of the American Monthly Pilot Chart, but believed to be more comprehensive. From these it is considered that a shortening in the passages of sailing vessels, and low powered steamers, as well as increased security to life and property afloat would result. It is suggested that the first of these Charts should be offered to the public on the 1st January, 1901.

The matter was adjourned for further consideration.

8. Submitted—Proofs of charts of North Atlantic weather in the winter of 1898–9, with an introduction. (Minutes 1899–1900, p. 33.) It was resolved that the charts should be held back, if possible, for the tinting of the land areas and the addition of more data as to temperature, and that the introduction be amplified. It was understood that any further details preparatory to the publication of the charts would be referred to the Chairman for decision.

9. Read—A Memorandum from the Marine Superintendent stating that since the last meeting seven logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

10. Read—the following letter (M.O. 853) respecting the charges for meteorological telegrams between the office and Germany :—

84523/00.

General Post Office, London,  
29th May, 1900.

SIR,

I AM directed by the Postmaster General to inform you that the German Postal Administration has recently raised a question as to the desirableness of continuing the existing method of accounting for the charges for the transmission of Meteorological telegrams exchanged between London and the Seewarte, Hamburg, and has suggested that they should be excluded from the Accounts between the British and German Post Offices.

Arrangements could be made to charge the Meteorological Office for the transmission of telegrams from London to Hamburg at the reduced rate of 1d. a word, and this department would therefore have no objection to the proposal so far as it relates to those telegrams, but it is unable to assent in regard to telegrams sent from Hamburg to London, inasmuch as it is not in a position to relinquish the charges accruing to it in respect of their transmission.

In these circumstances I am to suggest that a convenient way of dealing with the matter would be for the Meteorological Office to pay this department directly, at the reduced rate, for the trans-

mission of the telegrams from Hamburg or Cuxhaven to London. The effect of this arrangement would be that all telegrams sent on behalf of the Meteorological Office from Germany would be charged in the Meteorological Office Account at the reduced rate of 1d. a word.

The Postmaster General will be glad to learn, at your early convenience, whether the Meteorological Council are prepared to assent to this proposal.

I am, Sir,

Your obedient servant,

JOHN ARDRON.

The Secretary, Meteorological Office.

Submitted the following draft of reply (P.C. 1123). :—

Meteorological Office,  
June 5, 1900.

SIR,

IN reply to your letter, No. 84523/00, dated 29th May, 1900, I am directed by the Meteorological Council to say that they will be glad to concur in any rearrangement of the mode of rendering the accounts for telegrams between this office and the German stations that may be convenient to the German Postal Administration and the Postmaster General.

The Council note that it is proposed to charge the office in the account with the Postmaster General at the rate of 1d. per word for telegrams sent from the office to the Seewarte, Hamburg, instead of 2d. per word as heretofore and to include in the same account a charge at the same rate, 1d. per word, for telegrams to the office from Hamburg and Cuxhaven, for which no charge has hitherto been made in the account with the Postmaster General, all demands on account of telegrams from German stations to this office being hitherto included in an account rendered to this office by the Deutsche Seewarte at the rate of 15Pf. per word.

The Council would be glad to be informed whether under the proposed arrangement they are to expect any charge to be made to this office by the Deutsche Seewarte or the German Postal Administration on account of telegrams sent from Hamburg or Cuxhaven to this office in addition to the charge of 1d. per word for these telegrams as proposed to be made by the Postmaster General.

I am further to point out that under the existing arrangements, it is the practice for the Deutsche Seewarte in rendering the account to include no charge for the address of the telegram from Hamburg to this office, and so far as the Council are aware no charge is made for the daily telegram from Cuxhaven.

The Council have no desire to modify the existing practice in these respects.

I am, &c.,

W. N. SHAW,

Secretary.

The Secretary, General Post Office, E.C.

Approved.

11. Read—Letter (M.O. 840) from Dr. Snellen, of Utrecht, asking for observations to be made at Valencia, at 7 a.m., Greenwich mean time, and transmitted by telegram to Amsterdam.

The Secretary was instructed to give directions for the observations to be taken, and to arrange for their being forwarded to Amsterdam.

12. The Secretary reported that he had drawn up a circular (No. 46a) concerning harvest forecasts, and had arranged to send copies to the London press and press agencies, the principal agricultural societies, the secretaries of the chambers of agriculture, as well as to the recipients of the forecasts during the last harvest season.

13. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

#### WARNINGS ISSUED.

The signals were hoisted on 3 days, the total number of districts warned being 10. In 7 districts the warnings were justified, but in 3 they were not required.

#### GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

14. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of April 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Per-centages.			Per-centage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	33	67	50	74
"	b	24	23	24	
"	c	33	0	16	
"	d	10	10	10	
Scotland, E.	a	33	63	48	73
"	b	20	30	25	
"	c	37	0	19	
"	d	10	7	8	
England, N.E.	a	57	54	56	84
"	b	17	40	28	
"	c	20	3	12	
"	d	6	3	4	
England, E.	a	43	40	42	72
"	b	30	30	30	
"	c	17	20	18	
"	d	10	10	10	
Midland Counties	a	57	64	61	87
"	b	30	23	26	
"	c	7	13	10	
"	d	6	0	3	
England, S.	a	53	50	52	88
"	b	33	40	36	
"	c	7	10	9	
"	d	7	0	3	
Scotland, W.	a	27	73	50	74
"	b	23	24	24	
"	c	33	3	18	
"	d	17	0	8	
England, N.W.	a	33	54	44	75
"	b	33	30	31	
"	c	27	13	20	
"	d	7	3	5	
England, S.W.	a	40	53	47	79
"	b	37	27	32	
"	c	23	10	16	
"	d	0	10	5	
Ireland, N.	a	30	54	42	72
"	b	27	33	30	
"	c	37	10	24	
"	d	6	3	4	
Ireland, S.	a	33	57	45	69
"	b	24	23	24	
"	c	40	20	30	
"	d	3	0	1	
SUMMARY.					
British Islands	a	40	57	49	77
"	b	27	29	28	
"	c	26	9	18	
"	d	7	4	5	

15. Submitted—Proofs of new form (No. 52) for returns, from stations of the second order, made by the Royal Meteorological Society and the Scottish Meteorological Society. Approved.

16. It was agreed that a sunshine recorder be ordered for stock, to be available for issue when required.

17. Submitted—The following reports of work during the month of May, 1900 :—

#### MARINE BRANCH.

Examined ten new logs.

Discussion of the meteorological information for the region south of the Equator, between the West Coast of Africa and longitude  $90^{\circ}$  W. Preparing and extracting recently-received data for the little-frequented space from  $70^{\circ}$  to  $90^{\circ}$  W. Drawing monthly wind-roses for various-sized areas from  $2^{\circ}$  to  $5^{\circ}$  squares. Preparing form-charts for the publication of the results.

Examining revised proofs of the daily charts, exhibiting the stormy character of the winter of 1898-99 on the upper part of the North Atlantic. The whole of the charts have now gone to press.

Obtaining for the Hydrographic Department of the Admiralty information relating to the climate of the coasts of the Red Sea and the Gulf of Aden, for incorporation in the revised edition of the Pilot for those regions.

Arranging a sketch plan showing the proposed nature of the information for the suggested monthly Pilot Chart of the North Atlantic and Mediterranean.

CHAS. HARDING.

#### TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

*Weekly Weather Report*, 1900.—All numbers issued to date. *Monthly Summary* for March, issued; April, gone to printer and proof received to-day. (The production by printer both of the proof, and then of the worked-off copies, is a good deal delayed.) Appendices III. and IV. are well in hand.

*Daily Weather Report*, 1900.—All numbers issued promptly to date. *Monthly Correction Sheets*, issued up to that for April; May is in hand.

*Final Checking of Storm Warnings*, 1899, with Summaries, notes on Gales missed—done; results handed in.

*Checking of 8.30 p.m. Forecasts*.—April done, May nearly done.

*New Mean Values*, 30 years to 1900 (for Temperature, Rainfall, &c.). March completed.

*Reorganization of Daily Weather Report*, well advanced.

*Preparation of Simple Tables for Tension of Vapour*.—Three copies prepared, for Temperatures  $10^{\circ}$  F. to  $99^{\circ}$  F.

The following *Inquiries* by letter have also been received and attended to.

Wet days in London, October 5 to November 28, 1899.

Rainfall near Burnham Market, 8th and 9th April, 1900.

Wind in Victoria Street, Westminster, on Good Friday, 1900.

FREDC. GASTER.

#### PANTAGRAPH ROOM.

*Hourly Means*.—The whole of the sheets for the 1897 volume are now with the printer; no more sheets of proof have, however, been delivered by him, and so far only 48 pages have come to hand in four months.

The Harmonic Co-efficients for 1897 are calculated for four observatories; the fifth (Falmouth) cannot be done until the sheets come back from the printer.

*Daily Means of Temperature*.—The calculation of these values for the 25 years, 1871-95, is progressing steadily. Astronomical, instead of civil, time was used for the daily means of the first three years of the period, and this has involved a good deal of work which was not foreseen.

*Miscellaneous*.—Enquiries have been answered respecting :—

(a) The extreme wind force experienced in England.

(b) The frequency and duration of sunshine in winter in London.

R. H. CURTIS.

#### LAND ROOM.

The following enquiries were answered during May :—

No. 673, from the Town Clerk of Preston, Lancaster, as to gales experienced at Fleetwood during 1899 and 1900.—No. 718, from Mr. R. Thomas, of Mullion, Cornwall, particulars of climate at Eastbourne, Bournemouth, Llandudno, and Torquay, for use in preparing a "Guide to Mullion.—No. 752,

Department of Agriculture for Ireland, as to ground frosts reported at Irish stations in the ten years from 1890, for use in the inquiry concerning flax cultivation.

JOHN A. CURTIS.

In addition to the enquiries for information, referred to above, there were 16 personal enquiries during May for forecasts or other weather-information, and four inquiries by telegraph.

18. Reported—That the cash accounts for the quarter ended the 31st March last had been this day examined by the Chairman and Prof. Darwin, and would be sent in due course to the Treasury, for the Audit Office. The receipts from the 1st January last, when there was a balance of £3,020 10s. 6d., were £5,128 0s. 10d., against £5,450 10s. 9d. in the corresponding period of the preceding financial year. The payments were £4,445 19s. 5d., against £4,940 7s. 10d. during the same period in the previous year. The balance in hand and at the bank on the 31st March, 1900, amounted to £3,702 11s. 11d., and at the same date in 1899 to £2,267 15s. 7d.

19. Submitted—The following statement of accounts :—

Cash balance on 21st May	...	...	...	£6,055	4	3
Receipts from 22nd May to 5th June	...	...	...	46	7	5
				<hr/>		
				6,101	11	8
Cheques drawn from 22nd May to 5th June	...	...	...	838	8	6
				<hr/>		
Cash balance on 5th June...	...	...	...	£5,263	3	2
				<hr/>		

20. Submitted—The following list of publications which had been received since the last meeting :—

*Allingham, W.*—A manual of marine meteorology for apprentices and officers of the world's merchant navies.

*Cambridge, Philosophical Society.*—Transactions. Volume 18.

*Lansing, Michigan State Board of Health.*—Principal meteorological conditions in Michigan in 1897.

*London, Admiralty, Hydrographic Department.*—Report on the undercurrents in the River Congo, West Africa, from observations by Commander H. E. Purey-Cust, R.N., H.M.S. "Rambler," 1899.

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63, Victoria Street, June 20, 1900.

PRESENT :

MR. GALTON, IN THE CHAIR.

MR. BUCHAN.

PROFESSOR DARWIN.

THE HYDROGRAPHER.

1. The minutes of the last meeting (June 6) were read. The minute with respect to forecasts for public use was deferred for reconsideration at the next meeting ; subject to this the minutes were confirmed.

2. Resolved—That Mr. Wallace's appointment date from the time at which he began to take charge of the instruments (April 1), and that his salary commence at £125 per annum. The consideration of the minimum salary to be attached to each of the four classes of clerks was deferred to the next meeting.

3. Read—The following letter (M.O. 897) from H.M. Treasury :—

9561/1900.

Treasury Chambers,  
8th June, 1900.

SIR,

IN reply to your letter of the 29th ultimo, I am directed by the Lords Commissioners of Her Majesty's Treasury to state that they are unable to award any pension to Mr. R. Strachan, late clerk in the office of the Meteorological Council, in respect of his previous employment under the Board of Trade. That employment appears to have been in the capacity of a temporary clerk, which does not qualify for pension; but even if it had been in the *permanent Civil Service* within the meaning of the Superannuation Act of 1859, My Lords would be precluded by the terms of that Act from granting any pension in respect of it, as it was not terminated by retirement on the ground of age, infirmity, or abolition of office, but by the voluntary acceptance of employment outside the service of the State.

I am, &c.,  
E. W. HAMILTON.

The Secretary,  
Meteorological Council.

Resolved—That a copy be sent to Mr. Strachan.

4. Reported—That the copies of the charts of the North Atlantic weather for 1898–9 had been printed off.

The Secretary was instructed to make arrangements for having the land areas tinted by lithography, and to have one set of the charts prepared with land temperatures inserted by hand.

5. Submitted—Proofs of the revised form of the Daily Weather Report (Minutes, May 22, p. 17).

Various suggestions were made, and the Secretary was requested to revise the proof, and to take steps for the issue of the new form as soon as practicable.

6. The Secretary was authorised to proceed with the arrangements for the sale of separate copies of the Daily Weather Report.

7. Read—A memorandum from the Marine Superintendent stating that since the last meeting two logs had been received, neither of them being excellent.

8. Reported—That since the last meeting of the Council no Warnings have been issued, nor any Gales experienced on the coasts of the British Islands.

FREDC. GASTER.

9. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 5th June ... ..	5,263	3	2
Receipts from 6th to 19th June ... ..	51	15	10
	<hr/>		
	5,314	19	0
Cheques drawn from 6th to 19th June ... ..	131	16	2
	<hr/>		
Cash balance on 19th June ... ..	£5,183	2	10

10. Submitted—The following list of publications which had been received since the last meeting :—

[*Bangalore, Mysore Government Meteorological Department.*]—Meteorology in Mysore for 1899, being the results of observations at Bangalore, Mysore, Hassan, and Chitaldrug. Seventh annual report by John Cook.

*Bombay Government Observatory.*—Report on the condition and proceedings of the Government Observatory, Colaba, for the year 1899–1900.

*Bruce, W. S.*—The proposed Scottish National Antarctic expedition.

*Bucharest, Institut Météorologique.*—Album climatologique de Roumanie, par S. C. Hepites.

*Bucharest, Institutul Meteorologic al Romaniei.*—Analele . . . publicate de S. C. Hepites. Tom. 14, 1898.

[*Calcutta, Meteorological Office, Bengal.*]—Summary of the meteorology of Bengal for the year 1899.

*Catania ed Etna.*—Notizie storiche e descrittive dei RR. Osservatorii di Catania e dell' Etna fino a tutto il 1899.

*Christiania, Norsk Meteorologisk Institut.*—Nedbøriagttagelser i Norge. Aarg. v., 1899.

*Epsom College Natural History Society.*—Report for the year ending Christmas, 1899. No. 11.

*Garstang, W.*—Report on the surface drift of the English Channel and neighbouring seas during 1897.

*Helsingfors, Finska Vetenskaps - Societeten.*—Öfversigt af Finska Vetenskaps - Societetens Förhandlingar. 41, 1898-99.

*Hepites, S. C.*—Contributiuni la fisica globului. IV. Determinari magnetice in România a. anul 1898.

—————Materiale pentru climatologia Romaniei. XI. Repartitiunea ploii pe districte si pe basenuri in Romania in anul 1898 st. n.

—————Organisation du service météorologique de Roumanie.

—————Régime pluviométrique de Roumanie.

*Kew Observatory.*—Report of the Kew Observatory Committee of the Royal Society. 1899.

*London, Royal Society.*—Year-book of the Royal Society of London. 1899, 1900.

*Margate, Medical Officer of Health.*—Annual report of the Medical Officer of Health for the year 1899, to which is appended the meteorological report.

*Miller, S. H.*—Reduction of meteorological observations made at Lowestoft from 1879 to 1898.

*Mossmann, R. C.*—Barometric and thermometric gradients between London and Edinburgh. 1764-1898.

—————Further results of Mr. Wragge's Ben Nevis observations taken in the year 1882. Humidity and temperature variability.

—————Results of meteorological observations taken in Edinburgh during 1899.

*Riccò A., e Saija, G.*—Osservazioni di temperatura eseguite nel Jonio e nell'Adriatico dagli ufficiali del piroscalo "Aspromonte" durante l'annata Agosto 1897—Luglio 1898.

*Saija, G.*—Sulle variazioni della rifrazione atmosferica.

*Saija, G., e Eredia, F.*—Risultati delle osservazioni meteorologiche del 1899 fatte nel R. Osservatorio di Catania.

*St. Petersburg, Observatoire Physique Central.*—Histoire de l'Observatoire Physique Central pour les premières 50 années de son existence. 1849-1899. Par . . . M. Rykatchew. 1<sup>e</sup> Partie.

*Stonyhurst College Observatory.*—Results of meteorological and magnetical observations. By the Rev. W. Sidgreaves. 1899.

*Ward, R. De C.*—Practical exercises in elementary meteorology.

63, Victoria Street, July 4, 1900.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.  
MR. GALTON.

PROFESSOR DARWIN.  
THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (June 20) were read and confirmed.
2. Forecasts for public use—It was agreed that, upon application, any public body should be supplied with daily forecasts for public exhibition on the terms applicable to the issue of Hay Harvest Forecasts.
3. Resolved—That the initial salaries of the several grades of Classified Clerks be as follows :—Class I., £225 ; Class II., £175 ; Class III., £125 ; Class IV., £75.
4. The Chairman reported that the Committee of the Royal Society (*see* Minute 3 of February 28, 1900) were proposing to recommend to the President and Council that the Articles of Association of the Meteorological Council should be so altered as to allow of only a certain number of the members of the Council to be paid, the paid members

being called directors. The proposals included certain other recommendations, not involving alterations of the Articles of Association, limiting the amount payable to the chairman and directors in accordance with the existing practice.

No objection was made to the proposals.

5. An application (M.O. 934) from the Royal Photographic Society to lend photographs for their exhibition in October next was read.

The Secretary was authorised to arrange for a selection of photographs or photographic records to be exhibited if he thought fit.

6. Read—The following memorandum from the Marine Superintendent upon the arrangements made for collecting observations of drift ice (Minutes, 1899–1900, p. 97).

ACTING upon the Council's instructions on behalf of the Danish Meteorological Institute, captains and owners of vessels voyaging to east and west of Greenland, and elsewhere within the limits of Arctic navigation, have been asked for their co-operation in a work having for its object the collection of information regarding the state of the ice in those regions between the months of March and August inclusive, with the result that the captains of the following vessels have undertaken to make and record the observations required :—

*Dundee Whalers.*

“Eclipse,” } Already in correspondence with the Danish Meteorological Institute.  
 “Diana,” }  
 “Balaena.” }  
 “Nova Zembla.” }

*Hudson Bay Traders.*

One steamer.  
 One sailing vessel.

For the Kara Sea no observation can be obtained this year, but Messrs. Popham and Willett, who despatched expeditions to the Yenisei and Obi in 1896–99 inclusive, have offered to supply extracts from the log books of their steamers, relative to the state of the ice south of Nova Zembla, through the Iron Gates, and in the Kara Sea, during the voyages referred to. On behalf of the Danish Meteorological Institute this offer was accepted, but the records have not yet been received.

7. Proofs of reproductions of cloud photographs for the “Instructions for keeping the Meteorological Log” were submitted and were approved subject to the modification of two of the photographs.

8. An application (M.O. 994) from Mr. Walter Garstang, naturalist to the Marine Biological Association, for certain data regarding monthly mean temperatures of the sea on the west of the British Isles was read.

The Secretary was authorised to supply the information asked for.

9. Read—A memorandum from the Marine Superintendent, stating that since the last meeting seven logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

10. Submitted the following return :—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HER MAJESTY'S DOCKYARDS, for the Quarter ended 31st March, 1900.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available, 1st Jan., 1900	43	71	144	70	72	53
	Received, new ... ..	...	30	100	41	15	10
	“ repaired, cleaned, &c.	33	52	34	9	16	...
	Total ... ..	76	153	278	120	103	63
	Issued ... ..	44	45	207	36	32	15
April 1st, 1900.	Total available ... ..	32	108	71	84	71	48

## COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office, 1st April, 1900 ...	45	32	120	108	250	71	80	84	80	71	50	50
Portsmouth, 1st April, 1900... ..	25	24	55	55	150	158	50	52	50	58	25	24
Devonport " ... ..	25	22	55	43	150	136	50	38	50	40	22	18
Chatham " ... ..	25	20	55	41	150	134	50	46	50	45	25	19
Sheerness " ... ..	6	4	15	11	30	17	10	6	10	6	10	4
Total ... ..	81	70	180	150	480	445	160	142	160	149	82	65
Queenstown, 1st April, 1900... ..	2	2	2	3	3	10	3	3	3	3	...	...
Gibraltar " ... ..	2	2	2	3	4	10	3	3	3	3	...	...
Malta " ... ..	11	11	15	8	60	60	10	11	10	9	1	2
Bombay " ... ..	4	4	3	5	10	10	4	5	4	6	1	2
Halifax " ... ..	3	5	4	5	20	22	4	4	4	3	1	2
Bermuda " ... ..	3	4	4	9	20	22	4	4	4	5	1	3
Jamaica " ... ..	3	3	2	5	10	16	2	...	2	1	1	1
Cape of Good Hope (1st January, 1900) ...	4	1	6	5	20	18	4	7	4	6	1	2
Trincomalee, 1st April, 1900 ... ..	3	3	3	5	10	21	4	5	4	6	1	1
Hong Kong " ... ..	12	8	12	12	30	...	12	8	12	8	2	4
Coquimbo " ... ..	2	2	4	4	15	20	2	3	2	4	1	1
Sydney " ... ..	5	3	6	5	25	27	6	5	6	6	1	2
Esquimalt " ... ..	4	1	5	3	15	3	2	2	2	5	1	2
Total ... ..	58	49	68	72	242	239	60	60	60	65	12	22

## TOTAL DEFICIENCIES.

Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1st April, 1900	Short at Meteorological Office	13	12	179	...	9	...
	" Dockyards—Home	11	30	35	18	11	17
	" " Abroad	9	...	3	...	...	...
	Grand Total short ...	33	42	217	18	20	17

## COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

1st April, 1900	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	" Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	" short ...	33	42	217	18	20	17
	Stock available for Issue ...	151	326	755	282	280	127
	Ordered ... ..	...	20	108	...	...	...
	Repairing ... ..	48	6	3	1	...	...
	Returnable from Depôts ...	28	24	16	14	13	...
	Total stock ... ..	227	376	882	297	293	127

R. F. WALLACE.

June 26th, 1900.

11. Read—Letter (M.O. 901) from the Secretary of the Rubber Estates of Pará, Limited, concerning the supply of instruments for a station in connexion with the Company.

The Secretary was authorised to afford facilities for the purchase of suitable instruments through the office.

12. Read—The following letter (*see* Minute 10 of June 6, 1900).

M.O. 975.

General Post Office, London,  
29th June, 1900.

SIR,

WITH reference to your letter of the 6th instant, I am directed by the Postmaster General to inform you that, as this Department is not in a position to forego the proportion of the charge now credited to it by the German Telegraph Administration in respect of telegrams sent from Cuxhaven and Hamburg to London, no alteration will be made in the mode of rendering the accounts so far as these telegrams are concerned.

I am, &c.,  
JOHN ARDRON.

The Secretary,  
Meteorological Office, S.W.

13. Read—Letter (M.O. 931) from the Royal Meteorological Society requesting a grant of £25 towards their inspection expenses, as in previous years (Minutes 1899–1900, p. 23).

The grant was approved and the Secretary was directed to ask for notes of the inspections.

14. The Secretary was authorised to arrange for the necessary inspections of stations in the current year.

15. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

None.

GALES EXPERIENCED.

None.

FREDC. GASTER.

16. Submitted—The following reports of work during the month of June, 1900 :—

MARINE BRANCH.

July 3rd, 1900.

Examined 12 new logs.

Discussion of the meteorological data for the Ocean district southward from the Equator between the longitudes of 20° E. and 90° W. Obtaining mean results for wind direction and force, and barometer and air and sea temperatures; also drawing wind-roses. Preparing form charts for the publication of the final results.

Investigating the generally very cold weather experienced over America and the abnormal mildness over Europe during the winter of 1898–99, in connection with the charts prepared to illustrate the stormy conditions on the Atlantic. A set of the North Atlantic charts for the winter of 1898–99 prepared for exhibition at the Royal Society's *soirée*.

Commenced the preparation of a January Pilot Chart for the North Atlantic and Mediterranean.

CHAS. HARDING.

## MONTHLY RETURN OF INSTRUMENTS ON CHARGE (APRIL—JUNE, 1900).

30th April, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On Charge, 1st April ...	67	108	153	89	80	7	28	79	117	3	5	4	
Received since ...	22	14	126	4	2	24	...	...	3	10	...	12	
	89	122	279	93	82	31	28	79	120	13	5	16	
<i>Cr.</i>													
Sent out during month	21	27	49	12	14	...	24	8	15	...	2	...	
On Charge, 1st May ...	68	95	230	81	68	31	4	71	105	13	3	16	

R. F. WALLACE.

31st May, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On Charge, 1st May ...	68	95	230	81	68	31	4	71	105	13	3	16	
Received since ...	16	31	33	11	11	...	...	...	3	...	...	...	
	84	126	263	92	79	31	4	71	108	13	3	16	
<i>Cr.</i>													
Sent but during month	8	5	22	11	13	...	2	1	2	10	1	...	
On Charge, 1st June ...	76	121	241	81	66	31	2	70	106	3	2	16	

R. F. WALLACE.

30th June, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On Charge, 1st June ...	76	121	241	81	66	31	2	70	106	3	2	16	
Received since ...	4	...	120	25	31	...	...	...	5	6	...	...	
	80	121	361	106	97	31	2	70	111	9	2	16	
<i>Cr.</i>													
Sent out during Month	19	13	26	30	32	24	1	...	8	...	...	1	
On Charge, 1st July ...	61	108	335	76	65	7	1	70	103	9	2	15	

R. F. WALLACE.

## PANTAGRAPH ROOM.

June 30th, 1900.

*Hourly Means.*—Proof sheets of the volume for 1897 have been read, and passed for press up to page 80, which is just one-third of the whole.

*Daily Means of Temperature.*—The calculation of means for the civil day for the years 1871–73 has been completed and checked.

The preliminary copying of the values has been finished for all observations with the exception of Aberdeen, for which place about one-third has yet to be done.

The calculation of the mean values has been completed and checked for Fort William. For Valencia the calculation has been done but is not yet checked, and for Aberdeen and Falmouth about one third of the mean values have been worked.

*Miscellaneous.*—A comparison has been made of pressure-plate and pressure-tube anemometer values for Bidston Observatory, 1899.

A Sunshine Recorder has been tested.

R. H. CURTIS.

## EXAMINATION BRANCH.

*Examinations.*

*January to March, 1899.*—Completed.

*April to June, 1899.*—Proceeded with.

*April and May, 1900.*—Valencia work completed.

Weekly examinations (on receipt) of Curves and Documents from all Observatories.

*Reports.*

*January to March, 1899.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

*April and May, 1900.*—Copies of "Notes of Errors" to Valencia.

*Miscellaneous.*

Sun printing photographic curves and tracing, and sun printing anemograph and rain curves. Mr. Bench engaged seven days in Office Department during Mr. Allen's absence on vacation.

T. E. ALLEN.

## LAND ROOM.

The following enquiries have been received and attended to during June, 1900.

Average rainfall, temperature, and humidity at Newquay, Cornwall (Mr. F. Hollinshed, M.O. 884).

Average rainfall, temperature, and amount of cloud at Sedbergh, Yorkshire (Rev. E. H. Culley, M.A., M.O. 893).

\* Average temperature of the British Isles for each quarter from 1854 (Marine Biological Association of the United Kingdom, Plymouth, M.O. 922).

Average temperature, rainfall, and sunshine at St. Tudy, North Cornwall (Miss Aston, M.O. 959)

\* Maximum and minimum temperature at certain stations on the South Coast during December 1897 (Medical Officer of Health for Kingstown, M.O. 968).

Weather between Newhaven and London, December 18–23, 1899 (L.B. & S.C. Railway, Solicitors' Department, M.O. 974).

JOHN A. CURTIS.

In addition to the enquiries for information referred to above, there were 20 personal enquiries during June for forecasts or other weather information, and 19 enquiries by telegraph.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 19th June ... ..	5,183	2	10
Receipts from 20th June to 3rd July ... ..	177	19	11
	5,361	2	9
Cheques drawn from 20th June to 3rd July ... ..	1,430	7	3
Cash balance on 3rd July ... ..	£3,930	15	6

\* No charge made.

Submitted—The following list of publications which had been received since the last meeting :—

*Antoniadi, E.*—The photography of clouds. 2 papers.

*Brunck, Otto.*—Die chemische Untersuchung der Grubenwetter.

*Falmouth, Royal Cornwall Polytechnic Society.*—Annual report, 1899.

*Liverpool Observatory.*—Report of the Director of the Observatory to the Marine Committee, and meteorological results deduced from the observations taken . . . in the year 1899.

*Rio Janeiro, Repartição da Carta Marítima, Directoria de Meteorologia.*—Instrucções meteorológicas organisadas pelo Capitão Tenente A. B. Silvado.

*St. Petersburg, Meteorological Section of the Central Hydrographical Committee.* Summary of hydro-meteorological observations. Part 2, 1897–1898. (In Russian).

*Worthing Observatory.* Meteorology. 1899.

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63, Victoria Street, October 24, 1900.

PRESENT :

MR. F. GALTON, IN THE CHAIR.

MR. BUCHAN.  
THE HYDROGRAPHER.

PROFESSOR DARWIN.  
MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (July 4) were read and confirmed.

2. Reported—That the sum of £1,463 had been paid, on September 21st for an Annuity of £150 per annum on the life of Mr. R. Strachan, to the Commissioners for the reduction of the National Debt ; that the first quarterly payment of the annuity would become due on January 5th, 1901 ; that it would be necessary to affix the seal of the Council to a power of attorney for the receipt of the quarterly payments. (*See M.O. 665.*)

Resolved—That power of attorney be given to the Bank of England to receive the quarterly payments on behalf of the Council, and that the seal be affixed to the necessary documents in the presence of the Secretary and two other members of the Council.

3. *Irish Department of Agriculture and Technical Instruction.*—Reported—Correspondence in connexion with letter 1,379 from the Secretary of the Department of Agriculture and Technical Instruction for Ireland asking that the Department might be furnished with an early indication of the first approach of severe frost, with a view to the protection of the tobacco crop.

Approved.

4. The Secretary presented the following Report on the meeting of the International Meteorological Committee and Sub-Committees at Paris, September, 1900.

The Committee met on Saturday, September 15, after the completion of the open Congress on Meteorology which had been held during the week, and with which the meetings of the various Sub-Committees on Solar Radiation, Meteorological Aeronautics, Clouds, Weather Telegraphy, and Terrestrial Magnetism, were combined. Any member of the Congress was allowed to attend the meetings of the Sub-Committees, but was not allowed to vote in case of a division. The general arrangement was for Sub-Committees to sit at 9 a.m., and 1 p.m., and for the General Meetings of the Congress, to take place at 3 p.m., with such modifications as were necessary to allow of afternoon visits to the Observatory at Parc-St.-Maur, and to M. L. Teisserenc de Bort's Observatory for Dynamical Meteorology at Trappes. Sub-Committees met simultaneously in separate rooms.

The Sub Committee on Weather Telegraphy, which I was authorised to attend, had meetings on three days, and discussed propositions introduced by Professor van Bebbler in favour of (1) the extension of the "Radial System" now found to work satisfactorily in Germany, including the exclusive or preferential use of telegraph wires for a specified interval; (2) the definition of 7 a.m. and 6 p.m. G.M.T. as the hours of observation for international purposes; (3) the selection of Amsterdam as the international centre of distribution of weather telegrams, and (4) the formation of an international government commission, including meteorologists and telegraphists, to make the necessary arrangements.

The discussion was of a desultory character and extended over several meetings, and finally resulted in a resolution in favour of approaching the International Telegraphic Bureau at Berne with the view of securing the appointment of a commission, such as that proposed by Professor van Bebbler, to consider the best means to be adopted for obtaining an effective international system of weather telegraphy.

The work of the Sub-Committee on Aeronautics attracted a good deal of interest and was ultimately prolonged beyond the week assigned for the Congress. Amongst other things, the installations of apparatus, the methods adopted and results obtained at Blue Hill, Trappes, Strassburg, and Berlin, were discussed, and a proposal was made by Messrs. Hergesell and Teisserenc de Bort in favour of initiating simultaneous periodical international ascents of unmanned balloons (ballons sondes). Ultimately a resolution was adopted asking the International Committee to approach the Government of the Republic with the view of getting the arrangements initiated by negotiations between the European countries through the ordinary diplomatic channels.

These two resolutions came up for approval at the meeting of the International Committee, and were both accepted by that body, which also received and adopted a report from the Sub-Committee on Clouds, asking for further international observations.

It was agreed, at the suggestion of the Sub-Committee on Magnetism, to invite the directors of magnetic observatories to send in lists of "quiet" days to the Secretary for circulation.

No report was presented to the Committee by the Radiation Sub-Committee which had discussed apparatus and results.

At the opening of the meeting of the Committee, I was elected a member of the Committee in place of Mr. Scott, who had resigned, and Prof. Palazzo (Director, *ad interim*, of the Central Meteorological Bureau at Rome) was elected in place of Prof. Tacchini. M. Hildebrandsson was elected Secretary of the Committee in place of Mr. Scott. There were present at the meeting Prof. Mascart (in the Chair), MM. Davis (Argentine), Hepites (Roumania), Hildebrandsson (Sweden), Mohn (Norway), Palazzo (Italy), Paulsen (Denmark), Rykatcheff (Russia), Shaw (Great Britain), Snellen (Holland).

The questions of summoning a General Congress and of the time for the next meeting of the Committee were considered informally. It was understood that no steps would be taken with regard to summoning a General Congress before the next meeting of the Committee, and that the Committee would be summoned, if there were business to be transacted, in 1902. As regards the place of meeting of the Committee in that year, an invitation from Mr. Willis Moore to hold the next meeting in Washington was declined by the Chairman without formal vote, on account of the distance, and in the course of conversation it transpired that London would be very generally regarded as a convenient place for meeting.

At the General Meetings of the Congress a very large number of papers, of very varying degrees of interest and importance, were read. Balloons and kites occupied a good deal of attention, the dangers of the latter being dealt with by Dr. Assmann. Papers on gun-firing for protection against hail were discussed.

Among the papers on the last day of the meeting was one by Mr. Wragge, on the Queensland Weather Service, and in particular on the work of the station of Mount Kosciusko, the highest point of Australia (7,600 feet).

Lieutenant Kesslitz, of the Austrian Hydrographic Office, Pola, read a paper advocating the noting of the occurrence of earthquakes by mentioning them in the Daily Weather Reports of the several meteorological offices.

General Rykatcheff read a paper on the comparison for a year of readings of wet and dry bulbs in screens of the Russian, French, and English (Stevenson) patterns with those of an Assmann Aspirating Apparatus. The deviations amounted only to some tenths of a degree Centigrade in the middle of the day, and were somewhat less in the case of the Stevenson screen than in those of the others.

September 18, 1900.

W. N. SHAW.

5. *Correspondence with Lloyd's.*—Read—The following letter (M.O. 1,025) ; also letters 1,062 and 1,165 :—

Lloyd's,  
10th July 1900

SIR,

I HAVE the honour to inform you that my Committee have recently established Signal Stations at the following places in far-distant countries :—

Point de Galle (Ceylon).  
Cape Verde (Senegal).  
Sabang Bay, Pulo Wai (Sumatra).

Possibly it might be considered desirable by your office to have meteorological observations taken from either or all of these places, and I am directed to beg that you will be so good as to inform your Council that if such should be the case, my Committee will be very pleased to render any assistance in arranging for this to be carried out.

I am, &c.,  
H. M. HOZIER,  
Secretary.

The Secretary,  
Meteorological Office.

The Secretary was instructed to thank Lloyd's for their offer, and arrange, after consultation, for such reports from the stations as should be found practicable ; if possible, for reports following the type of lighthouse registers.

Read—The following letter, M.O. 1,309 :—

Lloyd's,  
14th September, 1900.

SIR,

I should be glad to hear at your convenience whether the Meteorological Returns we send you from our Signal Stations are of use, and, if so, whether you would desire the arrangement extended in any way.

Would it not be convenient, do you think, to adopt the Metric System, and give the Barometer readings in millimètres, as in France. Perhaps, at your leisure, you would be kind enough to furnish me with your views on this point.

I am Sir, &c.,  
JOHN HOUGH,  
For Secretary.

The Secretary,  
Meteorological Office.

The Secretary was directed to refer to the subject when consulting with Lloyd's with respect to the reports from stations.

6. *Telegraphic Reports to Washington.*—Submitted—The following letter (M.O. 1,205), and also letters, dated September 4th and October 12th, from the Weather Bureau.

Weather Bureau,  
Washington, D.C.  
August 7th, 1900.

MY DEAR COLLEAGUE,

With a view to improving our work in forecasting the character and course of storms, it is the desire of this Office to secure daily weather reports by cable from Valentia, Ireland, and, if possible, from the north coast of Ireland and the north-west coast of Scotland. It is believed that the great "permanent" cyclonic and anti-cyclonic areas of the North Atlantic have a controlling influence which extends even to the eastern parts of the United States, and that movements, shiftings, or changes in character of these areas will be indicated by reports from extreme western Europe when such reports are considered in connection with data from the cable islands of the Atlantic.

The reports from stations under your jurisdiction could be sent in a cipher which would be furnished by this Office, and the expense of cabling and telegraphing, and, if necessary, for making the observations, would, of course, be assumed by this Office. The regular morning observations of your service would answer all requirements, and the data desired could be embodied in about two cipher words.

Thanking you in advance for any action you may take in the direction indicated,

I am, very respectfully,  
H. E. WILLIAMS,  
Acting Chief, U.S. Weather Bureau.

Mr. W. N. Shaw,  
Secretary, Royal Meteorological Society,  
63, Victoria Street, S.W., London, England.

The Secretary reported that he had intimated to the Chief of the Weather Bureau that the Office would make the necessary arrangements for transmitting the telegrams, with the approval of the Council.

Approved.

7. *Mr. C. T. R. Wilson's Appointment.*—Read—The following letter (M.O. 1450):—

Sidney Sussex College,  
Cambridge,  
23rd October, 1900.

DEAR MR. SHAW,

Mr. Wilberforce's departure from the Cavendish Laboratory has resulted in a considerable amount of teaching work falling to me; I succeed him as University Demonstrator. For this term especially I shall have to give up a good deal of time to teaching work.

Under the circumstances, I feel that I should not be justified in receiving remuneration from the Meteorological Council for the research I may do this term.

I hope, however, to complete some unfinished investigations before the end of the year, in time for them to be brought into the report of my year's work.

I think I mentioned when I saw you last that I had begun some experiments on the ionisation of air. I have continued these experiments both here and, during September, at Peebles, and they have given results which are, I think, of importance. I have found it possible to detect and measure the leakage, through the air, of electricity from an insulated conductor suspended within a closed vessel containing dust-free air not exposed to any known ionising agent. The leakage goes on in the dark. The method adopted leaves no room for ambiguity as to the path of the leakage; it is through the air, not through the supports. The relation between current and E.M.F. is such as would result from a continuous production of ions within the vessel; and the magnitude of the leakage is such as would result from the splitting up into ions of about 15 neutral molecules in each cubic centimetre per second. It is possible, of course, that the walls of the vessel may have something to do with the production of the ions; this is a point which I hope to settle shortly.

I am, &c.,  
C. T. R. WILSON.

8. *Application from the Town Clerk of Southport for Grant in Aid of the Expenses of the Meteorological Observatory at Southport.*—Read—The following letter (M.O. 1,279) referring to M.O. 659, 1898, and reply dated April 2nd, 1898.

Town Hall, Southport,  
6th September, 1900.

METEOROLOGICAL STATION.

SIR,

REFERRING to my predecessor's letter of the 28th March, 1898, and your reply thereto of the 2nd April, 1898, No. M.O. 659, I am directed to renew the application for a grant in aid of the Meteorological Station and Observatory at Southport, and I shall be glad if you will bring the matter before the Meteorological Council or other proper authority with a view to a suitable allowance being made to the Corporation in respect of the working and maintenance of this station.

I understand that this observatory is one of the best, if not the best, equipped station out of London, and the Council hope not to have to either dispense with the station or cripple its usefulness on account of expense. It is, however, only maintained at an annual expense which my Council feel should not fall entirely upon Southport, when the observations and tables are of advantage and are relied upon not only by a large section of the North of England, but also to a very large degree in compiling the statistics and observations for the whole country.

I enclose a copy of the annual report for the year 1899, and shall be glad to furnish any further information which may be desired to enable this application to be dealt with in the proper quarter.

I am, &c.,  
J. ERNEST JARRETT,  
Town Clerk.

R. H. Scott, Esq., F.R.S.

The Secretary was directed to draft a reply to be submitted to the next meeting.

9. *Proposed observations at Teneriffe.*—Read—A letter (M.O. 1363) from Mr. A. S. Brown, asking for the support of the Council in the initiation of a scheme of observations at different levels on the Island of Teneriffe.

It was agreed that a reply be sent declining the suggestion.

10. *Comptometer*.—The Secretary reported that the calculating machine supplied on approval (Minute 4 of June 6, 1900) had been found very useful, and that he desired to retain it.

Approved.

11. *Atlantic Weather Charts, 1898-9*. Reported—That, with the sanction of the Chairman, Captain Hepworth had attended the meeting of the British Association at Bradford, and had read the introductory text as a paper in Section A, and that the preface, introduction, and explanatory notes were now ready to go to the printer.

It was agreed that the text should be printed in triple columns on double foolscap paper, the same size as the charts.

12. Read—A memorandum from the Marine Superintendent, reporting that since the last meeting forty-seven logs had been received, nine of them being excellent.

The Secretary was directed to return the best thanks of the Council to the Observers.

13. *Pilot Charts*.—Submitted the following correspondence (P.C. 1,304 and M.O. 1,074 and 1,385) :—

Meteorological Office,  
5th July, 1900.  
SIR, I AM directed by the Meteorological Council to inform you that they contemplate the issue in a cheap form, for the use of the Mercantile Marine, of monthly pilot charts of the North Atlantic Ocean.

As the utility of this action will depend entirely upon the readiness with which the charts will be procurable, the Council are anxious to know if the Board of Trade will be able to aid by instructing any of their officials at the ports who are in constant touch with officers of merchant vessels to undertake, first, the distribution of these charts gratis to officers on the Meteorological Office list as observers, and, secondly, the sale to others. It is hoped that the price may be as low as 6d.

If the Board of Trade is able to aid in this manner, the Council will be much obliged if they can be informed what branch of the Board of Trade service would be employed and at what ports they would be available, for though the Council would propose to begin only at a small number of large ports in the first instance, it would be convenient to know how far the system could be extended.

I am, &c.,  
W. N. SHAW,  
Secretary.

The Assistant Secretary,  
Marine Department,  
Board of Trade.

*Reply.*

Board of Trade  
(Marine Department),  
21st July, 1900.

SIR, I AM directed by the Board of Trade to acknowledge the receipt of your letter of the 5th instant, respecting the proposed issue of monthly pilot charts of the North Atlantic Ocean.

The Board desire me to state that they will be pleased to make arrangements for the distribution of these charts to officers of the Mercantile Marine, and their sale to others through the Superintendents of Mercantile Marine Offices at all ports where such offices are established.

I am to add that the Board will be glad to be informed at what ports it is intended in the first instance to introduce the system, in order that the necessary instructions may be issued to their Superintendents and a notice may be prepared calling the attention of those who use the Mercantile Marine Offices to the issue of the charts.

I am, &c.,  
WALTER J. HOWELL.

The Secretary,  
Meteorological Office.

M.O. 1,385.

Stationery Office,  
October 5, 1900.

DEAR SIR, Pattern charts returned herewith. The cost of printing by lithography in black and two colours from a transfer taken from a plate, and printing a description in letter-press at back on wove (thick) paper, will be roughly as under :—

500 copies	...	...	...	...	...	£8	10	0
1,000 "	...	...	...	...	...	11	0	0
2,000 "	...	...	...	...	...	15	10	0
5,000 "	...	...	...	...	...	29	0	0

In this estimate the cost of engraving plate is not included. Probably to obtain the plate we should have to pay from £7 to £8.

Yours faithfully,  
R. W. MOFFREY.

Captain Hepworth.

Copies.	Cost.			Price per Copy.
	£	s.	d.	d.
500	8	10	0	4.08
1,000	11	0	0	2.64
2,000	15	10	0	1.86
5,000	29	0	0	1.39

The Secretary was directed to include provision for Atlantic Pilot Charts in the memorandum to be forwarded to the Stationery Office with a view to the estimates for the ensuing year.

14. Reported correspondence with Prof. Sampson, of Durham, respecting a solar-radiation thermometer ordered by him and broken in transit.

The consideration of the matter was postponed till the next meeting.

15. *Fishery barometer at Inniscoo Island.* The Secretary reported that he had received an application (M.O. 1.242) from Inniscoo Island, and that, after correspondence with the Coast Guard Officer, he had given directions for a barometer to be sent, but that it had been broken in transit, and that inquiries were now being made into the circumstances of the breakage.

16. Reported—That the following instruments had been ordered since last meeting of Council :—

*For M.O. Account—*

	Cost	£	s.	d.
2 Presentation Aneroids ... ..	5	15	0	
6 Station Barometers ... ..	21	5	0	
9 Lenses for Sunshine Recorders ... ..	25	10	0	
1 Sunshine Recorder Frame ... ..	3	10	0	

*For C. Account—*

	Cost	£	s.	d.
12 Marine Barometers ... ..	43	10	0	
48 Thermometers ... ..	14	8	0	
24 Maximum Thermometers ... ..	16	16	0	
24 Minimum " ... ..	16	4	0	
24 Solar Radiation in Vacuo ... ..	22	4	0	
24 Terrestrial Minimum in Vacuo ... ..	19	4	0	

R. F. WALLACE.

24th October, 1900.

17. *Storm warnings:—Submitted—* The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 19 days, the total number of Districts warned being 123. In 89 districts the warnings were justified, but in 34 they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER

Telegraph Branch.

24th October, 1900.

18. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of June 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	64	63	64	89
"	b	30	20	25	
"	c	3	10	6	
"	d	3	7	5	
Scotland, E.	a	60	57	59	92
"	b	33	33	33	
"	c	7	7	7	
"	d	0	3	1	
England, N.E.	a	64	77	71	87
"	b	13	20	16	
"	c	20	0	10	
"	d	3	3	3	
England, E.	a	63	64	64	84
"	b	17	23	20	
"	c	20	13	16	
"	d	0	0	0	
Midland Counties	a	60	60	60	85
"	b	23	27	25	
"	c	17	10	14	
"	d	0	3	1	
England, S.	a	60	54	57	84
"	b	30	23	27	
"	c	10	20	15	
"	d	0	3	1	
Scotland, W.	a	47	83	65	85
"	b	30	10	20	
"	c	23	7	15	
"	d	0	0	0	
England, N.W.	a	54	52	53	85
"	b	33	31	32	
"	c	13	17	15	
"	d	0	0	0	
England, S.W.	a	50	59	55	87
"	b	30	34	32	
"	c	17	7	12	
"	d	3	0	1	
Ireland, N.	a	54	80	67	94
"	b	40	14	27	
"	c	3	3	3	
"	d	3	3	3	
Ireland, S.	a	50	67	59	80
"	b	23	20	21	
"	c	17	10	14	
"	d	10	3	6	
SUMMARY.					
British Islands	a	57	65	61	86
"	b	27	23	25	
"	c	14	10	12	
"	d	2	2	2	

Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of July 1900 :—

The letters used have the following signification :

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	45	81	63	89
"	b	42	10	26	
"	c	10	9	10	
"	d	3	0	1	
Scotland, E.	a	55	65	60	85
"	b	26	23	25	
"	c	10	3	6	
"	d	9	9	9	
England, N.E.	a	52	58	55	83
"	b	32	23	28	
"	c	16	19	17	
"	d	0	0	0	
England, E.	a	61	49	55	81
"	b	16	35	26	
"	c	13	10	11	
"	d	10	6	8	
Midland Counties	a	55	45	50	86
"	b	29	42	36	
"	c	13	13	13	
"	d	3	0	1	
England, S.	a	58	52	55	86
"	b	29	32	31	
"	c	10	16	13	
"	d	3	0	1	
Scotland, W.	a	39	77	58	83
"	b	39	10	25	
"	c	13	13	13	
"	d	9	0	4	
England, N.W.	a	55	52	54	81
"	b	29	26	27	
"	c	6	13	10	
"	d	10	9	9	
England, S.W.	a	49	55	52	83
"	b	32	29	31	
"	c	6	6	6	
"	d	13	10	11	
Ireland, N.	a	36	42	39	84
"	b	48	42	45	
"	c	6	0	3	
"	d	10	16	13	
Ireland, S.	a	42	39	41	76
"	b	35	35	35	
"	c	13	13	13	
"	d	10	13	11	
SUMMARY.					
British Islands	a	50	56	53	83
"	b	32	28	30	
"	c	11	10	11	
"	d	7	6	6	

Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of August 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	50	63	57	88
"	b	33	30	31	
"	c	10	0	5	
"	d	7	7	7	
Scotland, E.	a	54	67	61	89
"	b	30	27	28	
"	c	13	3	8	
"	d	3	3	3	
England, N.E.	a	70	67	69	89
"	b	20	20	20	
"	c	7	10	8	
"	d	3	3	3	
England, E.	a	57	67	62	89
"	b	27	27	27	
"	c	13	6	10	
"	d	3	0	1	
Midland Counties	a	64	80	72	91
"	b	23	14	19	
"	c	10	3	6	
"	d	3	3	3	
England, S.	a	67	64	66	92
"	b	23	30	26	
"	c	7	3	5	
"	d	3	3	3	
Scotland, W.	a	33	67	50	75
"	b	37	13	25	
"	c	17	13	15	
"	d	13	7	10	
England, N.W.	a	57	53	55	79
"	b	20	27	24	
"	c	17	3	10	
"	d	6	17	11	
England, S.W.	a	57	63	60	85
"	b	27	23	25	
"	c	10	7	9	
"	d	6	7	6	
Ireland, N.	a	37	70	54	75
"	b	30	13	21	
"	c	20	7	14	
"	d	13	10	11	
Ireland, S.	a	50	50	50	82
"	b	30	33	32	
"	c	7	10	8	
"	d	13	7	10	
SUMMARY.					
British Islands	a	54	65	60	85
"	b	27	23	25	
"	c	12	6	9	
"	d	7	6	6	

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of September 1900 :—

The letters used have the following signification :—

a = complete success

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success, a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	33	64	49	80
"	b	30	33	31	
"	c	20	0	10	
"	d	17	3	10	
Scotland, E.	a	50	64	57	77
"	b	10	30	20	
"	c	20	3	12	
"	d	20	3	11	
England, N.E.	a	57	43	50	90
"	b	33	47	40	
"	c	7	10	9	
"	d	3	0	1	
England, E.	a	67	77	72	84
"	b	10	13	12	
"	c	23	10	16	
"	d	0	0	0	
Midland Counties	a	60	77	69	84
"	b	17	13	15	
"	c	23	10	16	
"	d	0	0	0	
England, S.	a	73	77	75	94
"	b	20	17	19	
"	c	7	6	6	
"	d	0	0	0	
Scotland, W.	a	47	73	60	79
"	b	17	20	19	
"	c	16	0	8	
"	d	20	7	13	
England, N.W.	a	60	60	60	87
"	b	17	37	27	
"	c	13	0	7	
"	d	10	3	6	
England, S.W.	a	53	67	60	80
"	b	30	27	29	
"	c	10	0	5	
"	d	7	6	6	
Ireland, N.	a	47	70	59	82
"	b	30	17	23	
"	c	20	10	15	
"	d	3	3	3	
Ireland, S.	a	50	70	60	83
"	b	23	23	23	
"	c	20	7	14	
"	d	7	0	3	
SUMMARY.					
British Islands	a	54	68	61	85
"	b	22	25	24	
"	c	16	5	10	
"	d	8	2	5	

19. Submitted—The following Statement respecting the Records for January to June, 1899, received from the Self-recording Observatories (*see* Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889).

	ABERDEEN.		ARMAGH.		FALMOUTH.		FORT WILLIAM.		KEW.		VALENCIA.	
<b>ANEMOGRAPH :—</b>	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
<i>Action of Instrument</i> ...	Good.	Good.	Good.	Good.	Good.	Good.	—	—	Good.	Good.	Good.	Good.
<i>Records deficient :—</i>												
Due to stoppage of clock	0	0	0	0	0	0	—	—	18 hrs.	18 hrs.	0	0
" other causes ...	0	0	0	0	34 hrs.	24 hrs.	—	—	1 hr.	2 hrs.	0	0
<i>No. of errors discovered :—</i>												
By general examination	0	1	11	18	13	8	—	—	1	0	1	0
<i>Reslts. of 40 Remeasmts. :—</i>												
Greatest difference ...	·0	1·0	·0	1·0	·0	1·0	—	—	·0	1·0	·0	1·0
Mn. diff. irrespectv. of sign	·0	·5	·0	·5	·0	·4	—	—	·0	·3	·0	·4
Residual diff. (— M.O.)	·0	·1	·0	·1	·0	·2	—	—	·0	·1	·0	·1
Orientation verified ...	Monthly	—	Monthly	—	Monthly	—	—	—	Monthly	—	Monthly	—
<b>RAIN GAUGE :—</b>												
<i>Action of Instrument</i> ...	Good.		Good.		Good.		Good.		Good.		Good.	
<i>Records deficient :—</i>												
Due to stoppage of clock	0		0		0		17 hrs.		7 hrs.		0	
" other causes ...	12 hrs.		2 hrs.		0		99 hrs.		0		0	
<i>No. of errors discovered :—</i>												
By general examination	0		2		11		79		0		0	
<b>BAROGRAPH :—</b>												
<i>Action of Instrument</i> ...	Good.		Good.		Good.		Good.		Good.		Good.	
<i>Character of Photography</i>	Good.		Good to Excellent.		Indiff. to Very Good.		Good.		Good.		Very Good.	
<i>Records deficient :—</i>												
Due to stoppage of clock	0		0		0		0		0		0	
" failure of light...	0		0		0		0		4 hrs.		0	
" other causes ...	2 hrs.		0		2 hrs.		2 hrs.		1 hr.		0	
<i>No. of errors discovered :—</i>												
In entry of standards ...	0		5		13		0		0		0	
" maxima and minima	5		42		21		1		1		6	
" calculating residuals	1		3		17		0		0		0	
" applying	1		5		28		1		1		1	
By general examination	1		59		72		7		7		6	
<i>Reslts. of 40 Remeasmts. :—</i>												
Greatest difference ...	·009		·006		·007		·010		·010		·015	
Mn. diff. irrespectv. of sign	·002		·002		·002		·002		·002		·002	
Residual diff. (— M.O.)	— ·001		·000		·000		·000		·000		— ·001	
<i>Mean monthly diff. between simultaneous Barograph and Stand. Bar. readings.</i>	·002		·002		·003		·001		·001		·002	
<b>THERMOGRAPH :—</b>												
<i>Action of Instrument</i> ...	Good.		Good.		Good.		Good.		Good.		Good.	
<i>Character of Photography</i>	Good.		Very Good.		Fair.		Good.		Good.		Indifferent to Good.	
<i>Records deficient :—</i>												
Due to stoppage of clock	Dry. 0	Wet. 0	Dry. 0	Wet. 0	Dry. 0	Wet. 0	Dry. 0	Wet. 0	Dry. 0	Wet. 0	Dry. 0	Wet. 0
" failure of light ...	0	0	0	0	0	0	0	0	0	0	0	8 hrs.
" impfetly moist bulbs	—	0	—	2 hrs.	—	54 hrs.	—	4 hrs.	—	3 hrs.	—	3 hrs.
" partly frozen bulbs	—	92 hrs.	—	33 hrs.	—	70 hrs.	—	87 hrs.	—	21 hrs.	—	21 hrs.
" other causes ...	2 hrs.	2 hrs.	0	0	4 hrs.	5 hrs.	0	0	0	0	0	0
<i>No. of errors discovered :—</i>												
In entry of standards ...	0	0	4	1	11	13	1	0	0	0	1	1
" maxima and minima	1	—	5	—	10	—	2	—	5	—	—	—
By general examination	1	0	21	23	24	25	1	2	3	8	8	8
<i>Reslts. of 40 Remeasmts. :—</i>												
Greatest difference ...	·2	·2	·2	·2	·2	·2	·2	·2	·2	·2	·2	·2
Mn. diff. irrespectv. of sign	·1	·1	·1	·1	·1	·1	·1	·1	·1	·1	·1	·1
Residual diff. (— M.O.)	·0	·0	+ ·1	·0	·0	+ ·1	·1	·1	·1	·1	·0	·0
<i>Mean monthly diff. between simultaneous Thermogph. and Stand. Ther. readings.</i>	·2	·2	·2	·2	·2	·2	·1	·1	·1	·1	·1	·1

## ABERDEEN.

*Anemograph.*—The traces are satisfactory throughout.

*Rain Gauge.*—The action of the instrument was good and the results satisfactory.

*Barograph.*—The photographic records were not up to the usual standard during January and March.

*Thermograph.*—During the first half of January the dry bulb zero-line was very narrow, with a double edge. Apparently something was done on the 14th (although no note was made as requested in the Code of Regulations, page 1) by which an improvement was effected. On the 19th the gas pipes were repaired and the definition of the zero lines was not so satisfactory, but subsequently improved. The zero lines were altered to the summer positions on May 30th.

*General.*—There was an improvement on the work of the previous half year, the clerical portion is very good.

## ARMAGH.

*Anemograph.*—The instrument was regularly lubricated. The velocity traces are intermittent at low rates owing to the mechanical defect alluded to in previous reports.

*Rain Gauge.*—The action of the instrument was satisfactory and the records good.

## FALMOUTH.

*Anemograph.*—The instrument was regularly oiled monthly, and the traces are good.

*Rain Gauge.*—Occasionally during May the stated times of ending differed considerably from the time of the termination of the trace, otherwise the records are satisfactory.

*Barograph.*—The photographic curves are generally very good and the instrument worked satisfactorily.

*Thermograph.*—A similar remark applies to these curves and instrument. The zero lines were changed to the summer positions on May 12th.

*General.*—Apart from the clerical portion of the work, which was not quite up to standard, the returns from this observatory were very good.

## FORT WILLIAM.

*Rain Gauge.*—During February, March, and June the stated times of ending differed considerably from the end of the traces, and the time lines of the curves should have been re-ruled in many cases before tabulating. On April 23rd the "pin of ratchet of winding drum broke," and was repaired.

*Barograph.*—The quality of the photography varied very much, but the instrument worked satisfactorily.

*Thermograph.*—During the first half of January the zero lines varied in breadth owing to the unequal power of the light. In February and March trouble was experienced with the light shutter not acting, the cause of which was not apparent. The zero lines were changed to the summer positions on June 1st.

*General.*—The character of the clerical work remains unchanged from previous reports.

## KEW.

*Anemograph.*—The instrument was working well and carefully attended to.

*Rain Gauge.*—The instrument was in good condition and results are satisfactory.

*Barograph.*—In February experiments were made with the view of improving the light and to prevent the secondary images. On the 22nd, and again on the 23rd, the tube of the instrument was shifted in order to remove the double edge at the lower part of the trace.

*Thermograph.*—Occasionally difficulty was experienced with stray rays of light causing secondary images, and attempts were made to blot them out. The zero lines were changed to the summer positions on May 26th, and they were lowered on June 1st.

*General.*—The difficulty at this observatory is largely caused by excess of light on the photographic curves in spite of numerous attempts to surmount it. The clerical work is well done.

## VALENCIA.

*Anemograph.*—The instrument was in good order and carefully attended to.

*Rain Gauge.*—The instrument worked satisfactorily, but the traces are at times faint.

*Barograph.*—The photographic curves are good and the instrument was in good order.

*Thermograph.*—The defect on the tube of the wet bulb causes the trace to be very much blurred at or about 40°, but this defect is intensified by other causes, probably an excess of light, for in some instances the traces are much better than others at the same temperature, and the curves are occasionally disfigured by secondary images. The zero lines were changed to the summer positions on April 6th.

*General.*—Reference to the accompanying table will show that the work generally is good.

T. E. ALLEN.

20. Submitted—The following reports of work during the three months ending with September, 1900 :—

MARINE BRANCH.

July.

Examined seven new logs and one lighthouse register.

Obtaining monthly results of wind and instrumental observations in the district southward from the Equator, between the West Coast of Africa and longitude 90° W. Drawing wind-roses and preparing wind charts.

Discussion of the conditions over the northern part of the Atlantic and adjacent continents between the middle of December, 1898, and the middle of February, 1899.

Preparing a Form Chart for the new series of Pilot Charts of the North Atlantic and Mediterranean.

Obtaining data bearing upon the distribution of cloud over the Atlantic, and Asia and the neighbouring seas during the solar eclipses of May 28 last, and of January 22, 1898.

Supplying Mr. Garstang with sea temperature means for each month over a part of the North Atlantic—Letter M.O. 994.

Preparing daily sunrise and sunset tables for the August Daily Weather Reports.

August.

Examined 16 new logs and four lighthouse registers.

Discussing the data for the region southward from the Equator between the West Coast of Africa to longitude 90° W., and preparing wind charts for August and January.

Preparing a descriptive account of the severe storms on the Atlantic, the great cold over America, and the warmth over Europe in the winter of 1898-99.

Collecting information for the North Atlantic and Mediterranean Pilot Chart for January, 1901.

Preparing daily sunrise and sunset tables for the September and October Daily Weather Reports.

One of the Junior Clerks sometimes called upon to take copies of the Daily Weather Reports to the various railway bookstalls.

September.

Examined 13 new logs and one lighthouse register.

Advancing the preparation of the wind and instrumental results for the South Atlantic district, and charting the winds for coastal regions.

Preparing daily notes to accompany the charts exhibiting the weather conditions on the upper Atlantic and adjacent countries in the winter of 1898-99.

Preparing the Pilot Chart for the North Atlantic and Mediterranean for January, 1901.

Arranging a sheet of cloud pictures for the new issue of the "Instructions for keeping the Meteorological Log."

Hydrographic remarks contained in logs Nos. 10,647 and 10,658 copied and sent to the Admiralty.

A junior clerk has frequently had to take copies of the Daily Weather Reports to the railway bookstalls.

CHAS. HARDING.

October 23, 1900.

METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

July, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On Charge, 1st July ...	31	6	178	7	14	7	1	26	79	7	2	15	
Received since ...	8	2	19	—	—	—	—	1	3	—	—	—	
	39	8	197	7	14	7	1	27	82	7	2	15	
<i>Cr.</i>													
Sent out during month	5	2	13	—	12	—	—	—	3	—	—	—	1 Sunshine Recorder.
On Charge, 1st August	34	6	184	7	2	7	1	27	79	7	2	15	

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

July, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st July ...	30	102	157	69	51	—	—	44	24	2	—	—	
Received since ...	13	44	18	9	13	—	—	2	—	—	—	—	
	43	146	175	78	64	—	—	46	24	2	—	—	
<i>Cr.</i>													
Sent out during month	12	33	45	10	7	—	—	4	—	—	—	—	
On charge, 1st August	31	113	130	68	57	—	—	42	24	2	—	—	

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

August, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st August	34	6	184	7	2	7	1	27	79	7	2	15	3 Sunshine Re-
Received since ...	19	—	17	—	1	—	—	—	23	—	—	—	recorders.
	53	6	201	7	3	7	1	27	102	7	2	15	None in Stock.
<i>Cr.</i>													
Sent out during month	14	1	6	—	2	—	—	—	—	3	—	2	2 Sunshine Re-
On charge, 1st Sept. ...	39	5	195	7	1	7	1	27	102	4	2	13	recorders.
													One in Stock.

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

August, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st August	31	113	130	68	57	—	—	42	24	2	—	—	
Received since ...	14	15	9	2	2	—	—	—	—	—	—	—	
	45	128	139	70	59	—	—	42	24	2	—	—	
<i>Cr.</i>													
Sent out during month	—	6	5	—	—	—	—	—	—	—	—	—	
On charge, 1st Sept. ...	45	122	134	70	59	—	—	42	24	2	—	—	

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

September, 1900.

	Barometers.	Aneroids.	Thermometers.				Solar Radiation.	Grass, Minimum.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.									
<i>Dr.</i>														
On charge, 1st Sept. ...	39	5	195	7	1	7	1	27	102	4	2	13		
Received since ...	6	—	3	—	5	—	—	1	—	—	—	—		
<i>Cr.</i>														
Sent out during month	45	5	198	7	6	7	1	28	102	4	2	13		
On charge, 1st Oct. ...	4	—	21	—	—	—	—	1	4	—	—	1		
	41	5	177	7	6	7	1	27	98	4	2	12		

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

September, 1900.

	Barometers.	Aneroids.	Thermometers.				Solar Radiation.	Grass, Minimum.	Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.									
<i>Dr.</i>														
On charge, 1st Sept. ...	45	122	134	70	59	—	—	42	24	2	—	—	—	
Received since ...	8	12	31	1	5	—	—	2	—	—	—	—	—	
<i>Cr.</i>														
Sent out during month	53	134	165	71	64	—	—	44	24	2	—	—	—	
On charge, 1st Oct. ...	6	—	30	—	—	—	—	—	—	—	—	—	—	
	47	134	135	71	64	—	—	44	24	2	—	—	—	

R. F. WALLACE.

## TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

To 24th October, 1900 (from end of May).

*Weekly Weather Report.*—All numbers issued to date. *Quarterly Summaries* for Second and Third Quarters issued. *Monthly Supplements*, April to June, issued; July in hand. Appendices III. and IV. (now issued once in 5 years) mean weekly values for January to June in the 20 years 1881–1900 prepared.

*Daily Weather Report.*—All numbers issued to date; *Monthly Correction Sheets*, April to August issued. (The Report almost completely re-arranged.)

*Checking of Daily (8.30 p.m.) Forecasts, 1900.*—Done to end of September.

*Primary Checking of Storm Warnings issued in 1900.*—Done to date.

*Harvest Forecasts, 1900.*—Issue organized and completed. The increase in the number of recipients has been remarkable—total number 129, against 20 to 25 in former years; full report is in hand.

*Inquiries by Telegraph.*—Number this year (in the 4 months) 154; last year 56. Personal inquiries have also been very numerous this year.

*Inquiries by Newspapers.*—Increased enormously—on some occasions they amounted to 6 or 8 a day.

*Calculating Mean Values for 8 a.m. Temperature (two each month) for the Telegraphic Reporting Stations, and drawing Charts for same; also for Mean Maximum and Minimum Values, and drawing Charts for issue in the Daily Weather Report.*—Done to date.

*Examining into the Abnormal Barometric Oscillations of July 29th.*—Done.

*Examining into Hygrometric Values for Several Days in May, and preparing necessary Tables, &c.*—Done.

*Installation and Experimenting with Electrical Thermometer.*—In progress.

*Preparing Diagrams of the New Average Temperatures, Rain Values, &c., for 30 years, 1871–1900 (for use in the Weekly Weather Report, 1901.*—Commenced.

*Inspection Notes for England, Scotland, and Ireland.*—All prepared, and inspections almost completed; examination of results in progress.

FREDC. GASTER.

October 24th, 1900.

The Annual Vacation has now been taken by all the Staff. There has been much absence due to sickness.

PANTAGRAPH ROOM.

August 1st, 1900.

*Hourly Means.*—Volume for 1897.—This work has not been advanced, no proof sheets having been received from the printer since June 21st. Volume for 1898.—Most of the Mean Values for Valencia for January are worked.

*Daily Means of Temperature for 25 years.*—The preliminary copying of the Daily Values has been completed; and the remainder of the Mean Values have been calculated and checked, and all are now being copied for the printer.

Some curves to show the Daily March of Temperature have been drawn from the Mean Values, but not much progress has been made with them as yet.

*Mean Temperature Values for the Helder.*—The calculation of these has been begun.

*Miscellaneous.*—A sunshine recorder for Jersey has been tested and passed; and another of a new pattern intended for Sheffield has been examined, but is not yet finally passed.

Some time has been occupied in connexion with an anemometer under construction for the Sonnblick Observatory.

Supplies of oil for lubricating have been forwarded to the several anemometer stations.

R. H. CURTIS.

W. N. Shaw, Esq., F.R.S.

PANTAGRAPH ROOM.

August 31st, 1900.

*Hourly Means.*—Volume for 1897.—No further proof sheets having been received, this work has not been advanced. Volume for 1898.—Some progress has been made with the Means for Valencia.

*Daily Means of Temperature, 1871–1895.*—The copying out and checking of these results has been completed and the values are now ready for press.

Mean Temperature Values for the Helder for the 25 years 1871–1895 have been calculated.

R. H. CURTIS.

W. N. Shaw, Esq., F.R.S.

PANTAGRAPH ROOM.

October 1st, 1900.

*Hourly Means.*—Volume for 1897.—Proof sheets up to page 120 have been received, read, and passed for press. Volume for 1898.—The Mean Values for Valencia are about two-thirds completed.

*Daily Means of Temperature, 1871–1895.*—A series of curves to exhibit the Daily March of Temperature throughout the year have been drawn.

*Miscellaneous.*—The Bunhill Row Sunshine Cards for the second quarter of the year have been tabulated for the Royal Meteorological Society.

Diagrams of the diurnal variation of pressure on the Gold Coast have been drawn for Mr. Robins, C.E.

An enquiry respecting the mean force of the wind in the British Isles has been answered.

R. H. CURTIS.

W. N. Shaw, Esq., F.R.S.

EXAMINATION BRANCH.

1st August, 1900.

*Examinations.*

*April and May, 1899.*—Completed.

*June to September, 1899.*—Proceeded with.

*June, 1900.*—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.*

*April and May, 1899.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

*June, 1900.*—Copies of "Notes of Errors" to Valencia.

... Sun-printing photographic curves and tracing and sun-printing anemograph and rain curves.

... Preparation of notes for Inspectors.

T. E. ALLEN.

## EXAMINATION BRANCH.

1st September, 1900.

*Examinations.**June, 1899.*—Completed.*July to September, 1899.*—Proceeded with.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.**June, 1899.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.  
... Sun-printing photographic, Dines' and bridled anemograph curves.

T. E. ALLEN.

## EXAMINATION BRANCH.

1st October, 1900.

*Examinations.**July, 1899.*—Completed.*August to October, 1899*—Proceeded with.*January to June, 1900.*—Kew work proceeded with.*July and August, 1900.*—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.**July, 1899.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.*July and August 1900.*—Copies of "Notes of Errors" to Valencia.

... Progress of work greatly retarded during first half of month, while Mr. Bench was acting as Office Keeper.

T. E. ALLEN.

## LAND ROOM.

October 23rd, 1900.

Enquiries during July, August, and September, 1900 :—

1. Mr. J. W. Cooper.—Humidity at certain towns in the North of England (M.O. 992).
2. Mr. MacKnight.—Rainfall over Great Britain for May to July 1899 and 1900 (M.O. 1,031).
3. Royal Commission on Salmon Fisheries.—Rainfall over England and Wales in the years 1891–1899 (M.O. 997).
4. Willey & Co.—Rainfall and sunshine at Wandsworth from April 1st, 1900, weekly (M.O. 1,006).
5. Dr. D. Noël Paton.—Rainfall over England and Wales in the 10 years 1881–1890 (M.O. 997).
6. Mr. W. E. Long.—As to the number of days on which a wind velocity of 10 miles per hour and upwards may be expected at Saxmundham (M.O. 1,216).
7. Messrs. Brammer and Bell.—As to the weather off Souter Point during certain days in August 1900 (M.O. 1,228).
8. Mr. Burgholt.—Rainfall at Brighton on July 30th and August 2nd (M.O. 1,248).
9. Messrs. Colls and Son.—Weather in London during October and November, 1899 (M.O. 1,249).
10. Mr. Thos. Morris.—Meteorological averages for Ilfracombe, etc. (M.O. 1,267).
11. Mrs. G. L. Kime.—Rainfall values for Lincolnshire (M.O. 1,338).
12. Mr. J. B. Sandford.—Wind and weather at Kingstown and Queenstown in September 1899 (M.O. 1,331 and 1,362).
13. Mr. T. H. Shutters-Young.—Winds between London and Portsmouth on certain days in October 1895–1899 (M.O. 1,390).

JOHN A. CURTIS.

In addition to the enquiries for information referred to above, there were 92 personal enquiries during July, August, and September for forecasts or other weather information, and 135 enquiries by telegraph.

21. Reported—That the Accounts had been examined by Mr. Price, of the Exchequer and Audit Department, on the 24th ult. (Letter M.O. 1,323).

22. Submitted—The following Statement of Accounts :—

Cash balance on 3rd July	...	...	...	£3,930 15 6
Receipts from 4th July to 23rd October	...	...	...	7,339 4 9
			11,270 0 3	
Cheques drawn from 4th July to 23rd October	...		...	4,965 8 4
			£6,304 11 11	
Cash balance on 23rd October	...	...	...	£6,304 11 11



24. Submitted—The following Statement of Accounts for the six months ending 30th September, 1900 :—

RECEIPTS.			PAYMENTS.				
	£	s. d.	£	s. d.	£	s. d.	
Balance from year 1899-1900 ... ..	—		3,702	11 11	ADMINISTRATION :	£	s. d.
Proportion of vote ... ..	—		7,000	0 0	Secretary ... ..	362	10 0
Repayment of expenses charged under—					Salaries and wages ...	454	7 6
(1.) Incidental expenses	15	1 0			Rent, fuel, and lighting	367	3 10
(2.) Observatories ...	11	18 6			Incidental and contingent expenses ...	92	9 6
			26	19 6	Furniture and fittings*	12	13 11
SPECIAL RESEARCHES :					Expenses incidental to International Meteorological Congress...	26	5 11
Grant for investigation on atmospheric electricity ... ..	—		80	0 0	Pensions† ... ..	1,735	0 0
SUPPLY OF INFORMATION :							
Daily Weather Charts and Forecasts ...	137	1 7			SPECIAL RESEARCHES :		
6 p.m. Charts ...	12	10 0			Salaries and other charges ... ..	—	312 2 8
Reports for Press Agencies, &c. ...	53	5 9			LAND METEOROLOGY :		
Telegrams sent abroad	80	19 7			Observatories and stations, including remuneration of observers	1,078	18 5
			283	16 11	Salaries :— Discussion and reduction of observations, &c. ...	709	12 0
SALE OF INSTRUMENTS, &c. :							1,788 10 5
Royal Navy account	6	1 6			WEATHER INFORMATION AND FORECASTS :		
Mercantile Marine account ... ..	20	12 0			Telegraphic reports and storm warnings, remuneration of observers, &c. ... ..	996	5 8
"M.O." (Stations) account ... ..	17	15 6			Salaries :—Preparation and issue of reports and forecasts ...	947	6 9
			44	9 0			1,943 12 5
Repayment of Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—		202	16 5	INSPECTIONS :		
Commission charged on work done for Colonies, &c. ...	—		12	2 0	Salaries and travelling expenses* ... ..	—	—
					OCEAN METEOROLOGY :		
					Salaries :—Discussion and reduction of observations... ..	655	3 0
					Expenses incidental to the supply of instruments :—		
					Proportion for care and issue of instruments	62	10 0
					Royal Navy ... ..	354	12 10
					Mercantile Marine	120	13 3
							1,192 19 1
					Miscellaneous commissions executed for Colonial and Foreign institutions, &c. ...	—	183 9 5
					BALANCE :		
					Cash at Bank ... ..	2,765	14 7
					" at Office ... ..	70	16 6
					Advances for Travelling expenses ... ..	45	0 0
							2,881 11 1
			£11,352	15 9			£11,352 15 9

LIABILITIES.			ASSETS.		
	£	s. d.		£	s. d.
To Council ... ..	437	10 0	By cash at Bank ... ..	2,765	14 7
" Post Office (partly estimated) ...	394	15 0	" " at Office ... ..	70	16 6
" sundry creditors ... ..	303	6 7	" H.M. Exchequer ... ..	650	0 0
" balance ... ..	2,528	11 2	" sundry debtors ... ..	177	11 8
	£3,664	2 9		£3,664	2 9

\* Some expenses not brought to account.

† Includes payment of £1,463 for annuity for Mr. R. Strachan.

25. Submitted—The following list of publications which had been received since the last Meeting :—

- Allahabad, Meteorological Office.*—Administration report of the Meteorological Reporter to Government, North-Western Provinces and Oudh, for the year 1899–1900.  
 ————— Annual Statement of rainfall in the North-Western Provinces and Oudh for the year 1899.  
 ————— Brief sketch of the meteorology of the North-Western Provinces and Oudh, and adjacent parts of Rajputana and the Panjab, for the year 1899.  
*Assmann, R.*—Beiträge zur Erforschung der Atmosphäre mittels des Luftballons.  
*Bangalore, Mysore Government Meteorological Department.*—Report on rainfall registration in Mysore for 1899. By J. Cook.  
*Berlin, Königlich Preussisches Meteorologisches Institut.*—Ergebnisse der Gewitter-Beobachtungen im Jahre 1897.  
 ————— Ergebnisse der meteorologischen Beobachtungen in Potsdam, 1898.  
*Bornstein, R.*—Luftdruckverteilung und Monddeklination, 2<sup>e</sup> Mitteil.  
*Bremen, Meteorologische Station I. Ordnung.*—Deutsches meteorologisches Jahrbuch. Ergebnisse der meteorologische Beobachtungen. Herausgegeben von P. Bergholz. Jahrg. 10, 1899.  
*British New Guinea.*—Annual report on British New Guinea, 1897–98—1898–99.  
*Budapest, Kön. Ung. Reichsanstalt für Meteorologie und Erdmagnetismus.*—Publicationen, 1900. Bd. 2. Wolkenbeobachtungen in Ó-Gyall im Jahre 1898, bearbeitet von Sigmund von Karvázy.  
 ————— Publicationen, 1900, Bd. 3. Die jährliche Gang der Temperatur in Ungarn. Von Sigmund Róna.  
*Cairo, Observatoire Khédivial.*—Résumé mensuel des observations météorologiques. 1895–1898, Jan.–Dec.  
*Calcutta, Meteorological Office, Bengal.*—Administration report of the Meteorological Reporter to the Government of Bengal for the year 1899–1900.  
 ————— *India.*—Brief memorandum on the weather in India during the months of June and July, and forecast of the general distribution of the rainfall in India during the months of August and September 1900.  
 ————— Memorandum on the snowfall in the mountain districts bordering Northern India, and the abnormal features of the weather in India during the past year, with a forecast of the probable character of the south-west monsoon rains of 1900.  
 ————— Report on the administration of the Meteorological Department of the Government of India in 1899–1900.  
*Carlsruhe, Centralbureau für Meteorologie und Hydrographie.*—Deutsches meteorologisches Jahrbuch. Grossherzogthum Baden. Die Ergebnisse der meteorologischen Beobachtungen im Jahre 1899. Zugleich II. Theil des Jahresb.  
 ————— Jahresbericht . . . mit den Ergebnissen der meteorologischen Beobachtungen und der Wasserstandszeichnungen am Rhein und an seinen grössern Nebenflüssen für das Jahr 1899.  
*Chaves, F. A.*—Rapport sur l'établissement projeté du service météorologique international des Açores.  
*Chemnitz, K. Sächsisches Meteorologisches Institut.*—Abhandlungen. Heft 4. Die Meteorologie in der Landwirtschaft. i. Der Sonnenschein von P. Schreiber.  
 ————— Decaden-Monatsberichte, 1899. Jahrg. 2.  
*Christiania, Norsk Meteorologisk Institut.*—Oversigt over Luftens Temperatur og Nedbøren i Norge, 1899.  
*Christiania, Norwegisches Meteorologisches Institut.*—Wolken-Beobachtungen in Norwegen, 1896–97. Bearbeitet von N. J. Föyn.  
*Coimbra, Observatorio Meteorologico e Magnetico da Universidade.*—Observações meteorológicas e magneticas. 38, 1899.  
*Collenette, A.*—Droughts in Guernsey during the fifty-year period, 1843–1893.  
 ————— The rainfall of Guernsey for the years 1897–1899.  
 ————— The sunshine of Guernsey for the years 1897–1899.  
 ————— Weather and climate in their relation to health and disease.  
*Cracow, C. K. Akademii Umiejętności w Krakowie.*—Materiały do klimatografii Galicyi zebrane przez sekeye meteorologiczna komisji fizyograficznej . . . 1899.  
*Croydon Microscopical and Natural History Club.*—Report of the Meteorological Sub-Committee for 1899.  
*Curtis, R. H.*—The diurnal variation of the barometer in the British Isles.  
*Dickson, H. N.*—The mean temperature of the surface waters of the sea round the British Coasts, and its relation to the mean temperature of the air.  
*Eastbourne.*—Annual report of meteorological observations for the year 1899.  
*Eaton, H. S.*—Returns of rainfall, &c., in Dorset. 1899.  
*Edinburgh, Royal Society.*—Proceedings. Vol 22, 1897–1899.  
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THE Tenth Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, November 7th, 1900, at the hour of 2h. p.m.

The following Members were present :—

Mr. GALTON in the Chair.

Mr. BUCHAN.

Prof. DARWIN.

THE HYDROGRAPHER.

Mr. SHAW (Secretary).

The Secretary read the notice convening the meeting as follows :—

Meteorological Office, 63, Victoria Street, S.W.,  
October 29th, 1900.

SIR, I BEG to inform you that the tenth ordinary general meeting of the Meteorological Council will be held on Wednesday, the 7th proximo, at 2h. p.m., for the receipt of the Report of the proceedings of the Council during the past year, the consideration of the estimates for the year 1901-1902, the appointment of auditors for a year ending 30th June 1901, and the transaction of other ordinary business.

A draft copy of the Estimates is enclosed.

I am, &c.,  
(Signed) W. N. SHAW,  
Secretary.

The Secretary reported that in accordance with the Articles :—

1. The Council had submitted a Report of its proceedings to the Royal Society for presentation to Parliament.

2. That the annual estimates for 1900-1901 had been prepared and submitted to the Treasury; that the estimates had been subsequently revised to provide for superannuation allowances, and the revised draft submitted to the Treasury and approved. That the accounts up to June 30th, 1900, had been examined by two members of the Council, and had been submitted for audit in due course.

3. That the ordinary meetings of the Council had been held on the following days :—

1899	...	November	22	1900	...	February	28	1900	...	May	22
"	...	December	6	"	...	March	14	"	...	June	6
"	...	"	20	"	...	"	28	"	...	"	20
1900	...	January	17	"	...	April	11	"	...	July	4
"	...	"	31	"	...	"	25	"	...	October	24
"	...	February	14	"	...	May	9				

4. That Extraordinary General Meetings had been held on January 31 and February 14, 1900.

5. That the proceedings had been regularly recorded and printed.

The Report as read was adopted.

Read—Letter 1432 from the Treasury, requesting that the estimates for the Office should be sent in as usual by December 1.

Submitted the following memoranda :—

## MATERIALS for preparing ESTIMATES for 1901-1902.

	Expenditure 1899-1900.	Estimated Expenditure 1901-1902.	Proposed for 1901-1902.	Voted for 1900-1901.
<i>Administration :</i>	£	£	£	£
(1.) Council ... ..	938*	900	900	900
(2.) Secretary ... ..	784*	750	750	750
(3.) Salaries :				
Chief Clerk ... ..	333			
2 Junior Clerks ... ..	290			
Extra work ... ..	3			
Office Keeper ... ..	80			
2 Messengers ... ..	104			
Caretaker ... ..	100			
	910			
Add for increments of salaries, &c. ... ..	10			
	920	920	920	920
(4.) Rent, fuel, and lighting :				
Rent ... ..	635			
Fuel ... ..	58			
Lighting ... ..	39			
	732	732	700	700
(5.) Incidental and contingent expenses :				
Office Keeper's contingent account ... ..	69			
Postage ... ..	63			
Carriage of parcels, &c. ... ..	17			
Books and Printing ... ..	33			
Sundries ... ..	18			
	200			
(5a.) Furniture and office repairs ... ..	98			
(5b.) Expenses incidental to International Meteorological Congress ... ..	3			
	301			
Deduct repayments under this head, and for commission ... ..	26			
	275	275	300	300
(6.) Pensions :				
Mr. Scott (1 month) ... ..	33			
Capt. H. Toynbee ... ..	144			
	177	544	550	550
<i>Special Researches and Experiments :</i>				
(1.) Salaries :				
1 Junior Clerk ... ..	150			
Female Staff (3 in number) ... ..	260			
	410			
Transfer from head <i>Land Meteorology</i> ... ..	250			
	660	660		
(2.) Other charges :				
Anemometers at Holyhead ... ..	11			
Electrometer fittings (Kew) ... ..	24		760	700
Sundries ... ..	6			
	41			
Researches on atmospheric electricity, &c. ... ..	60	100		
Carried forward ... ..	—	4,881	4,880	4,820

\* Under the new arrangement commencing March 1st, 1900, the Secretary's stipend of £750 per annum is inclusive of his fees as a member of Council. In the return of expenditure, 1899-1900 (after correspondence with the Exchequer and Audit Department), the Secretary's fees as a member of Council are included in the item "Council," and the item "Secretary" is correspondingly reduced. In the columns of proposed expenditure, on the other hand, the Secretary's stipend is shown in full and a deduction is made under the item "Council."

	Expenditure 1899-1900.	Estimated Expenditure 1901-1902.	Proposed for 1901-1902.	Voted for 1900-1901.
Brought forward ... ..	£ —	£ 4,881	£ 4,880	£ 4,820
<i>Land Meteorology:</i>				
(1.) Observatories and stations :				
Aberdeen (allowance 275 <i>l.</i> ) ... ..	275			
Armagh ( " 50 <i>l.</i> ) ... ..	51			
Ben Nevis ( " 100 <i>l.</i> ) ... ..	100			
Falmouth ( " 250 <i>l.</i> ) ... ..	254			
Fort William ( " 250 <i>l.</i> ) ... ..	248			
Glasgow ( " 75 <i>l.</i> ) ... ..	77			
National Physical Laboratory (allowance 400 <i>l.</i> )	404			
Stonyhurst (allowance 56 <i>l.</i> ) ... ..	61			
Valencia ... ..	494			
Five Anemograph stations ... ..	67			
Meteorological Societies (Observations 2nd Order, Form A. (details) 7 stations. Form B. (results) 28 stations).	161			
Instruments, forms, &c. ... ..	29			
Deduct on account of the termination of the Grant to the Ben Nevis Observatories at end of 1901 ... .. £60	2,221			
And receipts for grazing, sale of forms, &c. ... ..	29			
	89			
Add for expenses at Distant Stations ... ..	14			
	75			
	2,146	2,146	2,190	2,250
(2.) Salaries : Discussion and reduction of observations :				
Observatories :				
1 Senior Clerk ... ..	275			
4 Junior Clerks ... ..	610			
1 Unclassified Clerk ... ..	41			
Extra work ... ..	3			
	929			
Transfer to head <i>Special Researches</i> ... ..	250			
	(a.) 679			
Stations of Second Order :				
1 Senior Clerk ... ..	275			
3 Junior Clerks ... ..	223			
1 Unclassified Clerk ... ..	14			
Extra work ... ..	1			
	(b.) 513	1,178	1,200	1,200
(a) + (b) = ... ..	1,192			
Deduct for reduction of Staff, &c. ... ..	14			
	1,178			
<i>Weather Information and Forecasts :</i>				
(1.) Telegraphic reports and storm warnings :				
Reports from inland stations ... ..	484			
Reports from abroad ... ..	130			
Reports sent abroad ... ..	449			
Storm warnings ... ..	266			
Hay harvest forecasts ... ..	16			
Private wires ... ..	46			
Sundry telegrams, forecasts, &c. ... ..	32			
Payments to reporters, &c. (allow- ances and expenses), 9 months	114*			
Do. do. ... ..	407			
Postage of reports and forecasts ... ..	245			
Instruments, &c. ... ..	64			
Wrappers, printing, &c. ... ..	10			
Weekly Reports ... ..	48			
Sundries ... ..	26			
Deduct repayments (including £95 for Sale of M.O. instruments) ... .. £788	2,337			
*Add 3 months' allowances to P.O. Clerks, &c., £38, and say £50 to replenish instru- ments sold ... .. 88	700			
	1,637	1,637	1,680	1,750
Carried forward ... ..	—	9,842	9,950	10,020

	Actual Expenditure 1899-1900.	Estimated Expenditure 1901-1902.	Proposed for 1901-1902.	Voted for 1900-1901.
	£	£	£	£
Brought forward ... ..	—	9,842	9,950	10,020
(2.) Salaries:—Preparation and issue of reports and forecasts:—				
1 Senior Clerk (9 hours daily) ... ..	309			
7 Junior Clerks (5 work 9 hours daily) ... ..	1,188			
1 Unclassified Clerk ... ..	52			
2 Messengers, and extra Commissionaires ... ..	133			
Addition for late evening and Sunday attendance, and for extra work ... ..	206			
	1,888			
Add for increments of salaries, &c. ... ..	10			
	1,898	1,898	1,900	1,880
<i>Inspections:</i>				
Mr. Buchan, salary and travelling expenses ... ..	183			
„ Baker, travelling expenses ... ..	35			
„ Brodie „ ... ..	16			
„ Constable „ ... ..	39			
„ J. A. Curtis „ ... ..	22			
„ R. H. Curtis „ ... ..	36			
„ F. Gaster „ ... ..	22			
„ Scott „ ... ..	58			
Royal Meteorological Society, contribution towards cost of their inspections ... ..	25			
	436	436	450	400
<i>Ocean Meteorology:—</i>				
(1.) Salaries:—Discussion and reduction of observations:—				
Marine Superintendent ... ..	267			
2 Clerks in charge of instruments ... ..	440			
1 Senior Clerk ... ..	275			
4 Junior Clerks ... ..	628			
1 Unclassified Clerk ... ..	30			
Extra work ... ..	1			
	1,641			
Deduct proportion chargeable to care and issue of instruments (say) ... .. £130				
And for reduction of staff, &c. ... .. 178	308			
	1,333	1,333	1,340	1,250
(2.) <i>Care and issue of Instruments:—</i>				
Proportion chargeable to Salaries ... ..	—	130	130	250
Instruments, repairs, &c., for the Royal Navy	320			
Deduct repayments under this head ... ..	5			
	315	430*	500	500
Instruments, repairs, &c., for the Mercantile Marine ... ..	78			
Agents' fees and incidental charges ... ..	77			
	155			
Deduct repayments under this head ... ..	35			
	120	270*	280	250
Reserve for superannuation ... ..	—	—	750	750
Totals ... .. £	—	14,339	15,300	15,300

\* Average of Expenditure of last 5 years.

## SYNOPSIS of OFFICE SALARIES.

Service.	Proposed for 1901-1902.	Voted for 1900-1901.	1901-1902.	
			Increase.	Decrease.
	£	£	£	£
Administration (not including Council)...	1,670	1,670	—	—
Special Researches ...	660	660	—	—
Land Meteorology ...	1,200	1,200	—	—
Weather information ...	1,900	1,880	20	—
Ocean Meteorology ...	1,470	1,500	—	30
Totals ...	6,900	6,910	20	30

## METEOROLOGICAL OFFICE. ESTIMATES for the Year 1901-1902.

Heads of Service.	Proposed for 1901-1902.		Voted for 1900-1901.		1901-1902.	
	Increase.	Decrease.				
<i>Administration :</i>	£	£	£	£	£	£
Payment of Council ...	900	—	900	—	—	—
Secretary ...	750	—	750	—	—	—
Salaries and wages ...	920	—	920	—	—	—
Rent, fuel, and lighting ...	700	—	700	—	—	—
Incidental and contingent expenses ...	300	—	300	—	—	—
Pensions ...	550	—	550	—	—	—
		4,120		4,120	—	—
<i>Special Researches and Experiments :</i>						
Salaries ...	660	—	660	—	—	—
Other charges ...	100	—	40	—	—	—
		760		700	60	—
<i>Land Meteorology :</i>						
Observatories and stations ...	2,190	—	2,250	—	—	—
Salaries: Discussion and reduction of observations ...	1,200	—	1,200	—	—	—
		3,390		3,450	—	60
<i>Weather Information and Forecasts :</i>						
Telegraphic reports and storm warnings ...	1,680	—	1,750	—	—	—
Salaries: Preparation and issue of reports and forecasts ...	1,900	—	1,880	—	—	—
		3,580		3,630	—	50
<i>Inspections :</i>						
Salaries and travelling expenses ...	—	450	—	400	50	—
<i>Ocean Meteorology :</i>						
Salaries: Discussion and reduction of observations ...	1,340	—	1,250	—	—	—
Expenses incidental to the supply of instruments :						
Care and issue of instruments...	130	—	250	—	—	—
Royal Navy ...	500	—	500	—	—	—
Mercantile Marine ...	280	—	250	—	—	—
		2,250		2,250	—	—
Reserve for Superannuation ...	—	14,550	—	—	—	—
		750		750	—	—
Totals ...	—	15,300		15,300	110	110

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 2,226).

The Chairman and Mr. Buchan were appointed auditors for the year ending June 30, 1901.

The meeting then adjourned.

The ordinary meeting was then held.

1. The Minutes of the last meeting (October 24) were read and confirmed.

2. It was resolved that £75 be paid to Mr. R. Strachan as superannuation allowance for the two quarters to September 30, 1900, not covered by the annuity purchased from the National Debt Commissioners.

3. *Application from Southport (Minute 8 of October 24).*—The Secretary submitted a draft reply, and the matter was referred to the Chairman and Secretary for despatch.

4. *Correspondence with Prof. Sampson (Minute 15 of October 24).*—It was resolved that after consideration of the correspondence the Council had no alternative but to regard Prof. Sampson as liable for the cost of the thermometer.

5. Submitted—the following letter (M.O. 1500) from the Royal Society :—

M.O. 1500.  
DEAR SIR,

The Royal Society,  
3rd November, 1900.

I AM directed to forward for the information of the Meteorological Council the enclosed copy of a scheme for the reconstitution of the Meteorological Council, which has been approved by the President and Council of the Royal Society; and to say that the President and Council are prepared, upon being called upon to do so, to appoint persons to form the Meteorological Council in accordance with Section II. of the scheme under reference.

I am, &c.,  
ROBERT HARRISON,  
Assist. Sec., Royal Society.

The Secretary to the  
Meteorological Council.

#### I.

In place of Articles 4, 5, 6, 7, and 8 of the present Articles of Association of the Meteorological Council the following shall be substituted :—

4. *Admission of Members.*—The Association shall consist of the Meteorological Council—a body of seven or more persons, not exceeding ten in all, of whom one is the Hydrographer of the Admiralty for the time being, and the others are nominated by the President and Council of the Royal Society.

5. *Management of the Association.*—The business of the Association shall be managed by a body of Directors, of whom the Hydrographer to the Admiralty shall be one. The President and Council of the Royal Society shall from time to time appoint as many other members of the Association as they may think fit, and for such periods as they may think fit, to be such Directors.

6. *Nomination of Chairman.*—The Chairman shall be one of the Directors, and shall be appointed from time to time by the President and Council of the Royal Society.

7. *Appointment of Secretary.*—The Secretary shall be appointed from time to time by the Directors, and may be one of the Directors.

8. *Meetings, Proceedings, &c.*—A General Meeting of the Association shall be held at least once in each year, in accordance with Section 49 of the Companies Act of 1862. The Meetings of the Directors shall be held as the Directors shall appoint, and their proceedings shall be regularly recorded and printed. The Association shall submit, yearly, a Report of its Proceedings to the Royal Society for presentation to Parliament.

#### II.

The President and Council of the Royal Society shall approve the proposed alteration of the Articles, and shall, in accordance therewith, appoint seven or more persons, not exceeding ten in all, to form the Meteorological Council, and shall, in the first instance, appoint four members of the Association, and four only, besides the Hydrographer to the Admiralty, to be Directors, and shall appoint one of the Directors to be Chairman; and shall resolve that the number of Directors shall not be subsequently changed without consultation with the Meteorological Council. If the Meteorological Council object to any proposed change, no such change shall be effected without the approval of the Treasury.

#### III.

The Directors shall receive a remuneration for their services, but the total sum allotted yearly for this purpose shall not exceed £1,000, the amount authorised by the Treasury. The apportionment of this sum shall be regulated by a Resolution of a General Meeting of the Association, subject to the approval of the President and Council of the Royal Society. Provided always that (1) the yearly sum allotted to the Chairman shall not exceed £300; (2) the yearly sum allotted to any other Director shall not exceed £125 with the addition of travelling expenses; (3) the Hydrographer to the Admiralty shall be remunerated by a yearly payment proportionate to the number of his attendances at the Meetings of the Directors.

It was agreed that an Extraordinary General Meeting be summoned for November 21 for the consideration of the suggested alterations of the Articles, and that the General

Meeting for confirming the alteration of the Articles, if approved, be held on December 19.

6. *Fishery Barometers.*—Reported—the receipt of a letter (M.O. 1481) from the Fishery Board for Scotland informing the Council that the barometer at Ullapool, granted in 1892, had been maliciously damaged by some person or persons unknown under such circumstances that no blame could be attached to those in whose care the instrument was placed.

Also the receipt of a letter from Mr. J. G. Weir, M.P., asking for a fishery barometer for the Kyle of Lochalsh.

The Secretary was directed to take steps for replacing the broken barometer at Ullapool, and to make further inquiries about the application for the Kyle of Lochalsh.

7. In the absence from the office of the Marine Superintendent, through illness, no report of logs received was made.

8. *Daily Weather Report.*—The Secretary reported the receipt of letters respecting the revised form of the Daily Weather Report which had been issued since August 1st.

He also reported that Mr. T. G. Benn, of Newton Reigny, near Penrith, who had sent observations to the Office for many years, had expressed his willingness to send to the Office at his own expense, until the end of the year at least, a daily telegram of 8 a.m. observations (M.O. 1402), and that the telegrams had been received since November 1, and the observations entered upon the Daily Weather Report.

The Secretary was directed to convey the thanks of the Council to Mr. Benn for his co-operation.

The Secretary reported further that Mr. Cresswell, of Edgbaston, observer for the Midland Institute, Mr. Mainland, of Darwen, observer for the Darwen Corporation, and Mr. Shadick, of Clacton-on-Sea, observer for the Clacton Urban District Council, had expressed their willingness to forward observations by post from those stations daily, and he was instructed to proceed with the arrangements for substituting additional observations received from British Stations in place of the 2 p.m. reports on p. 4 of the Daily Weather Report.

It was further reported that the sales of single copies of the Daily Weather Report at the Office and at railway stations had amounted to 190 in August, 81 in September, and 70 in October.

It was agreed to continue the arrangements for the sale, and to provide, if practicable, for copies to be sent to Waterloo, Paddington, and Fenchurch Street.

9. *Self-recording Thermometer.*—Reported that the instrument offered for trial for a few months by the Cambridge Scientific Instrument Company (*see* Minutes 1899–1900, p. 14) had been installed—the recording apparatus being placed in the telegraph room, and the thermometer coil in the Stevenson screen on the roof of the Office.

10. The Secretary reported that on November 1 he had received a visit from Dr. F. Bidlingmaier, Magnetician and Meteorologist of the German South Polar Expedition, who had requested that arrangements might be made for daily observations to be taken at land stations and on British ships in all oceans at Greenwich mean noon during the period of the South Polar Expeditions (probably the civil year 1902.)

11. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

#### WARNINGS ISSUED.

The signals were hoisted on three days, the total number of districts warned being seventeen. In twelve districts the warnings were justified, but in five districts they were not required.

#### GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

A sharp but temporary gale from W. and N.W. was felt on the north-east coast of England on the night of October 26–27. Of this there was no indication in the chart for 6 p.m. of the 26th. The matter is now being investigated.

FREDC. GASTER.

Telegraphic Branch,  
7th November, 1900.

12. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of October 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	52	65	59	83
"	b	13	35	24	
"	c	22	0	11	
"	d	13	0	6	
Scotland, E.	a	49	74	62	84
"	b	19	26	22	
"	c	19	0	10	
"	d	13	0	6	
England, N.E.	a	74	68	71	96
"	b	20	29	25	
"	c	3	3	3	
"	d	3	0	1	
England, E.	a	52	58	55	88
"	b	26	39	33	
"	c	13	3	8	
"	d	9	0	4	
Midland Counties	a	39	61	50	88
"	b	39	36	38	
"	c	16	3	9	
"	d	6	0	3	
England, S.	a	61	65	63	91
"	b	26	29	28	
"	c	7	6	6	
"	d	6	0	3	
Scotland, W.	a	52	74	63	86
"	b	23	23	23	
"	c	9	3	6	
"	d	16	0	8	
England, N.W.	a	39	74	57	86
"	b	35	23	29	
"	c	13	3	8	
"	d	13	0	6	
England, S.W.	a	42	78	60	94
"	b	49	19	34	
"	c	6	0	3	
"	d	3	3	3	
Ireland, N.	a	39	77	58	78
"	b	19	20	20	
"	c	26	0	13	
"	d	16	3	9	
Ireland, S.	a	26	68	47	76
"	b	32	26	29	
"	c	26	0	13	
"	d	16	6	11	
SUMMARY.					
British Islands	a	48	69	59	86
"	b	27	28	27	
"	c	15	2	9	
"	d	10	1	5	

13. Submitted—The following reports of work during the month of October, 1900 :—

## MARINE BRANCH.

November 7th, 1900.

Examined nine new logs and one lighthouse register.

Discussion of the meteorological data for the ocean region southward from the equator between the West Coast of Africa and longitude 90° W.

Drawing wind-roses and the wind charts for the South American coastal regions for the months of January, February, and March, sent to the Hydrographic Department.

Adding daily remarks to the North Atlantic weather charts of the winter of 1898–99.

Preparing pilot charts of the North Atlantic and Mediterranean for January and February, 1901, and collecting information for March.

One of the junior clerks frequently lent to the Telegraphic Branch to take copies of the Daily Weather Reports to the railway bookstalls.

Tables prepared showing the daily times of sunrise and sunset at various stations for insertion in the Daily Weather Reports for November.

CHAS. HARDING.

## PANTAGRAPH ROOM.

November 1st, 1900.

*Hourly Means.*—Volume for 1897, proof sheets have been passed for press up to page 160.

Volume for 1898, Valencia Means and other values are nearly all worked, and about one-third of those required for Fort William are also ready.

*Daily Means of Temperature, 1871–95.*—These results are under discussion.

*Miscellaneous.*—The Holyhead pressure-plate anemometer observations have been tabulated to the end of September.

R. H. CURTIS.

## EXAMINATION BRANCH.

November 1st, 1900.

*Examinations.*

*August, 1899.*—Completed.

*September and October, 1899.*—Proceeded with.

*January to June, 1900.*—Kew work proceeded with.

*September, 1900.*—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.*

*January to June, 1899.*—Report on work of all observatories to Council.

*August, 1899.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

*September, 1900.*—Copies of "Notes of Errors" to Valencia.

T. E. ALLEN.

## LAND ROOM.

November 6th, 1900.

*Enquiries during October, 1900.*

1. Mr. E. Fidler.—Average rainfall on Snowdon and at certain places near Snowdon (M.O. 1376).

2. Rev. C. F. Knight.—Average rainfall and humidity at Ramsgate, London and Plymouth (M.O. 1391).

3. Messrs. Lloyd and Pratt.—As to the number of days of rain, snowstorm, and gale at Southampton from December, 1899, to September, 1900 (M.O. 1462).

4. Messrs. Forsyth and Maule.—As to the rainfall between Farnham and Haslemere (Surrey) from August, 1898, to February, 1899 (M.O. 1483).

JOHN A. CURTIS.

In addition to the enquiries for information referred to above, there were nine personal and twelve telegraphic enquiries for weather forecasts during October.

14. Submitted the following :—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HER MAJESTY'S DOCKYARDS for Quarter ending 30th June, 1900.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available, 1st April, 1900	32	108	71	84	71	48
	Received, new ... ..	—	20	108	—	—	—
	„ repaired, cleaned ...	29	17	3	1	—	—
	Total ... ..	61	145	182	85	71	48
	Issued ... ..	8	22	20	12	14	4
July 1st, 1900.	Total available ... ..	53	123	162	73	57	44

## COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office, 1st July, 1900 ...	45	53	120	123	250	162	80	73	80	57	50	44
Portsmouth, 1st July, 1900 ...	25	25	55	54	150	174	50	56	50	62	25	25
Devonport " ...	25	22	55	41	150	136	50	45	50	47	22	18
Chatham " ...	25	19	55	33	150	133	50	42	50	42	25	16
Sheerness " ...	6	4	15	10	30	17	10	6	10	6	10	8
Total ...	81	70	180	138	480	460	160	149	160	157	82	67
Queenstown, 1st July, 1900 ...	2	2	2	3	3	10	3	3	3	3	0	0
Gibraltar " ...	2	2	2	3	4	10	3	3	3	3	0	0
Malta " ...	11	11	15	16	60	48	10	10	10	8	1	2
Bombay " ...	4	4	3	5	10	13	4	5	4	6	1	2
Halifax " ...	3	3	4	4	20	18	4	3	4	1	1	1
Bermuda " ...	3	4	4	9	20	17	4	4	4	5	1	3
Jamaica " ...	3	4	2	5	10	16	2	0	2	1	1	1
Cape of Good Hope " ...	4	6	6	5	20	26	4	7	4	6	1	2
Trincomalee " ...	3	4	3	5	10	21	4	5	4	6	1	1
Hong Kong " ...	12	10	12	12	30	21	12	12	12	10	2	6
Coquimbo, March 31st, 1900 ...	2	3	4	4	15	18	2	3	2	4	1	1
Sydney, 1st July, 1900 ...	5	3	6	6	25	16	6	6	6	8	1	2
Esquimalt " ...	4	3	5	3	15	10	2	2	2	6	1	2
Total ...	58	59	68	80	242	244	60	63	60	67	12	23

## NET DEFICIENCIES.

Date.	Particulars of Surplus (+) and Shortage (-).	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1st July, 1900	Meteorological Office ...	+ 8	+ 3	-88	- 7	-23	- 6
	Dockyards—Home ...	-11	-42	-20	-11	- 3	-15
	" Abroad ...	+ 1	+12	+ 2	+ 3	+ 7	+11
	Net shortage ...	2	27	106	15	19	10

## COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

1st July, 1900	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	" Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	Net shortage ...	2	27	106	15	19	10
	Stock available for Issue ...	182	341	866	285	281	134
	" Ordered ...	0	0	0	0	0	0
	" Repairing ..	21	9	3	2	2	0
	" Returnable from Depôts	8	20	13	3	6	2
Total stock ...	211	370	882	290	289	136	

November 5th, 1900.

R. F. WALLACE.

15. Reported—That the cash accounts for the quarter ended the 30th June last had been this day examined by Prof. Darwin and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts from the 1st April last, when there was a balance of £3,702 11s. 11d., were £3,907 6s. 9d. against £3,798 16s. in the corresponding period of the preceding financial year. The payments were £3,616 13s. 4d. against £3,407 3s. 11d. during the same period in the previous year. The balance in hand and at the bank on the 30th June, 1900, amounted to £3,993 5s. 4d., and at the same date in 1899 to £2,659 7s. 8d.

16. Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 23rd October ... ..	6,304	11	11
Receipts from 24th October to 6th November ...		30	10 8
		<hr/>	
	6,335	2	7
Cheques drawn from 24th October to 6th November	1,174	0	0
		<hr/>	
Cash balance on 6th November ... ..	£5,161	2	7
		<hr/> <hr/>	

17. It was agreed to provide a flag pole for the Office, and to provide a ladder for Valencia Observatory (*see* M.O. 1513).

18. Submitted—The following list of publications, which had been received since the last meeting:—

- Adelaide Observatory*.—Rainfall in South Australia and the Northern Territory during 1897; with weather characteristics of each month. By Sir C. Todd.
- Wissenschaftliche Luftfahrten*.—Ausgeführt vom Deutschen Verein zur Förderung der Luftschiffahrt in Berlin. Unter Mitwirkung von O. Baschin, W. von Bezold, R. Börnstein, H. Gross, V. Kremser, H. Stade und R. Süring. Herausgegeben von R. Assmann und A. Berson. Bd. 1-3.
- Bayard, F. C.*—A new reduction of the meteorological observations at Greenwich.
- Berlin, Königlich Preussisches Meteorologisches Institut*.—Bericht über die Thätigkeit . . . im Jahre 1899 von W. von Bezold.
- Calcutta, Surveyor-General of India*.—General report on the operations of the Survey of India Department . . . during 1898-99.
- Fergola, E., Rajna, M. e Angelitti, F.*—Determinazione della differenza di longitudine tra Napoli e Milano. Mediante osservazioni fatte nel 1888. Pubbl. R. Osserv. di Brera in Milano.
- Hellmann, G.*—Regenkarte der Provinzen Westpreussen und Posen.
- Lisbon, Observatorio do Infante D. Luiz*.—Annaes. 1895-1896.
- Lisbon, Observatorio do Infante D. Luiz*.—Annaes . . . Observações dos postos meteorológicos. 1891-1894.
- Loanda, Observatorio Meteorologico*.—Observações meteorológicas. Vol. 7, 1892-1893.
- London, Admiralty, Hydrographic Department*.—The Red Sea and Gulf of Aden Pilot. Fifth edition.
- Melbourne Observatory*.—Report of the Board of Visitors to the Observatory; together with the report of the Government Astronomer. 34th, 1899-1900.
- International Meteorological Committee*.—Report of the Saint Petersburg Meeting, 1899. Published by the Authority of Meteorological Council.

An Extraordinary General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, November 21st, 1900, at the hour of 2h. 30m. p.m.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.  
PROFESSOR DARWIN.

MR. GALTON.  
THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

The Secretary read the notice convening the meeting, as follows :—

### THE METEOROLOGICAL COUNCIL.

*Incorporated under Section 23 of the Companies' Act, 1867.*

NOTICE is hereby given that an Extraordinary General Meeting of the Members of this Association will be held at the Registered Office of the Association, No. 63, Victoria Street, in the City of Westminster, on the 21st day of November, 1900, at half-past Two o'clock in the afternoon for the purpose of considering, and, if thought advisable, of passing the following Special Resolution :—

That in place of the present Articles of Association the following shall be substituted :—

#### ARTICLES OF ASSOCIATION.

\* (1.) For the purposes of registration the number of the Members of the Association is declared not to exceed ten.

\* (2.) These Articles shall be construed with reference to the provisions of the Companies' Act, 1862, and the Companies' Act 1867, and terms used in these Articles shall be taken as having the same respective meanings as they have when used in these Acts.

\* (3.) The Association is established under the authority of the Lords Commissioners of the Treasury, for the purposes expressed in the Memorandum of Association.

(4.) *Admission of Members.*—The Association shall consist of the Meteorological Council—a body of seven or more persons, not exceeding ten in all, of whom one is the Hydrographer to the Admiralty for the time being, and the others are nominated by the President and Council of the Royal Society.

(5.) *Management of the Association.*—The business of the Association shall be managed by a body of Directors, of whom the Hydrographer to the Admiralty shall be one. The President and Council of the Royal Society shall from time to time appoint as many other Members of the Association as they may think fit, and for such periods as they may think fit, to be such Directors.

(6.) *Nomination of Chairman.*—The Chairman shall be one of the Directors, and shall be appointed from time to time by the President and Council of the Royal Society.

(7.) *Appointment of Secretary.*—The Secretary shall be appointed from time to time by the Directors, and may be one of the Directors.

(8.) *Meetings, Proceedings, &c.*—A General Meeting of the Association shall be held at least once in each year, in accordance with Section 49 of the Companies' Act of 1862. The meetings of the Directors shall be held as the Directors shall appoint, and their proceedings shall be regularly recorded and printed. The Association shall submit, yearly, a report of its proceedings to the Royal Society for presentation to Parliament.

\* (9.) *Accounts, Audit.*—The Annual Estimates shall be submitted for approval to the Treasury, and the accounts, after examination by two Members of the Association, shall be sent to the Treasury for audit.

\* (10.) A notice may be served by the Association upon any Member, either personally or by sending it through the post as a prepaid letter, addressed to such Member, at his registered place of abode. Any notice, if served by post, shall be deemed to have been

served at the time when the letter containing the same would be delivered in the ordinary course of the post, and in proving such service it shall be sufficient to prove that the letter containing the notice was properly addressed and put into the Post Office.

(11.) *Temporary Provision.*—Until the appointment of Directors by the Royal Society under the provisions of Article 5 shall have been made, the business of the Association shall continue to be managed by the Members of the Meteorological Council as heretofore constituted.

No alteration is proposed in the Articles marked (\*),

By order of the Meteorological Council,

W. N. SHAW,  
Secretary.

63, Victoria Street,  
10th November, 1900.

The Chairman moved, and Mr. Buchan seconded, the special resolution embodied in the notice convening the meeting.

The resolution was adopted unanimously.

The Secretary was directed to notify to the Royal Society that the resolution had been duly passed, that the meeting for the confirmation of the resolution would be summoned for the 19th December, and to inform the Royal Society that, subject to the confirmation and other formalities being complied with, the Council leave it to the Royal Society to take such action in the matter as they think fit.

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The ordinary meeting was then held.

1. The minutes of the last meeting (November 7) were read and confirmed.

2. Reported—The following letter (P.C. 2,173) sent to the Town Clerk of Southport in accordance with Minute 3 of November 7.

P.C. 2,173.

Meteorological Office,

November 12th, 1900.

SIR,

Your letter of the 6th ultimo has been laid before the Council, and in reply I am directed to say that the Council have been informed from time to time by the published reports, and from other sources, of the excellent meteorological work done at Southport under the direction of Mr. Baxendell and his father. They fully appreciate the value of such an observatory and the services which it can render to the locality in which it is placed and to other parts of the country. They regret, however, that they are unable to contribute to the maintenance of the observatory.

In the scheme adopted by the Government for the administration of the parliamentary grant entrusted to the Council, no contribution of that kind is contemplated, and the Council has accordingly made no such grant.

The Council fully recognise the value and importance to many classes of the community, as well as to the science of meteorology, of systematic observations at numerous and well-selected stations, and they would welcome the regular organisation of a system of stations in suitable positions by the several County Councils or other local bodies. If such an organisation were carried out, the larger districts might well maintain an observatory of the order of the one which has been so successfully maintained at Southport.

Some provision for concerted action and uniformity of standard between the different districts would of course be desirable, and even necessary, but assuming these to be provided for, as doubtless they could be, the Council think that an organisation of the character indicated would be more effective if carried out by the local authorities in the several districts than if dependent upon a central organisation in London, and that such an arrangement would be found to be more in accordance with established tradition and practice.

I am, &c.

W. N. SHAW,  
Secretary.

The Town Clerk,  
Southport.

3. *Telegraphic Reports to Washington*—(see *Minute 6 of October 24*).—Submitted—  
The following letters :—

M.O. 1,532.

Weather Bureau, Washington,  
October 27, 1900.

DEAR SIR,

Referring to previous correspondence with regard to telegraphic reports from certain stations of your service, the Azores and the Continent, I beg to say that a report of the result of a conference at Paris, between Captain Chaves, of Ponta Delgada, Azores, and Mr. F. J. Walz, a representative of this Department, enables me to advise you further regarding the proposed plan of reports.

It appears that while Captain Chaves has obtained concessions whereby messages can be transmitted free of charge between Ponta Delgada, St. Michaels, and Lisbon, Portugal, and between Horta, Fayal, and New York, they will be subject to a toll of twenty-six cents a word between Ponta Delgada and Fayal. As it will be necessary in the conduct of this work to practise a degree of economy which will be consistent with an effective service, and having in mind your courteous offers of co-operation, it has occurred to me that the reports from Ponta Delgada, Lisbon, and possibly from points on the Continent, can be included in the messages containing reports from your stations. This plan could be made operative provided you receive the reports in time to cable them not later than noon, Greenwich time. If they are not now received in time for cabling at that hour, it is believed that arrangements can be made with the several observatories to transmit their reports earlier in the day. According to the report above referred to, the observations at Ponta Delgada are now taken at noon, Greenwich mean time (10.06 a.m., local time). If they could be taken at an earlier hour, say at 8.00 a.m., local time, would it be possible for you to utilize them in your daily work and transmit them to Washington? If a service which would secure for this Department the reports referred to can be effected through your office, what expense would be incurred for cable tolls from Ponta Delgada and Lisbon to London? And if you now receive morning reports by telegraph from Paris and Hamburg, at what cost to this Department for telegraph tolls to London could they be secured? You will observe that in the prosecution of this plan this Department is inclined to take the fullest advantage of your kind offer of co-operation. It is assumed, however, that our demands upon your courtesy will not be considered excessive and that the co-operation we desire will prove profitable to both services, and of value to Atlantic maritime and coast interests. For its part, this Department will defray all expense for telegraphing weather code messages from London to Washington, and will, if necessary, assume the expense of telegraphing reports from the Azores and the European points named to London, provided they can be sent that way at an expense not greater than by other routes, and can be transmitted, with your reports, in time to reach Washington not later than 2.00 p.m., Greenwich mean time. We will also undertake to, at your expense, furnish you any observations you may desire from this side and also any advices regarding the weather of the western Atlantic and the presence and probable course of severe storms which advance from the American continent over the Atlantic.

Captain Chaves will not return to Ponta Delgada until December. The plan above outlined can, however, be made operative at an earlier date, provided it is practicable and meets with the approval of your Office.

Again thanking you for past, and, in anticipation, for future courtesies,

I am,

Yours very truly,

WILLIS L. MOORE,

Chief of Bureau and Acting Secretary of Agriculture.

Mr. W. N. SHAW,  
Secretary, Meteorological Office.

P.C. 2202.

Meteorological Office,  
63, Victoria Street, London, S.W.,  
November 16th, 1900.

DEAR SIR,

I have gone carefully through your letter of October 27th, 1900, in conjunction with your previous letters, and, if I understand rightly, you desire to obtain through this Office a cabled report of observations from the following stations :—Ponta Delgada, Lisbon (Letter of October 27th), Valencia, Blacksod Point, Malin Head, Stornway, Sumburgh Head, London (Letter of September 4th), Paris, Hamburg (Letter of October 27th), the report from each station to be represented by two words of your code, a copy of which will be supplied to us.

I would first remark that we receive in this Office, daily, a report of observations from each of the stations mentioned, except Hamburg, instead of which Cuxhaven appears in our Daily Weather Report. Assuming that the substitution of Cuxhaven for Hamburg will not be of material consequence, I have next to say that the hours of observation at the various stations are not the same, but are as follows :—

Ponta Delgada	...	...	...	...	9.0	a.m.	Greenwich	Mean	Time.
Lisbon	...	...	...	...	8.36	"	"	"	"
English, Scotch, and Irish Stations	...	...	...	...	8.0	"	"	"	"
Paris	...	...	...	...	6.51	"	"	"	"
Cuxhaven	...	...	...	...	7.0	"	"	"	"

Next, as to time of arrival :—

The telegrams from the Scotch, Irish, French, and German stations arrive, generally speaking, by 9.0 a.m. or thereabout. The telegrams from Ponta Delgada are very irregular in their arrival; the times during the last fortnight have varied between 10.46 a.m. and 1.41 p.m. (G.M.T.), but generally

speaking they are here before 12 noon. The Lisbon reports are also irregular, but they also generally come in before noon. With occasional omissions of one or more reports, we could accordingly send you a collective telegram from this Office at 12 noon daily, containing observations from the stations I have mentioned.

As regards cost, the cable messages from the Azores have so far been sent to us free of charge, and the rest of the messages are part of our regular organisation; accordingly no charge would be made on account of the cost of transmission of the observations to London.

As regards compiling and coding the message to Washington, I presume that the names of the stations would not be telegraphed, but that the observations would be arranged according to an order of stations, probably alphabetical, agreed upon beforehand and that in case the report from any one or more stations had not arrived at the time of despatch, the word "wanting" or some corresponding code word would take the place or places of the missing observations in the message.

The cost of coding the message in this way may be taken at 6*d.* (12 cents) per day.

If this arrangement will be of service to you, I shall be glad to give the necessary instructions upon hearing from you confirming the list of stations. I enclose a form showing a complete list of the stations from which we receive daily telegraphic reports and indicating the nature of the information sent to us.

I note with pleasure your willingness to furnish observations in return. Just at present this Office is not in a position to extend the scope of its operations, but I shall look forward to making some demand upon you at some future time.

Yours faithfully,  
W. N. SHAW,  
*Secretary.*

4. *Forecasts of Fog for the London District.*—The Secretary reported that he had received requests for a special service of forecasts of fogs from Mr. Blackman, of the Electricity Supply Works of the Board of Works for the Poplar district (M.O. 1,479), and from Mr. Bailey, of the City of London Electric Lighting Company, Limited (M.O. 1,528); that he had discussed the matter with Mr. Bailey and with Mr. Conacher, the General Manager of the Metropolitan Electric Supply Company, at an interview, and had ascertained that the ordinary forecast service of the Office would not meet the requirements of the case.

It was resolved to send the following letter to the London County Council, suggesting a special inquiry into the occurrence and distribution of fog in the London district:—

P.C. 2,222.

Meteorological Office,  
63, Victoria Street, S.W.  
November 21st, 1900.

SIR,

I am directed by the Meteorological Council to ask you to bring before the County Council of London the following suggestion regarding an inquiry into the occurrence and distribution of fogs in the London District and their relation to other atmospheric and local conditions.

1. The suggestion arises from applications which have been received at the Meteorological Office from the Electric Supply Department of one of the Local Boards of Works and from some of the Electric Supply Companies of London for special forecasts or warnings of the approach of fogs.

2. The occurrence and distribution of fog are subject to variations of so local, and apparently so capricious, a character that the general forecasts drawn up by this Office for the South of England do not meet the requirements of the case; and the information that can at present be procured from day to day by the Office is not sufficient to justify an attempt to issue such special forecasts of fog for the individual districts of London as would meet these requirements.

3. The Council are fully conscious of the importance of a more precise knowledge of the conditions which govern the distribution of fog, not only for the lighting industry, but for many other interests of the population of London, but the funds at their disposal are not sufficient for the investigation of the local details of the atmospheric conditions on which the formation of fog depends in individual districts. These funds are not more than sufficient to enable the Office to deal generally with the meteorology of the British Isles and neighbouring seas and of the oceans traversed by British ships, for which objects the Parliamentary grant was from the outset specifically appropriated; and the Council has no staff at its disposal by whom local investigations can be undertaken.

4. The Council are of opinion that the appropriate mode of procedure in this present case would be to initiate a special inquiry during the winter months into the conditions associated with the development and distribution of fog in London and its vicinity, and for that purpose (1) to obtain records from properly selected positions in various parts of London; (2) to collate these records with the general atmospheric conditions at the time of the observations as shown by the information regularly furnished to this Office; and (3) as far as possible to ascertain the character of the information requisite for anticipating the occurrence of fogs in particular localities.

5. To carry out this suggestion it appears to the Council that it would be necessary to retain, for a limited period, the special services of a gentleman of suitable scientific qualifications. The course to be adopted at the conclusion of the initial investigation thus carried out would be a matter for further consideration.

6. The Meteorological Council have thought that it would not be beyond the province of the London County Council to provide the means of undertaking such an inquiry, which could not be satisfactorily carried out without the co-operation of many local authorities or bodies, and which in itself is one that may be reasonably expected to lead to ameliorations of the conditions of life in the Metropolitan area of some importance.

7. If, therefore, the County Council could provide for the special expenses incidental to the inquiry, and for the keeping of suitable records in the several districts, the Meteorological Council would, for their part, undertake the superintendence of the inquiry, and would afford any facilities which the organisation of the Office enables them to supply.

I am further directed to say that if the County Council is disposed to give its favourable consideration to the proposal, the Meteorological Council will be glad to furnish any further particulars that may be desired of the form which, in their opinion, the inquiry should take, and an estimate of the special expenses which would be incurred in its prosecution.

I am, &c.,  
W. N. SHAW,  
Secretary.

The Clerk to the County Council of London.

5. *Loan of Instruments.*—The Secretary reported an application from Mr. Harley Clark, of the Friends' Mission, Abadeyeh, Beyrout, Syria, who had assisted Mr. T. Little in recording observations at Brumana, on Mount Lebanon, asking for the loan of instruments with a view to forming a new station on another ridge of Mount Lebanon, about ten hours' journey from Brumana.

He also submitted the following :—

LIST OF STATIONS, NOT IN THE UNITED KINGDOM, TO WHICH INSTRUMENTS HAVE BEEN LENT.

Abaco (Bahamas).	Larnaka (Cyprus).
Ascension.	Limasol (Cyprus).
Abrolhos Island (Brazil).	Majunga (Madagascar).
Bahamas.	Mombasa (East Africa).
Bathurst.	Malden Island (4° S. and 155° W.).
Cay Sal (Bahamas).	Nicosia (Cyprus).
Cay Lobos (Bahamas).	New Guinea.
Calabar.	Papho (Cyprus).
Cape Coast Castle.	Principe (Gulf of Guinea).
Colon (Panama).	Peking.
Cape Spartel (Tangier).	Queensland.
Degama.	Rarotonga (South Pacific).
Famagusta (Cyprus).	Sombrero (West Indies).
Falkland Islands.	St. Thomas.
Fernando Noronha (South Atlantic).	St. Helena.
Great Isaac.	Teneriffe.
Gaboon (West Coast of Africa)	Tongoa.
Grand Bassam (West Coast of Africa).	Tobago.
Gambia (West Coast of Africa).	Tristan D'Acunha (South Atlantic)
Honolulu.	Valua Island (New Hebrides).
Inagua (Bahamas).	Watling Island (Bahamas).
Kyrenia (Cyprus).	Zanzibar.

This list does not include stations, at which no records are kept, and which are supplied with instruments from the Admiralty depôts.

6. Submitted the following :—

The permission of the Council is requested for ordering the following instruments :—

Thermometers, "A" account,—											
Ordinary,	...	...	60	Maximum	...	...	10	Minimum	...	...	10

CAMPBELL HEPWORTH,  
Marine Superintendent.

Approved, with the addition of 10 screens.

7. *Fishery Barometers.*—Reported—An application from the Chief Officer of the Coastguard at Peterhead, supported by the Inspecting Commander, Aberdeen Division, and forwarded by the Board of Trade, for a barometer for Peterhead, to be placed beside

the notice board on which the weather telegrams are exhibited, and taken care of by the Coastguard.

Mr. Buchan was requested to report as to the power of the locality to supply itself with a barometer for its own use.

8. Read—A memorandum from the Marine Superintendent stating that, since the meeting of October 24, eleven logs had been received, two of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

9. *Pilot Charts.*—Submitted—The following memorandum from the Marine Superintendent :—

While submitting to the Council drafts of the January and February Pilot Charts of the North Atlantic and Mediterranean, it is suggested that the future work of compiling the remarks will be furthered when the date is fixed for the publication of the first issue, as it is proposed to base upon the intelligence given in the earlier Charts the information which will be conveyed subsequently.

The January Chart was drafted with a view to its being the first of the series, as may be seen by the character of the notices.

The Mercantile Marine Offices suggested as being most suitable for introducing the system of sale and distribution are as follows :—

Aberdeen.	Liverpool.
Birkenhead.	London.
Blyth.	"    Poplar.
Bristol.	"    Victoria Docks.
Barry.	"    Tilbury.
Belfast.	Leith.
Cardiff.	Manchester.
Dartmouth.	Middlesbrough.
Dundee.	Newcastle.
Glasgow.	Newport.
Greenock.	Shields, North.
Grimsby.	"    South.
Gloucester.	Southampton.
Hartlepool.	Sunderland.
Hull.	Swansea.

The Draft Chart for January, 1901, was approved, and it was agreed that it be forwarded for lithographing.

10. Submitted—The following :—

#### REPORT OF INSPECTIONS OF STATIONS IN CONNEXION WITH THE OFFICE—1900.

The telegraphic reporting stations, a number of climatological stations, and the self-recording instruments at the observatories and other stations, have been inspected during the summer. Dr. Buchan undertook the Scottish Stations, Mr. Gaster those in the North and East of England, Mr. R. H. Curtis the South-Western District and the Channel Islands, Mr. J. A. Curtis the Midland Counties and South Wales, and Mr. Brodie the South-Eastern parts of England, while I took charge of the inspection of the stations in Ireland and the North-Western District of England. After inspecting one station, Mr. Brodie found himself unable to proceed on account of his health, and the more urgent part of the work in the district assigned to him was carried out later by Mr. R. Curtis and Mr. J. A. Curtis.

The self-recording instruments at the various stations, except Holyhead and Scilly, have been inspected by Mr. T. W. Baker and Mr. E. G. Constable, of Kew Observatory, who have also, as a rule, inspected the telegraphic reporting instruments or climatological instruments at the stations they have visited.

The climatological stations in connexion with the Royal Meteorological Society have been inspected by Mr. Marriott.

In presenting the notes of the inspections I have thought it best to group them according to the classification of the stations. The notes on the telegraphic-reporting stations are given first, then those of climatological stations, distinguishing between normal climatological stations (stations of the second order of the international classification) and other stations, which furnish data of a less complete character. The notes about the self-recording instruments at the observatories and other stations follow.

In the course of the inspections it has become clear that it would add materially to the efficiency and practical value of the system, and favour the punctuality of the returns, if the monthly results of the observations could be tabulated and circulated among the observers and others interested in climatological studies within a short time, say three or four weeks, of the close of the month. This need not add materially to the work of the Office; I have therefore asked Mr. J. Curtis to prepare a memorandum on the subject for presentation to the Council.

It is also clear that some improvement is necessary in the means at the disposal of an inspector for testing the adjustments of the sunshine recorders if the tests are to be carried out in a limited time. The accuracy of adjustment is not required to be of a high order, and an efficient and inexpensive instrument could probably be designed for the purpose.

I directed Mr. R. Curtis to ascertain during his visit to Jersey whether the sunshine reports for that station could be transmitted with the daily telegram, and he has reported (M.O. 745) that arrangements can be made for the transmission of the reports in consideration of a payment of £2 yearly.

Mr. R. Curtis has also reported (M.O. 745) upon the places at which the daily weather reports and storm-warning signals are exhibited at Plymouth.

The station barometer which I took with me for the purpose of comparing the barometers was unfortunately broken before its arrival at the Holyhead Telegraphic Station, and during the inspections I had only a small aneroid for the purpose of comparison. Its readings compared with the barometers at the stations, though not sufficiently trustworthy to form the basis of corrections, show that a comparison of the barometers is desirable.

November 21st, 1900.

W. N. SHAW.

#### NOTES BY THE INSPECTORS.

##### TELEGRAPHIC REPORTING STATIONS.

###### ENGLAND AND WALES.

*Dungeness*, November 10th.—All the instruments were in excellent order, and on the day of my visit both the observers read them accurately. The principal observer, however, Mr. Taylor, has not had very much experience in the work, while the assistant observer finds his sight failing somewhat. I went over the details of the work carefully with both observers, and strongly urged the absolute necessity of constant care on their part. I paid special attention to the barometer comparison, and a mean of four readings, at intervals of about an hour, showed the reporting instrument to read .005 inch too low.

I gave directions for the thermometer screen to be repainted.

J. A. C.

*Holyhead*, September 24th.—The observer is very careful and methodical. The thermometer readings were entered without any corrections, and the barometer readings may be slightly higher than they should be owing to the setting. The rain gauge is in a small dell, surrounded by dwarf willows or osiers; these will be cut this season, and a small poplar which is growing up will be removed. The alternative position is on a lawn in front of the Sailors' Home where the observer lives, but the gauge, if placed there, would be more liable to casualties than in its present position. The situation is very fully exposed to winds. It might be an advantage to get all the observations at Holyhead under one system, and an admirable exposure on Salt Island could probably be obtained.

The observer has no deputy, and has not been absent since he took up the position as Superintendent of the Sailors' Home.

W. N. S.

*Jersey, St. Aubin's*, September 7th-8th.—Since the last inspection the barometers had been moved to a new site, which is a very good one. I measured the difference in altitude by levelling from the old site. The instruments were all clean, and in good order, except that the porcelain scale of one thermometer is broken. I think the observations are carefully made, but the station is certainly a bad one for wind and sea observations. At my suggestion, Mr. Fisher undertook to exhibit the Daily Weather Report in the Railway Station.

R. H. C.

*Pembroke, St. Ann's Head*, September 21st.—I found the instruments in good order, and the observers to be careful and intelligent. Both men, however, set the barometer a little too high at first, but after instruction their readings agreed very closely with mine. The thermometer screen and rain gauge are about 200 yards from the light-house, while an equally good exposure could be obtained within 50 yards, or even less.

For report on sunshine recorder see page 86.

J. A. C.

*Portland Bill*, September 12th.—As this was the first inspection of this station since it was started, special care was taken to ensure that the work was properly understood. Both the observers are painstaking and intelligent, and impressed me as being much interested in their work. The column of spirit in the minimum thermometer was broken, and the fault had been in existence for some time. The only fault in observing was that the assistant observer set the vernier of the barometer rather high.

R. H. C.

*Shields, North*, October 8th-9th.—Whilst inspecting this station Mr. Clarke had the misfortune to break the dry bulb thermometer, No. 4187; accordingly the spare thermometer, No. 4385, was fitted up to replace it. The barometers, maximum and minimum thermometers, and rain gauge were all in good order.

Mr. Clarke and myself took several independent readings of the barometers and thermometers, and on the whole were in very fair agreement.

T. W. B.

*Scilly, August 28th.*—Special attention was again given to the use the observer should make of his barograph traces in making up his telegrams. The instruments were all in good order except for a large dent in the side of the rain gauge, caused by a stone; some fern growing near this instrument was removed. At present there is no deputy observer at this station, Mr. Williams, who acted in that capacity last year, having been removed to Lizard. A special survey having recently been made, I was able to get some accurate heights of the instruments above M.S.L.

For report on anemograph see page 83.

R. H. C.

*Spurn Head, October 8th.*—A new maximum thermometer had been supplied, and everything was in good order. Unfortunately, the regular observer was absent, but his "supply" was an able and trained man, and gave me every facility for examining and testing the instruments. The drift sand, which abounds, had gained a little on the thermometers, but this was to be set right. The time available for inspecting this station in a day is really too brief occasionally, owing to the necessity of depending on the tide in journeying there and back.

F. G.

*Yarmouth, August 28th.*—The traces of the "Richard" barograph are now better than they were at the time of my last visit, and, as requested, I pointed out the importance of reporting the baric changes as shown on the curves.

The thermometers, screen, and rain gauge were all in good order.

For report on anemograph see page 84.

E. G. C.

#### SCOTLAND.

*Aberdeen, August 21st.*—The instruments are in remarkably good order and the observations are evidently made with great care and attention. The special attention of the observer was called to the occasional occurrence of discrepancies between his estimations of wind-force and the records of the anemometer. At next inspection the matter will be further inquired into. With reference to the late telegrams, particularly on Sundays, received at the Meteorological Office, it was arranged that in future the exact time of handing in the telegram to the post office will be forwarded to London as a check on the time sent by the post mistress.

For report on self-recording instruments see page 81.

A. B.

*Leith, September 28th.*—The instruments are in good order, are well attended to, and the observations are made with special care and attention. The muslin of the wet bulb is changed every fortnight. The thermometers and rain gauge are, in every direction except to westward, remarkably well exposed; but to westward, as previously reported, a new street has been built. Inquiries were made as to a new site, but no better situation has yet been found. It may be mentioned that the instruments are practically under the care of the superintendent of the bowling green.

A. B.

*Nairn, August 21st.*—The instruments are in remarkably good order, and the observations continue to be made with punctuality and intelligence. The two younger sisters are being trained by Miss Penny to observe.

A. B.

*Stornoway, August 17th.*—The screen, railing, and sunshine-recorder supports were ordered to be repainted. The new barometer, No. 585, is now the reporting one, the old barometer, No. 560, being now used only as a check barometer, otherwise the instruments were in very good order, and the observations are made with precision and accuracy. Full explanations were given regarding the management of the wet bulb thermometer in times of frost.

A. B.

*Wick, August 14th.*—Mr. Sinclair, who is still in weak health, was on holiday, and the observations are now almost wholly in Miss Sinclair's hands, assisted by her brother James, a pupil teacher, who understands the work well. The screen was ordered to be repainted, otherwise the instruments were in very good order, and the observations are made with marked care and attention. The journal of observations and reductions now leaves nothing to be desired.

A. B.

#### IRELAND.

*Blacksod Point, October 6th.*—The instruments were well attended to; the only points requiring notice were (1) that the rain gauge was slightly out of level, and the funnel rocked on the supports owing to the overlapping of the metal at the joint; (2) the cistern of the case of the sea thermometer was unsoldered and leaky. Mr. Marshall, who is a very competent observer, undertook to have these points seen to. (3) The barometers are liable to be exposed to the sun in the early morning, as they are close to a window facing S.S.E., but the position is the best available. The exposure of the instruments is very good, and there is telephonic communication between the room where the

barometers are placed and the telegraph office at Belmullet, 12 miles distant, so that there are all the necessary arrangements for a very satisfactory station.

A self-recording aneroid would be a very useful addition to this important station.

W. N. S.

*Donaghadee*, October 13th.—I had the advantage of seeing both the observers, Mr. Conolly and his deputy, Mr. Bolt, and I found that the station was in good hands. The exposure of the instruments is satisfactory, and the observations seemed carefully made and reported. The thermometer screen needed some small repairs, which the observer can carry out if the materials are sent to him. The wet bulb needed fresh dressing, the supply of muslin having become exhausted. I went carefully through the details of the work with the observer, and found that he took an intelligent interest in it.

W. N. S.

*Malin Head*, October 11th.—The station has a remarkably good exposure, but is difficult of access. A squall of wind with rain prevailed during the inspection and made the process difficult. The observer, Mr. J. Putt,\* is a capable man, but has received no book of instructions, and is depending upon what he picked up under Mr. Hicks, of Scilly. He was not at the station when I arrived, but I saw his assistant, P. Doherty, who seemed interested in the observations, and likely to become a competent observer; subsequently Mr. Putt himself arrived. A number of minor points in the mounting of the instruments and observing required attention, and the rain gauge, which had furnished very remarkable records for some months, proved to have been seriously damaged by stones, and quite useless. I gave instructions for a new one to be telegraphed for and for the old one to be sent to the office.

W. N. S.

*Parsonstown*, September 28th.—The office is very fortunate in being able to obtain such satisfactory stations for telegraphic reporting as well as for climatological observations in the centre of Ireland. The association with Lord Rosse's astronomical observatory has very great advantages. The meteorological observations are carefully organised by Dr. Boeddicker, and the observers, Mr. Colvin for the telegraphic reporting, and Mr. Rowe for the climatological observations, are quite efficient. The instruments were all in good order, though the instrumental corrections were of a rather old date. A rain gauge recently installed had been found to be leaky between the funnel and the containing cylinder, and had been made good with red lead.

The sunshine recorder is liable to some obstruction by the shadow of trees in the early mornings and late evenings, and the estimation of wind direction and velocity is also somewhat difficult on account of the trees. Dr. Boeddicker will give special attention to the observations of the wind so that the proper allowance may be made for the local circumstances.

W. N. S.

*Roche's Point*, October 3rd.—The rain gauge had been moved about 12 feet to the north of its old position, on account of the erection of a wooden shed, 8 feet high and 9 feet square, by the War Office, at about 5 feet from the old position. The gauge is now about 17 feet away from the N.E. face of the shed, and between the thermometer screen with its railed enclosure and the edge of the cliff. It is entirely exposed to the public on the open space which is used as a playground for the boys of the small community. The gauge shows some signs of damage to the rim. The thermometer screen was in a dilapidated condition; some of the louvres were broken, and the staples holding the ring of the padlock fell out as I opened the screen. The rail fence was similarly dilapidated. The view of the screen and gauge from the observer's house is obstructed by the new shed. I gave instructions for the strictly necessary repairs to the screen to be carried out by Mr. O'Brien, contractor to the Board of Works, but it would be desirable for the arrangements for the exposure of the instruments to be entirely reconsidered, and a new enclosure made in a more suitable position. The general situation of the station is admirable; the observer has long experience and is very much interested in the work.

W. N. S.

*Valencia, Cahircivren*, October 2nd.—The instruments were all in good order, properly attended to, and intelligently used.

For report on self-recording instruments see page 82.

W. N. S.

#### CLIMATOLOGICAL STATIONS.

##### NORMAL CLIMATOLOGICAL STATIONS† (SECOND ORDER STATIONS OF THE INTERNATIONAL CLASSIFICATION) :—

##### ENGLAND AND WALES.

*Ampleforth College*, October 6th.—This station is situated in a position inconvenient to get at, but the observer suggests that before further inspection information should be supplied to him a few days in advance, and then a trap shall be sent to Gilling Station to convey the Inspector to the College.

\* Since the inspection, Mr. Putt has been transferred by Lloyd's to another station, and his place has been taken by Mr. A. Cox, who was some time ago the observer for the Office at the North Foreland.

† A normal climatological station is one at which readings are taken each day at 9 a.m. and 9 p.m., local time, and which is provided with the following instruments, properly verified and exposed:—Barometer, dry bulb, wet bulb, maximum and minimum thermometers, and rain gauge.

The barometer was excellent, the dry and wet thermometers very good, but the maximum and minimum thermometers, the screen, and the rain gauge all needed improvement, in accordance with the information given in the inspection notes. These failures were expressed to the observer at the time of inspection, and care will be taken to carry out the alterations, gradually. The observer and his assistant are both most careful and zealous.

F. G.

*Belvoir Castle*, October 9th.—Observer, Mr. Divers, for the Duke of Rutland. All the instruments in excellent order, and capitally mounted. Observer very careful and zealous. Greater attention will be paid in future to the regular insertion on Form 19 of weather and cloud observations.

F. G.

*Bennington*, September 18th.—This station, which is nearly midway between Buntingford, Stevenage, and Ware, is on the highest ground in the whole of the district, which is of a very undulating character. The instruments are placed in an extension of the lawn in front of the house, the ground sloping to the eastward. All the instruments were clean and in good order.

W. M.

*Berkhamsted*, September 12th.—The instruments are well exposed on a grass plot in a rose garden. The ground slopes from north-north-east to south-south-west. The sunshine recorder, which is on the roof of the house, was not in proper adjustment for time; the spot of light being about 15 minutes fast. I re-adjusted and securely fixed the recorder. Three grass minimum thermometers are in use; two of which had spirit at the top of the tube. At the previous inspection I found one had gone down  $5.1^{\circ}$ ; on again testing the thermometer I found that it had gone down still more, and that it was reading  $7.3^{\circ}$  too low. All the other instruments were in good order.

W. M.

*Bramley*, November 15th.—The instruments were all in very good order, and the work at this station is carefully carried out. The thermometer screen has no double roof, and to prevent overheating a covering of sacking and cocoa fibre matting had been placed on top. I considered that this covering would affect the readings more than the freely exposed roof, and I therefore removed it. I lowered the maximum thermometer a few inches so as to decrease the risk of erroneous readings from the heated roof, and I also altered its level, having convinced myself that certain peculiar readings which had been noted were due to the angle at which the instrument was suspended. Mr. Bartlett continues to take much interest in the work.

J. A. C.

*Chester*, September 25th.—Everything was in excellent order at this station, and the records are most carefully kept. The monthly schedules sent to the office are in arrear owing to want of time to copy them out. There is reason to think that if assistance were given in bringing up the arrears Mr. Mitchell would be able to keep up the current work in future. The observer asked to be supplied with the Daily Weather Report in exchange for his observations. This publication would be of great service to him in locally forecasting the weather, and in other ways.

J. A. C.

*Darwen*, October 19th.—The station is provided with an exceptionally extensive equipment of instruments through the munificence of Mr. Gillibrand, J.P. They are exposed in a capital situation in Bold Venture Park. In addition to the usual instruments of a normal land station there have been installed a Campbell-Stokes sunshine recorder (of the so-called Universal pattern), a barograph, a thermograph, a Lége self-recording rain gauge, three thermometers for earth temperature measurements at 1 foot, 4 feet, and 10 feet depth respectively, a Dines' pressure tube anemometer and a cup anemometer; the latter is, however, not now used for the wind measurements.

The temperature of the water in a large pond is also read daily.

With the exception of the recording rain gauge, which was out of repair, the instruments were all in good order; the thermograph seemed liable to deterioration on account of the exposure of the recording parts to the action of the air, but the conditions seemed unavoidable with the particular form of instrument employed.

The proper supervision and adjustment of the instruments from time to time, some of them very delicate, require skill and experience as well as care, and it is fortunate that Mr. G. Mainland's services are available for those purposes. Mr. Mainland supervises the work of the station, the observations being generally taken by Mr. Martin.

Mr. Mainland kindly expressed his willingness to supply the office with copies of any of the observations made at the Gillibrand Observatory if they are likely to be found of practical utility by the Council. The returns would, doubtless, be found very useful for collation with those of our other normal land stations.

I was glad to find that it might be practicable for the returns of the evening observations to be sent by post each night if the Council should wish to include returns from land stations in the Daily Weather Reports.

W. N. S.

*Durham Observatory, October 4th.*—Professor Sampson is now responsible for this observatory and is aided by Mr. Carpenter, junior. Nearly everything was as one could wish. A Stevenson's screen has replaced the old "Glaisher's stand" which used to be employed at this station, and although it is not mounted on the four conventional "legs" it is well exposed, and I cannot apprehend any injurious effect on the thermometers from the improvised stand.

Wind Direction is good, but I cannot say so much for the Force. The observer while *estimating* the force is biased by the velocity at which he estimates the wind to be blowing, and this estimate has been obtained from an anemometer not really well exposed. The velocity of wind registered by this instrument being lower than that of the standard anemometers at Yarmouth and Holyhead (from which our values were drawn) the estimates are consequently low.

I endeavoured to instruct the observer as far as time would permit, but fear some other plan is necessary in order to correct such errors.

F. G.

*Eastbourne, November 14th.*—The observer, Mr. R. Sheward, had lately undergone an operation for cataract, and the work is at present being carried on by Mr. Taylor, a clerk in the office of the Medical Officer of Health, whom I found to be both careful and intelligent. All the instruments were in good order except that the wet-bulb mounting was too thick. I found the practice has been to read the thermometers at night by the light of an electric street lamp some little distance away. I strongly advise the use of a hand lamp to prevent mistakes.

For report on sunshine recorder see page 85.

J. A. C.

*Edgbaston, August 22nd.*—The site is admirable for the exposure of the various instruments; the juxtaposition of the high tower of the monument for the anemometer and sunshine recorder and the extensive level surface of the cover of the reservoir of the city waterworks for the rain gauge and thermometer screen must be regarded as singularly fortunate.

The observations for the office are conducted in a very satisfactory manner. It would be better to have the 8-inch rain gauge more firmly fixed; with that exception the instruments were in excellent order. They include a number of self-recording instruments in addition to the usual equipment of a normal climatological station. The whole constitutes a very valuable and well-arranged observatory.

W. N. S.

*Fulbeck, October 10th.*—This is an excellent station, the instruments are good; the observer is careful and accurate and is greatly aided by his wife and another observer who understand the work well. The rain gauge is a good (5-inch) instrument, but needed fixing more firmly. Observer wishes to send a weekly schedule for the Weekly Weather Report.

F. G.

*Manchester, October 16th.*—I visited the station maintained by the City of Manchester at their Cleansing Department, No. 299, Oldham Road, of which Mr. J. Hazzelewood is the observer, under the direction of Dr. J. Niven, the Medical Officer of Health. For so urban a station the exposure is remarkably good, the thermometer screen and rain gauge being placed in an enclosure of about 22 feet in diameter which forms a grass plot with a narrow concrete margin in a spacious yard. The instruments were all in good order, and Mr. Hazzelewood is an observer of long experience.

In addition to the usual equipment of a normal land station there were in use here a Negretti self-recording rain gauge (which is found to show generally less rain than the 5-inch gauge of the station), and two thermometers for recording underground temperature in  $1\frac{1}{4}$ -inch iron pipes; one is set at 1 foot and the other at 4 feet depth. The sunshine recorder is of the Jordan pattern. This makes it difficult to carry out what would otherwise be an interesting comparison, namely, the relative amounts of sunshine recorded at the Corporation station and in Whitworth Park where the Owens College maintains an observatory.

I had the advantage of seeing Professor Schuster, F.R.S., in whose charge the Whitworth Park Observatory is placed, and ascertained that he would be willing to forward to the office copies of any of the observations made in Whitworth Park. I subsequently ascertained the following particulars as to the station:—Latitude  $53^{\circ} 27' 30''$  N., Longitude  $2^{\circ} 13' 45''$  W., height above sea-level 124 feet 8 inches. In a railed enclosure about 17 feet in diameter is an 8-inch rain gauge upon a column about 4 feet high, a large thermometer screen, underground thermometers for 6 inches and two feet depth respectively, and in a specially erected hut about 30 feet to the west of the enclosure is a Robinson anemometer, a barograph, and some other apparatus. At the sides of the hut are exhibited the Daily Weather Report of the office and the results of the observations at the station. I think it desirable that the office should obtain the results from this station, which is especially valuable from its association with the department of physics of the Owens College.

W. N. S.

*Morpeth, Cockle Park Tower, October 3rd.*—The instruments had all been handed over to Mr. W. H. Hogg, a very competent man, who had been instructed by the previous observer in the method of handling and observing them, and in keeping a monthly record on Form 19. All the instruments were in an excellent condition, their exposure unaltered, and very good; the wet bulb was properly mounted and (except for a slight sheltering about sunrise) the sunshine recorder was very well exposed. Mr. Hogg takes great interest in his work and makes an excellent observer.

F. G.

*Parkstone*, September 13th.—The position of the vane used for wind observations has become unsatisfactory owing to the growth of trees, the vane will therefore be removed and re-erected in a more open spot and upon a longer pole. I know of no station where more care is taken in making the observations, and it is in every respect most satisfactory.

R. H. C.

*Plymouth*, September 3rd.—The two minimum thermometers here were defective, the air minimum reading a degree and a half too low, while the spirit in the grass minimum was broken for a space of about five degrees; in other respects the instruments were in good order. The observer promised to send at once the arrears of observations.

For report on anemograph see page 83.

R. H. C.

*Rousdon*, August 20th.—This station is on high ground (over 500 feet above sea-level) about half a mile from the sea, and midway between the towns of Lyme Regis and Seaton. There was no change in the zeros of the thermometers. I recommended that buttons be put below the maximum and minimum thermometers to prevent them shaking in strong winds.

For report on sunshine recorder see page 86.

W. M.

*St. David's*, September 20th.—Everything was in excellent order at this station, where the work is carried out with the utmost care and attention. As desired, I inquired carefully about the wet bulb, but could find no evidence of any improper mounting or treatment.

J. A. C.

*St. Leonards*, November 12th.—I found the instruments in good order at this station, where the work is very carefully done.

At Dr. Colborne's suggestion, the Corporation has recently set up on the sea front a louvred box about 7 feet long by 3 feet wide, in which are exposed a large Richard aneroidograph, a hair hygrometer, and a Richard thermograph. The minima recorded by the latter instrument seem, however, to be too high, but I could discover no sufficient reason for this apparent discrepancy.

For report on sunshine recorder see page 85.

J. A. C.

*Scarborough*, September 7th.—The Corporation, towards the end of last year, appointed Mr. W. W. Larkin as Borough Meteorologist, and he commenced his duties on January 4th. A new set of instruments had been obtained, and these were placed in a garden at the eastern side of St. Nicholas House until July, when they had to be removed owing to building operations. They were then placed in the Peasholm allotments at the north end of the town. As the thermometer screen was over bare soil, and was close to steep sloping ground on the west, I recommended that a portion of ground further to the south-east be railed off, and grass laid down, and that the instruments be placed therein. The barometer is mounted on gimbals in a room at St. Nicholas House. On testing the thermometers it was found that the minimum had gone down 0.5°.

For report on sunshine recorder see page 87.

W. M.

*Seaham Harbour*, October 5th.—The dry bulb and the "spare" thermometer both appeared to give indications rather too high, but beyond this all was well. The observer, Mr. Aird, has been reporting for many years, and is very careful and prudent in his work.

F. G.

*Southampton*, September 15th.—The exposure of the rain gauge and thermometer screen has been improved by reducing the height of a privet hedge adjoining; the instruments were in excellent order. Col. Hellard, R.E., expressed his appreciation of the periodical inspection of the station. Mr. Cook who has for upwards of 30 years taken the observations told me he would probably retire from the office at the close of this year.

For report on sunshine recorder see page 87.

R. H. C.

*Stokesay*, September 24th.—The present observer is Rev. W. M. D. La Touche, son of the late Vicar, who had sent observations to the office for 11 years. The instruments are the same as formerly in use, and are in the same positions. I found them all in very good order, except that the rain gauge was not firmly fixed and not quite level, and that the rain gauge measure was badly broken. A new glass has since been obtained. Both Mr. La Touche and Miss Tonkin, the assistant observer take great interest in the work, and every care is given to secure satisfactory returns.

J. A. C.

*Stonyhurst*, August 11th.—Nothing special to note. It was readily agreed to make the additional entries on the forms as desired.

For report on self-recording instruments see page 81.

E. G. C.

*Tealby*, October 12th.—This station is only fairly good. Observations are occasionally irregular—instruments not very good (especially the rain gauge), and not really well placed. I did not see any chance of material improvement, but gave necessary advice. The rain gauge is a very poor instrument indeed.

F. G.

*Tenby*, September 18th–19th.—This is practically a new station, the instruments having been removed to new positions, and the observer recently changed. The present observer, Mr. Truscott, is quite competent, and seems anxious to do the work well. The monthly schedules have not been sent up lately, and this was explained to be due partly to want of time, and partly to an impression gained from the former observer that no practical use was made of the sheets in the office. I explained our method of publication of climatological results, and urged the importance from their own point of view of Tenby being included in the Official Meteorology of the country. Possibly the Town Council if applied to would be able to further assist with the preparation of the sheets. The instruments are good, they were in good order and well exposed.

For report on sunshine recorder see page 87.

J. A. C.

*Wessington Court*, September 15th.—This is a new station which had never been inspected. The instruments are the same as those previously in use at Heysham Hall, Lancashire, and the observer, Mr. Lomas, is also the same.

I found the instruments had been very carefully removed and had sustained no damage from the journey. The new exposure is excellent, and the observations are conducted with great care, Miss Grafton herself taking considerable interest in the work.

The height of the station was not known, and I therefore ran a line of levels (as best I could with the means at my disposal) from a B.M. on the church, a quarter of a mile distant, and determined the height of the barometer cistern to be 440 feet.

J. A. C.

## SCOTLAND.

*Braemar*, August 22nd.—A portion of spirit, estimated to equal  $1.4^{\circ}$ , was lodged near the top of the tube of the minimum thermometer, which was rectified by the observer under my direction. Otherwise the instruments were in very good order, and the observers evince much intelligence and care in the work of observing.

A. B.

*Dundee*, August 23rd.—The instruments and observations are thoroughly well attended to at this station.

A. B.

*Dunrobin*, August 14th.—The observations are carefully and well made, and the instruments are kept in good order.

A. B.

*Edinburgh*, October 2nd.—The observer is accurate, intelligent, and enthusiastic, and all the instruments are in admirable order. It is contemplated making some changes in the exposure of the sunshine recorder.

A. B.

*Fort William*, August 10th.—The instruments are in admirable order, and the observations continue to be made with much care and intelligence. The rim of the rain gauge being slightly notched at points, it was replaced by the spare gauge in stock. As regards the thermometers in the large screen for the recording instruments, the maximum thermometer was found to have no correction, and the new minimum a correction of  $-0.1^{\circ}$ .

For report on self-recording instruments see page 82.

A. B.

*Glencarron*, August 16th.—Full explanations and directions were given as to the handling of the wet bulb thermometer in times of frost. As the door of the screen was somewhat decayed, a new one has been ordered from the makers in Edinburgh, otherwise the instruments were in good order and the observations are made with much care and correctness.

A. B.

*Gordon Castle*, August 20th.—The barometer, which was accidentally broken last year, was sent to Edinburgh for repair, and after comparison with the standard was returned to Gordon Castle. It is now in good order, and all the other instruments are also in good order, and the observations are made with intelligence and care.

A. B.

*Lairg*, August 13th.—A new maximum thermometer had been added to replace one which had been accidentally broken. The inside funnel of the rain gauge required soldering, which the observer is to attend to. Otherwise the instruments were in good order, and Mr. and Mrs. Macrae give much attention to secure punctuality and accuracy in making the observations.

A. B.

*Lednathie*, August 24th.—The observations show much intelligence and skill, and the instruments, including the R.H.C. anemometer, are kept in excellent order. Miss Morrison, the observer's daughter, has now become assistant observer.

A. B.

*Poltalloch*, August 8th.—The observations continue to be carefully made, and the instruments are in good order. It was arranged that observations of clouds will be now regularly made at 9 a.m. and 9 p.m.

A. B.

*Rothesay*, August 7th.—The instruments were all in excellent order, and the observations are made with quite remarkable intelligence, care, and fulness.

A. B.

## IRELAND

*Armagh*, August 16th.—The thermometers, screen, &c., were in good order, Dr. Dreyer has shifted the grass minimum thermometer further away from the Stevenson screen.

For report on self-recording instruments see page 84.

E. G. C.

*Belfast, Queen's College*, October 13th.—This is an important climatological station. It includes some instruments, such as the rain gauge and self-recording anemometer of unusual pattern. In the latter, a direction arrow is stamped upon a running paper tape every hour. I went through the details of the work with Professor Morton and the observer. Mr. Wylie who superintends the observations was unable to be present. The observer set the barometer rather low as compared with my setting. We went over a number of barometer readings for July and August that had seemed doubtful, and ascertained that a number of them referred to occasions when the observations were taken by deputy in the observer's absence. It also transpired that the evening readings could not always be carried out exactly at 9 p.m. It was arranged that when this was done the time of observation should be noted on the sheet.

It would be desirable that the wind records should be checked by a daily eye-observation, because in case of the gear of the recorder becoming unhitched the directions recorded might be erroneous for a considerable period without any error being detected.

The instruments were all in good order.

W. N. S.

*Dublin, City Station*, September 26th.—Sir John Moore certainly makes the best practicable use for meteorological purposes of an enclosed city garden—a difficult site for the exposure of instruments. His extensive experience of meteorological observations and their application enables him to obtain most valuable data from his station.

W. N. S.

*Dublin, Phoenix Park*, August 18th.—Everything was in good order at this station.

For report on anemograph see page 84.

E. G. C.

*Glasnevin*, September 27th.—The station is very well attended to. Mr. Moore was away when I visited it, but Mr. Pope, the observer, was present, and also Mr. McArdle, who reduces the observations and keeps the register, and who acts as observer in Mr. Pope's absence. The records are very well kept, and the observer seemed quite competent and careful. The minimum thermometer and grass thermometer did not appear to have been verified at Kew, and the tables of corrections for the thermometers in use probably need revising. The maximum thermometer did not set easily, and it was arranged that in ordinary practice it should be "swung" for the purpose of setting.

Observations of the forms of cloud are not taken.

W. N. S.

*Londonderry*, October 12th.—No records on Form 19 have been received from this station during the current year. They formed part of the returns of the office sent to the Registrar General for Ireland. I had an interview with Mr. J. Conroy, who at one time initiated observations for the office at Chatham and is an observer of great competence and experience. I learned that he had discontinued the series of complete climatological observations and, on account of his age, he is not disposed to take them up again. The Town Council had appointed a committee to consider the establishment of a station (M.O. 1952), but I understood they were not prepared to do the work without a grant from the office. A regular Medical Officer of Health had been appointed a few months ago.

Mr. Conroy still supplies to the Office and to the Registrar-General for Ireland a weekly return of extremes of temperature and total rainfall.

W. N. S.

*Markree Castle*, October 9th.—The observations by Mr. Henkel, for Colonel Cooper, are very carefully and satisfactorily made and recorded. The instruments were all in good order, except that the rain gauge was not firmly fixed, and the grass near it had grown so high that some error due to

splashing of heavy rain might occur. The grass was also long under the thermometer screen and the grass minimum thermometer.

For report on sunshine recorder see page 87.

W. N. S.

*Parsonstown*, September 28th.—See page 72.

#### OTHER CLIMATOLOGICAL STATIONS.

##### ENGLAND AND WALES.

*Alnwick Castle*, October 6th.—Here all the instruments were satisfactory, with the exception that the wet bulb had several folds of rather thick material wrapped round it, the observer's attention was drawn to the matter and he was requested to use muslin in future.

For report on anemograph see page 83.

T. W. B.

*Cirencester*, September 14th.—The instruments were all in good order, except that the grass minimum had about 2° of separated spirit, which I corrected. The thermometer screen is, however, in need of repair, two of the legs being rotten; these should be at once repaired. The maximum and minimum instruments are still only one inch from the door of the screen, and I think this may account for the abnormal readings sometimes reported.

The observations are now carried out under the direction of Prof. Locke, B.A., Prof. Ohm having left the college. The observer is careful and intelligent and reads the instruments correctly.

For report on sunshine recorder see page 85.

J. A. C.

*Clifton*, September 5th.—The instruments have been removed from the lawn outside the Headmaster's house to a gravelled enclosure between the college and the road. The site is not an ideal one, but it appears to be the best available; its proximity to the road, along which there is a fair amount of traffic, accounted for the dusty condition in which I found the instruments. It was promised that the weekly reports should be posted earlier in future.

R. H. C.

*Colly Weston*, October 11th.—The instruments at this station are partly those which belonged originally to the late Mr. Coventry, of Ketton and Duddington. The thermometers are well placed, but instruction was necessary as to the management of the maximum and minimum thermometers, and this was given. There has been some difficulty about the maximum, and a new instrument is to be obtained shortly. (This has now been done, and reports for the Weekly Weather Reports are to commence on January 1st, 1901.)

F. G.

*Cullompton*, August 18th.—The instruments are placed in a garden 40 feet wide, and very long and open. The ground in the garden is almost level, but in the neighbourhood falls slightly to the river Culm, which is barely half a mile to the east. There was no change in the zeros of the thermometers. A bed of marigolds had been planted on one side of the rain gauge, and these had grown up too close to the funnel. I requested that those near the gauge be cut down forthwith.

For report on sunshine recorder see page 85.

W. M.

*Disserth*, September 22nd.—This is a new rainfall station, which had never been inspected. The gauge is 5 inches in diameter, and was not firmly fixed. The rim is slightly out of shape, but the distortion is not enough to vitiate the record.

The exposure is good, but a still better exposure is available, and the observer promised to have the instrument firmly re-set in the position I selected for it.

J. A. C.

*Felirstowe*, October 16th.—The instruments were generally in good condition, but the spirit of the minimum thermometer contained a bubble of air, and for some time past the readings of that instrument must have been about 1·2° too high. This defect was remedied. The rain gauge was not very securely fixed. I advised that this matter should be seen to at once. It is probable that the gauge will be shortly removed from its present position, as the plot of land upon which it stands will be required for building purposes. The exposure of the sunshine recorder is not perfect. The loss of sunshine is at present not serious, but in time, as the building operations progress, it will be necessary to choose a new site.

F. J. B.

*Hastings, St. Peter's Crescent*, November 13th.—This is a rainfall station, returns from which have recently been offered to the office. The gauge is 8 inches in diameter, and is well exposed in a garden on the southern slope of Ore valley, which runs east and west at the back of the town, with open country immediately beyond it.

The observer, Rev. H. H. Breton, B.A., F.R. Met. Soc, is very interested in the work, and may be able to extend his outfit later on. There appear to be some important differences between the rainfall here and that reported from the two stations in St. Leonards, and I recommend therefore that the station be accepted.

J. A. C.

*Littlestone on-Sea*, November 12th.—The outfit of instruments at this station and their exposure is very good indeed, but the observer needed instruction both in reading the various instruments and in their management. I went over the details of the work with him carefully, and, since he is an intelligent workman and seemed anxious to learn the duties, I am hopeful that the station will now prove to be a useful one.

The returns hitherto received (they began in March, 1900) must, except for the sunshine values, be regarded as of no value.

For report on sunshine recorder see page 86.

J. A. C.

*Llandoverly*, September 22nd.—The exposure of the instruments at this station is not very good, being in a small and rather confined garden, but no better site is available. The instruments are clean, and are carefully attended to, but the errors of the maximum and minimum thermometers are rather large, namely,  $+0.7^{\circ}$  and  $-1.2^{\circ}$  respectively. Mr. Watkins is an observer of long experience.

J. A. C.

*Lytham*, October 17th.—This station is under the superintendence of Dr. T. Cecil Fisher, who was appointed Medical Officer of Health some months ago, and observations are taken by Mr. H. Topping, Sanitary Inspector, at 9 a.m. each day. The barometer is of Admiral Fitzroy's pattern, and belongs to the National Life Boat Institution, and can only be read to  $.01$  inch, and the rain gauge is a rather crude instrument with a 5-inch funnel having a coarse rim. The thermometer screen stands on a stone pedestal whose top is 2 feet square; the base is surrounded with grass. The thermometers and sunshine recorder are quite satisfactory instruments, but the recorder requires some adjustment for level. The observer has not had much experience of the work, and requires a little practice in estimating fractions of a division. An earth thermometer for readings at 4 feet is included in the equipment.

W. N. S.

*Newport, Mon.*, September 17th.—This is a rainfall station that had not previously been inspected. In future, observations of the maximum and minimum temperature in the shade and of earth temperature at 1 foot and 4 feet will be included in the returns sent in. The gauge is 5 inches in diameter, and it is placed 7 feet above the ground on a stack of iron pipes which are not likely to be removed. This stack stands in the yard of the waterworks depôt in Friars Street almost in the centre of the town. The position of the gauge is the best available, and the record will in my opinion correctly represent the rainfall of Newport itself.

J. A. C.

*Pant-y-reos*, September 17th.—This is a rainfall station which had never been inspected. Pant-y-reos is one of three reservoirs belonging to the Newport Corporation, from which town it is about 7 miles distant. The gauge is 5 inches in diameter, and is somewhat out of repair. It was also loose in the ground, though prevented from falling over. Being in a valley the gauge is necessarily sheltered to some extent from certain winds, but it is well exposed to the south-west, which is the rainy quarter, and I was unable to suggest any improvement in the position. I think the readings are carefully taken.

J. A. C.

*St. Helen's*, October 15th.—In addition to the usual instruments of a normal climatological station, this station includes a Baxendell recording anemoscope and a Dines' pressure-tube anemometer, which are very well exposed on a hut erected on the brow of the hill on the slope of which the park is situated. The barometer hangs in the same hut instead of, as formerly, being in the workshop adjoining the greenhouse. The thermometer screen and rain gauge are in a railed enclosure 16 feet in diameter about 40 feet away from the hut on the east side. An earth thermometer, is installed in the same enclosure 4 feet below the ground level in a cast iron 4-inch pipe with water at the bottom. At this station also the level of the subsoil water is regularly observed. The observer is now Mr. W. D. Tyrer acting under the instructions of Dr. Drew Harris. With a little more practice he will become a very competent observer. All the instruments were in good order, except the wet bulb thermometer which required fresh muslin. It has not yet been found practicable to arrange for observations to be made at 9 p.m.

The removal of the barometer to its new position has altered the height of the cistern above the M.S.L., and the height is not now exactly known. Starting from the level of the ground at the rain gauge, which has been calculated to be 152 feet 4 inches above M.S.L. (making use of a bench-mark on the wall in the stable yard), I determined roughly the height of the cistern of the barometer to be 156 feet 7 inches. Dr. Harris undertook to ask the surveyor to ascertain the height of the cistern in its present position. The station has a very good site and is a very valuable one.

W. N. S.

*St. Leonards, West Marina*, November 13th.—The wet bulb at this station was not properly mounted, the muslin being tied on loosely, and not trimmed off. Otherwise all was in very good order, and the observer is very accurate and careful.

J. A. C.

*Shaftesbury*, August 20th.—The town of Shaftesbury is 700 feet above sea-level, and is built on the top of a hill. The instruments are placed in the garden in front of the hospital which overlooks a steep declivity on the south-east. There was no change in the zeros of the thermometers. The wet bulb was not working properly. I recommended that a fresh water receptacle be used. I also altered the position of the maximum and minimum thermometers in the screen. I recommended that the 2-foot earth thermometer be placed closed to the 1-foot. The rubber round the bulb of the 1 foot earth thermometer occasionally became jammed in the tube, so I removed it, and also covered the cap with gutta percha, to prevent rain getting into the tube.

W. M.

*Swarraton*, August 28th.—The village of Swarraton, which is about 10 miles north-east of Winchester, lies in a valley, the sides of which rise to about 150 feet. The instruments are placed in a piece of ground railed off in a field on the eastern side of the valley, which runs north and south. They are about half-way up the slope. On comparing the thermometers, it was found that the maximum had gone up 0.1°. The covering of the wet bulb needed changing. I recommended that muslin be employed instead of the kind of covering used, which was too thick.

W. M.

*Totland Bay*, September 14th.—The new position of the instruments here is excellent and a great improvement upon the old site. Mr. Dover was away from home, but he has trained a very careful assistant to act in his absence, who read the instruments accurately. I asked him to call Mr. Dover's attention to one or two points I had been requested to mention.

R. H. C.

*Ynis-y-bro*, September 17th.—This is a rainfall station that had never been inspected. It is at one of the reservoirs belonging to the Newport Corporation, situate about 3 miles from the town. The gauge is 5 inches in diameter, and I found it placed on the edge of a steep bank about 8 feet high. In its present position a good deal of rain is likely to be carried up and over the gauge, and I therefore selected another site which will be almost free from this defect. The height of the rim of the gauge was 2 feet above the ground. I asked that in its new position this should be reduced to one foot. The observer, who read the measuring glass correctly, impressed me as a careful and attentive observer.

J. A. C.

## SCOTLAND.

None.

## IRELAND.

*Edenfel, Omagh*, October 10th.—Colonel Buchanan takes great interest in the maintenance and preservation of the records made at his house. The situation is a remarkable one—on the top of an eminence of no great elevation, but of very gradual slope, with open country in all directions outside the plantations of Edenfel.

It would be a remarkably good site for a sunshine recorder, and the lowness of its mean temperature would add special interest to the records of sunshine.

W. N. S.

*Kingstown, Co. Dublin*, August 24th.—This being a proposed second order and sunshine station, I inspected some suggested sites for the sunshine recorder, in company with Dr. Power (the Medical Officer of Health) and the Town Surveyor, and finally advised that the instrument be placed on the roof of the new municipal buildings. I also visited the proposed position for the meteorological instruments in the park and tested the maximum and minimum thermometers now in use, and went through the necessary details and explanations with Dr. Power.

E. G. C.

*Kingstown*, September 25th.—The arrangements for this station are not yet complete. The rain gauge and the thermometer screen are set up in separate enclosures in a narrow belt of garden bed or shrubbery at the side of the "People's Park" next the sea front, which affords a very free exposure. The belt is close to the park boundary which has the railway with a road on either side separating it from the foreshore. The rain gauge enclosure is about 9 feet in diameter and made of narrow iron railing. The sunshine recorder is to be placed on the top of the municipal offices and will be well exposed, as described in Mr. Constable's report. The barometer is to be at Dr. Power's house. Dr. Power is anxious to make the station efficient, and is taking a great amount of personal trouble in the matter. The observer for the temperature and rainfall will be one of the park attendants under Dr. Power's direction.

There is an anemometer on the pier in the charge of the Board of Works, but the office does not receive any records from it.

W. N. S.

*Newcastle, Co. Wicklow, September 27th.*—The site of the station is an exceedingly good one for the exposure of instruments, but Dr. Steede has found some difficulty in getting the observations regularly carried out and reduced. The wet bulb thermometer was mounted too low in the screen so that the water dripped from the bulb. This can, however, be easily put right, and I left instructions for it.

The rain gauge is about 6 feet from the screen on the south side of it. There is ample space for it to be removed to a greater distance as has been suggested; the only point for consideration is the possible necessity for enclosing the instruments in a fence.

W. N. S.

#### STATIONS WITH SELF-RECORDING INSTRUMENTS.

##### A.—OBSERVATORIES. (First Order Stations of the International Classification.)

*Falmouth, October 12th–15th.*—The instruments at this observatory were all in excellent order and the photography was very good.

The anemometer was taken down and cleaned, the different bearings afterwards being lubricated with fresh sperm oil.

The cups and stays were quite sound, but two blades of the fans were found loose, these were resoldered and made secure. The clock and recorder received due attention, and after remounting the instrument the orientation was tested and found correct. Next, the barograph and thermograph were examined and cleaned as usual, the dots shifted from the summer to the winter position, and the thermometers tested.

I had the rain gauge clock taken to pieces and cleaned, and then took rubbings of both the self-recording and spare funnels.

T. W. B.

*Oxford, Radcliffe Observatory, August 29th–30th.*—The self-recording meteorological instruments here were, as usual, in first class order. The barograph and thermograph were performing satisfactorily, and the photographic curves were very good.

The Robinson anemometer was dismantled, and the old oil—which was rather dirty—was removed and new sperm added. All parts were cleaned, and the orientation was tested and found correct.

The Beckley rain gauge was examined as usual. The thermometers in the thermograph and the Stevenson screens were compared with Kew Standard, No. 720.

E. G. C.

*Stonyhurst, August 10th–11th.*—The self-recording meteorological instruments at this observatory appeared to be working in a satisfactory manner.

The anemometer was dismantled and cleaned. The lubricant—sperm and paraffin—was fluid, but dirty, and had dried up in the cup on the head of the velocity shaft.

I think it would be well if the office could send a supply of their sperm oil for use here. The blades of the windmill governors are beginning to wear away.

The fusee spring clock driving the cylinder required attention, oiling, &c., which was done. Orientation was good. Both barograph and thermograph were cleaned, and a stouter winding cord was fitted to the clock barrel of latter instrument, the one in use being rather slight.

Lenses and condensers were examined, and the barometer tube cleaned.

The photographic traces of the dry bulb zero line were somewhat faint and too fine. I corrected this, and gave some suggestions for the improvement of the curves, but I am afraid that the irregular gas pressure will always cause variations in the intensity of the traces. The clock of the Beckley rain gauge, No. 3, was cleaned, and a new clock-line fitted, and a new pen and supply of ink was furnished for this instrument.

The thermometers were compared with the Kew Standard thermometer, No. 720, at 57° F., and the corrections required are given in the table.

E. G. C.

#### SCOTLAND.

*Aberdeen, October 2nd–1th.*—All the instruments at this observatory were working very satisfactorily, with the exception of the barograph clock. Owing to the wear of the pallets of the escapement, the beat had become very weak and the arc of vibration of the pendulum extremely small so that there was danger of its stopping.

The clock was put in the hands of a local watch maker, who altered the position of the pallets by means of a brass washer and rebushed some of the pinion holes, which greatly improved its action. Professor Niven stated that the thermograph clock had been similarly treated in the early part of the year.

I cleaned the lenses and other parts of both barograph and thermograph, after which the standard thermometers were tested.

The anemograph was in excellent order, the bearings of all parts being well oiled and in good condition. After cleaning and replenishing the bearings with fresh sperm oil the orientation was examined and found correct.

On examining the rain gauge I found the clock in such capital order that it did not require any special cleaning. Rubbings of both the self-recording and spare gauges were obtained in the usual way.

For report on other instruments see page 71.

T. W. B.

*Fort William*, September 22nd-24th.—The dry thermograph tube was broken on July 15th, and Mr. Rankin reported that he had fitted up the spare tube on the 18th and both were run as dry bulbs, but shortly after Dr. Buchan's visit on August 16th the new tube was made a wet bulb as well as the Standard thermometer, No. 671.

My attention was called to the photographic sheets, which were a good deal discoloured by stray light, and also to the traces which were liable to overlap owing to a difference in the range of the scales of the two thermograph tubes. I took down the new tube and reblacked the stem to block out the stray light. After performing this operation we decided to run the new tube as a dry bulb, and also the Standard thermometer, No. 671, was again made a dry bulb. A new scale will have to be constructed for the new thermometer as soon as a sufficient number of eye-observations have been taken.

The zero lines were changed from the summer to the winter position, and the various thermometers were tested.

I took the barograph clock to pieces and cleaned it as well as the other parts of the instrument; also the rain gauge clock was cleaned and a new line fitted to the weight.

The pipe leading from the funnel to the receiver was found cracked, a new piece of piping was substituted, and afterwards rubbings were taken of both the self-recording and spare funnels.

For report on other instruments see page 76.

T. W. B.

*Glasgow*, September 19th-21st.—Professor Becker drew my attention to the unsafe condition of the metal frame which supports the thermograph tubes as well as the dry and wet Standard thermometers. This was discovered shortly before my visit, and had been temporarily secured by means of strong wire. I had all the thermometers dismounted, and on examining the supporting frame found that the principal brass tube had split throughout its entire length and in one place was cracked transversely, indeed the brass had become quite rotten.

A new brass tube was fitted to the frame and all parts were made quite sound before the thermometers were remounted.

The zero values were changed from the summer to the winter position and the various thermometers tested. Afterwards the usual cleaning of the clock and other parts of the thermograph was duly performed.

The barograph was also examined and cleaned, and the sun recorder was found in correct adjustment. I had the anemometer dismounted and cleaned all parts, the bearings being lubricated with fresh sperm oil as supplied by the office. The orientation was tested and the sheet containing the result was sent in with this report.

On examining the rain gauge it was discovered that the bottom of the Stonyhurst discharger had become unsoldered and in consequence was rendered useless. This I got repaired and left the instrument working quite satisfactorily. The clock was oiled and a rubbing taken of the funnel.

T. W. B.

#### IRELAND.

*Valencia, Co. Kerry*, August 21st-23rd.—The weather at the time of my visit to this observatory was rather rough and unsettled, but I managed to dismount the anemometer. The sperm oil in the direction-roller sink was rather thick and dirty, and had "caked" on the rollers. All parts were soaked in paraffin, cleaned, and fresh sperm added. The cups, stays, fans, &c., are in a satisfactory condition, and the exterior portion of the instrument has been recently painted. The fusee spring clock driving the cylinder required cleaning and oiling, which was done, and the pencils, &c., received attention. Orientation was good.

The barograph and thermograph were working in a satisfactory manner, and the photographic curves were good; but as it was doubtful if the clock cords would last much longer, I fitted new lines and cleaned both clocks, also the lenses and condensers. The Beckley rain gauge, No. 8, was dismounted and cleaned. A new pen and supply of ink was furnished to Mr. Cullum, as well as a new pen for the "Richard" barograph.

The corrections to the thermometers are given in the table.

For report on other instruments see page 72.

E. G. C.

## B.—ANEMOGRAPH STATIONS.

## ENGLAND AND WALES.

*Alnwick Castle*, October 6th.—The anemometer was going satisfactorily, and is regularly attended to and oiled by the resident mechanic.

The exposed parts of the instrument were examined and all the bearings found to be well lubricated with sperm oil. I also attended to the recorder and clock, and tested the orientation; the sheet containing the result was forwarded with this report. From an inspection of the curves the tracings sent in to the office appear to be carefully made, excepting that in the original sheets the pencil marks slightly overlap the printed scale both top and bottom, but this is not shown in the tracings.

For report on other instruments see page 78.

T. W. B.

*Fleetwood*, August 13th–14th.—The exterior portion of the Robinson anemograph at this station has not been taken down since 1898, and considering this, the instrument was in very fair order. It was taken down, examined, and cleaned. The sperm oil in the direction-roller sink was fluid, but very dirty, and there was no oil in the cup on velocity shaft, but the head of the screw plug for the feeding hole was quite burred off, and the shaft had not been oiled for some little time. I had this remedied and a new slot cut.

The endless worm on the direction-fan spindle is much worn, causing considerable side-shake, and both of the lower "lignum vitæ" steps are cracked. The direction is inclined to be a trifle sluggish.

The clock, pencils, &c., were cleaned and oiled. I found that the plate and nut holding the direction mitre wheel was loose, and could be lifted up; this was put right.

The orientation was satisfactory.

E. G. C.

*Holyhead*, September 25th.—I visited the instruments with Mr. Cotton, and gave instructions for some small repairs and for repainting the notice board. There seemed to be too much play in the collar of the Robinson anemometer. Mr. Cotton will apply to the Board of Trade for the painting of the stage which was erected at the expense of the Board.

W. N. S.

*Plymouth*, September 3rd.—This anemometer had not been dismantled since it was first set up, and Mr. Prigg asked me to examine it. I found the water-level had not been properly maintained, and in consequence the records for some time past have not been accurate. The water in the container was thick with a red sediment resembling iron rust, and altogether the instrument was in very bad order. It was cleaned and re-adjusted, and I gave the man in charge of it some instruction as to its future management. The anemometer is very well exposed.

I was informed that the records of this instrument, as well as those of the other self-recording instruments at the station, would willingly be placed at the service of the office should it at any time desire them.

For report on other instruments see page 75.

R. H. C.

*Scilly*, August 28th.—Both the Robinson and the pressure-tube anemometers were dismantled and thoroughly cleaned. The former was in good order, except that the parts which are not readily accessible required cleaning, but there were nowhere any signs of undue wear.

The pressure-tube was working well, but I found that some of the soldered joints were becoming corroded, although as yet the evil has not progressed very far.

Both instruments needed repainting. When restarted after cleaning they both worked very satisfactorily.

For report on other instruments see page 71.

R. H. C.

*Shields, North*, October 8th–9th.—Here the recorder and clock greatly needed cleaning, as the dust and dirt which was shaken down upon the instrument during the gale in June last had got into the clutches of the pencils as well as the wheels gearing into the clock. The shafting really passes down a disused chimney, and in order to protect the recording apparatus from any débris, two boards were fitted up when the instrument was first erected, but evidently one of them had got displaced and so allowed the dust to come through on to the instrument. I pointed this out to Captain Robson, who is a comparatively new observer, and had the board replaced in his presence.

The external parts of the anemometer were dismantled and cleaned and all bearings supplied with fresh sperm oil, after which the orientation was examined and found correct.

Some little difficulty was experienced in getting the clock into proper beat and it stopped during the night. The next day further attention was given to it, and on the following morning Captain Robson informed me that it had gone all right.

For report on other instruments at North Shields see page 70.

T. W. B.

*Farmouth*, August 27th–28th.—The examination and cleaning of the anemometer here was carried out under difficult conditions, the wind blowing about 40 miles an hour, but with assistance I was able to dismount and overhaul it. The instrument was in good order and well lubricated, and the oil was in a most satisfactory state, both as regards colour and fluidity.

All parts were cleaned, and lubricated with fresh sperm.

The orientation was good.

The support of the stand to which attention was drawn in my last report has been temporarily repaired, and as the heart of the wood seems sound it may stand for some time longer.

I devoted considerable time to the improvement of the velocity pencil markings, and I think that the traces now will be decidedly better, and also mark to the printed scale, but as I have before reported it is an old type of recorder and difficult to do much with.

For report on other instruments see page 71.

E. G. C.

#### SCOTLAND.

*Deerness*, September 27th–28th.—At the time of my visit the weather turned out very wet and stormy, and in consequence I was unable to entirely dismount the external parts of the anemometer. The cups, however, were taken off and the velocity shaft, which had broken down in the Spring, was found to have been carefully and neatly repaired by the local smith. The direction shafting was slightly rubbing against the woodwork inside the hut, this was cut away so as to leave the shaft quite free.

The action of the velocity pencil is not very satisfactory, and the trace is bent backwards at the end of each revolution of the pencil, thus showing that the spiral is not true.

Mr. Spence also reports that the trace at times is serrated. On a previous inspection the screw thread of the spindle supporting the pencil was accidentally broken, and the nut is only held by a couple of threads. Should the traces become worse I would suggest that the recording portion of the instrument, including the cylinder, but not the clock, be sent to Mr. Munro for repair.

T. W. B.

#### IRELAND.

*Armagh*, August 15th–16th.—The Robinson anemometer at this observatory is apparently regularly looked after and lubricated. It was taken down and all parts cleaned. The oil was in excellent order, clean and fluid; it was replaced with fresh sperm. There is nothing special to note, the instrument—generally speaking—being in good condition, although the fan-spindle worm is beginning to wear away.

The clock, recording pencils, &c., were cleaned and oiled. The velocity pencil rises at times above the plane of the paper in calms, but this cannot be corrected with the present spiral.

The orientation was good.

The rain gauge clock required attention, it was cleaned, and a new pen was fitted to the float of gauge.

For report on other instruments see page 77.

E. G. C.

*Dublin, Phœnix Park*, August 16th–17th.—The anemometer here I found was well lubricated, but wanted cleaning. It was all dismounted and overhauled.

The oil in the plunger or brake box was in a fairly satisfactory state, but that in the ball bearings for the direction plate was dirty and rather viscid. Fresh sperm was used for both, and all was left clean and in good order.

The clock seems to have been a little erratic of late—it certainly wanted cleaning; this was done, and the pendulum-bob was slightly raised.

The orientation was satisfactory.

Greenwich mean time is now used here.

Corporal Blackmore has charge of the meteorological instruments, and seems to take considerable interest in them.

For report on other instruments see page 77.

E. G. C.

## C.—SUNSHINE STATIONS.

## ENGLAND AND WALES.

*Berkhamsted*.—See page 73.

*Blackpool*, October 20th.—Dr. Anderson was unavoidably absent when I visited the station for the purpose of seeing the sunshine recorder, but the observer, Mr. H. Smith, of the Public Health Office, showed me the instrument and gave me all necessary information. It appears to be somewhat out of adjustment both for level and azimuth, and the lens seems rather deficient in burning power. Instructions should be sent for readjusting it. It was not practicable to carry out any satisfactory readjustment during my visit for want of suitable tools and materials.

W. N. S.

*Bournemouth*, September 13th.—The arrangements respecting observations here are in a transition state, and for the present no returns will be sent to us. The position of the recorder is unsatisfactory owing to trees, and the instrument itself is not a good one. I mentioned both these points to the Town Clerk, and also said that if asked to do so the Meteorological Office would assist in the selection of a better instrument.

R. H. C.

*Cirencester*, September 14th.—I found the recorder clean, in good focus, and firmly clamped in its place, which is on top of a wooden stand. The adjustment was not quite correct, and I altered it as far as I could without removing the clamping irons, which I deemed it unwise to attempt. I found the card correctly set in its place, and I think the instrument is carefully attended to.

For report on other instruments see page 78.

J. A. C.

*Cullompton*, August 18th.—The sunshine recorder was in good adjustment. I called attention to a tree on the east-north-east, and also to one on the west-north-west, which required their tops to be cut off.

W. M.

*Cullompton*, September 5th.—The station had not been seen for the office before. The instrument is well placed, but growing trees to the west are likely to interfere presently with the record. The observations are most carefully made, and the station excellently represents the sunshine of the district.

For report on other instruments see page 78.

R. H. C.

*Darwen*.—See page 73.

*Durham*.—See page 74.

*Eastbourne*, November 14th.—This instrument is admirably placed, and I found it clean and in very good order. The card, however, was not in its right place by about fifteen minutes in time, the defect being probably due to the failure of Mr. Sheward's eyesight referred to in the previous report on this station.

For report on other instruments see page 74.

J. A. C.

*Edgbaston*.—See page 74.

*Falmouth*.—See page 81.

*Felixstowe*.—See page 78.

*Guernsey*, September 10th.—The record is from a Jordan photographic recorder well placed on the roof of the house and on the highest part of St. Peter Port. The instrument was loose, and required to be made fast to prevent its getting out of adjustment. Dr. Carey expressed his willingness to send other climatological observations if desired to do so.

R. H. C.

*Hastings*, November 13th.—The recorder now stands on the top of a tower built for it on the house of Mr. Farnham, the Water Manager, where it has a very excellent exposure. The adjustment is very good, and the instrument is very carefully attended to.

The station possesses a second recorder, which is in position, but not in use.

It is the custom at this station to tabulate the sunshine for each hour of the day, and these hourly tabulations are, I was informed, at the service of the office should they at any time be asked for.

For report on other instruments see page 75.

J. A. C.

*Jersey, St. Heliers, September 7th-8th.*—A new recorder had recently been sent to this station, and it had not been accurately placed in position. The post on which it stands was strengthened and the adjustment then made good. The attention of the observer was called to some recent irregularities in returning the cards to the office. I also inquired as to whether the amount of sunshine could be telegraphed to the Meteorological Office daily, and arranged with the Harbour Master as to the steps to be taken for the purpose.

R. H. C.

*Littlestone-on-Sea, November 12th.*—The recorder is admirably exposed on the top of a water tower which stands close to the sea front. With a possible exception, due to a turret which rises 3 feet above the recorder on the opposite side of the tower, the exposure is perfect.

I found the instrument standing on a stone slab, unfixed, and without any marks to indicate its correct position. The sphere, too, was not central in the bowl. With some little trouble I corrected this latter defect, and then, after carefully adjusting the instrument, I securely bedded it in Portland cement. I instructed the observer to keep a careful watch on the record as the winter solstice approached, and if he found the turret referred to above to interfere with the record to report the fact at once. The instrument was clean and the card properly in position.

For report on other instruments see page 79.

J. A. C.

*Lytham.*—See page 79.

*Manchester.*—See page 74.

*Margate, November 13th.*—The instrument here is one of the "Universal" pattern, and it was badly out of adjustment. I had first to dismount it and correct some errors in the instrument itself before it could be properly set up. The exposure of the recorder leaves nothing to be desired.

R. H. C.

*Morpeth, Cockle Park.*—See page 74.

*Newton Reigny, October 18th.*—The recorder has a good exposure. Newton Reigny is two miles W.N.W. of Penrith; it is on the eastern slopes of the mass of the Cumbrian hills.

W. N. S.

*Newquay, August 31st-September 1st.*—The stand here was much decayed, and the recorder quite loose and not in proper adjustment. As there was some doubt whether the present observer could continue the observations, I tried to find another site for the instrument, but unsuccessfully. Eventually Mr. Pearce promised to make arrangements for the observations being continued at the present site, which has a perfect exposure, and I therefore repaired the stand and readjusted the instrument. I found considerable alteration of the pedestal was necessary to get the ball central in the bowl. Mr. Pearce will endeavour to get the observations taken over by the Town Council.

R. H. C.

*Oxford.*—See page 81.

*Pembroke, St. Ann's Head, September 21st.*—The recorder stands on a wooden post 5 feet 3 inches high, over grass, on the Head, which is 150 feet above the sea. From E.N.E. to W.N.W. through south the exposure is perfect, and to N.E. and N.W. there is nothing subtending an angle greater than about 3°. The instrument was clean, in good adjustment, and is, I believe, carefully attended to. It stands near the thermometer screen and about 200 yards from the light-house.

For report on other instruments see page 70.

J. A. C.

*Plymouth.*—See page 75.

*Port Talbot, Margam Park, September 18th.*—The recorder stands on a wooden post on the Castle Terrace where it has a very good exposure, the trees, of which there are many in the park, interfere but very slightly if at all with its indications. I found the small pedestal on which the ball rests was quite loose, and with considerable play, I accordingly dismounted the instrument, and after some trouble succeeded in fixing the pedestal so that the ball was central in the bowl. I then replaced the instrument in exactly its old position on the wooden post. I think it likely the post will warp somewhat with changes of weather. The instrument appears to be very carefully attended to.

J. A. C.

*Rousdon, August 20th.*—The ball of the sunshine recorder was not quite in the centre of the frame. The ball weighed 3 lbs. Sir Cuthbert Peek has two other balls, one of which weighs 2 lbs. 15½ ozs. and the other 3 lbs. 1 oz. One is also slightly larger than the other, and denser in colour.

For report on other instruments see page 75.

W. M.

*Scarborough*, September 7th.—I recommended that the recorder be moved to a new position where when put on a post it will have a very fair exposure, as the only obstructions, viz., houses on the east and south east make an angle of 5° or 6°.

For report on other instruments see page 75.

W. M.

*Scilly*.—See page 71.

*Southampton*, September 15th.—The only point that called for remark in connexion with this recorder was that the yellowish tint of the lens appeared to me to be deeper than when I last saw it, an opinion which was shared by the observer. The glass was, however, perfectly clear and transparent, and yielded an excellent trace.

For report on other instruments see page 75.

R. H. C.

*Stonyhurst*.—See page 81.

*Tenby*, September 18th.—The recorder is placed on a wooden stand on the top of a tower 27 feet above the ground, and nearly 100 feet above the sea, with an exposure that may be termed perfect, except for a flag staff that may sometimes cut off a little sunshine. The instrument was out of adjustment for time, and slightly for latitude also. I dismantled it, therefore, and re-set it, so that the sun's image came exactly in the right place. I expect, however, the stand will warp with changes of weather. The cards, both for past months and for the future, will be sent to the office if desired, the office in that case supplying the blank cards as usual. The observer promised to send up the weekly returns more promptly in future.

For report on other instruments see page 76.

J. A. C.

*Torquay*, September 4th.—This instrument had not previously been seen on behalf of the office. Its site is excellent, and the instrument now in use is a very good one. It is, however, proposed to remove the recorder to a more convenient, although in other respects less satisfactory, site on the pier. The present observer is Mr. F. March, M.P.S., and he appears to have taken up the work very zealously.

R. H. C.

#### SCOTLAND.

*Aberdeen*.—See page 81.

*Braemar*.—See page 76.

*Dundee*.—See page 76.

*Edinburgh*.—See page 76.

*Fort William*.—See page 82.

*Glasgow*.—See page 82.

*Stornoway*.—See page 71.

#### IRELAND.

*Armagh*.—See page 77.

*Dublin, Phœnix Park*.—See page 77.

*Kingstown*.—See page 80.

*Markree Castle*, October 9th.—The sunshine recorder is not perfectly exposed, but the site is the best available; it requires fixing. The trace was not running quite parallel to the edges of the card, probably on account of the instrument not being quite level. Mr. Henkel will see to the adjustment of the instrument.

For report on other instruments see page 77.

W. N. S.

*Parsonstown*.—See page 72.

*Valencia*.—See page 82.

## COMPARISON OF INSTRUMENTS.

The following tables give the corrections required to be applied to the readings of the various instruments to make them agree with the Inspector's standards :—

## BAROMETERS.

## TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
<b>ENGLAND AND WALES.</b>				
	Inches.	Inches.	Inches.	
Dungeness ... ..	29·740	+ ·006	+ ·020	
Holyhead ... ..	—	—	—	
Jersey ... ..	30·140	+ ·005	+ ·008	
Liverpool (Bidston) ... ..	—	—	—	Not visited.
London (Brixton) ... ..	29·526	— ·003	—	
London Meteorological Office.	29·790	+ ·004	—	
Loughborough ... ..	—	—	—	Not visited.
Oxford ... ..	—	—	—	
Pembroke (St. Ann's Head)	30·231	+ ·013	+ ·013	
Portland Bill ... ..	30·413	+ ·001	+ ·004	
Scilly ... ..	30·377	— ·001	— ·002	
Shields ... ..	—	—	—	
Spurn Head ... ..	30·172	+ ·008	—	
Yarmouth... ..	—	—	—	
<b>SCOTLAND.</b>				
Aberdeen ... ..	29·625	·000	+ ·003	
Leith ... ..	29·747	— ·001	+ ·002	
Nairn ... ..	30·050	·000	+ ·003	
Stornoway ... ..	30·064	+ ·002	+ ·020	Vernier of check barometer out of order.
Sumburgh Head... ..	—	—	—	Not visited.
Wick ... ..	30·326	+ ·002	+ ·009	Both barometers now hang together.
<b>IRELAND.</b>				
Blacksod Point ... ..	—	—	—	
Donaghadee ... ..	—	—	—	
Malin Head ... ..	—	—	—	
Parsonstown ... ..	—	—	—	
Roches Point ... ..	—	—	—	
Valencia ... ..	—	—	—	

## BAROMETERS.

## NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
<b>ENGLAND AND WALES.</b>				
	Inches.	Inches.	Inches.	
Ampleforth ... ..	29·446	— ·004	—	A very good Fortin.
Belvoir Castle ... ..	29·852	+ ·002	—	
Bennington ... ..	—	—	—	
Berkhamstead ... ..	—	—	—	
Bramley ... ..	29·216	+ ·004	—	
Chester ... ..	29·979	+ ·005	—	
Darwen ... ..	—	—	—	
Durham ... ..	—	—	—	
Eastbourne ... ..	29·724	+ ·006	—	Comparison not reliable.
Edgbaston ... ..	—	—	—	
Fulbeck ... ..	29·946	— ·002	—	
Lytham ... ..	—	—	—	
Manchester ... ..	—	—	—	
Morpeth ... ..	29·581	+ ·003	—	

## BAROMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Stations, International Classification)—*continued.*

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
	Inches.	Inches.	Inches.	
Parkstone ... ..	30·332	— ·003	— ·002	
Plymouth ... ..	30·406	— ·001	—	
Rousdon ... ..	—	—	—	
St. David's ... ..	30·189	+ ·007	—	
St. Leonards ... ..	29·698	+ ·003	—	
Scarborough ... ..	—	—	—	
Seaham ... ..	29·492	— ·006	—	
Southampton ... ..	30·183	+ ·017	—	
Stokesay ... ..	29·470	+ ·002	—	
Stonyhurst ... ..	—	—	—	
Tealby ... ..	29·791	+ ·009	—	
Tenby ... ..	30·209	— ·018	—	
Wessington Court ... ..	29·771	— ·004	—	
SCOTLAND.				
Braemar ... ..	28·375	+ ·003	—	
Dundee ... ..	29·612	+ ·002	—	
Dunrobin ... ..	30·277	— ·001	—	
Edinburgh ... ..	29·426	— ·004	—	
Fort William ... ..	30·137	— ·008	—	
Glencarron ... ..	29·666	+ ·016	—	
Gordon Castle ... ..	29·812	+ ·004	—	
Lairg ... ..	30·000	+ ·020	—	
Lednathie ... ..	29·194	+ ·002	—	
Poltalloch ... ..	29·910	+ ·028	—	
Rothesay ... ..	29·606	— ·003	—	
IRELAND.				
Armagh ... ..	—	—	—	
Belfast ... ..	—	—	—	
Dublin (City) ... ..	—	—	—	
Dublin (Phoenix Park) ... ..	—	—	—	
Glasnevin ... ..	—	—	—	
Londonderry ... ..	—	—	—	
Markree Castle ... ..	—	—	—	
Parsonstown ... ..	—	—	—	

## BAROMETERS.

## OTHER CLIMATOLOGICAL STATIONS.

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS
ENGLAND AND WALES.				
	Inches.	Inches.	Inches.	
Cirencester ... ..	—	—	—	
Clifton ... ..	—	—	—	
Cullompton ... ..	—	—	—	
Felixstowe ... ..	—	—	—	
Littlestone ... ..	29·777	— ·005	—	
Llandoverly ... ..	—	—	—	

## BAROMETERS.

OTHER CLIMATOLOGICAL STATIONS—*continued.*

STATION.	Inspector's Standard Corrected.	Reporting Barometer.	Check Barometer.	REMARKS.
St. Helen's ... ..	—	—	—	
St. Leonards ... ..	—	—	—	
Shaftesbury ... ..	—	—	—	
Swarraton ... ..	—	—	—	
Totland Bay ... ..	30.245	+ .009	—	
SCOTLAND.				
None.				
IRELAND.				
Kingstown ... ..	—	—	—	
Newcastle... ..	—	—	—	

## THERMOMETERS.

## TELEGRAPHIC REPORTING STATIONS.

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maxi- mum.	Mini- mum.	Grass Mini- mum.	Spare.	REMARKS.
ENGLAND AND WALES.								
Dungeness ... ..	51.1	— 0.1	— 0.1	0.0	0.0	—	— 0.2	
Holyhead ... ..	58.7	— 0.5	— 0.3	+ 0.6	+ 0.1	—	— 0.3	
Jersey ... ..	62.0	— 0.7	+ 0.1	— 0.7	+ 0.1	—	— 1.0	Scale of dry bulb defective. Not visited.
Liverpool (Bidston) ... ..	—	—	—	—	—	—	—	
London (Brixton) ... ..	54.0	— 0.1	+ 0.1	0.0	0.0	— 0.1	—	
London M.O. ... ..	62.0	0.0	— 0.1	+ 0.1	0.0	—	—	
Loughborough ... ..	—	—	—	—	—	—	—	Not visited.
Oxford ... ..	59.0	— 0.3	— 0.3	— 0.4	+ 0.1	+ 0.4	—	
Pembroke (St. Ann's Head) ... ..	63.9	— 0.1	+ 0.2	0.0	+ 0.1	—	— 0.1	Scale of wet bulb almost illegible.
Portland Bill ... ..	61.0	0.0	+ 0.1	0.0	+ 0.9	—	0.0	The spirit column in the minimum was broken.
Scilly ... ..	63.4	— 0.6	— 0.4	— 0.4	— 0.1	—	0.0	
Shields ... ..	57.0	0.0	— 0.3	— 0.1	+ 0.7	—	—	
Spurn Head ... ..	58.0	— 0.3	— 0.2	0.0	0.0	—	0.0	
Yarmouth ... ..	61.5	— 0.1	— 0.2	— 0.3	+ 0.5	—	— 0.6	
SCOTLAND.								
Aberdeen ... ..	58.7	— 0.1	— 0.1	— 0.1	— 0.1	—	—	
Leith ... ..	55.9	— 0.1	— 0.2	0.0	+ 0.4	—	— 0.2	
Nairn ... ..	60.4	— 0.7	— 0.7	0.0	+ 0.4	—	— 0.1	
Stornoway ... ..	61.3	— 0.1	— 0.1	+ 0.2	+ 0.1	—	— 0.1	
Sumburgh Head... ..	—	—	—	—	—	—	—	Not visited.
Wick ... ..	59.9	— 0.5	— 0.5	0.0	+ 0.1	—	—	
IRELAND.								
Blacksod Point ... ..	49.9	— 0.2	— 0.2	+ 0.1	+ 1.0	—	— 0.3	
Donaghadee ... ..	49.7	— 0.3	— 0.4	0.0	+ 0.5	—	0.0	
Malin Head ... ..	50.7	— 0.3	— 0.2	+ 0.1	— 1.0	—	—	
Parsonstown ... ..	56.6	— 0.5	— 0.2	— 0.4	+ 0.1	—	—	
Roches Point ... ..	54.1	— 0.7	— 0.4	+ 0.1	+ 0.3	—	— 0.4	
Valencia ... ..	54.3	— 0.6	— 0.5	— 0.5	— 0.1	—	+ 0.3	

## THERMOMETERS.

NORMAL CLIMATOLOGICAL STATIONS (Second Order Station, International Classification).

STATION.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maxi- mum.	Mini- mum.	Grass Mini- mum.	Spare.	REMARKS.	
ENGLAND AND WALES.									
Ampleforth ... ..	54.3	0.0	+ 0.1	—	—	—	—	A "Six" Max. and Min.	
Belvoir Castle ... ..	56.3	- 0.6	- 0.6	- 0.3	- 0.2	- 0.7	0.0		
Bennington ... ..	62.0	- 0.1	- 0.1	- 0.2	- 0.2	0.0	—		
Berkhamstead ... ..	58.4	- 0.4	- 0.3	+ 0.1	0.0	0.0	—		
Bramley ... ..	52.8	0.0	+ 0.1	+ 0.1	+ 1.1	—	—		
Chester ... ..	63.3	- 0.1	0.0	- 0.7	0.0	- 0.2	—		
Darwen ... ..	49.7	- 0.1	- 0.1	- 0.6	+ 0.3	—	—		
Durham ... ..	51.9	- 0.1	- 0.1	- 0.1	+ 0.3	—	—		
Eastbourne ... ..	51.1	0.0	0.0	0.0	+ 1.1	—	—		
Edgbaston ... ..	62.0	- 0.7	- 0.7	0.0	- 0.1	—	—		
Fulbeck ... ..	64.0	- 0.1	- 0.1	- 0.1	0.0	0.0	—		
Lytham ... ..	57.3	- 0.1	- 0.1	- 0.2	- 0.1	—	—		
Manchester ... ..	—	—	—	—	—	—	—		Not read.
Morpeth ... ..	52.0	0.0	0.0	+ 0.1	+ 1.0	0.0	—		
Parkstone... ..	63.0	- 0.2	- 0.1	- 0.2	+ 0.3	+ 0.5	—		
Plymouth... ..	61.7	0.0	- 0.3	- 0.4	+ 0.7	+ 0.3	—	The minimum read at first 1.5 too low. The error could not be reduced be- low 0.7. The grass minimum had a large error owing to the spirit column being broken.	
Rousdon ... ..	60.8	- 0.1	+ 0.3	+ 0.1	+ 0.7	+ 1.0	—		
St. David's ... ..	58.2	- 0.4	- 0.5	- 0.9	- 0.2	+ 1.4	- 0.1		
St. Leonard's ... ..	51.3	- 0.5	- 0.7	- 0.2	- 0.1	—	—		
Scarborough ... ..	54.4	0.0	0.0	+ 0.1	+ 0.5	—	—		
Seaham ... ..	60.2	- 0.6	- 0.8	+ 0.2	+ 0.2	—	- 0.8		
Southampton ... ..	59.0	- 0.3	- 0.1	- 1.0	+ 0.2	0.0	—		
Stokesay ... ..	61.5	- 0.3	- 0.5	- 0.3	- 0.2	+ 0.4	—		
Stonyhurst ... ..	57.0	- 0.1	- 0.3	- 0.1	+ 0.4	+ 0.4	—		
Tealby ... ..	51.0	- 0.5	- 0.6	- 0.9	+ 1.0	—	- 0.2		
Tenby ... ..	62.4	- 0.3	0.0	- 0.2	0.0	+ 1.0	—		
Wessington Court ... ..	58.4	- 0.4	- 0.3	- 0.3	+ 0.1	- 0.1	—		
SCOTLAND.									
Braemar ... ..	54.4	- 0.3	- 0.4	0.0	0.0	—	—		
Dundee ... ..	52.0	+ 0.5	+ 0.5	- 1.4	+ 0.4	—	—		
Dunrobin ... ..	62.8	0.0	0.0	- 0.1	0.0	—	—		
Edinburgh ... ..	55.2	- 0.2	- 0.3	+ 0.4	0.0	+ 0.2	0.0		
Fort William ... ..	60.3	- 0.2	- 0.2	0.0	0.0	—	—		
Glencarron ... ..	58.0	- 0.1	- 0.1	+ 0.1	+ 0.2	—	—		
Gordon Castle ... ..	58.0	0.0	+ 0.1	0.0	+ 0.2	—	—		
Lairg ... ..	57.5	0.0	- 0.2	- 0.1	- 0.1	—	—		
Lednathie ... ..	55.0	- 0.2	- 0.2	- 0.2	+ 0.3	—	—		
Poltalloch ... ..	59.0	0.0	0.0	0.0	+ 0.3	—	—		
Rothesay ... ..	56.8	0.0	0.0	+ 0.2	+ 0.3	—	—		
IRELAND.									
Armagh ... ..	63.5	- 0.4	- 0.4	0.0	0.0	—	—		
Belfast ... ..	50.1	0.0	0.0	+ 1.0	+ 0.2	—	—		
Dublin (City) ... ..	—	—	—	—	—	—	—	Not read.	
Dublin (Phoenix Park)... ..	—	—	—	—	—	—	—	Not read.	
Glasnevin... ..	—	—	—	—	—	—	—	Not read.	
Londonderry ... ..	—	—	—	—	—	—	—		
Markree Castle ... ..	53.7	- 0.2	- 0.3	- 0.4	+ 0.3	+ 0.2	—		
Parsonstown ... ..	56.7	- 0.5	- 0.2	+ 0.1	- 0.2	—	—		

THERMOMETERS.  
OTHER CLIMATOLOGICAL STATIONS.

STATIONS.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maxi- mum.	Mini- mum.	Grass Mini- mum.	Spare.	REMARKS.
ENGLAND AND WALES.								
Alnwick Castle ... ..	50·0	-0·2	-0·2	-0·2	+0·4	—	—	Could not detect any spirit at top of tube of minimum.
Cirencester ... ..	64·4	0·0	0·0	+0·1	0·0	+0·4	—	
Clifton ... ..	58·0	-0·6	-0·2	-0·4	0·0	—	—	
Colly Weston ... ..	—	—	—	—	—	—	—	
Cullompton ... ..	62·1	-0·1	-0·4	0·0	+0·3	+0·5	—	
Felixstowe ... ..	52·0	0·0	0·0	+0·3	-0·2	—	—	
Littlestone ... ..	47·8	+0·2	+0·1	+0·2	+0·6	+0·9	—	
Llandovery ... ..	63·0	—	—	-0·7	+1·2	—	—	
St. Helen's ... ..	50·6	-0·1	-0·1	-0·2	+0·2	+0·5	—	
St. Leonard's ... ..	51·3	-0·5	-0·7	-0·2	-0·1	—	—	
Shaftesbury ... ..	61·5	0·0	0·0	-0·2	0·0	—	—	
Swarraton ... ..	57·7	0·0	-0·1	-0·6	-0·2	—	—	
Totland Bay ... ..	62·0	-0·2	+0·3	-0·2	+1·2	—	—	
SCOTLAND.								
None.								
IRELAND.								
Edenfel ... ..	50·7	—	—	+0·2	-0·3	—	-0·7	
Kingstown ... ..	—	—	—	—	—	—	—	
Newcastle ... ..	56·7	-0·5	-0·6	-0·1	-0·3	—	—	

THERMOMETERS.  
OBSERVATORIES.

STATIONS.	Inspector's Standard Corrected.	Dry Bulb.	Wet Bulb.	Maxi- mum.	Mini- mum.	Grass Mini- mum.	Spare.	REMARKS.
ENGLAND AND WALES.								
Falmouth ... ..	55·0	-0·6	-0·1	-0·5	+0·1	—	—	
Oxford ... ..	59·0	-0·3	-0·3	-0·4	+0·1	+0·4	—	
Stonyhurst ... ..	57·0	-0·1	-0·3	-0·1	+0·4	+0·4	—	
SCOTLAND.								
Aberdeen ... ..	51·0	-0·1	-0·6	0·0	+0·3	—	—	
Fort William ... ..	57·0	0·0	-0·2	0·0	-0·1	—	—	
Glasgow ... ..	57·0	0·0	0·0	0·0	+0·1	—	—	
IRELAND.								
Valencia ... ..	54·3	-0·6	-0·5	-0·5	-0·1	—	+0·3	

11. The Secretary submitted the following memorandum, drawn up by Mr. J. A. Curtis, at his request, upon the monthly publication of results from land stations of the second and third orders :—

Land Room,  
October 24th, 1900.

**SUGGESTED IMMEDIATE PUBLICATION OF CERTAIN RESULTS FROM STATIONS OF THE SECOND ORDER.**

It is suggested that a Table be prepared and sent to the correspondents of the office by, say, the 15th of each month, giving the monthly results from all the Stations of the Second Order, and from some of those of the Third Order.

Such a publication would certainly be of advantage, for

- (a.) It would be a recognition of the value of the work of the volunteer observers.
- (b.) It would disseminate valuable information with the least possible delay.
- (c.) It would enable many of the observers who compile tables for the local press, &c., to make a better use of their own observations by giving them the means of comparison with other stations, thus increasing both interest and usefulness.
- (d.) It would be a great incentive to the observers to perfect their returns and to send them up promptly.
- (e.) By showing at a glance the want of information in certain districts, it would probably result in stations being started in places at present unrepresented.
- (f.) It would allow of the publication of results from some excellent stations (Cooper's Hill for instance), the returns from which are not at present published by us.

Given that the returns came to hand promptly, I anticipate no great difficulty in having such a Return as is suggested in print by about the 15th of each month.

This publication would not involve much additional labour, for as regards the great majority of the stations all the work that would be required is done under the present arrangements, but done so long after date that very much of the interest in it has passed away. The extra work would be the checking of the returns which are not now included in the Office publications, and the passing of the Monthly Results through the press.

The form at present used in Part II. of "Observations at Stations of the Second Order" would, I think, be a suitable one for the purpose in view, but it would be well to add a column to show the duration of bright sunshine at those stations which have sunshine recorders.

The number of stations required to be provided for is 65, and the results from these stations could be printed on a single sheet of quarto size.

JOHN A. CURTIS.

12. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

**WARNINGS ISSUED.**

The signals were hoisted on 4 days, the total number of districts warned being 19. In 13 districts the warnings were justified, but in 6 they were not required.

**GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.**

None.

FREDERIC GASTER.

Telegraphic Branch,  
21st November, 1900.

13. *Use of unpublished data.*—Permission was given to Mr. Brodie to make use of unpublished data contained in the Annual Checking of Storm Warnings in the preparation of a paper on "The Prevalence of Gales on the Coasts of the British Islands during the 30 years 1871–1900," for the Royal Meteorological Society.

14. Reported—That the cash accounts for the quarter ended the 30th September last had been this day examined by Professor Darwin and Dr. Buchan, and would be sent in due course to the Treasury, for the Audit Office. The receipts from the 1st July last, when there was a balance of £3,993 5s. 4d., were £3,742 17s. 1d., against £3,717 18s. 10d. in the corresponding period of the preceding financial year. The payments were £4,854 11s. 4d., against £3,260 4s. 8d. during the same period in the previous year. The balance in hand and at the bank on the 30th September, 1900, amounted to £2,881 11s. 1d., and at the same date in 1899 to £3,117 1s. 10d.

15. Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 6th November ... ..	5,161	2	7
Receipts from 7th to 20th November ... ..		8	10
			5
	5,169	13	0
Cheques drawn from 7th to 20th November ... ..		43	3
			4
Cash balance on 20th November ... ..	£5,126	9	8

16. Submitted—The following list of publications which had been received since the last meeting:—

*Calcutta, Meteorological Office, India.*—Rainfall of India, 8th year, 1898.

*Frankfurt am Main, Physikalischer Verein.*—Jahresbericht . . . für das Rechnungsjahr 1898–1899.

*Vienna, Hydrographischer Dienst in Oesterreich.*—Beiträge zur Hydrographie Oesterreichs. Herausgegeben vom k. k. hydrographischen Centralbureau. IV. Heft. Die Hochwasserkatastrophe des Jahres 1899 im österreichischen Donaugebiete.

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63, Victoria Street, December 5, 1900.

PRESENT:

MR. GALTON IN THE CHAIR.

THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (November 21) were read and confirmed, subject to verbal alterations in the report of inspections to be reported at the next meeting.

2. *Loan of Instruments.*—The provision of instruments for a station on Mount Lebanon (Minutes of Nov. 21) was not sanctioned as it is not the practice of the Office to supply instruments for inland stations.

3. *Sunshine recorders.*—It was agreed that the Secretary report further upon an instrument for testing the adjustments of sunshine recorders. (*See Minute 10 of November 21.*)

4. *Sunshine records from Jersey.*—It was agreed to make arrangements for including sunshine readings in the daily telegram from Jersey at a cost not exceeding £2 per annum.

5. *Sunshine records from Oxford.*—The Secretary was directed to ascertain whether sunshine readings could be included in the daily telegram from Oxford.

6. *Observations at Chester* (Minutes, p. 73).—It was agreed the Office undertake the transcription of the arrears at this station provided that Mr. Mitchell will keep up the current work in future.

7. The Secretary was authorised to send a copy of the daily weather report in return for the observations at Chester, and two copies of the report in return for a transcript of the observations made at Whitworth Park Meteorological Observatory, in connexion with the Owens College, Manchester.

8. The Secretary was directed to report further with regard to the suggested immediate publication of results from climatological stations (Minute 11 of Nov. 21).

9. *Kew Observatory*.—It was resolved that the Director of the National Physical Laboratory be asked to report from time to time on the self-recording instruments maintained for the Council at Kew Observatory.

10. Reported—The following letter from the Royal Society, with enclosure :—

M.O. 1,602.

MY DEAR SIR,

I AM desired by the Secretaries to send you the enclosed copy of a letter which has been received from H.M. Treasury with reference to the Superannuation Scheme of the Meteorological Council.

The Royal Society,  
November 24th, 1900.

I am, &c.,  
ROBERT HARRISON,  
Asst. Sec., R.S.

W. N. SHAW, Esq.,  
Secretary, Meteorological Council.

[COPY.]

18,502/1900.

Treasury Chambers,  
21st November, 1900.

MY LORD,

I HAVE laid before the Lords Commissioners of Her Majesty's Treasury Professor Rucker's letter of the 9th instant, and enclosures, containing the scheme of the Meteorological Council for providing superannuation allowances for the clerks in their employment, and I am to state that my Lords raise no objection to that scheme.

They agree that it is desirable to add the proposed notes on pages 24 and 137 of the report; and they will arrange that these notes should appear in the report as issued to Parliament.

I am, &c.,  
(Sd.) FRANCIS MOWATT.

The President  
of the Royal Society.

11. *Cloud Observations in connexion with International Balloon Ascents*.—The Secretary reported that he had received from the Secretary of the International Committee (M.O. 1,540) a request for cloud observations on the day of international balloon ascents, the first Thursday of each month, and on the days preceding and following; that he had addressed a letter (P.C. 2,281) to various observatories offering to supply forms for the entry of observations and a copy of the International Cloud Atlas for reference.

Approved.

12. *Planting of Trees in the Old Deer Park, Richmond*.—Reported—The receipt of a letter (M.O. 1,621) from the Director of the National Physical Laboratory intimating that it was proposed to plant trees in that part of the Deer Park which was in charge of the Corporation, and that the trees would in time make the stand for cloud observations unsuitable, except for clouds near the Observer's Zenith, and asking for the opinion of the Council with regard to the matter.

The Secretary was directed to reply (P.C. 2,318) strongly deprecating any action which would prejudice the continuation of the cloud observations or the initiation of similar ones in the Old Deer Park.

13. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of November 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	47	70	59	81
"	b	27	17	22	
"	c	26	10	18	
"	d	0	3	1	
Scotland, E.	a	27	53	40	74
"	b	37	30	34	
"	c	30	10	20	
"	d	6	7	6	
England, N.E.	a	40	64	52	87
"	b	50	20	35	
"	c	10	13	12	
"	d	0	3	1	
England, E.	a	37	57	47	82
"	b	37	33	35	
"	c	10	7	9	
"	d	16	3	9	
Midland Counties	a	37	60	49	84
"	b	37	33	35	
"	c	13	7	10	
"	d	13	0	6	
England, S.	a	43	53	48	92
"	b	47	40	44	
"	c	10	7	8	
"	d	0	0	0	
Scotland, W.	a	43	80	62	87
"	b	37	13	25	
"	c	13	0	6	
"	d	7	7	7	
England, N.W.	a	53	57	55	87
"	b	27	37	32	
"	c	13	3	8	
"	d	7	3	5	
England, S.W.	a	33	70	52	87
"	b	43	27	35	
"	c	17	0	8	
"	d	7	3	5	
Ireland, N.	a	40	77	59	84
"	b	37	13	25	
"	c	13	3	8	
"	d	10	7	8	
Ireland, S.	a	37	67	52	80
"	b	33	23	28	
"	c	17	0	9	
"	d	13	10	11	
SUMMARY.					
British Islands	a	40	64	52	84
"	b	37	26	32	
"	c	16	6	11	
"	d	7	4	5	

14. *Instruments for the Antarctic Expedition.*—Read—The following letter :—

M.O. 1622.

Hydrographic Department, Admiralty.

SIR,

29th November, 1900.

I BEG to forward a list of the Meteorological instruments which it is proposed by the Meteorological Committee of the National Antarctic Expedition shall be supplied to the Expedition.

The Admiralty have consented to furnish instruments to the Expedition, and though it was not contemplated that there would be so many special instruments necessitating purchase, there will be no difficulty made in providing from Hydrographic funds money for such as are not in stock amongst the Admiralty instruments at the Meteorological Office.

It will be a great advantage, however, if the Meteorological Council will aid by undertaking the construction and purchase of such instruments, and I have the honour to request that the Secretary may be empowered to arrange for this in communication with this Department. The list will probably require modification in some of its details.

I am, &amp;c.,

W. J. L. WHARTON,  
Hydrographer.The Secretary,  
Meteorological Office.

## SUPPLY OF INSTRUMENTS TO ANTARCTIC EXPEDITION, SUGGESTED BY METEOROLOGICAL COMMITTEE.

Name of Instrument.	Ship.	Station.	Remarks.	Estimated Cost.
	No.	No.		£ s. d.
<b>PRESSURE.</b>				
Barometers :—				
Marine ... ..	2	—	In stock.	
Station ... ..	—	2	In stock.	
Aneroids ;—				
Large... ..	3	—	—	
Small sling, to bear height of 10,000 feet.	—	6	—	18 0 0
Hypsometers ... ..	—	2	—	9 10 0
<b>TEMPERATURE.</b>				
Thermometers, mercurial or- ordinary low range.	6	6	In stock.	
Thermometers, graduated to −40° F.	—	12	—	6 0 0
Thermometers, spirit, graduated to −80° F.	12	18	Six ordered, graduated to −70° F.	15 0 0
Maximum, mercurial ... ..	3	3	In stock.	
Minimum, spirit... ..	3	3	In stock.	
Sling thermometers ... ..	—	6	—	3 15 0
Thermograph ... ..	1	2	One ordered reading to −50° F.	22 1 0
Hygrograph ... ..	—	2	—	14 0 0
Solar radiation, black bulb in vacuo.	—	4	—	4 0 0
Solar radiation, bright bulb ...	—	4	—	4 0 0
Sunshine recorder (Campbell Stokes)	—	1	—	9 9 0
Thermometer screens, small ship's.	1	—	Will require to be special ...	0 15 0
Thermometer screens, Steven- son's, framed to be put to- gether on arrival.	—	2	—	5 0 0
Anemometer ... ..	—	?	—	5 0 0
Rain-gauge ... ..	—	?	In stock.	

## ADDITIONAL INSTRUMENTS SUGGESTED BY MR. SCOTT.

Name of Instrument.	Ship.	Station.	Remarks.	Estimated Cost.
Aspirator, Assmann's ... ..	No. 1	No. 1	?	£ s. d. 10 0 0
Hydrometers ... ..	8	—	Ordered in oceanographical equipment.	
Earth thermometers, B.A. Committee pattern.	—	2	?	3 0 0
Cloud mirror ... ..	—	1	?	?
Spirit thermometers for terrestrial radiation.	—	2	?	2 0 0

The application was agreed to.

15. *Fishery Barometer for Kyle of Lochalsh.*—Reported—A further letter (M.O. 1494) from Mr. J. G. Weir, M.P., and a memorandum from Dr. Buchan thereupon.

It was agreed to ask Dr. Buchan for a report as to the importance of Kyle of Lochalsh as a station for sea-going fishing boats.

16. Read—A memorandum from the Marine Superintendent stating that since the last meeting two logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

17. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

## WARNINGS ISSUED.

The signals were hoisted on 5 days, the total number of districts warned being 18.

In 16 districts the warnings were justified, but in two districts they were not required.

## GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
5th December, 1900.

18. *Daily Weather Report.*—A form for the entry on p. 4 of the "additional observations from stations in the United Kingdom" (Minute 8 of November 7, 1900) and a revised order of stations on p. 1 were approved.

19. *Second Order Stations.*—The volume of observations at Second Order Stations for 1897 was approved for press.

20. Submitted—The following reports of work during the month of November, 1900 :—

## MARINE BRANCH.

December 4, 1900.

Examined nine new logs.

For the district southward from the Equator, from 20° E. to 90° W., obtaining monthly wind and instrumental results for various sized areas; drawing wind-roses, and preparing wind charts for April and May for the coastal regions round South America. Proof of the January engraved chart received.

North Atlantic and Mediterranean Pilot Charts for 1901. The form chart forwarded to the engraver and the January chart to the lithographer. The charts for February, March, and April being prepared.

Calculating the sun's altitude at various sunshine-recording stations, and preparing daily sunrise and sunset tables for the December daily weather reports.

Obtaining the number of days' observations contained in Office logs, south of 50° S., for Mr. Scott.

Obtaining for the owners of the ship "Carmanian" information relating to the weather likely to have been experienced on the North Pacific in the early autumn of last year.

Assistance rendered in preparing for the display of weather charts on the landings; and in taking copies of the daily weather report to the railway bookstalls.

CHAS. HARDING.

#### TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(to December 5th, 1900).

*Weekly Weather Report*.—All numbers issued promptly to date. *Monthly Supplements*—July, August, September, all issued. October copy gone to the printers.

*Daily Weather Report*.—All numbers issued promptly to date. Monthly correction and addition sheets to October, issued.

*Primary Checking of Storm Warnings, 1900*—Done to date.

*Checking of 8.30 p.m. Forecasts*—Done to end of November.

*Inquiries by Telegraph and Personally*—Still considerable, and those by newspaper correspondents are somewhat frequent.

*Investigation* into conditions which accompanied the thunderstorm of 27th July, 1900—Recommenced.

*Drawing Charts of Mean 8 a.m. and Mean Minimum Temperature* for half-months November–December, December, and December–January—Done, and maps printed.

*Sectional Paper prepared*, for plotting the new averages for bright sunshine and accumulated heat (for 1901 W.W.R.).

*Calculating 10-day Means of Temperature, &c. (4 Sets)*, for Germany—Done.

*Re-arranging Order of Stations in Daily Weather Report*, altering forms, preparing and altering forms for New Year—Done.

*Attending one day in Westminster County Court*, and giving evidence—Done.

*Preparing Sheet of Monthly Average and Extreme Values* for pressure, temperature, rainfall, and bright sunshine, for January to June (30 years 1871–1900)—Done, and copy gone to printer.

Telegraphic Branch,

5th December, 1900.

FREDC. GASTER.

#### PANTAGRAPH ROOM.

December 1st, 1900.

##### *Hourly Means.*

Proof sheets of the volume for 1897 have been passed for press up to page 186.

Further progress has been made with the calculation of the Means, &c., required for the volume for 1898.

The daily mean temperature results, 1871–95, are still under discussion.

Five-day means of pressure for Aberdeen, Kew, and Valencia, for October, 1898, to March, 1899, calculated, for special investigation.

Harmonic co-efficients of pressure and temperature for Aberdeen, 1897, calculated.

##### *Miscellaneous.*

(1) Diagram prepared for Sir N. Lockyer.

(2) Enquiry as to lowest altitude at which sun will make a record on sunshine recorder.

(3) Adjustment of sunshine recorder at Margate.

(4) Report on inspections, and matters arising therefrom.

R. H. CURTIS.

#### EXAMINATION BRANCH.

1st December, 1900.

##### *Examinations.*

*September, 1899*.—Completed.

*October and November, 1899*.—Proceeded with.

*January to June, 1900*.—Kew work proceeded with.

Weekly examinations (on receipt) of curves and documents from all Observatories.

##### *Reports, &c.*

*September, 1899*.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

Preparation of Diary of Operations for 1901, and correcting proof.

Preparation of Inspection Notes for printing.

Work in connection with Kew weather, July 27th, 1900.

T. E. ALLEN.

## LAND ROOM.

December 4th, 1900.

Enquiries during November, 1900 :—

1. Messrs. Lloyd and Pratt.—Weather at Southampton on certain days in 1899 and 1900. (M.O. 1,462.)
2. Messrs. Forsyth and Maule.—Average rainfall in Surrey in the neighbourhood of Hindhead. (M.O. 1,483.)
3. Messrs. Lloyd and Pratt.—Heavy rains at Southampton from May 22nd to September 30th, 1900. (M.O. 1,508.)
4. Mr. Alex. A. Wright.—Wind (direction and velocity) and weather in the neighbourhood of Motherwell, April 12th, 1900. (M.O. 1,554.)
5. Messrs. Woodburn and Holme.—Wind and weather (including tracings of anemograms) at Holyhead on November 7th–12th, 1900. (M.O. 1,566.)
6. Dr. G. A. Crace-Calvert.—Rainfall and sunshine at various places in Wales and in Lancashire. (M.O. 1,598.)

JOHN A. CURTIS.

In addition to the enquiries referred to above, there were 14 personal enquiries during November for forecasts or other weather information, and 24 enquiries by telegraph.

21. *Bonus to Observers at Telegraphic Stations.*—It was resolved that the usual bonus of £3 3s. be given to those of the telegraphic observers who have discharged their duties faithfully during the year.

22. Submitted—The following Statement of Accounts :—

	£	s.	d.
Cash balance on 20th November ... ..	5,126	9	8
Receipts from 21st November to 4th December ...		8	13
		8	13
Cheques drawn from 21st November to 4th December	1,020	14	0
Cash balance on 4th December ... ..	£4,114	8	9

23. Submitted—The following list of publications which had been received since the last meeting :—

*Bath, Medical Officer of Health.*—Annual report to the Bath Urban Sanitary Authority, by the Medical Officer of Health. 31st and 34th, 1896 and 1899.

*Berne, Eidgenössisches Oberbauinspectorat, Hydrometrisches Bureau.*—Graphische Darstellung der schweizerischen hydrometrischen Beobachtungen sowie der Lufttemperaturen und Niederschlags-höhen für das Jahr 1899.

*Cape Town, Meteorological Commission, Cape of Good Hope.*—Report of the Meteorological Commission for the year 1899.

*London, Nautical Almanac Office.*—The nautical almanac and astronomical ephemeris for the year 1901 for the meridian of the Royal Observatory at Greenwich.

*Peking, Inspectorate General of Customs.*—Medical reports for the half-year ended 31st March 1900.

*Washington, Department of Agriculture, Weather Bureau.*—Bulletin G. W.B. No. 221. Atmospheric radiation : a research conducted at the Allegheny Observatory and at Providence, R.I. By F. W. Very.

An Extraordinary General Meeting of the Meteorological Council was held at 63, Victoria Street, on Wednesday, December 19th, 1900, at the hour of 2h. 30m. p.m.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.  
PROFESSOR DARWIN.

MR. GALTON.  
THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

The Secretary read the notice convening the meeting, as follows :—

## THE METEOROLOGICAL COUNCIL.

*Incorporated under Section 23 of the Companies' Act, 1867.*

NOTICE is hereby given that an Extraordinary General Meeting of the Members of this Association will be held at the Registered Office of the Association, No. 63, Victoria Street, in the City of Westminster, on the 19th day of December, 1900, at half-past Two o'clock in the afternoon, for the purpose of considering, and, if thought advisable, confirming the following Special Resolution duly passed at an Extraordinary General Meeting held at the same place on the 21st day of November, 1900.

That in place of the present Articles of Association the following shall be substituted :—

### ARTICLES OF ASSOCIATION.

\*(1.) For the purposes of registration the number of the Members of the Association is declared not to exceed ten.

\*(2.) These Articles shall be construed with reference to the provisions of the Companies' Act, 1862, and the Companies' Act, 1867, and terms used in these Articles shall be taken as having the same respective meanings as they have when used in these Acts.

\*(3.) The Association is established under the authority of the Lords Commissioners of the Treasury, for the purposes expressed in the Memorandum of Association.

(4.) *Admission of Members.*—The Association shall consist of the Meteorological Council—a body of seven or more persons, not exceeding ten in all, of whom one is the Hydrographer to the Admiralty for the time being, and the others are nominated by the President and Council of the Royal Society.

(5.) *Management of the Association.*—The business of the Association shall be managed by a body of Directors, of whom the Hydrographer to the Admiralty shall be one. The President and Council of the Royal Society shall from time to time appoint as many other Members of the Association as they may think fit, and for such periods as they may think fit, to be such Directors.

(6.) *Nomination of Chairman.*—The Chairman shall be one of the Directors, and shall be appointed from time to time by the President and Council of the Royal Society.

(7.) *Appointment of Secretary.*—The Secretary shall be appointed from time to time by the Directors, and may be one of the Directors.

(8.) *Meetings, Proceedings, &c.*—A General Meeting of the Association shall be held at least once in each year, in accordance with Section 49 of the Companies' Act of 1862. The meetings of the Directors shall be held as the Directors shall appoint, and their proceedings shall be regularly recorded and printed. The Association shall submit, yearly, a report of its proceedings to the Royal Society for presentation to Parliament.

\*(9.) *Accounts, Audit.*—The Annual Estimates shall be submitted for approval to the Treasury, and the accounts, after examination by two Members of the Association, shall be sent to the Treasury for audit.

\*(10.) A notice may be served by the Association upon any Member, either personally or by sending it through the post as a prepaid letter, addressed to such Member, at his registered place of abode. Any notice, if served by post, shall be deemed to have been

served at the time when the letter containing the same would be delivered in the ordinary course of the post, and in proving such service it shall be sufficient to prove that the letter containing the notice was properly addressed and put into the Post Office.

(11.) *Temporary Provision.*—Until the appointment of Directors by the Royal Society under the provisions of Article 5 shall have been made, the business of the Association shall continue to be managed by the Members of the Meteorological Council as heretofore constituted.

No alteration is proposed in the Articles marked (\*),

By order of the Meteorological Council,  
W. N. SHAW,  
Secretary.

63, Victoria Street,  
5th December, 1900.

The Chairman proposed, and Mr. Galton seconded, the confirmation of the Special Resolution embodied in the notice convening the meeting.

The proposal was adopted unanimously.

The Secretary was directed to forward a copy of the Resolution to the Registrar of Joint Stock Companies, and when the revised articles had been duly registered to inform the Royal Society of the fact.

The following letter was read:—

M.O. 1694.

DEAR SIR,

I am directed to inform you that your letter (1500) of the 23rd ultimo was laid before the President and Council of the Royal Society at their last meeting, when it was agreed to defer until a later date the appointment of Directors of the Meteorological Council under Article 5 of the Articles of Association enclosed in your letter. In the meantime it was resolved that Article 11 be approved as a temporary measure.

The Royal Society,  
December 12th, 1900.

I am, &c.,  
ROBERT HARRISON,  
Asst. Sec. Royal Society.

W. N. Shaw, Esq., F.R.S.,  
Secretary to the Meteorological Council.

The ordinary meeting was then held.

1. The revised draft of the minutes of November 21st was signed.
2. The minutes of the last meeting (December 7th) were read and confirmed.

3. *Sunshine Records at Oxford.*—The Secretary reported that he had learned from the Radcliffe observer (M.O. 1689) that the sunshine returns at Oxford could not be included in the daily telegram because the recorder “is mounted at a height of about 100 feet on the top of a central tower close to the anemometers, a rain gauge, maximum and minimum and wet and dry bulb thermometers.” They are only visited once a day at noon, and a second visit in darkness to take out the sunshine cards is not practicable.

4. The Secretary reported a letter (M.O. 1695) from the Royal Society asking for a report on the disposition of the grant for researches in atmospheric electricity to be sent in by January 31st, 1901. He also reported that he had communicated with Mr. C. T. R. Wilson on the matter.

## 5. Read—The following letter :—

M.O. 1720.

Burlington House,  
London, W.,  
December 18th, 1900.

MY DEAR SHAW,

At the request of Mr. Borchgrevinck, two volumes of meteorological observations taken in Antarctic regions have been deposited here by Mr. Bernacchi.

The observations are neatly entered.

The President and Council of the Royal Society will be much obliged if you would report as to whether these observations should all be reduced, and if so whether the task could be undertaken under the auspices of the Meteorological Council.

Sir Michael Foster and I informed Mr. Borchgrevinck that the Royal Society had no funds at its disposal for the reduction of observations, but it is possible that Sir G. Newnes may be willing to bear the cost.

It would add to the value of your report if you could give an estimate of the cost.

Mr. Bernacchi (who took the observations) is not sure whether he will have another engagement after the new year, but, if he is free, he would like to assist in the reductions. He would expect to be paid. In case you wish to communicate with him, his address is L. Bernacchi, 39, Sackville Gardens, Hove, Brighton.

I am, &c.  
A. W. RÜCKER,  
Secretary, Royal Society.  
Per R. Harrison, Assistant Secretary.

W. N. Shaw, Esq., F.R.S.,  
Secretary of the Meteorological Council.

The Secretary also mentioned that Mr. Scott had asked for an estimate of the cost of extracting and reducing the information in possession of the Office, not already reduced, concerning the higher latitudes of the southern ocean.

The Hydrographer was requested to ascertain and report to the Council what information it was desirable to furnish for the purposes of the proposed antarctic expedition, and the Secretary was instructed to ascertain from the Royal Society whether it was to be understood that the records of the Borchgrevinck expedition were at the disposal of the Society, and whether any steps were being taken by Sir G. Newnes towards the discussion and publication of the results.

6. Submitted—A letter (M.O. 1647) from Mr. James A. Allan, of Glasgow, from which the following is an extract :—

“ While on the subject (Daily Weather Report), may I suggest that it would be an advantage if there were a reporting station on the West of Scotland between Stornoway and Malin Head—say at Barra or Tiree, both of which have now telegraphic communication—also if the morning newspaper forecasts could be based on observations made within six or eight hours of the time of issue, instead of on reports for 6 p.m. the previous day. The whole weather system may have changed in the 14 hours between the time of observation and the time the forecasts are in the hands of the public, which must often lead to apparent failure and undeserved criticism of the Meteorological Office. Of course, I am aware that a change would involve night work on the part of the observers, telegraph officers, and forecasters—but this should not be an insuperable difficulty, especially if, as I believe, increased accuracy of forecast would result, which would lead to much greater interest being taken by the public generally in the work of the Office.”

7. *Pilot Charts*.—A first proof of the Pilot Chart for January was referred to the Hydrographer.

8. *Fishery Barometer for the Kyle of Lochalsh* (Minute 15 of December 5th).—After a report from Mr. Buchan, it was agreed that a detailed report, as suggested by him, be obtained from the local representative of the Fishery Board for Scotland.

9. *Loan of Instruments*.—It was agreed that application be made to the Admiralty to allow Capt. Tamplin of the s.s. “El Dorado” to draw a barometer from the dépôt at Hong Kong.

10. Read—A memorandum from the Marine Superintendent stating that since the last meeting seven logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers, and to present a copy of the Meteorological Charts of the Red Sea (Official Number 106), to Captain Mitchell of the s.s. "Prome."

11. *Storm Warning Signals.*—Submitted—The following letter :—

M.O. 1718.

SIR,

I beg to inform you that it has been represented to me by Mr. Byrne, Lloyd's Agent at Ballycastle, Co. Antrim, that if notices of atmospheric disturbances near that coast could be forwarded to him the information would be of great service to local fishermen and others. There is, I believe, a very considerable fishing industry in Ballycastle, and Ballycastle would be a very good centre for such announcements to be published, as our agent, Mr. Byrne, has considerable facilities for making the information in such notices known to those affected. I should, therefore, be much obliged if the Council of the Meteorological Office would be so good as to allow the matter to receive consideration.

Lloyd's, E.C.,

18th December, 1900.

I am, &c.,

H. HOZIER,  
Secretary.

The Secretary,  
Meteorological Office.

12. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 9 days, the total number of districts warned being 54.  
In 47 districts the warnings were justified, but in 7 they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
19th December, 1900.

13. *Monthly Weather Report.*—The question of including returns from stations of the First and Second Orders in the Monthly Report was considered, and adjourned for further consideration.

14. It was resolved that the thanks of the Council be given to Lady Strachey for the presentation of a flag to the Office in connexion with the return of the Naval Brigade in May last.

15. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 4th December ... ..	4,114	8	9
Receipts from 5th to 18th December ... ..	16	13	4
	<hr/>		
Cheques drawn from 5th to 18th December ...	4,131	2	1
	31	11	0
	<hr/>		
Cash balance on 18th December ... ..	£4,099	11	1

16. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of May, 1900 (omitted before) :—

The letters used have the following signification :—

a = complete success

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	61	71	66	88
"	b	20	23	22	
"	c	16	3	9	
"	d	3	3	3	
Scotland, E.	a	61	68	65	84
"	b	13	26	19	
"	c	20	6	13	
"	d	6	0	3	
England, N.E.	a	52	68	60	85
"	b	26	23	25	
"	c	16	6	11	
"	d	6	3	4	
England, E.	a	58	52	55	89
"	b	32	35	34	
"	c	7	13	10	
"	d	3	0	1	
Midland Counties	a	77	55	66	86
"	b	10	29	20	
"	c	10	10	10	
"	d	3	6	4	
England, S.	a	65	65	65	91
"	b	23	29	26	
"	c	6	3	5	
"	d	6	3	4	
Scotland, W.	a	52	71	62	88
"	b	32	20	26	
"	c	13	6	9	
"	d	3	3	3	
England, N.W.	a	52	61	57	84
"	b	32	23	27	
"	c	13	10	12	
"	d	3	6	4	
England, S.W.	a	55	71	63	81
"	b	26	10	18	
"	c	13	19	16	
"	d	6	0	3	
Ireland, N.	a	71	68	70	89
"	b	16	23	19	
"	c	7	6	7	
"	d	6	3	4	
Ireland, S.	a	61	74	68	82
"	b	13	16	14	
"	c	16	10	13	
"	d	10	0	5	
SUMMARY.					
British Islands	a	61	66	64	86
"	b	22	23	22	
"	c	12	8	10	
"	d	5	3	4	

17. Submitted—The following list of publications which had been received since the last meeting :—

*Aachen, Meteorologische Station.*—Deutsches meteorologisches Jahrbuch für 1899. Meteorologische Station I. Ordnung in Aachen. Ergebnisse der meteorologischen Beobachtungen . . . . . Herausgegeben . . . von P. Polis. Jahrg., 5.

*Allingham, W.*—Weather “causerie.”

*Azambuja, G. A. de.*—Anuario do Estado do Rio Grande do Sul, 1901. Anno 17.

*Dorpat, Kaiserliche livländische gemeinnützige und ökonomische Sozietät.*—Bericht über die Ergebnisse der Beobachtungen an den Regenstationen 1898, 1899. 2 vols.

*Hamburg, Deutsche Seewarte.*—Deutsche ueberseeische meteorologische Beobachtungen. Heft 9.

*Holitsin, B.*—Meteorological observations at Nova Zembla. App. to the Report of the Expedition of the Imp. Acad. of Science to Nova Zembla in the summer of 1896.

*Moreno y Anda, M., y Gomez, A.*—El clima de la República Mexicana en el año de 1896. Año ii.

*Polis, P.*—Die Entwicklung der Meteorologie unter besonderer Berücksichtigung der Aachener Station im neunzehnten Jahrhundert. Festrede bei der Einweihung des Meteorolog. Observatoriums auf dem Wingertsberg im Stadtgarten zu Aachen.

*Rodriguez, A.*—Sulla pressione atmosferica e sue relazioni con le fasi e posizioni della luna, con un' appendice sui valori d'insolazione raccolti alla Specola Vaticana durante 6 anni.

*St. Petersburg, Central Physical Observatory.*—Report of the Central Physical Observatory for 1898. Presented to the Imp. Acad. Sc. by M. Rikatcheff.

*St. Petersburg, Observatoire Physique Central Nicolas.*—Annales . . . publiées par M. Rykatchew, 1898. Parties i.-ii. 2 vols.

*Wild, H.*—Über den säcularen Gang der Inclination und Intensität des Erdmagnetismus in St. Petersburg-Pawlowsk.

*Zürich, Schweizerische Meteorologische Central-Anstalt.*—Annalen . . . 1898. “Der Schweiz. meteor. Beob.” 35. Jahrg.

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63, Victoria Street, January 16, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.

|

MR. GALTON.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (December 19th, 1900) were read and confirmed.

2. *Antarctic Work.*—The Secretary reported his reply (P.C. 152) to the letter from the Secretary of the Royal Society (Minute 5 of December 19th) concerning Mr. Bernacchi's observations.

It was agreed that, if the Royal Society desired it, arrangements should be made for the reduction and tabulation of the observations by the Office, and that facilities should be given, as far as practicable, for drawing up an introduction and a paper on the relation between wind direction and temperature.

Read—The following letter (M.O. 58), and a memorandum by Captain Hepworth thereupon :—

M.O. 58.

National Antarctic Expedition,  
1, Savile Row, W.  
4th January, 1901.

SIR,

IN view of the approaching voyage of exploration to the Antarctic regions it is of great importance to obtain a full statement of the existing knowledge as to the physical conditions of the Southern and Antarctic Oceans.

I understand that there are many meteorological logs kept by ships when south of 55° S. which have not yet been charted and discussed.

I should be greatly obliged if you would convey to the Meteorological Council my request that they might consider the possibility of undertaking this work, and if it be found possible, that they should sanction the discussion and publication of the results for the Southern and Antarctic Oceans before the date of sailing of the National Antarctic Expedition in July next.

I am, &c.,

CLEMENTS R. MARKHAM.

W. N. Shaw, Esq., F.R.S.,  
Secretary, Meteorological Council.

Resolved—That a letter be sent to Sir C. Markham suggesting that Mr. R. H. Scott should call and formulate a definite proposal after consultation with the Office. (P.C. 151.)

3. *Magnetic Observations at Valencia.*—At the request of Professor Fitzgerald (M.O. 1749) it was resolved to continue the magnetic observations at Valencia for a further period of six months from January 1st, 1901. (See Minute 10 of March 28th, 1900.)

4. *Royal Meteorological Society.*—Read—Letter (M.O. 70) from Mr. Marriott requesting a report upon the work of the Office during 1900 for insertion in the Annual Report of the Council of the Society.

5. *Naval and Military Exhibition at the Crystal Palace, 1901.*—Read—Letter (M.O. 18) asking that the Council would “lend their valued name as supporting the exhibition.”

The Secretary was instructed to reply to the effect that support of the exhibition was not within the scope of the duties entrusted to the Office. (P.C. 173.)

6. *Pilot Charts.*—The final revise (see Minute 7 of December 19th) of the Pilot Chart for January was submitted for approval, together with an estimate by the Marine Superintendent of the number required for issue by the Office.

Certain alterations were approved and a requisition of 650 copies for distribution as specimens, with a circular intimating that it was the intention of the Council to issue similar charts monthly from April 1st, 1901, and specifying the terms of issue, was allowed.

7. *Ben Nevis Observatories.*—Read—The following letter (M.O. 111) :—

M.O. 111.

DEAR SIR RICHARD,

Scottish Meteorological Society,  
10th January, 1901.

SIR Arthur Mitchell has received intimation of a donation of £500 to aid in continuing the Ben Nevis Observatories for another year, or to the end of 1902, which would give time for the completion for the printing in full of the whole of the observations, and of the various discussions which will be published in the same volumes.

In the circumstances may I hope that the Meteorological Council will continue their annual grant of £350 for another year, or to the end of 1902.

Yours faithfully,

ALEXANDER BUCHAN.

8. *Fishery Barometers.*—(1.) Kyle of Lochalsh.—The report (M.O. 1494, 1900) from the Fishery Board for Scotland (see Minute 8 of December 19th) was submitted and found to refer to Kyleakin, also a letter from Mr. Buchan to the effect that if a barometer be provided it should be placed at the railway terminus.

The railway station was approved as a suitable place for a barometer, and it was agreed to supply the instrument if Mr. Buchan's final report upon the matter should be favourable.

(2.) Glenarm.—It was agreed to supply a barometer to be placed in charge of the Chief Officer of the Coast Guard at Glenarm, on the application of the Chief Officer, forwarded by the Coast Guard authorities at Carrickfergus.

9. *Storm Warning Signal*.—It was agreed to make inquiry of the Coast Guard with reference to the application from Lloyd's for a storm cone at Ballycastle (Minute 11 of December 19th).

10. Read—A memorandum from the Marine Superintendent stating that since the last meeting six logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

11. Reported—The following instruments have been ordered since last meeting of Council :—

	Cost	£	s.	d.
New clock and cylinder for Dines' Anemometer at Scilly		4	16	0
6 Maximum Thermometers ... ..	„	4	2	6
6 Minimum Thermometers ... ..	„	4	2	6
2 Stevenson's Screens ... ..	„	4	4	0

14th January, 1901.

R. F. WALLACE.

12. *Instruments for New Guinea*.—Submitted—The following letter (M.O. 103) and enclosure (*see* Minute 9 of May 9th, 1900) :—

M.O. 103.

1, Victoria Street, London, S.W.,

SIR,

15th January, 1901.

IN reference to your letter of the 15th May last, and my subsequent call on you, respecting the desire of the Government of British New Guinea to be furnished with six sets of instruments, I have the honour, by direction, to transmit herewith a copy of a letter received from the Government Secretary, Port Moresby, on the subject, and shall be glad to be advised of the decision of your Council in the matter.

I have, &c.,  
CHAS. S. DICKEN,  
Secretary.

The Secretary,  
Meteorological Office.

[COPY.]

Government Secretary's Office, Port Moresby,  
15th October, 1900.

SIR,

I AM directed by the Lieutenant-Governor to acknowledge with many thanks your letter of the 25th May, and His Excellency fully appreciates the trouble taken by you in respect of certain further sets of meteorological instruments to be used in this Possession.

His Excellency wishes me to say that owing to local difficulties and causes indispensably connected with the initiation of our administrative work in outlying districts it was not easy to keep the instruments or their records and returns in a very satisfactory manner in some cases. Mr. Le-Hunte thinks, however, that now that the Government has become better established, the Meteorological Office may feel more assured that proper attention will be given both to the care of the instruments and regular transmission of returns. His Excellency therefore hopes greatly that the Council may find it possible to supply the instruments requested.

2. With regard to the form to be used, the late Governor, Sir William MacGregor, regarded that of the Council as somewhat elaborate for our circumstances, and approved the one hitherto printed in our Government Gazette when opportunity offered. I think it is possible that the Meteorological Council are not aware that a report on our local observations has been printed yearly in the Annual Report for British New Guinea. If you will be so good as to call their notice to this point and let me know if a set of such reports would be of value to them, I will endeavour to furnish the numbers although some are virtually out of print.

3. I would have returned an earlier reply to your letter, but was under the impression from the last paragraph of your letter above mentioned that I might hear from you again as to the decision of the Council to grant the use of the instruments in question.

I have, &c.,  
A. MUSGRAVE,  
Government Secretary.

C. S. Dicken, Esq., Secretary.  
Agent-General for Queensland.

13. *Admiralty*.—Submitted—The following letter (M.O. 102) :—

M.O. 102.

Admiralty,  
15th January, 1901.

SIR,

I AM commanded by my Lords Commissioners of the Admiralty to request you will inform the Meteorological Council that they consider it will be to the advantage of H.M. Service that Messrs. Coode & Matthews, the Admiralty Resident Chief Engineers at Dover, should receive daily the weather reports and forecasts as well as storm warnings, and my Lords will be glad if arrangements can be made accordingly.

I am to observe that any out of pocket expenses will be repaid by the Admiralty.

As regards the storm warnings, my Lords would suggest that a similar procedure should be adopted as is already applied in the case of the Nore, namely, that the message be sent to the Admiralty and be telegraphed to Dover from this Department.

I am, &c.,  
EVAN MACGREGOR.

The Secretary,  
Meteorological Office.

The Secretary was authorised to make the arrangements asked for.

14. Submitted—The following communication from the International Meteorological Committee (M.O. 1674) :—

M.O. 1674.

COMITÉ INTERNATIONAL MÉTÉOROLOGIQUE.

MONSIEUR ET CHER COLLÈGUE,

Sur la proposition de M. *Mohn*, la conférence à Munich en 1891 a adopté la résolution suivante :

“ Il est recommandé à tous les météorologistes de donner les lectures barométriques réduites à la pesanteur normale aussitôt que possible, au plus tard à partir du 1<sup>er</sup> janvier 1901 ; de plus, dans toutes les Tables et Cartes, il doit être spécifié que la correction a été appliquée. En tête des Tables, la valeur de la réduction à la pesanteur normale sera donnée de telle façon qu'on puisse immédiatement la connaître avec une erreur pas plus grande que  $\frac{1}{10}$  de millimètre.”

Les tables internationales indiquent (page A. 33) la manière de réduire les lectures barométriques à la pesanteur normale, en tenant compte de la latitude et de l'altitude.

La correction ainsi déterminée est une constante pour chaque hauteur barométrique et pour chaque station. En y ajoutant la correction instrumentale et l'effet de la température, il est facile de construire une table nouvelle, qui donnera la pression normale, sans rien changer aux habitudes des observateurs. (Voir : *Meteor. Zeitschr.* 1891. p. 249.)

Il est à désirer que cette méthode soit appliquée à toutes les observations que l'on utilise pour la construction des cartes synoptiques journalières.

Il y a lieu également de réduire à la pesanteur normale les observations publiées dans les annuaires et les bulletins des différents services. On pourrait alors chercher une précision plus grande. Le calcul des variations de gravité a été fait en assimilant la terre à un ellipsoïde formé de couches homogènes. Or, les observations du pendule ont révélé des anomalies nombreuses et importantes, qui tiennent à l'inégale distribution des matériaux du globe. Les différences entre le calcul et l'observation ne sont pas négligeables pour les lectures barométriques. M. *Mohn* a constaté lui-même en Norvège des erreurs qui peuvent atteindre et même dépasser  $\frac{1}{10}$  de millimètre. Il serait donc nécessaire de déterminer en chaque station la valeur exacte de la gravité par des observations du pendule ou de l'hypsomètre.

Le moment n'est guère venu encore de généraliser l'emploi de déterminations aussi précises et la correction habituelle par la formule approchée suffira dans la plupart des cas.

Il importe surtout qu'en tête des tableaux d'observations on indique nettement si les lectures barométriques ont été ramenées à la pesanteur normale et quelle valeur a été adoptée pour la correction, afin que les nombres conservent toujours une signification bien définie.

Nous avons donc l'honneur de vous proposer de mettre en pratique la résolution de la conférence, de Munich à partir du

1<sup>er</sup> janvier, 1901

en adoptant les mesures suivantes :

1<sup>o</sup>. Pour les stations, dont les observations sont transmises par télégraphe aux services centraux les lectures barométriques seront toujours réduites à la pesanteur normale.

2<sup>o</sup>. Dans les tableaux d'observations publiées on indiquera, si les hauteurs barométriques ont été ramenées à la pesanteur normale ou non, et aussi la valeur du terme de correction employé, si les lectures ont été réduites à la pesanteur normale, ou, dans le cas contraire, la correction qu'il conviendrait d'apporter aux nombres des tableaux.

Prier d'adresser les réponses le plus tôt possible au Secrétaire du Comité international.

Agréer, Monsieur, l'assurance de notre plus haute considération.

Paris et Upsal en décembre 1900.

Le Président,  
E. MASCART.

Le Secrétaire,  
H. H. HILDEBRANDSON.

15. *University of Birmingham.*—The Secretary reported that upon the application of Professor Poynting, on behalf of the University of Birmingham, he had given directions for a free copy of the Daily Weather Report to be sent to the University, and for some other publications of the Office to be presented to the library of the University.

Approved.

16. *Edinburgh Museum of Science and Art.*—Read—Letter (M.O. 69) from Mr. F. Grant Ogilvie, of the Edinburgh Museum of Science and Art.

It was agreed to send to the museum a copy of the Daily Weather Report, to place the museum on the list for publications, and to send specimens of records from the instruments if desired for exhibition.

17. *Aneroidograph at Yarmouth.*—It was resolved to obtain a new aneroidograph as a substitute for the one at Yarmouth, and to have the latter repaired and kept in reserve at the Office.

18. *Inspectors' Reports.*—The Secretary was authorised to send a copy of the Inspectors' reports of the stations to the respective observers.

19. *Kew Observatory.*—Submitted—The following report forwarded by the Director of the National Physical Laboratory, in compliance with the request of the Council (Minute 9 of December 5th, 1900) :—

M.O. 1706.

The National Physical Laboratory,  
December 21st, 1900.

DEAR SIR,

I HAVE pleasure in enclosing with this a report on the meteorological observations at the National Physical Laboratory (Kew Observatory), which Dr. Chree, Superintendent of the Observatory Department of the laboratory, has drawn up at my request.

I am, &c.,  
R. T. GLAZEBROOK,  
Director.

The Secretary,  
Meteorological Office.

The National Physical Laboratory,  
December 20th, 1900

DEAR MR. SHAW,

IN accordance with your letter M.O. 1662, I asked Mr. Constable to make any notes that occurred to him, and enclose what he has written. I have also some remarks to add from myself.

*Thermograph.*—The frequent additions of water that appear necessary to the wet bulb thermograph do not appear to me altogether satisfactory. On almost every occasion the watering causes a slight dislocation of the trace and implies a discontinuity in the physical condition of the instrument. When the temperature is below or in the immediate neighbourhood of 32° the behaviour of the wet bulb is decidedly not ideal. This is, of course, a comparatively rare occurrence in most years in this climate. If the Meteorological Office have no definite information as to the relative advantages and disadvantages of the hair hygrometers, which seem pretty commonly used in some foreign countries, it seems a question for examination. Another question that seems to have received much attention abroad is that of the artificial ventilation of thermometers. Assmann's arrangements seem in pretty common use.

*Black Bulb Thermometers in vacuo.*—We have had a good deal of trouble on this head, but I think it is not a subject that the Meteorological Office takes up. Mr. Hicks is making some black bulb thermometers of a new kind which we expect to have an opportunity of examining.

*Sunshine Recorder.*—The Office has been informed before that the time scale of our instrument is not absolutely correct at all seasons of the year. From our experience here we have reason to think that if the different sunshine recorders in use in this country were set up in one place there would be some startling discrepancies. There are differences in the glass and in its back focal length, as well as in the distance between the glass and the cards. Usually the surface of the card comes within the back focal distance, and in consequence, during strong sunshine, the width of the burned strip is sometimes distinctly too large. This tends, of course, to exaggerate the duration of strong sunshine, especially when there are frequent interludes of sunshine and shadow. In faint sunshine, on misty days, there are somewhat conspicuous differences between instruments; in some cases there is no visible record when in other cases it is quite distinct. Those concerned in the development of health resorts are not the most likely persons to appreciate the importance of uniformity in sunshine recorders. If the Meteorological Office saw its way to specify an exact standard there should be a distinct advantage in accuracy.

*Barograph.*—The Office is aware that the compensation for temperature is not absolutely correct. This introduces, of course, variation into the "residual" correction. During 1900 the working

standard barometer—with which the absolute measurements are taken—has been on the whole somewhat dirty. As notified in the “tabulations,” it was recently found necessary to clean the instrument, and as the first attempt was unsuccessful the operation had to be repeated. On these grounds the conditions under which barometer readings have been taken have been more variable and less satisfactory than usual. There have been, however, a good many comparisons of the working standard with the large standards, and it is hoped that no serious uncertainties have been introduced.

*Anemometers.*—During the past year, as repeatedly mentioned to the Office, the behaviour of the Dines’ anemometer in light winds has been unsatisfactory. The last attempts to reduce the friction of the vane have certainly improved the action, but even at its best the instrument is seemingly less satisfactory in light winds than the Robinson, which in its turn is not satisfactory when a constant factor and uniform friction correction is assumed. The more I see of the Dines the stronger is my impression that it is not a proper type of instrument for giving mean velocities or the integral of mean velocity. It seems an absolute waste of the record to regard it as intended for the drawing by hand of a continuous curve through the parts of the sheet where there is most ink. If the instrument is sufficiently dead beat, and the length, section, &c., of the connecting tubes are practically immaterial, then the proper use to make of the trace—supposing the time scale open enough—is to minutely examine the special features of storms. Such an examination should throw light on the existence of quasi wave motion, and by inter-comparison of traces from different stations might enable the persistence of gusts, their rate of transmission, &c., to be investigated. I do not know whether any one (say Professor K. Pearson) has carefully thought what exactly it is one gets by drawing a freehand curve through a Dines’ trace, whether it is a mean velocity or the square root of a mean square. In the case of the Robinson it is certainly not an arithmetic mean velocity that is got from the trace unless the wind be steady. According to the theory which I gave in the *Phil. Mag.* (Vol. 40, 1895, pp. 63–90), when there are large and frequent oscillations in the wind velocity, the Robinson, besides smoothing down the oscillations, exaggerates the mean velocity. A similar theory has since been advanced by Rateau for air meters, and his experiments seem in the case of these instruments in good accord with the theory. I am aware that comparisons made at various stations between Dines and Robinson records, the former treated in the way described above, show very fair uniformity in the ratios of the total monthly runs given by the two instruments. Monthly runs, however, or even those for much shorter periods, comprise a great variety of conditions, and a complete comparison of the two instruments would involve a separation of the records according to wind steadiness as well as velocity.

On the question of the “factor” we know, of course, *a priori* that there is no such thing as a constant factor, and before finally deciding on any change it might be well to consider whether the application of a constant factor is the best that can be done with reasonable regard to labour involved. The application of a constant friction correction at low velocities, irrespective of the peculiarities of particular instruments or the state of the lubricant, is certainly open to criticism. For various reasons, which will be sufficiently understood from remarks made above, the question of the factor should be settled by *direct* experiments with a *Robinson* apparatus of the standard size; and it is much to be desired that the effects of variation in the experimental conditions—answering as nearly as may be to the normal gusty character of wind—should be ascertained. A “factor” based on rotation experiments, in each of which uniform velocity is aimed at, may not be the best to apply to an anemometer working under normal conditions. It is also, I think, open to doubt how far motion in a circle influences the record through centrifugal force effects. The question of anemometer exposure—as well as height above the ground—to which Mr. Curtis has frequently called attention—is also of great importance. In a much sheltered station reducing the factor from 3 to, say, 2.25 would certainly be a step in the wrong direction so far as concerns the deduction of the true wind velocity at a given height above level ground free from trees or buildings. Unless the exposure is really good, it might be best to have various factors according to the wind direction, these being determined by special experiments made with an auxiliary anemometer at the nearest available open space. In comparing small anemometers here we find it expedient to disregard records in south winds, the dome interfering slightly with anemometers placed on the existing staging (though not, we hope, with our standard Robinson itself).

*Atmospheric Electricity.*—In the summer some experiments were made as to the relative goodness of insulation afforded by the Mascart insulators employed here and by blocks of solid paraffin and sulphur. When quite fresh and free from dust the paraffin and sulphur—which gave almost identical results—insulated very decidedly better than the Mascart’s. After, however, several weeks’ use this superiority had very much diminished; but it was thought that if an arrangement were devised protecting the sulphur or paraffin from dust, one or other might probably be a distinct improvement on the Mascart’s. At Lyons, Le Cadet describes the use of sulphur pillars—replaced at intervals—as a great improvement on the insulators previously tried, and the present acting Director of Batavia Observatory spoke warmly of stearine pillars replaced monthly. It is desirable that the insulation should be as nearly uniform as our variable climate permits, otherwise there are difficulties in the interpretation of the records from the water dropper. We cannot at present claim to have reached the standard of uniformity that is desirable. Partly as a check on the insulation, eye observations with a portable electrometer have been made as regularly as circumstances allowed on a pillar in the garden.

During the experiments with the paraffin and sulphur insulators some of the results suggested, if they did not absolutely prove, that when the thermometer apparatus in the same room was heated to near the boiling point the insulation fell off. Vapour—whether steam or products of combustion—is *a priori* a probable cause of defective insulation. The Director has, however, decided to put up a partition across the room, so that in the near future this probable source of disturbance will be removed or much reduced.

In some of his recent work Lord Kelvin found that a water dropper generated electricity to some extent, but expressed the opinion that with an instrument working, like ours, in the open air this defect is wholly negligible. It may, however, be doubted whether in very calm weather such is absolutely the case.

*Rain Gauge.*—Besides the pen referred to by Mr. Constable, trial was made both on the rain gauge and on the Dines anemometer of a Dittmar pen obtained from the Cambridge Instrument Company, but the results were not satisfactory in either case.

When inspecting the electrograph curves casually alongside of the rain cards, at times when negative potential has existed, I have been struck by the fact that the scale of the rain gauge cards seems rather contracted for this kind of work. When a sudden change of potential arises it would be interesting to know whether there has been any corresponding irregularity in the rainfall. Again with a very light rainfall the change of ordinate in the rain curve is so microscopic, taking the thickness of the line into account, that sometimes one is in doubt whether negative potential has or has not been accompanied by rain.

*Earth Thermometry.*—Nothing has been done in this direction here since a report was made on the electrical resistance thermometers kept underground for a year.

CHARLES CHREE.

#### NOTES ON M.O. LETTER NO. 1662.

The self-recording instruments as a whole are working well, and considering the length of time they have been in use, they show but little signs of wear, the most pronounced wearing being naturally in the pallets and escape wheel of the driving clocks.

There are a few small details which could be improved upon.

1. Anemometer.—The records on the metallic sheets as at present used are very indistinct indeed in damp weather, and the substitution of silver for present brass helices would largely overcome this, or failing this change, then the metallic surface of the paper should be better than it is now.

The question of the continued employment of the factor 3 wants discussion, and it seems a pity to go on indefinitely producing curves and records which are known to be erroneous.

2. Photographic sheets.—A reduction in the annual cost of the photographic paper could be obtained by discontinuing the use of the "second" or duplicate curves on the barograph and thermograph.

Personally, I think these duplicate curves are now unnecessary, as a total failure with the present gelatino-bromide sheets is practically unknown, and the "second" sheets have been dropped at Oxford and Valencia.

3. Rain gauge.—The Willesden sheets now used for this instrument have proved to be an improvement, where care has been taken with them, but the pens are rather too liable to sudden death if jammed or knocked, and we are trying to improve upon this by the use of a silver barrel pen which is stouter and more rigid and has very little of the ink exposed.

The Beckley rain gauge is now looked upon as the M.O. standard, but its present make, &c., can be decidedly improved upon.

In practical use it has the following faults:—

1. The scale, both as to rainfall and time is much too contracted.
2. The rate of emptying is not fast enough.
3. Also the float-receiver should be made to hold more than at present before discharging, say 0.3 or 0.4 inch. This would reduce considerably the number of emptyings for a given fall, and in conjunction with an improvement in No. 2 would be decidedly better, as with the present arrangement there is always a doubt in *very* heavy rains—such as accompany thunderstorms, &c.—as to whether the falling rain is not escaping as the water empties out.

A rectangular lamp, say same length as inside of iron cover, with a small circular wick should be provided for use in snowstorms, &c. The evaporation, caused by warming the bottom of receiver and pipe, could be neglected, bearing in mind the ordinary conditions prevailing with snow measurements.

E. G. C.

20. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council:—

#### WARNINGS ISSUED.

The signals were hoisted on 14 days, the total number of districts warned being 99. In 76 districts the warnings were justified, but in 23 districts they were not required.

#### GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDERIC GASTER.

Telegraphic Branch,  
16th January, 1901.

21. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of December, 1900 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	45	74	60	88
"	b	36	20	28	
"	c	6	3	4	
"	d	13	3	8	
Scotland, E.	a	35	58	47	82
"	b	42	29	35	
"	c	13	13	13	
"	d	10	0	5	
England, N.E.	a	45	68	57	87
"	b	42	19	30	
"	c	10	13	12	
"	d	3	0	1	
England, E.	a	42	58	50	83
"	b	39	26	33	
"	c	13	13	13	
"	d	6	3	4	
Midland Counties	a	39	58	49	78
"	b	39	20	29	
"	c	16	19	18	
"	d	6	3	4	
England, S.	a	45	55	50	84
"	b	42	26	34	
"	c	13	16	15	
"	d	0	3	1	
Scotland, W.	a	19	84	52	87
"	b	58	13	35	
"	c	13	0	7	
"	d	10	3	6	
England, N.W.	a	32	65	49	87
"	b	45	32	38	
"	c	20	3	12	
"	d	3	0	1	
England, S.W.	a	35	65	50	89
"	b	52	26	39	
"	c	13	3	8	
"	d	0	6	3	
Ireland, N.	a	26	78	52	83
"	b	42	19	31	
"	c	23	0	11	
"	d	9	3	6	
Ireland, S.	a	29	68	49	81
"	b	39	26	32	
"	c	19	3	11	
"	d	13	3	8	
SUMMARY.					
British Islands	a	36	67	52	85
"	b	43	23	33	
"	c	14	8	11	
"	d	7	2	4	

22. Submitted—The following reports of work during the month of December, 1900 :—

**MARINE BRANCH.**

15th January, 1901.

Examined nine new logs.

Discussion of the Southern Ocean from the west coast of Africa to longitude 90° W. Tabulating and grouping the winds, and summing and meaning the instrumental observations; preparing wind-roses for areas round the South American coasts; and examining a proof of the engraved January coastal chart.

North Atlantic and Mediterranean Pilot Charts for 1901. February and March prepared, and April in course of preparation. Examining proofs of the lithographed Form chart, and the letterpress for the January issue.

North Atlantic weather during the winter of 1898–99. Reading proofs of letterpress.

Preparing sunrise and sunset tables for use in the Daily Weather Reports for January.

CHAS. HARDING.

**PANTAGRAPH ROOM.**

1st January, 1901.

*Hourly Means.*—Proofs of the volume for 1897 have been read and revised up to page 208, leaving 32 pages to complete the work.

About one-fourth of the various tables of mean values, &c., required for the volume for 1898 are now completed.

*Daily Means of Temperature.*—The discussion of these values has occupied a good deal of time. Curves have been drawn, and special work done in two or three directions.

*Miscellaneous.*—(1.) Mean values calculated for Falmouth and Aberdeen to test the effect of high water on the barometric tide.

(2.) A rainfall "Form" for use with the self-registering gauge has been ruled on copper.

R. H. CURTIS.

**EXAMINATION BRANCH.**

1st January, 1901.

*Examinations.*

October, 1899.—Completed.

November and December, 1899.—Proceeded with.

January to August, 1900.—Kew work proceeded with.

October and November, 1900.—Valencia work proceeded with.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.*

October, 1899.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

Correcting proof of Inspection Notes.

Fort William Dry and Wet Bulb Scale Values—Measurements for checking.

T. E. ALLEN.

**LAND ROOM.**

14th January, 1901.

*Enquiries during December, 1900.*

1. Dr. G. A. Crace-Calvert.—Further enquiry as to sunshine and rainfall in North Wales, &c. (M.O. 1598.)

2. M. Demtschinsky.—For daily means of pressure and temperature at four British stations during the period 1882–1900. (M.O. 1571.)

3. Messrs. D. McGregor & Co.—Average rainfall in Mid Lanark and at Forres. (M.O. 1710.)

4. Sir Norman Lockyer, F.R.S.—For rainfall values for Mauritius, St. Helena, and New Zealand. Also prevalent wind directions in New Zealand. (M.O. 1714.)

JOHN A. CURTIS.

In addition to the enquiries referred to above, there were 24 personal enquiries during December for forecasts or other weather information, and 15 enquiries by telegraph.

## 23. Submitted—The following Statement of Accounts :—

	£	s.	d.
Cash balance on 18th December ... ..	4,099	11	1
Receipts from 19th December to 15th January ...	4,910	7	10
	<hr/>		
	9,009	18	11
Cheques drawn from 19th December to 15th January	1,796	11	5
	<hr/>		
Cash balance on 15th January ... ..	£7,213	7	6
	<hr/> <hr/>		

## 24. Submitted—The following list of publications which had been received since the last meeting :—

*Bombay, Meteorological Office.*—Brief sketch of the meteorology of the Bombay Presidency for 1899–1900.

*Carlsruhe, Centralbureau für Meteorologie und Hydrographie.*—Beiträge zur Hydrographie des Grossherzogthums Baden. X Heft : Die Niederschlagsverhältnisse des Grossherzogthums Baden. Zweite Bearbeitung.

————— Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogthum Baden. 1900. 1. Halb.

*Durban, Natal Observatory.*—Report of the Government Astronomer for the year 1899.

*Georgetown, Demerara.*—Meteorological observations taken at the Botanic Gardens, Georgetown, April 1899 to March 1900.

*Helsingfors, Finska Vetenskaps-Societeten.*—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. 40–42. 1897–8—1899–1900. 3 vols.

*Kitto, E.*—Cornwall as a winter resort. Fourth edition. Revised by E. Kitto.

*Lloyd's Calendar*, 1901.

*London, Admiralty, Hydrographic Department.*—Report on sounding cruise of H.M.S. "Egeria" (Commander Morris H. Smyth), on the proposed Pacific cable route, by Lieut. B. T. Somerville, R.N. North Pacific Ocean, 1899.

*London, Meteorological Office.*—Report of the Meteorological Council for the year ending 31st of March, 1900.

*Margules, Max.*—Temperaturstufen in Niederösterreich im Winter 1898–99.

*Müttrich, A.*—Ueber den Einfluss des Waldes auf die Lufttemperatur nach den in Eberswalde an verschieden aufgestellten Thermometern gemachten Beobachtungen.

*Newquay, Urban District Council.*—Annual report of the Medical Officer of Health and meteorological report. 1897, 1898. 2 vols.

————— Annual report on the health and sanitary condition of the town and urban district of Newquay. 1899.

*Oña, Observatorio.*—Observaciones meteorológicas hechas en el Colegio Máximo de la Compañía de Jesus en Oña, Provincia de Burgos. 1900.

*Rotch, A. L.*—The international congresses of meteorology and aeronautics at Paris.

*St. Petersburg, Observatoire Physique Central Nicolas.*—Atlas climatologique de l'Empire de Russie, publié par l'Observatoire Physique Central Nicolas à l'occasion du cinquantième anniversaire de sa fondation. 1849–1899.

*Trieste, Osservatorio Astronomico Meteorologico.*—Rapporto annuale . . . . contenente le osservazioni meteorologiche di Trieste e di alcune altre stazioni Adriatiche per l'anno 1897. Vol. 14.

*Washington, Department of Agriculture, Weather Bureau.*—W.B., No. 232. Bulletin H. West Indian hurricanes. By E. B. Garriott.

## 25. It was agreed that the next meeting but one be on February 12th.

63, Victoria Street, January 30, 1901.

## PRESENT :

SIR R. STRACHEY IN THE CHAIR.

MR. BUCHAN.  
PROFESSOR DARWIN.MR. GALTON.  
THE HYDROGRAPHER.MR. SHAW (*Secretary*).

1. The Minutes of the last meeting, January 16th, were read and confirmed.

With reference to Minute 16, in compliance with a request forwarded through Mr. Buchan (M.O. 199), the Secretary was authorised to supply instruments on the usual terms to the Museum of Science and Art, Edinburgh.

2. Resolved—That on the occasion of the funeral of Her late Majesty, Queen Victoria, on Saturday, February 2, the Office be closed except for necessary telegraphic work.

3. *Antarctic work* (see Minute 2 of January 16).—Read—The following letter (M.O. 169) from Sir Clements Markham.

M.O. 169.

National Antarctic Expedition, W.,  
January 24th, 1901.

DEAR SIR,

WITH reference to your letter of the 17th inst., I beg to say that the Committee would be glad to obtain the copy of the following data from the Meteorological Office :—

1. Those relating to squares 493-499 incl.
2. Those relating to squares 500-503 incl.

in the form of the new office data books.

The Committee are prepared to allot a sum not exceeding £25 (twenty-five pounds) towards the cost of this extraction.

Yours faithfully,  
CLEMENTS R. MARKHAM.W. N. Shaw, Esq., F.R.S.,  
Meteorological Office.

The Secretary reported that :—

Dr. R. H. Scott, Capt. Scott, and Dr. Gregory called at the Office on Saturday, January 19th, and the question of the supply of Meteorological data from the Office records for the use of the Antarctic expedition was discussed at an interview between these gentlemen, the Secretary, and the Marine Superintendent. It transpired that the data desired were (1) those relating to squares 493 to 499, inclusive (2,996 days' observations), for the use of the Meteorologists of the expedition; (2) those relating to squares 500 to 503, inclusive (207 days' observations) for the use of the Magneticians; that a manuscript copy of the data in the form of the new office data-books would meet the requirements.

The question of the cost of making the extracts and of the provision of the necessary funds was not dealt with at the interview.

Of the staff of the Marine Department of the Office, five, namely, two boy-clerks and three female clerks, are now engaged upon work exactly corresponding to what is asked for but for entirely different longitudes. The female clerks are, however, from time to time engaged also in drawing windroses to represent the mean results obtained. When all five are engaged in extracting data from the logs they accomplish the work at about the rate of 1,000 days' observations per week. The appropriate logs are selected and set apart for them and the results are subsequently checked by one or other of the classified clerks of the department.

To complete the work asked for by the end of May, starting on February 1st (3203 days' observations in 13 weeks) would necessitate the diversion of one boy-clerk or one female clerk to the exclusive purpose of extracting the desired data from the logs and occupy a substantial portion of the time (3 weeks) of another. Moreover the necessary selection and preparation of the logs and the checking of the results would have to be provided for in addition.

The work if carried out in this manner, with provision for retaining an office copy, could only be regarded as anticipating the work which would, sooner or later, be done in the same form by the Office, if the Council should decide that the work which is now being carried out for the South Atlantic should be, in course of time, extended to the South Pacific without change of general plan.

The work would occupy 84 monthly data books of 50 pp. each for that marked (1) with an average of nearly 36 days' observations in each book. For that marked (2) a single data book for each square for the 12 months would probably suffice with an average of 50 days' observations in each book.

The Secretary was authorised to make arrangements for furnishing the data asked for on the terms of Sir C. Markham's letter.

4. *India Office, Mr. J. Allan Broun's MSS.*—Submitted—The following letter (M.O. 138) and enclosure :—

M.O. 138.

India Office,  
January 21st, 1901.

SIR, WITH reference to the letter from the Meteorological Office, M.O. 109, dated 13th February, 1891, I am directed to forward herewith a copy of a letter from the Government of India regarding the disposal of the manuscript volumes of Mr. Broun's Meteorological Observations, and request that you will will be so good as to communicate your wishes in the matter at an early date.

I am, &c.,  
A. N. WOLLASTON,  
Registrar and Superintendent of Records.

The Secretary,  
The Meteorological Office.

No. 279.

GOVERNMENT OF INDIA.—DEPARTMENT OF REVENUE AND AGRICULTURE.  
(Meteo.)

Calcutta,  
December 13th, 1900.

SIR, I AM directed to advert to despatch No. 48, dated 22nd October, 1890, to Her Majesty's Secretary of State for India, in which the Government of India intimated their willingness to undertake the publication of the manuscript volumes of the late Mr. J. A. Broun's Meteorological Observations taken at Trevandrum.

The work of editing and publishing these records which was entrusted to the present Meteorological reporter to the Government of India has been completed and Mr. Eliot solicits orders as to the disposal of the manuscript. The records were transmitted to India with Lord Cross' Despatch No. 20, Public (Records) of the 5th March, 1891, and, so far as the Government of India are aware, no condition was made as to their eventual disposal. I am to suggest that the wishes of the heirs of the late Mr. Broun should be ascertained as to the disposal of the original manuscripts.

I have, &c.,  
(Sd.) J. HOLDERNESS,  
Secretary.

To Her Majesty's  
Under Secretary of State for India.

The Secretary was directed to write in reply explaining that the documents were handed over by Mrs. J. A. Broun to the Office, and intimating that in the opinion of the Council they should remain in the custody of the Meteorological Department of the Government of India.

5. *Foreign Office, Victoria Nyanza Observations.*—Submitted—the following letter (M.O. 174) and enclosures :—

M.O. 174.

Foreign Office,  
January 26th, 1901.

SIR, I AM directed by the Secretary of State for Foreign Affairs to transmit to you to be laid before the Council the accompanying documents, as marked in the margin, relative to the Lake-levels of Victoria Nyanza.

In Sir H.  
Johnston,  
No. 233.

I am to request that you will be good enough to forward a copy of these documents to Mr. Ravenstein.

Sir H. John-  
ston, No. 225.

I am, &c.,  
FRANCIS BERTIE.

The Secretary  
To the Meteorological Council.

No. 225.—UGANDA.

Entebbe, Uganda,  
October 29th, 1900.

MY LORD, I HAVE the honour to inclose herewith the papers showing the levels of Lake Victoria Nyanza from November, 1899, to September, 1900, at Entebbe, and from March, 1900, to July, 1900, at Port Ugowe.

Owing to my absence in the western part of the Protectorate and to the delay in sending these on the part of the person charged with the task—a delay which was in no way his fault, and which

it would be tedious to explain further—the lake levels for transmission to the Foreign Office were kept back until my return.

I understand, however, that Mr. Cunningham on his own responsibility sent the lake levels to Lord Cromer, as he imagined that any delay in this respect might be inconvenient.

I have, &c.,  
(Signed) H. H. JOHNSTON,  
Her Majesty's Special Commissioner.

The Marquess of Salisbury, K.G., &c.

It was agreed to comply with the request of the Foreign Office. It was also understood that communication with respect to the observations would be made by the Chairman to the Royal Geographical Society.

6. *Royal Meteorological Society*.—Submitted—The following note in reply to Mr. Marriott's letter (*see* Minute 4 of January 16th) :—

NOTE ON THE WORK OF THE METEOROLOGICAL OFFICE DURING THE YEAR, 1900.

The routine work of the Office has been continued as heretofore. The demand for information on the part of the public has increased; especially for forecasts of weather during the harvest season, which, by direction of the Council, are sent daily to agriculturists and others, who desire to have them for public use, at the cost of the telegrams only.

The annual volume of five day means of hourly readings of self-recording instruments at Valencia, Kew, Falmouth, Fort William, and Aberdeen for 1896, has been issued; that for 1897 is completed and nearly ready for issue. The volume of observations at second order stations for 1897 is now issued.

Mean values of all the elements, with extremes of temperature for 30 years, at the telegraphic reporting stations for the six months, January to June, were prepared for issue on January 1st, 1901, as a supplement to the Daily Weather Report; the corresponding values for the remaining six months will be ready shortly and will be issued on July 1st, 1901.

On August 1st, 1900, a number of changes were introduced in the Daily Weather Report, which had for their main objects, the extension of the area for which information is given, and the addition of some particulars as to British stations which send daily information to the Office.

From the beginning of the current year, the latter object will be more fully served by including returns sent by post or by telegraph from observers in various parts of the country to whom the Council are greatly indebted for this assistance.

Each day's report now includes a barometric chart for the whole of Europe, for the morning of the previous day, with climatic information about a number of selected stations regarded as being of special importance to travellers.

Moreover, the Council have made temporary provision for the sale at 1d. each of single copies of the Daily Weather Report, at the Office and at the following terminus railway stations :—King's Cross, St. Pancras, Euston, Victoria, and Charing Cross.

In the supplementary information in the Daily Weather Report, it is clearly brought out that the observations in the United Kingdom at 8 a.m. are taken at an hour later than the corresponding observations on the Continent. To avoid the inconvenience of reports arriving so late the Dutch and German Weather Departments have applied to the Council for a special service of observations at 7 a.m. (G.M.T.) at some of the British stations and the Council have made the necessary arrangements. The additional service has now been in operation since May 1st, 1900.

The authorities of the Deutsche Seewarte also solicited the co-operation of the Council in furnishing data with regard to pressure, temperature, and rainfall at four British stations, for a series of charts of ten-day means of pressure and temperature for practically the whole of the Northern hemisphere, with the exception of the Pacific Ocean. Commencing with the first ten days of July, these "decadic" charts are now being issued by the Seewarte as a supplement to its daily report, about three weeks after the conclusion of the successive ten-day periods.

By international agreement, simultaneous investigations of the upper air by means of balloons and kites take place in various countries of Europe on the first Thursday in each month. The special circumstances of the case prevent the Council initiating experiments of this character in the British Isles, but ascents of unmanned balloons (ballons sondes) have been arranged on the days agreed upon, by Mr. P. Y. Alexander, of the Experimental Works, Bath. In connexion with the ascents, Prof. Hergesell, of Strassburg, Chairman of the International Sub-Committee for Aeronautics, requested the co-operation of the Council in the collection of cloud observations for the day preceding and the day following, as well as for the day of each ascent. The following observatories have expressed their willingness to co-operate in this matter :—Greenwich, Kew, Oxford, Glasgow, Rousdon, Valencia, Falmouth, Liverpool, Stonyhurst, and Aberdeen. They forward to the Office observations of clouds for the three appropriate days of each month, for transmission to Prof. Hergesell, who undertakes the necessary arrangements for collating the results.

In the autumn the Council issued the English version of the report of proceedings of the St. Petersburg meeting of the International Committee in 1899. The most conspicuous feature of the publication is a long report by M. Violle, upon the measurement of Solar radiation; meteorological work with kites and balloons receives its share of attention, and nearly all subjects of recent meteorological investigation are touched upon.

At the instance of the Council, Mr. C. T. R. Wilson, F.R.S., has been continuing his researches into the phenomena associated with atmospheric electricity. A report upon his work will be presented to the Royal Society at the end of January, 1901.

It has been publicly announced that the site of the new departments of the National Physical Laboratory will be at Bnshey Park instead of in the Old Deer Park, Richmond, as originally arranged. The Council are, however, glad to have learned that this change of place will not interfere with the continuity of the meteorological records of Kew Observatory, where the instruments belonging to the Council will still be maintained.

In the Marine Department the Charts illustrating the weather in the North Atlantic during the winter of 1898-9, which formed the subject of a paper by the Marine Superintendent at the British Association at Bradford are now ready for issue, with an introduction and notes, and represent a very striking example of a peculiar type of distribution of atmospheric conditions producing unusual warmth on the East of the Atlantic with unusual cold on the Western shores.

The Council have made arrangements for issuing a monthly Pilot Chart of the Atlantic Ocean and the Mediterranean Sea, commencing from April, 1901. It is intended to make the Charts available for issue gratis to Captains and Officers of the Mercantile Marine, who are on the Office list as observers and to place them on sale for other members of the same service. In this work the Board of Trade have kindly given their assistance by undertaking the distribution of the Charts through the Offices of the Mercantile Marine at certain ports. The Charts will also be on sale to the public, through the usual Agents of H.M. Stationery Office. The Meteorological Office will receive and transmit to the Agents the names of subscribers if desired.

Approved.

7. *U.S. Weather Bureau*.—Submitted—The following letters from the Chief of the United States Weather Bureau respecting the transmission of reports by cable (*see* Minute 3 of November 21st).

M.O. 1709.

U.S. Department of Agriculture,  
Weather Bureau, Washington, D. C.,

December 3rd, 1900.

MY DEAR COLLEAGUE,

I AM in receipt of your letter of November 16th, 1900, and beg to say that your summary therein of the plan of cable reports from London to Washington accords with the plan of this office, as outlined in previous correspondence. In detail, the plan is as follows:—

Reports are desired from London, Valentia, Blacksod Point, Malin Head, Stornoway, Sumburgh Head, Paris, Cuxhaven (to represent Hamburg), Lisbon, and Ponta Delgada.

As regards the time of cabling the reports it is desirable that they shall be received at this office not later than noon, Greenwich mean time; therefore it is not deemed advisable to delay the message on account of late reports from Lisbon or Ponta Delgada, after 11 a.m. Greenwich Mean Time.

As regards your suggestion to number the stations instead of naming them in the cablegrams, and, in case of missing reports, send the word "wanting" or some other code word to take the place of the missing reports, it has been the experience of this office that confusion will arise, often at critical times, when code words are subjected to the liability of clerical and telegraphic errors. It is believed, for this reason, that it will be well to name each station and follow the name with the report for that station. No mention need then be made of missing stations.

In anticipation of your instructions for beginning the service from London, necessary arrangements with the cable company regarding the payment of cable tolls will be made by this office.

You will please find herewith a copy of the Weather Bureau code arranged for cabling the data desired. Each station will require three words; the first word will be the name of the station; the second, the reading of the barometer and the temperature of the air; the third, the direction of the wind and the state of the weather, and the force of the wind. In sending the force of the wind it will be necessary to give the nearest force, in even numbers, on a scale of 0 to 12; when the force is represented by an odd number the next highest even number code word can be sent. When a wind direction and no force is reported the "O" word can be sent. Please address the messages "Weather, Washington." No signature or name of sender will be required.

Trusting that the proposed extension of our service will render possible storm forecasts which will be of benefit to the shipping interests of the North Atlantic, and acknowledging the kind co-operation on your part, without which this result would be rendered very remote, if not impossible of achievement, I beg to thank you for your very marked courtesy to the Weather Bureau, and for the great interest you have manifested in our work, and to say that we are prepared to at any time serve you and the interests you represent to the extent of our resources.

Very sincerely yours,

WILLIS L. MOORE,  
Chief U.S. Weather Bureau.

Mr. W. N. Shaw,  
Secretary Meteorological Office,  
London, S.W.

M.O. 159.

U.S. Department of Agriculture,  
Weather Bureau, Washington, D. C.,

January 12th, 1901.

MY DEAR COLLEAGUE,

IN reply to your favour of the 22nd ult., I beg to say that with the exception of December 28th and 29th, when your region of observation was swept by a storm of exceptional severity, which doubtless disarranged lines of telegraphic communication, your cablegrams have been promptly received. As regards the Ponta Delgada report, it is a matter of regret that a report of such importance to North Atlantic and European meteorological work, as viewed from a forecasting point of view, cannot be given a better service by the Portuguese cable officials. In this connection please accept my thanks for your kindness in responding to my cable of the 5th inst., in which I asked you to, if convenient, cable the Lisbon and Delgada reports special when received.

The Weather Bureau has been in correspondence with Captain Chaves, Director of the Ponta Delgada Observatory, and an agreement has been reached whereby reports by cable will be interchanged between Washington and Horta, Fayal. As Captain Chaves will remain in Portugal, in the interest of a weather service for the Azores, until February, the time of beginning of the interchange of the reports referred to cannot now be determined.

The cipher code which will be used in cabling the reports is identical with that which has been used nightly for some years by this office in cabling meteorological and hydrographic data to Professor Mascart at Paris. By means of this cipher the principal areas of high and low barometer of the North American continent are located, the course of the line of 30.00 inches of pressure which surrounds the principal area of low barometer is followed and reports of derelicts, icebergs, fogs, &c., as furnished by lately arrived steamers, are provided for. The cablegrams vary in length from three to 12 words. In a previous letter you expressed the hope that you would be able at some future time to make some demands upon this office for data. Such demands will be welcome to the Weather Bureau, and they will be met in a manner which will indicate the degree of appreciation in which your most courteous and valuable co-operation is held.

In connection with your remarks concerning the delivery of messages to the Western Union Company, I beg to say that in case any difficulty is experienced in arranging for a messenger to call daily, including Sundays, for the messages, this office will undertake to arrange for the service desired. We desire to put you to the least possible trouble in rendering the service we receive.

The question of identifying the whole inches of the barometer readings is one that will occasionally be presented. It is, however, possible, as a rule, to identify the inches by the other conditions reported.

Again thanking you for the very successful operation of the plan of cablegrams, and for substantial evidences of your interest in the work, I am,

Very truly yours,

WILLIS L. MOORE,

Chief U.S. Weather Bureau.

Mr. W. N. Shaw,  
Secretary Meteorological Office,  
London, S.W.

8. *Ben Nevis Observatories* (Minute 7 of January 16th).—The consideration of the question of a grant in aid of the observatories for the year 1902 was postponed pending the receipt of a formal application from the directors of the observatories.

9. *International Catalogue of Scientific Literature*.—The consideration of an invitation from the Royal Society (M.O. 200) to subscribe for one or more of the following 17 annual volumes:—Mathematics, Mechanics, Physics, Chemistry, Astronomy, Meteorology (including Terrestrial Magnetism), Mineralogy (including Petrology and Crystallography), Geology, Geography (Mathematical and Physical), Palæontology, General Biology, Botany, Zoology, Human Anatomy, Physical Anthropology, Physiology, (including Experimental Psychology, Pharmacology, and Experimental Pathology), and Bacteriology, at an average cost of £1 per volume was postponed for further information respecting the range of the several subjects.

10. *Pilot Charts*.—A draft circular to accompany specimen copies of the charts (Minute 6 of January 16th) was referred to the Hydrographer.

11. *Lloyd's Stations* (see Minute 5 of October 24th).—Submitted—The following letter (M.O. 153):—

M.O. 153.

Lloyd's, E.C.,

January, 22nd 1901.

SIR,

WITH reference to previous correspondence with regard to the proposal that Lloyd's signalmen at certain foreign stations, viz., Point de Galle, Cape Verde, and Sabang Bay, should take observations

for the Meteorological Office, and also with reference to the letters which you were good enough to address me on the 2nd, 18th, and 27th July, 1900, I am instructed by the Committee of Lloyd's to write to you as follows :—

The Committee will be very pleased to give instructions to the signalmen at the above places to take meteorological observations and keep records for the Meteorological Office, provided that no unforeseen difficulties arise in consequence of these men not being Britons, and not understanding the language of this country or our system of measurement.

At Point de Galle watch is kept day and night, and therefore, if the signalmen, who are natives, are competent to keep the log, there can be no objection to the log being kept in the form of the Meteorological Register suggested by you and enclosed in your letter of the 17th July.

In the case of Cape Verde and Sabang Bay watch is only kept in the day time, and therefore, it would be impossible for the men to fill in records of observations which should be made during the night, but I enclose herewith a form of Return\* of Meteorological Observations similar to that which is kept at Lloyd's signal station at Cape Spartel and forwarded to the Meteorological Office, and if this would meet the requirements of the Office, endeavours will be made to have such a form filled up and forwarded periodically from Lloyd's signal stations at Cape Verde and Sabang Bay.

My Committee feel that it would be a graceful act on the part of the Meteorological Council if the Council would provide the necessary instruments for taking these observations.

I should be grateful if you would be so good as to permit me to be favoured with a few further copies of the form of Meteorological Register enclosed with your letter of the 17th July last, and also a copy of the instructions furnished by the Meteorological Office to Lloyd's signal station at Cape Spartel with regard to weather observations at that station.

I am, &c.,  
H. M. HOZIER,  
Secretary.

The Secretary,  
Meteorological Office.

12. *Instruments for New Guinea* (Minute 12 of January 16th).—The matter was referred to the Secretary for despatch with the understanding that the Council desired observations from New Guinea, and would furnish instruments if they could be assured of receiving the observations.

13. *Fishery barometers, Kyle of Lochalsh* (*see* Minute 8 of January 16).—Mr. Buchan's final report being favourable, it was agreed to supply the instrument as requested.

14. *Read*—A memorandum from the Marine Superintendent stating that since the last meeting three logs had been received, one of them being excellent.

The Secretary was directed to return the best thanks of the Council to the observers.

15. Submitted the following :—

RETURN of ADMIRALTY INSTRUMENTS in the OFFICE and at HER MAJESTY'S DOCKYARDS  
for Quarter ending 30th September, 1900.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office.	Available, 1st July, 1900	53	123	162	73	57	44
	Received, new ... ..	—	—	—	5	4	—
	"    repaired, cleaned ... ..	20	36	13	2	5	—
	Total ... ..	73	159	175	80	66	44
	Issued ... ..	4	16	50	8	5	4
Sept. 30, 1900 ...	Total available ... ..	69	143	125	72	61	40

\* Form 19.

## COMPARISON of ESTABLISHMENT and STORE.

Depôts.	Barometers.				Thermometers.							
	Mercurial.		Aneroid.		Ordinary.		Max.		Min.		Screens.	
	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.	Est.	Store.
Meteorological Office, 1st October, 1900 ...	45	69	120	143	250	125	80	72	80	61	50	40
Portsmouth, 1st October, 1900 ...	25	20	55	35	150	148	50	51	50	57	25	22
Devonport " ...	25	17	55	44	150	145	50	42	50	43	22	10
Chatham " ...	25	8	55	21	150	99	50	39	50	38	25	12
Sheerness " ...	6	2	15	6	30	14	10	5	10	5	10	7
Total ...	81	47	180	106	480	406	160	137	160	143	82	51
Queenstown, 1st October, 1900 ...	2	2	2	4	3	9	3	3	3	3	0	0
Gibraltar " ...	2	2	2	2	4	9	3	3	3	3	0	0
Malta " ...	11	10	15	13	60	52	10	12	10	11	1	1
Bombay " ...	4	4	3	5	10	10	4	5	4	6	1	2
Halifax " ...	3	4	4	4	20	19	4	4	4	3	1	2
Bermuda " ...	3	4	4	9	20	17	4	4	4	5	1	1
Jamaica " ...	3	3	2	4	10	16	2	0	2	1	1	1
Cape of Good Hope " ...	4	2	6	5	20	23	4	6	4	2	1	2
Trincomalee " ...	3	4	3	5	10	21	4	5	4	6	1	1
Hong Kong " ...	12	6	12	10	30	7	12	9	12	10	2	6
Coquimbo " ...	2	3	4	4	15	18	2	3	2	4	1	1
Sydney " ...	5	3	6	4	25	16	6	6	6	8	1	2
Esquimalt " ...	4	1	5	3	15	2	2	2	2	3	1	2
Total ...	58	48	68	72	242	219	60	62	60	65	12	23

## NET DEFICIENCIES.

Date.	Particulars of Surp'ns (+) and Shortage (-).	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1st Oct., 1900	Meteorological Office ...	+24	+23	-125	- 8	-19	-10
	Dockyards—Home ...	-34	-74	- 74	-23	-17	-31
	" Abroad ...	-10	+ 4	- 23	+ 2	+ 5	+11
	Net shortage ...	-20	-47	-222	-29	-31	-30

## COMPARISON of EXISTING STOCK of INSTRUMENTS AVAILABLE for ISSUE with ESTABLISHMENT.

1st Oct., 1900	Establishment at—						
	Meteorological Office ...	45	120	250	80	80	50
	Dockyards—Home ...	81	180	480	160	160	82
	" Abroad ...	58	68	242	60	60	12
	Total Establishment ...	184	368	972	300	300	144
	Net shortage ...	20	47	222	29	31	30
	Stock available for Issue ...	164	321	750	271	269	114
	" Ordered ...	0	0	60	10	10	10
	" Repairing ..	32	26	4	0	0	0
	" Returnable from Depôts	21	9	29	2	7	0
	Total stock ...	217	356	843	283	286	124

R. F. WALLACE.

January 29th, 1901.

16. Submitted—The following letter (M.O. 147) from the Deutsche Seewarte :—

M.O. 147.

Hamburg,  
den 17 Januar, 1901.

DIE unterzeichnete Direktion beehrt sich dem Meteorological Office zu unterbreiten, dass der weitere Ausbau des wettertelegraphischen Systems in Deutschland als von ganz besonderer Wichtigkeit eine weitere Aenderung des Bezuges der Wetternachrichten von den Britischen Inseln in hohem Grade wünschenswerth erscheinen lässt, indem sich das Bedürfniss herausgestellt hat, an Stelle der erst gegen Mittag eintreffenden Sammeltelegramme nur Einzeltelegramme mit direkter Zustellung treten zu lassen. Die Bitte der Direktion geht nun dahin, veranlassen zu wollen, dass wenn möglich vom 1. Mai d. J. ab die Beobachter in Portland Bill, Yarmouth, und Aberdeen in gleicher Weise wie bereits seit dem 1/5 1900 die Beobachter in Blacksod, Stornoway, Shields, und Scilly und unter den gleichen Bedingungen der Extravergrütungen für die Beobachter und die Telegraphenämter um 7<sup>a</sup> Greenwich Zeit für die Seewarte eine Extrabeobachtung ausstellen und vor 7 $\frac{1}{2}$ <sup>a</sup> Gr. Zeit ein direktes Telegramm an die Seewarte aufgeben, das für die Zeit vom 1 Mai bis 15 September die Abendbeobachtung mit 2 Gruppen und die ersten 3 Morgengruppen, neben der Adresse also 5 Textgruppen, und für die Zeit vom 16. September bis 30 April nur die 3 Morgengruppen als Text enthält. Zu diesem Zeitpunkte würde dann der Bezug der beiden von dort am Vormittag auf der Seewarte eingehenden Sammeltelegramme aufhören. Für die genannten vier Stationen, die bereits direkte Telegramme an die Seewarte senden, würde nur die Aenderung treten, dass diese Telegramme vom 1. Mai d. J. ab an Stelle der bisherigen 2 Morgengruppen bis zum 15. September die angegebenen 5 Gruppen und vom 16. September bis Ende April die 3 Morgengruppen enthaeten würden.

Für den Bezug der von den Britischen Inseln am Nachmittag und Abend an die Seewarte abgehenden Telegramme ist eine Aenderung nicht beabsichtigt. Indem die unterzeichnete Direktion die Hoffnung ausspricht, dass das Meteorological Office der Durchführung der vorgetragenen, für den Wetterdienst in Deutschland überaus wichtigen Maassnahme wie im früheren Falle gütiges Entgegenkommen zeigen werde, spricht jene im Voraus ihren aufrichtigsten Dank für diese weiteren Bemühungen aus und bittet insbesondere auch um gefällige Aeusserung, ob die neuen direkten Telegramme, neben den Telegrammgebühren, für die gleichen Extra-Vergütungen, wie sie für, die bereits direkt berichtenden 4 Stationen festgesetzt worden sind, bezogen werden können.

Die Direktion der Seewarte,  
DR. NEUMAYER.

An das Meteorological Office  
in London.

17. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 8 days, the total number of districts warned being 44.

In 36 districts the warnings were justified, but in 8 districts they were not required.

GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
30th January, 1901.

18. *Telephone.*—The Secretary was directed to report upon the cost and other matters incidental to the installation and the use of a telephone in the Office.

19. *Atmospheric electricity.*—Submitted—The following letter (M.O. 193) from Mr. C. T. R. Wilson :—

M.O. 193.

Sidney Sussex College, Cambridge,  
January 29, 1901.

DEAR MR. SHAW,

I SEND you herewith a paper containing an account of my later investigations for the Meteorological Council. It is not very long, and should think it might go into the "Proceedings."

I hope to send tomorrow a short report of my work as a whole for the Meteorological Council.

The only portions of my investigations which I consider to have led to results of importance, are, however, those of which an account is given in this and the previous paper "On the Comparative Efficiency, &c."

Yours truly,  
C. T. R. WILSON.

W. N. Shaw, Esq., F.R.S.

REPORT ON INVESTIGATIONS IN ATMOSPHERIC ELECTRICITY (REFERRED TO IN  
MR. WILSON'S LETTER.

The principal results of the investigations are contained in two papers, the first "On the Comparative Efficiency as condensation nuclei of positively and negatively charged Ions," already published (Phil. Trans. A 193, pp 289-308), the second "On the Ionisation of Atmospheric Air," sent with this report. A preliminary note, containing a statement of some of the results of the experiments which are described at length in the latter paper, was read before the Cambridge Philosophical Society on November 26th, 1900. (Many of the results were arrived at independently by Geitel in a paper published almost simultaneously in the *Physikalische Zeitschrift*).

In these two papers experiments are described proving that water condenses much more readily on negatively than on positively charged "ions," and that such ions are continually being produced in atmospheric air even in the dark. The degree of supersaturation required to make water condense on positive and negative ions respectively was measured; and an approximate determination was made of the number of ions produced per second in each c.c. of air at atmospheric pressure. The number of ions produced per c.c. was found to be nearly proportional to the pressure.

In addition to the problems considered in the two papers named, several other questions have been investigated; the results arrived at are, however, of less importance, and I have not considered them deserving of publication.

An attempt to derive information from a comparison of the Greenwich and Kew electrograph curves was abandoned on account of the methods employed at the two observatories not being comparable, and from the want of knowledge of the scale values of the Greenwich curves.

The study of the electrograph curves showed how difficult it is to obtain really trustworthy measurements of the variations of electrical potential at a point by means of recording apparatus. This is mainly due to the difficulty of maintaining efficient insulation for long periods. My own experience has led me to conclude that sulphur is probably the most satisfactory insulating material for such work; this is in accordance with the experience of Le Cadet.

A study of the electrograph curves from Kew in connection with the corresponding rain gauge curves and weather registers led to the following results, most of which have for long been generally accepted conclusions.

(1) The atmospheric potential is almost invariably positive except when precipitation is taking place in the neighbourhood. Practically all cases in which even momentary periods of negative values of the potential occur, not coincident with rain, are within 36 hours of the beginning or end of the period of fine weather in which they occur.

(2) When there is precipitation, negative potentials nearly always occur. Thunderstorms, snowstorms, hail, and heavy rain are accompanied by rapid alternations of high positive and high negative values. Distant thunder is accompanied by such reversals, sheet lightning without thunder is not accompanied by any disturbance on the electrograph curve.

(3) There are cases of rain not associated with negative potentials, sometimes, in fact, accompanied by a rise in the positive potential. These seem, however, to be all cases of slight rain, generally mist or drizzle.

(4) Fogs are nearly always accompanied by abnormally high values.

(This may, perhaps, be explained if we take into account the ionisation of the air, for under the influence of the earth's potential gradient there will be a continuous streaming of positive ions down to the negatively charged surface of the earth. These will become entangled in the fog, and a positive charge will go on accumulating in the fog so long as the supply of positive ions is maintained. This action of clouds or fogs in destroying the mobility of the ions has been pointed out by Elster and Geitel in the *Ann. der Physik.* vol. 2, 1900, p. 425.)

5. Clouds not associated with rain, do not cause negative potentials.

6. The usually accepted diurnal and annual variations of potential appear to be indicated by the curves.

Experiments were made on the efficiency as "collectors" of atmospheric electricity of electrometer matches and of platinum wires maintained at a bright red heat by means of a current from a secondary cell.

It was found that collectors of the latter form worked very well if not exposed to air currents strong enough to reduce their temperature below bright redness. It is probable that they would be suitable for use in balloon ascents, in which the measurements would be made with only a slight relative motion of the wire and air.

With hot wire collectors, so long as the wire is glowing brightly, the rate at which the potential of the air at the point under investigation is acquired by the electrometer is the same whether the potential of the electrometer is initially above or below that of the air; *i.e.*, whether positive or negative electricity is escaping from the collector. This is not the case, as is well known, if the wire be only dull red; positive electricity escapes from such a wire much more readily than negative. I have found the behaviour of the ordinary electrometer match to be similar to that of the dull-red wire; in this case, however, negative electricity escapes much more readily than positive; the time required for the difference between the initial and final potential to be reduced by one-half being frequently five or six times as great when the initial potential is above the final than when it is below it. It is evident that in the case of rapidly changing potentials, whether actual reversals occur or not, this may lead to serious error; positive values of potential tending to be over-estimated and negative values under-estimated.

C. T. R. WILSON.

Sidney Sussex College.  
January 30, 1901.



## 21. Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 16th January ... ..	7,213	7	6
Receipts from 15th to 29th January ... ..	54	0	0
	<u>7,267</u>	<u>7</u>	<u>6</u>
Cheques drawn from 16th to 29th January ... ..	356	15	0
	<u>£6,910</u>	<u>12</u>	<u>6</u>

## 22. Submitted—The following list of publications which had been received since the last meeting :—

*Adelaide Observatory.*—Meteorological observations made at the Adelaide Observatory, and other places in South Australia and the northern territory, during the year 1897, under the direction of C. Todd.

*Bolton.*—Annual report of the Museums and Meteorological Observatory for 1900.

*Chauveau, A. B.*—Sur la variation diurne de l'électricité atmosphérique.

————— Sur l'électricité atmosphérique d'après les observations à la Tour Eiffel et au Bureau Central météorologique.

*Hollesley Bay, Colonial College.*—Summary of meteorological observations taken at the Colonial College, Hollesley Bay, 1900.

*London, Meteorological Office.*—Meteorological observations at stations of the second order. 1897.

*Marriott, W.*—Rainfall in the West and East of England in relation to altitude above sea-level.

*Mellish, H.*—The weather of 1900, at Hodsock Priory, Worksop, with tables for the 25 years 1876–1900.

*Perth Observatory.*—Meteorological observations made at the Perth Observatory and other places in Western Australia, during the year 1899.

*Ryckevorsel, — van.*—Comparison of the instruments for absolute magnetic measurements at different observatories.

*Shanghai Meteorological Society.*—Seventh annual report for the year 1898. The atmosphere in the far East during the six cold months; its normal state, its perturbations. Hints to navigators. By Rev. A. Froc.

————— Appendix to the seventh report. Atlas of the mean isobars and mean directions of the wind in the far East. Part I. The six cold months. By Rev. A. Froc.

*Washington, Department of Agriculture, Weather Bureau.*—Report of the Chief of the Weather Bureau, 1898–99.

————— Tables of daily precipitation at special river and rainfall stations of the United States Weather Bureau for the years 1893, 1894, 1895.

————— *Smithsonian Institution.*—Annual report of the Board of Regents . . . for the year ending June 30, 1898.

————— *United States Naval Observatory.*—Report of the Superintendent . . . for the fiscal year ending June 30, 1900.

63, Victoria Street, February 12th, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (January 30th) were read and confirmed.

2. The Secretary reported that R. Waley Cohen, B.A., of Emmanuel College, Cambridge, was engaged in the Office, under his direction, on an inquiry into the seasonal variations of temperature at the four observatories, Aberdeen, Kew, Falmouth, and Valencia, as shown in the mean daily temperatures for the 25 years 1871-1895.

3. *Antarctic Work* (Minute 3 of January 30th).—The Secretary reported that, on the recommendation of Miss Anderson, Miss M. Gridley had been engaged, in the first instance for a fortnight, as temporary clerk, at a salary of 30s. per week for regular office hours ; that overtime of one hour per day for room 12 and also for Mr. Allingham, who will select and prepare the logs, had been sanctioned on the understanding that the additional hour would be paid for in the same way as the late attendance in the Telegraphic branch.

Approved.—The arrangement to be terminable by the Secretary at his discretion.

4. *International Catalogue of Scientific Literature* (Minute 9 of January 30th).—The selection of the volumes to be taken by the office was left to the Chairman and Secretary.

5. *Deutsche Seewarte* (Minute 16 of January 30th).—The Secretary was requested to ascertain what facilities could be obtained from the Post Office for the 7 a.m. service proposed.

6. *Admiralty Instruments*.—With reference to a requisition from the Admiralty (M.O. 214) for four barometers, one aneroid and eight ordinary thermometers for Esquimalt, the Marine Superintendent reported that the instruments requisitioned had been despatched in May last by the ship "Ilala," and that the ship is now 91 days overdue from Monte Video.

It has since been ascertained that the ship has arrived.

It was also resolved to order sufficient thermometers to bring the stock up to the establishment. (*See Minute 15 of January 30th.*)

7. *Central Africa*.—Submitted—The following letter forwarded by the Director of the National Physical Laboratory with M.O. 256 :—

The Universities Mission to Central Africa,  
Mpondas, Fort Johnson,  
British Central Africa,

December 18th, 1900.

DEAR SIR,

WE are endeavouring at this station, which is situated at the extreme south of Lake Nyasa, to keep a record of the rainfall and shade temperature daily. I should be glad, if you have any charts on which to keep records if you could send me one, mentioning where they are to be obtained. If you could advise me as to any other observations that are useful, and how to record them, I should be glad. Is there any society that makes free grants of instruments for taking meteorological observations? I must apologise for troubling you, but in this out of the way spot it is difficult to find who the right person is to write to.

Yours truly,  
ROBERT J. DILL (Mr.).

8. *Fishery Barometer for Peterhead*.—Read—Mr. Buchan's report, in pursuance of Minute 7 of November 21, and a memorandum from Dr. Sinclair of Peterhead, referred to in the report (M.O. 1,539) giving information about a public barometer in charge of the Harbour Master at Peterhead.

Resolved—That the request for a barometer be not complied with.

9. *Roche's Point Telegraphic Station*.—The Secretary reported that he had accepted an estimate from Patrick J. Lynch, Contractor to Board of Works, Whitegate, County Cork, for replacing the screen fence blown away by the gale of December 28th, by 70 feet of new fencing, to enclose the rain gauge as well as the thermometer screen, at a cost of £6 3s.

Approved.

10. Read—A memorandum from the Marine Superintendent stating that since the last meeting six logs had been received, one of them being excellent.

The Secretary was directed to present Charts No. 59 to Captain Alfred Woolfall and to return the best thanks of the Council to the other observers.

11. METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

October, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st Oct. ...	47	134	135	71	64	—	—	44	24	2	—	—	
Received since ...	22	28	29	9	9	—	—	1	—	—	—	—	
	69	162	164	80	73	—	—	45	24	2	—	—	
<i>Cr.</i>													
Sent out during month	25	38	15	8	8	—	—	3	—	—	—	—	
On charge, 1st Nov. ...	44	124	149	72	65	—	—	42	24	2	—	—	

C. H.

R. F. WALLACE.

METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

November, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st Nov. ...	44	124	149	72	65	—	—	42	24	2	—	—	
Received since ...	2	15	4	—	—	—	—	—	—	—	—	—	
<i>Cr.</i>													
Sent out during month	46	139	153	72	65	—	—	42	24	2	—	—	
On charge, 1st Dec. ...	7	20	17	1	1	—	—	—	2	—	—	—	
	39	119	136	71	64	—	—	42	22	2	—	—	

C. H.

R. F. WALLACE.

METEOROLOGICAL OFFICE.—MONTHLY RETURN OF A. INSTRUMENTS ON CHARGE.

December, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st Dec. ...	39	119	136	71	64	—	—	42	22	2	—	—	
Received since ...	22	3	13	1	1	—	—	10	19	—	—	—	
<i>Cr.</i>													
Sent out during month	61	122	149	72	65	—	—	52	41	2	—	—	
On charge, 1st Jan. 1901	8	21	59	14	14	—	—	8	—	—	—	—	
	53	101	90	58	51	—	—	44	41	2	—	—	

C. H.

R. F. WALLACE.

METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE

October, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.	
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.							
<i>Dr.</i>														
On charge, 1st Oct. ...	41	5	177	7	6	7	1	27	98	4	2	12	} 1 Sunshine Re- corder frame. 6 Lenses.	
Received since ...	8	1	16	1	2	—	—	—	—	—	—	—		
<i>Cr.</i>														
Sent out during month	49	6	193	8	8	7	1	27	98	4	2	12		
On charge, 1st Nov. ...	10	—	20	—	1	—	—	1	8	1	—	3		
	39	6	173	8	7	7	1	26	90	3	2	9		

C. H.

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

November, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On charge, 1st Nov. ...	39	6	173	8	7	7	1	26	90	3	2	9	} 1 Sunshine Re- corder frame. 6 Lenses.
Received since ...	19	—	73	24	24	24	24	—	6	1	—	—	
	58	6	246	32	31	31	25	26	96	4	2	9	
<i>Cr.</i>													
Sent out during month	20	—	62	24	24	24	24	1	8	1	—	1	
On charge, 1st Dec. ...	38	6	184	8	7	7	1	25	88	3	2	8	

C. H.

R. F. WALLACE.

## METEOROLOGICAL OFFICE.—MONTHLY RETURN OF M.O. INSTRUMENTS ON CHARGE.

December, 1900.

	Barometers.	Aneroids.	Thermometers.					Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.	Grass, Minimum.						
<i>Dr.</i>													
On Charge, 1st Dec. ...	38	6	184	8	7	7	1	25	88	3	2	8	} 1 Sunshine Re- corder frame. 6 Lenses.
Received since ...	2	—	10	1	—	—	6	3	8	1	—	—	
	40	6	194	9	7	7	7	28	96	4	2	8	
<i>Cr.</i>													
Sent out during month	6	—	47	5	1	—	—	4	9	1	—	3	
On Charge, 1st Jan. 1901	34	6	147	4	6	7	7	24	87	3	2	5	

C. H.

R. F. WALLACE.

12. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

## WARNINGS ISSUED.

The signals were hoisted on two days, the total number of districts warned being twelve.

In two districts the warnings were justified by gales (force eight and upwards), and in four districts by strong winds (forces six and seven), but in six they were not required.

## GALES EXPERIENCED, FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
12th February, 1901.

13. Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of January 1901 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	58	49	54	81
"	b	23	32	27	
"	c	16	19	18	
"	d	3	0	1	
Scotland, E.	a	61	52	57	84
"	b	23	32	27	
"	c	6	10	8	
"	d	10	6	8	
England, N.E.	a	52	58	55	89
"	b	36	32	34	
"	c	6	3	5	
"	d	6	7	6	
England, E.	a	55	71	63	86
"	b	26	19	23	
"	c	13	10	11	
"	d	6	0	3	
Midland Counties	a	45	71	58	82
"	b	29	19	24	
"	c	13	10	12	
"	d	13	0	6	
England, S.	a	58	68	63	86
"	b	29	16	23	
"	c	10	16	13	
"	d	3	0	1	
Scotland, W.	a	49	52	51	81
"	b	32	29	30	
"	c	13	16	15	
"	d	6	3	4	
England, N.W.	a	48	55	52	75
"	b	23	23	23	
"	c	19	13	16	
"	d	10	9	9	
England, S.W.	a	48	61	55	71
"	b	23	10	16	
"	c	26	16	21	
"	d	3	13	8	
Ireland, N.	a	45	48	47	74
"	b	29	26	27	
"	c	13	16	15	
"	d	13	10	11	
Ireland, S.	a	52	58	55	75
"	b	19	20	20	
"	c	16	6	11	
"	d	13	16	14	
SUMMARY.					
British Islands	a	52	59	56	80
"	b	26	23	24	
"	c	14	12	13	
"	d	8	6	7	

14. Submitted—The following reports of work during the month of January, 1901:—

## MARINE BRANCH.

February 11th, 1901.

Examined seven new logs and one lighthouse register.

Obtaining wind and instrumental results in various-sized areas for the region southward from the Equator, between the West Coast of Africa and longitude 90° W. Drawing wind-roses for sea areas, and also for land stations, preparing coastal wind charts for South America, and examining proofs of engraved coastal charts.

The North Atlantic and Mediterranean Pilot Chart for January, 1901 (specimen number), passed for press. The April chart, the first of the series, nearly ready for the lithographer, and the information for May prepared for charting.

Revised proofs of the letterpress dealing with the weather of the North Atlantic during the winter of 1898-99 passed for press.

Preparing an estimate of Antarctic data and the cost of extracting it, for the use of the approaching expedition.

Tables of sunrise and sunset at various stations for the months of February, March, and April prepared for use in the Daily Weather Reports.

Hydrographic notices from the logs of the P. and O. ss. "India" (No. 10,692) and the barque "Loch Katrine" (No. 10,694) copied and sent to the Hydrographer.

Assistance given in distributing copies of the Daily Weather Reports amongst the railway bookstalls.

CHAS. HARDING.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH.  
Marine Superintendent.

## TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(Two months to February 12th, 1901.)

*Weekly Weather Report*, 1900.—Appendix I., parts 4 and 5, issued. Completing set.

" II. Completed and sent finally "for press."

" III. and IV. Done to end of third quarter of year.

*Weekly Weather Report*, 1901.—All numbers issued to date. Summary for January in hand.

*Daily Weather Report*, 1900.—Title page and frontispiece all gone to printer. Corrections and additions all issued.

*Daily Weather Report*, 1901.—All numbers issued promptly to date; charts of temperature drawn to 22nd March.

*Primary Checking of Storm Warnings*.—Done to date.

*Checking of (8.30 p.m.) Daily Forecasts*, 1900.—Done to end of January.

*Ten-Day means for Germany*.—Stations increased; all done to date.

*Inquiry as to thunderstorm of July 27th*, 1900.—Nearly completed, with diagram, &c.

*Interviews with newspaper agents* take up much time when the weather is at all extreme, or changes suddenly.

*Monthly Charts*.—Showing distribution of average temperature for 30 years, 1871-90, in progress. Maximum shade temperature, minimum, and mean values all included.

*Hay Harvest Forecasts*, 1900.—Report in hand, with checking.

*Types of Weather*.—Study recommenced.

There has again been considerable sickness in the branch; Mr. Gaster has been absent on several days on a Jury at Queen's Bench, and as a witness (for Secretary) on one day.

*Inquiries during January, 1901.*

Midland Railway Company.—Daily temperatures at Edinburgh, London, Paris, Lyons and Marseilles for winter months of four years (1896-1900). (M.O. 5.)

Messrs. Robins and Clark.—Wind and rain at Corton, near Lowestoft, from 11th December, 1899, to 11th January, 1900. (M.O. 57.)

Professor Ward, Harvard University, U.S.A.—Examples of variation of temperature and mean temperatures of various kinds at stations in the British Isles. (M.O. 137.)

Messrs. Allnutt Bros.—Frosts at Antwerp from October 1st to 20th, 1900, and in London, October 20th to November 7th. (M.O. 190.)

Messrs. Willett.—Prevailing winds in London, January 1st-30th, 1901. (M.O. 204.)

Messrs. W. A. Crump and Son.—Weather near Middlesbrough, January 27th 1901. (M.O. 235.)

FREDC. GASTER.

February 12th, 1901.

## EXAMINATION BRANCH.

February, 1st 1901.

*Examinations.*

*November and December, 1899*.—Proceeded with.

*January to August, 1900*.—Kew work completed.

*September to December, 1900*.—Kew work proceeded with.

*October to December, 1900*.—Valencia work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

*Reports, &c.*

*January to August, 1899.*—Copies of "Notes of Errors" to Kew.  
*October to December, 1900.*—Copies of "Notes of Errors" to Valencia.  
 Tabulating thermograph curves and working hygrometrical values for 27th July, 1900, at Kew and Radcliffe Observatories. Sun printing photographic curves.

T. E. ALLEN.

## PANTAGRAPH ROOM.

February 1st, 1901.

*Hourly Means.*—Volume for 1897. Proofs have been read and signed for press up to page 224. Volume for 1898. Further progress has been made with the calculation of mean values required for this volume.

*Kew Mean Values for 1900.*—A request for these means for the report of the National Physical Laboratory was received at the middle of the month, and the values are now about half finished.

*Daily Means of Temperature.*—Special work has been done in connexion with the discussion of these values, and they have been replotted on a fresh diagram.

*Sunshine Recorder for Antarctic.*—Some time has been occupied in connexion with the preparation of a special design for this instrument.

*Inquiries.*—From Messrs. Watson, Liverpool, as to the wind and weather at Holyhead for some days in December, 1900. From Chamber of Commerce, Jersey, as to monthly amounts of sunshine on the South Coast of England.

*Miscellaneous.*—Anemograms from Bath, and sunshine cards from Kingstown, have been specially examined.

R. H. CURTIS.

## LAND ROOM.

February 11th, 1901.

*Inquiries during January, 1901.*

1. Messrs. R. and R. F. Kidd.—As to the wind and weather off the Tyne, on December 15th and 16th, 1900. (M.O. 29.)

2. Horace Darwin, Esq., M.A.—The daily rainfall at certain stations in Kent and Surrey from February to October, 1880.

3. Mr. Wm. Seddon.—Winter temperatures at Colwyn Bay, Bournemouth, Torquay, Ventnor, &c. (M.O. 83.)

4. Mr. B. Jacob.—As to the weather at Claypole, in Notts, in August, 1900. (M.O. 130.)

5. Messrs. Plunkett and Kenny.—As to the wind at Inniskeen, Co. Louth, in July, 1900.

JOHN A. CURTIS.

In addition to the inquiries referred to above there were 23 personal inquiries during January for forecasts or other weather information, and 10 enquiries by telegraph.

## 15. Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 29th January ... ..	6,910	12	6
Receipts from 30th January to 11th February ...	17	2	10
	6,927	15	4
Cheques drawn from 30th January to 11th February	647	10	1
	£6,280	5	3

## 16. Submitted—The following list of publications, which had been received since the last meeting:—

*Calcutta, Meteorological Office, Bengal.*—Meteorological summary for the monsoon period of 1900.

*Colombo, Surveyor General's Office.*—Report on the meteorology of Ceylon for 1899.

*Copenhagen, Institut Météorologique de Danemark.*—Annales de l'Observatoire Magnétique de Copenhague publiées par A. Paulsen. Années 1895–1896.

*Fritsche, H.*—Die Elemente des Erdmagnetismus und ihre saecularen Aenderungen während des Zeitraumes 1550 bis 1915. Publication iii.

*Greenwood, W. N.*—Greenwood's nautical almanac, general and Kludonometric tide tables and post directory. . . . 1901.

*London, Admiralty, Hydrographic Department.*—Sailing directions for Dardanelles, Sea of Marmara, Bosphorus, and Black Sea. 5th ed., 1900.

*Stockholm, Kongl. Svenska Vetenskaps-Akademi.*—Meteorologiska iakttagelser i Sverige utgifna af Kongl. Svenska Vetenskaps-Akademi, anställda och utarbetade under inseeende af meteorologiska Central-Anstalten. Bd. 37; 2 dra ser., Bd. 23, 1895.

*Tyndall, W. H.*—Meteorology, Oxford Road, Redhill, for the year 1900.

*Tyrer, R.*—The meteorology of Cheltenham. Abstract of meteorological observations taken at the Observatory, Prestbury Road, Cheltenham, during 1900.

63, Victoria Street, February 26, 1901.

PRESENT:

SIR R. STRACHEY, IN THE CHAIR.

MR. BUCHAN.  
PROFESSOR DARWIN.

THE HYDROGRAPHER.  
MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (February 12th) were read and confirmed.

2. *International Catalogue of Scientific Literature*.—Reported—that in pursuance of Minute 4 of February 12th the following volumes had been ordered for the Office (P.C. 445):—A. Pure Mathematics. B. Mechanics. C. Physics. E. Astronomy. F. Meteorology. J. Geography. R. Bacteriology.

3. *Instruments for New Guinea* (Minutes 12 of January 16th and 12 of January 30th).—Read—the following letters:—

P.C. 341.

Meteorological Office,  
February 6th, 1901.

SIR,

With reference to your letter of January 15th, and the enclosure from the Government Secretary at Port Moresby, I am directed to inform you that the Council would be willing to furnish the six sets of instruments asked for, provided that satisfactory arrangements can be made for the return of observations made with them.

2. For this purpose the return of observations should be made monthly, in manuscript, upon Form 19 issued by this Office. It is the usual form for observations from similar stations elsewhere; if the observers are unable to carry out the observations necessary for the complete return, a certain number of spaces in the form would be left blank. The use of the same forms for different stations, even though they may not all be completely filled up, has great advantages.

3. I gather from the Government report for 1892–3 that the instruments supplied in 1890 were duly distributed to the stations by the Government Secretary, but no manuscript returns have been received by the Office. It does not clearly appear from the correspondence where the arrangements broke down, nor is it clear from the Government Secretary's letter whether the instruments now asked for are intended for six new stations or in part to replace loss in those already supplied.

4. The position of affairs, plainly stated, is that three sets of instruments were supplied in 1890, of which we have very little news and no manuscript observations, and what is suggested as changing the situation to such an extent as to justify the Council now in lending six more sets of instruments is that the Government has become better established. The arrangements for the disposition of the instruments in 1892–3 by Mr. Musgrave seem to have been made with care and judgement, and the only difficulty seems to have been in connexion with the forwarding of the observations to this Office. If it can be assumed that under the improved conditions referred to by the Government Secretary the understanding upon which the instruments are lent can now be effectively carried out, I am authorized by the Council to furnish them.

5. I enclose herewith a list [not printed here] of observations which have been received in this Office from British New Guinea in printed form. If the list does not represent completely the observations published by the New Guinea Government, the Council will be glad to receive the necessary additions, in accordance with the suggestion contained in Mr. Musgrave's letter of the 15th October.

The Secretary  
To the Agent-General for Queensland.

I am, &c.,  
W. N. SHAW,  
Secretary.

M.O. 265.

Queensland Government Office, London, S.W.,  
February 13th, 1901.

SIR,

In reference to your letter of the 6th instant, on the subject of the supply of six sets of instruments asked for by the British New Guinea Government, I am directed by the Agent-General to state that the Council may rest assured that the returns of observations will be regularly supplied

by the British New Guinea Government, and he trusts therefore that the instruments asked for will be furnished.

A copy of your letter and its enclosure, and of this assurance, will be forwarded to the British New Guinea Government by this mail.

I am, &c.,  
CHAS. S. DICKEN,  
Secretary.

The Secretary,  
The Meteorological Office.

The Secretary reported that on receipt of the letter (M.O. 265) he had given instructions for the instruments to be supplied.

Approved.

4. *Instruments for Lloyd's foreign stations* (Minutes 5 of October 24th, 1900, and 11 of January 30th).—It was resolved to supply instruments for Sabang Bay, but not for Cape Verde or Point de Galle.

5. *Instruments for Fort Johnston, Central Africa* (Minute 7 of February 12th).—It was agreed that a reply be sent to Mr. Glazebrook's letter intimating that it is contrary to the practice of the Council to supply instruments for stations in the interior, but that the Council will be glad to afford facilities for obtaining instruments at the lowest cost, and to furnish any information that may be required as to the mode of exposure and use of the instruments.

6. Read—the following letter :—

M.O. 306.

Scottish Meteorological Society, Edinburgh,  
February 21st, 1901.

SIR.

In the concluding paragraph of your letter to me of March 29th, 1899, you say :—"As the Council understand from your letter under reply that your Directors do not contemplate the continuance of work at Ben Nevis or Fort William after 1901, they think it will be convenient that you should now receive the formal notice, contemplated when the grants to these observatories were first made, that the grants will cease at the end of the year 1901."

With reference to this, I am instructed by the Directors of the Ben Nevis Observatories to inform you that, as the result of another gift of £500, they find themselves able to carry on the two observatories till the end of 1902, provided the Meteorological Council continue their annual grant of £250 to the Fort William Observatory till the end of 1902.

The Directors hope that your Council will feel able to continue this grant.

The grant of £100 per annum to the Ben Nevis Observatory was under a different arrangement. The resolution of your Council to give it is dated February, 1879, and the Directors understood that it was to continue to be given so long as observatory buildings on Ben Nevis were provided, and so long as a copy of the observations made in them was regularly transmitted to the Council.

I remain, &c.,  
ARTHUR MITCHELL.

W. N. Shaw, Esq., F.R.S.,  
Secretary, Meteorological Council.

The Secretary was instructed to write in reply intimating that in arranging for the disposition of the funds at their disposal the Council have already had regard to the fact that it was proposed to discontinue the Ben Nevis Observatories in December, 1901, and they cannot reconsider the arrangements until the accounts are completed after the close of the financial year, March 31st, 1901.

He was also instructed at the same time to request the Directors of the Observatories to furnish, not later than May 31st of the current year, a report of the work done at the two observatories in the year ending on March 31st, 1901 (or on such other date as may be convenient), to form the basis of a notice of the work of the Observatories to be included in the Annual Report of the Council to the Royal Society, for presentation to Parliament; and having regard to the purpose for which the report is desired, to ask that reference might be made therein to purposes of practical and scientific utility which the Observatories are intended to serve.

7. *Kingstown Harbour Anemograph*.—Read—the following letter :—

M.O. 281.

Office of Public Works, Dublin,  
February, 1901.

SIR,

I am directed by the Commissioners of Kingstown Harbour to state that the anemograms referred to in their letter of the 25th ultimo were dispatched to the Meteorological Office on the 12th instant.

In compliance with the request contained in your letter of the 31st ultimo, the Board will have pleasure in forwarding the records to your department in future at the end of each month.

I am, &amp;c.,

H. WILLIAMS,  
Secretary.The Secretary,  
Meteorological Council.

8. *Office Instruments for the Antarctic Expedition*.—It was agreed that the thermometers selected from among those belonging to the office to be lent to the expedition be tested at the National Physical Laboratory, at the expense of the Office.

9. Read—A memorandum from the Marine Superintendent stating that since the last meeting one log had been received and had been classed “excellent.”

The Secretary was directed to return the best thanks of the Council to the observers.

10. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

## WARNINGS ISSUED.

The signals were hoisted on 2 days, the total number of districts warned being 10.

In 1 district the warnings were justified by a subsequent gale, and in 3 districts by strong winds in 6 districts they were not required.

## GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
26th February 1901.

11. *Annual Volumes of Observations*.—The volume of Hourly Means for 1897 was approved for publication, and the Secretary was authorised to proceed with the preparation of the corresponding volume for 1898 and with the volume of observations at Second Order Stations for the same year.

12.—Reported—That the cash accounts for the quarter ended the 31st December last had been this day examined by Professor Darwin and Dr. Buchan, and would be sent in due course to the Treasury, for the Audit Office. The receipts from the 1st October last, when there was a balance of £2,881 11s. 1d., were £3,688 13s. 3d., against £3,794 13s. 8d. in the corresponding period of the preceding financial year. The payments were £4,136 17s. 2d., against £3,891 5s. during the same period in the previous year. The balance in hand and at the bank on the 31st December, 1900, amounted to £2,433 7s. 2d., and at the same date in 1899 to £3,020 10s. 6d.

13. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 11th February ... ..	6,280	5	3
Receipts from 12th to 25th February ... ..	73	15	3
	<hr/>		
Cheques drawn from 12th to 25th February ...	6,354	0	6
	193	8	3
	<hr/>		
Cash balance on 25th February ... ..	£6,160	12	3

14. Submitted—The following list of publications, which had been received since the last meeting :—

*Aachen, Meteorologische Station.*—Ergebnisse der 1900 in Aachen von der meteorologischen station Aachen des Königl. Preuss. Meteorologischen Instituts angestellten Beobachtungen.

*Cambridge, Scientific Instrument Co.*—Callendar electric recorders, platinum thermometers, and apparatus for the measurement of small resistances.

*Hong Kong Observatory.*—China Coast meteorological register, 1900.

*Jersey, Observatoire St. Louis.*—Bulletin des observations météorologiques. 7<sup>e</sup> année, 1900.

*London, Admiralty, Hydrographic Department.*—The Mediterranean Pilot. Vol. IV. Third edition, 1900.

*Manchester, Great Central Railway.*—Monthly statement of rain fallen in the year ending 31st December, 1900.

*Ottawa, Department of Marine and Fisheries.*—Report of the Meteorological Service of Canada, by R. F. Stupart, 1897.

*São Paulo, Comissão Geographica e Geologica. Secção Meteorologica.*—Dados climatologicos, 1899.

*Scott, R. H.*—Note of a remarkable dust haze experienced at Teneriffe, Canary Islands, February 1898.

————— Results of percolation experiments at Rothamsted, September, 1870–August, 1899.

*Vienna, K. K. Central-Anstalt für Meteorologie und Erdmagnetismus.*—Jahrbücher. Jahrg, 1898.

63, Victoria Street, March 12, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

THE HYDROGRAPHER.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (February 26th) were read and confirmed.

2. *Antarctic work* (Minute 2 of January 16th).—Read—The following letter (M.O. 367) :—

M.O. 367.

Burlington House,  
London, W.,

March 6th.

MY DEAR SHAW,

The Royal Society has undertaken to publish, as part of or uniform with the philosophical transactions, the magnetic and meteorological observations of the Borchgrevink Antarctic Expedition, concerning which we have already had some correspondence.

I am directed by the President and Council to express the hope that the Meteorological Office will be able to prepare at the office the meteorological observations in the manner indicated in your letter, namely, that the remuneration required for the assistance of Mr. Bernacchi will be provided through the Royal Society.

Yours very truly,  
M. FOSTER,  
Sec. R.S.

W. N. Shaw, Esq., F.R.S.

It was agreed that the expenditure of a sum not exceeding £30 be authorised to meet the cost of the work undertaken by the Office in connexion with the reduction and tabulation of the observations on the representation of the Royal Society.

3. *Deutsche Seewarte* (Minutes 16 of January 30th and 5 of February 12th).—It was agreed that the Secretary draft a letter to the Post Office for approval by the Chairman.

4. *Recent information for Pilot Charts*.—The Secretary was authorised to make arrangements for the Marine Superintendent to visit Liverpool for a week for the purpose of securing returns from the officers of steamships, of recent information as to the position of ice, and other matters of importance to seamen.

5. *Re-issue of Office Publications*.—Read—The following memorandum from the Marine Superintendent :—

As there remain only 20 copies of Official No. 59, "Chart showing the surface temperature of the Atlantic, Indian, and Pacific Oceans," and there are none remaining of No. 90, "Cyclone Tracks in the South Indian Ocean," the republication of these important aids to navigation is suggested.

The Stationery Office are out of both publications.

It was agreed that Captain Hepworth be requested to report what additional information is available for a revised edition of Official No. 90, and how a reprint of Official No. 59 could best be obtained. It was also agreed to ascertain whether there were any copies of No. 90 to spare at Mauritius.

6. *Marine observations at noon G.M.T. during the period of the Antarctic Expedition*.—The Secretary was directed to ascertain from Dr. Neumeyer whether arrangements for observations at noon G.M.T. were being made in the case of the ships in correspondence with the Seewarte.

7. *Morning telegrams to the Liverpool Journal of Commerce* (M.O. 381).—It was agreed to inquire from the Post Office whether the telegrams could be sent direct from the Telegraph Office to Liverpool. Failing an arrangement of that kind it was agreed to charge 1s. 6d. per day for the information asked for and send it as early as possible.

8. *Forecasts for Marine Observers*.—On the recommendation of the Marine Superintendent it was agreed that Captains of ships who keep logs for the Office be allowed to have forecasts of weather before sailing sent to them by telegraph, upon application to the Office, without any charge beyond the cost of the telegrams, provided that proper arrangements are made for the payments on account of the telegrams.

9. *Daily Weather Report*.—Submitted the following letters :—

M.O. 354.

Newton Reigny,  
Penrith,

4th March, 1901.

DEAR MR. SHAW,

The following is the result of the checking of the forecasts which were sent by telegraph from Jan. 11th to Feb. 28th. Each forecast was considered under "Wind" and "Weather" separately, and the amount of success written on the back of each telegram at the end of the 24 hours to which it referred.

Yours faithfully,  
T. G. BENN.

PERCENTAGES.

				Wind.	Weather.	Average.	
Complete success	...	...	...	85.0	52.5	68.8	} 98.8
Partial success	...	...	...	12.5	47.5	30.0	
Partial failure	...	...	...	0.0	0.0	0.0	} 1.2
Total failure	...	...	...	2.5	0.0	1.2	
				100.0	100.0	100.0	100.0

The only complete failure was the forecast of the wind on Jan. 19th, which foretold "Easterly and North-easterly gales." The actual state of things was "light breezes from S. and S.S.E." The amount of success attained is very great and no favour whatever has been shown in arriving at the above results.

M.O. 386.

Newton Reigny,  
Penrith,

11th March, 1901.

DEAR MR. SHAW,

About the end of December last I wrote to you with reference to the daily telegrams from Newton Reigny, stating that the period for which I agreed originally to send them free of cost to the Council would expire at the end of the year.

On the 24th of that month you wrote to me saying that you would be glad if the telegrams could be continued for some little time longer, but that, by reason of circumstances which you explained, you felt prohibited from pressing upon the Council any suggestion as to taking up the cost of the telegrams before the close of the financial year. To that letter I replied that I should continue to send them at my own cost until the end of March, at which time I shall have sent 156 telegrams.

If it is the wish of the Council to have the continuity of the observations preserved, and the daily telegrams continued at their cost, I shall be pleased to hear from you to that effect sometime before the end of the month when, of course, I shall be pleased to arrange accordingly. If, however, the Council cannot see their way to take up the cost of the telegrams the observations will be discontinued on the 31st inst.

Yours very faithfully,  
T. G. BENN.10. *Foreign Stations.*—Submitted the following:—

LIST OF STATIONS, NOT IN THE UNITED KINGDOM, TO WHICH INSTRUMENTS HAVE BEEN LENT, WITH PARTICULARS OF THE OBSERVATIONS WHICH ARE NOW BEING RECEIVED.

Station.	Date supplied.	Instruments lent.	Observations received.
Abaco (Bahamas) ...	5.71	Barometer, thermometers, rain-gauge.	Lighthouse Register.
Ascension... ..	4.94	Rain-gauge, hydrometers ...	Nil.
Abrolhos Island (Brazil)	8.89	Barometer, thermometers, rain-gauge.	Nil.
Bahamas ... ..	12.59	Two barometers, thermometers all broken or useless. M.O. 254.70.	See Abaco, Cay Lobos, Cay Sal, Inagua and Watling Island.
Bathurst (Gambia) ...	9.87	Barometer, thermometers, rain-gauge.	Printed tables of comparative rainfall and summary of observations.
Cay Sal (Bahamas) ...	5.71	Barometer, thermometers, rain-gauge.	Lighthouse Register.
Cay Lobos (Bahamas) ...	5.71	Barometer, thermometers, rain-gauge.	Lighthouse Register.
Calabar ... ..	6.95	Barometer, two earth thermometers.	Nil.
Cape Coast Castle (Kubé Kur).	6.95	Four thermometers, two earth thermometers, rain-gauge.	Nil, since June, 1899.
Colon (Panama) ... ..	7.97	Barometer, thermometers, rain-gauge.	Observations twice daily.
Cape Spartel (Tangier) ...	4.93	Barometer, thermometers, rain-gauge.	Observations twice daily.
Degama (Calabar) ...	6.98	Thermometers, rain-gauge ...	Nil.
Famagusta (Cyprus) ...	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily.
Falkland Islands (Cape Pembroke).	3.59	Barometer, thermometers ...	Lighthouse Register.
Fernando Noronha (South Atlantic).	4.92	Barometer, thermometers, rain-gauge.	Nil.
Great Isaac ... ..	12.59	Aneroid ... ..	Nil.
Gaboon (West Coast of Africa).	7.87	Barometer, thermometers, rain-gauge.	Nil, since November, 1888.
Grand Bassam (West Coast of Africa).	8.87	Barometer, thermometers, rain-gauge.	Nil, since April, 1890.
Gambia (West Coast of Africa).	9.93	Barometer, thermometers, rain-gauge, anemometer.	See Bathurst.
Honolulu ... ..	Lr.999.89	Aneroid only ... ..	Nil.
Inagua (Bahamas) ...	5.71	Barometer, thermometers, rain-gauge.	Lighthouse Register.
Kyrenia (Cyprus) ...	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily

Station.	Date supplied.	Instruments lent.	Observations received.
Lagos [Capt. Standen] ...	6.98	Barometer, thermometers, rain-gauge.	Nil [Observations twice daily from Hospital].
Larnaka (Cyprus) ...	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily.
Limasol (Cyprus) ...	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily.
Majunga (Madagascar) ...	9.91	Barometer, thermometers, rain-gauge, anemometer.	Observations twice daily.
Mombasa (East Africa) ...	6.95	Barometer ... ..	Nil.
Malden Island (4° S. and 155° W.)	12.89	Barometer, thermometers, rain-gauge.	Observations twice daily.
Nicosia (Cyprus) ...	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily.
New Guinea ... ..	8.90	Three sets, barometers, thermometers, rain-gauges.	Nil, occasional observations at Port Moresby are printed in the "Annual Report of British New Guinea."
Papho (Cyprus) ... ..	11.80	Barometer, thermometers, rain-gauge.	Observations twice daily.
Principe (Gulf of Guinea)	5.93	Maximum, minimum, and solar thermometers.	Nil, since January, 1894.
Peking ... ..	7.88	Aneroid, thermometers ... ..	Nil.
Queensland [Survey] ...	7.66	Barometer, five aneroids, four hydrometers.	Nil.
Rarotonga (South Pacific)	5.93	Barometer, thermometers, rain-gauge.	Nil, since December, 1894.
Sombbrero (West Indies)	8.69	Barometer, thermometers, rain-gauge, anemometer.	Lighthouse Register.
St. Thomas ... ..	7.87	Thermometers, rain-gauge ...	Nil, since February, 1889.
St. Helena ... ..	12.91	Barometer, thermometers, anemometer, rain-gauge.	Observations twice daily, anemograms, rainfall (Form 50) from two stations.
Teneriffe (Santa Cruz) ...	9.87	Barometer ... ..	Nil.
Tongoa ... ..	9.93	Barometer, rain-gauge ... ..	Nil, since September, 1896.
Tobago ... ..	1.89	Barometer, thermometers, wind vane, rain-gauge.	Nil, since October, 1896.
Tristan Da Cunha (South Atlantic).	7.85	Barometer, thermometer, rain-gauge.	Nil.
Valua Island (New Hebrides).	3.91	Barometer, thermometers, anemometer.	Nil.
Watling Island (Bahamas)	6.88	Barometer, thermometers, rain-gauge.	Lighthouse Register.
Zanzibar ... ..	3.79	Barometer ... ..	Nil.

11. *Observations from Persia.*—Read—Letter (M.O. 378) from Rev. P. Darbois, Missionaire, Congregation de la Mission dite des Lazaristes, offering to forward observations from the Mission at Ourmiah, with a specimen of observations.

It was resolved that the letter be sent forward to the Meteorological Reporter to the Government of India.

12. *Holyhead Anemometers.*—Read—A memorandum (M.O. 402) from Mr. R. H. Curtis suggesting an additional consideration to W. Davies for his attendance to the anemometers at Holyhead, in particular the pressure plate anemometer.

Postponed.

13. *Telephones.*—The Secretary reported that he had received information as to the cost of Post Office telephones (M.O. 293), but was not yet in a position to make a recommendation on the subject.

14. Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of February, 1901 :—

The letters used have the following signification :—

a = complete success.

b = partial (i.e., more than half) success.

c = partial failure.

d = total failure.

DISTRICTS.		Percentages.			Percentage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	50	82	66	86
"	b	32	7	20	
"	c	18	7	12	
"	d	0	4	2	
Scotland, E.	a	46	71	59	82
"	b	22	25	23	
"	c	25	4	15	
"	d	7	0	3	
England, N.E.	a	64	57	61	90
"	b	29	29	29	
"	c	4	11	7	
"	d	3	3	3	
England, E.	a	39	61	50	79
"	b	29	29	29	
"	c	29	10	20	
"	d	3	0	1	
Midland Counties	a	50	50	50	84
"	b	36	32	34	
"	c	11	14	13	
"	d	3	4	3	
England, S.	a	57	46	52	82
"	b	25	36	30	
"	c	14	11	13	
"	d	4	7	5	
Scotland, W.	a	50	68	59	84
"	b	25	25	25	
"	c	21	7	14	
"	d	4	0	2	
England, N.W.	a	65	68	67	86
"	b	14	25	19	
"	c	14	7	11	
"	d	7	0	3	
England, S.W.	a	57	68	63	92
"	b	29	29	29	
"	c	11	0	5	
"	d	3	3	3	
Ireland, N.	a	47	61	54	90
"	b	39	32	36	
"	c	14	7	10	
"	d	0	0	0	
Ireland, S.	a	64	79	72	90
"	b	18	18	18	
"	c	14	3	8	
"	d	4	0	2	
SUMMARY.					
British Islands	a	54	65	60	85
"	b	27	26	26	
"	c	16	7	12	
"	d	3	2	2	

15. Read—A memorandum from the Marine Superintendent stating that since the last meeting six logs had been received, two of them being excellent.

The Secretary was directed to present Chart No. 123 to Capt. W. B. Holmes, R.N.R., of the R.M.S. "Matatua," and Chart No. 106 to Capt. J. W. C. Martyr, of the s.s. "Montrose," and to return the best thanks of the Council to the observers.

16. Submitted—The following as the result of the primary checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

**WARNINGS ISSUED.**

The signals were hoisted on 7 days, the total number of districts warned being 42.

In 20 districts the warnings were justified by subsequent gales, and in 16 districts by strong winds. In 6 districts they were not required.

**GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.**

None.

FREDC. GASTER.

Telegraphic Branch,  
12th March, 1901.

17. Submitted—The following reports of work during the month of February 1901 :—

**MARINE BRANCH.**

11th March, 1901.

Examined nine new logs and three lighthouse registers.

Tabulating and summing wind and instrumental data for various sized areas in the district southward from the equator, from 20° E. westward to 90° W. Drawing wind-roses and preparing South American coastal wind charts. First proofs of engraved April and May coastal charts examined and sent for revise. Original June and July coastal charts prepared and sent to the Admiralty for engraving.

The Atlantic and Mediterranean Pilot Charts for April and May prepared, and the one for April sent to the lithographer for reproduction. Information for the June chart in preparation. Assistance given in addressing and despatching copies of the January chart issued as a specimen.

Preparation and extraction of data in high southern latitudes for the use of the coming Antarctic Expedition.

Obtaining meteorological results for Ascension, St. Helena, and Tristan da Cunha for the revised Admiralty Sailing Directions.

Assistance given in distributing copies of the Daily Weather Reports amongst the railway bookstalls.

CHAS. HARDING.

Forwarded for the information of the Council.

CAMPBELL HEPWORTH,  
Marine Superintendent.

**TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.**

(To 12th March, 1901.)

*Weekly Weather Report*, 1900.—Appendix II., published; Appendices III. and IV., completed and sent to printer. Title page, preface, &c., being revised. *Monthly Summary*, December, issued.

*Weekly Weather Report*, 1901.—All numbers issued promptly to date. *Monthly Summary*, January, proof received and being examined; February is in hand.

*Daily Weather Report*, 1901.—All numbers issued to date. Monthly (additions and corrections) sheet for January issued. Two-monthly Charts of average values prepared to April; those for March–April have gone to lithographer.

*Checking of Storm Warnings*, 1901.—Done to date.

*Checking of 8.30 p.m. Forecasts*, 1901.—Done to end of February.

*Hay Harvest Forecasts*, 1900.—Checking completed. Report is in hand.

*Work of preparing Diagrams, &c., for Thunderstorm of July, 1900.*—Done.

*Preparation of 10-day Means for Germany*, done to date and forwarded.

*Preparation of New Averages.*—Rainfall 1866–1900 = 35 years } are now calculated for the  
 Rainy days 1871–1900 = 30 years } latter half of the year ;  
 those for temperature, &c.,  
 are still in hand.

Reducing the monthly averages of rainfall (both amount and rain days) for April–June to the weekly equivalents, plotting on sectional paper, and drawing curves for use in preparing the Weekly Weather Report—Done.

Drawing Monthly Charts of distribution of average maximum, minimum and mean temperatures for 30 years is going on steadily.

FREDC. GASTER.

#### PANTAGRAPH ROOM.

1st March, 1901.

*Hourly Means.*—Volume for 1897. The remainder of the proofs have been revised and the complete volume passed for press.

Volume for 1898. The various tables of mean values for *Valencia* have been sent to the printer ; those for the remaining observatories are still under preparation.

*Mean Values for Kew, 1900.*—These values, requested for the Annual Report of the National Physical Laboratory, were completed and sent to Kew on the 18th.

*Daily Means of Temperature.*—Further work has been done in connexion with the discussion of these mean values.

*Inquiry.*—From Dr. Hardwick, Newquay, as to the maximum daily amount of sunshine in each month, and number of sunless days, in 1900.

*Miscellaneous.*—Cape Adare sunshine records copied. Tabulation of the Jersey sunshine records checked. New form drawn for pressure-tube anemometers. Proofs of rain-gauge forms examined, &c.

R. H. CURTIS.

#### EXAMINATION BRANCH.

1st March, 1901.

##### *Examinations.*

*November and December, 1899.*—Proceeded with.

*September to December, 1900.*—Kew work completed.

Weekly examinations (on receipt) of curves and documents from all observatories.

##### *Reports, &c.*

*September to December, 1900.*—Copies of "Notes of Errors" to Kew.

Interview with Mr. E Kitto (Falmouth) on 9th February.

Sun printing photographic curves.

Tabulating thermograph curves and working hygrometrical values for 27th July, 1900, at Radcliffe Observatory.

Measurement for *Fort William Dry Bulb Scale Value and Lower Zero line Value.*

Selecting curves for frame.

T. E. ALLEN.

#### LAND ROOM.

11th March, 1901.

##### *Enquiries during February, 1901.*

1. Horace Darwin, Esq., M.A.—Rainfall values at Greenwich on certain days in the summer months of 1878–1896. (M.O. 238.)

2. Messrs. Crowders, Vizard, and Oldham.—Rainfall values at Buckfastleigh, South Devon, for the 20 years 1880–1899. (M.O. 231.)

3. M. Rijckevorsel.—Temperature at Faravohitra, Madagascar, for the seven years 1887–1893 (M.O. 201.)

4. The Town Clerk of Preston, Lancs.—As to the direction and force of the wind at Fleetwood on certain days in December, 1900. (M.O. 287.)

5. The Venerable Archdeacon Walker.—As to the average temperature in Uganda, British Central Africa. (M.O. 305.)

JOHN A. CURTIS.

In addition to the enquiries referred to above, there were 13 personal enquiries during February for forecasts or other weather information, and 12 enquiries by telegraph.

18.—Submitted—

MONTHLY RETURN OF "A." INSTRUMENTS ON CHARGE.  
January and February, 1901.

	Barometers.	Aneroids.	Thermometers.				Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.						
<i>Dr.</i>												
On Charge, 1st Jan., 1901	53	101	90	58	51	...	...	44	41	2	...	...
Received during { Jan.	35	33	84	23	28	...	...	4	...	...	...	...
Feb.	15	19	20	2	1	...	...	...	4	...	...	...
	103	153	194	83	80	...	...	48	45	2	...	...
<i>Cr.</i>												
Sent out during { Jan.	46	45	37	8	10	...	...	4	...	...	...	...
Feb.	12	6	85	...	1	...	...	...	...	...	...	...
	58	51	122	8	11	...	...	4	...	...	...	...
On Charge, 1st Mar. ...	45	102	72	75	69	...	...	44	45	2	...	...

13th March, 1901.

R. F. WALLACE.

MONTHLY RETURN OF "M.O." INSTRUMENTS ON CHARGE.  
January and February, 1901.

	Barometers.	Aneroids.	Thermometers.				Screens.	Hydrometers.	Rain Gauges.	Anemometers.	Storm Cones.	Miscellaneous.
			Ordinary.	Maximum.	Minimum.	Solar Radiation.						
<i>Dr.</i>												
On Charge, 1st Jan. ...	34	6	147	4	6	7	7	24	87	3	2	5
Received during { Jan.	6	2	12	...	1	...	...	3	6	1	...	...
Feb.	3	...	2	6	7	...	1	2	3	7	...	12
	43	8	161	10	14	7	8	29	96	11	2	17
<i>Cr.</i>												
Sent out during { Jan.	6	2	8	1	5	...	...	2	2	3	...	3
Feb.	2	...	23	2	3	...	4	1	3	1	...	3
	8	2	31	3	8	...	4	3	5	4	...	6
On Charge, 1st Mar. ...	35	6	130	7	6	7	4	26	91	7	2	11

13th March, 1901.

R. F. WALLACE.

19. Submitted—The following Statement of Accounts:—

Cash balance on 25th February ... ..	£	s.	d.
Receipts from 26th February to 11th March ...	6,160	12	3
	34	0	0
	6,194	12	3
Cheques drawn from 26th February to 11th March...	702	11	0
	£5,492	1	3

20. Submitted—The following list of publications which had been received since the last meeting :—

*Cambridge (Mass.), Astronomical Observatory of Harvard College.*—Annals. Vol. 43, Part 1. Observations and investigations made at the Blue Hill Meteorological Observatory, Mass., U.S.A., under the direction of A. L. Rotch. The eclipse cyclone and the diurnal cyclones, by H. H. Clayton.

*Copenhagen, Dansk Meteorologisk Institut.*—Isforholdene i de arktiske Have. 1900.

*Copenhagen and Hamburg, Dänisches meteorologisches Institut und Deutsche Seewarte.*—Tägliche synoptische Wetterkarten für den nordatlantischen Ozean und die anliegenden Theile der Kontinente. 14. Jahrg., 1-4 Quart., Dez. 1894–Nov. 1895.

*Curtis, R. H.*—An improved mounting for the lens and bowl of the Campbell-Stokes sunshine recorder.

*Herbertson, A. J.*—The distribution of rainfall over the land.

*Kidderminster, Medical Officer of Health.*—Reports on the health of the Borough by the Medical Officer of Health and Sanitary Inspector. 1900.

*Lamb, Edmund.*—Climatological observations, taken at Borden Wood, in the Parish of Chit-hurst, County of Sussex, during the years 1899, 1900.

*Lansing, Michigan State Board of Health.*—Principal meteorological conditions in Michigan in 1897–1899.

*London, Admiralty, Hydrographic Department.*—Pacific Islands, Vol. 2. Central Groups. Sailing directions for Fiji, Tonga, Samoa, Union, Phoenix, Ellice, Gilbert, Marshall Islands; New Caledonia, Loyalty, New Hebrides, Banks, Torres, and Santa Cruz Islands. Third edition.

*London, British Association for the Advancement of Science.*—Report. Bradford, 1900.

*Mendola, L. e Eredia, F.*—Andamento annuale della differenza di temperatura fra gli osservatori meteorici della R. Università degli studj in Catania.

*Peake, R. E., and Murray, Sir John.*—On the results of a deep-sea sounding expedition in the North Atlantic during the summer of 1899, by R. E. Peake, with notes on the temperature observations and depths, and a description of the deep-sea deposits in this area, by Sir John Murray.

*Vienna, Hydrographischer Dienst in Oesterreich.*—Jahrbuch des K. K. hydrographischen Central Bureaus. 6. Jahrg., 1898.

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63, Victoria Street, March 26, 1901.

PRESENT :

SIR R. STRACHEY, IN THE CHAIR.

PROFESSOR DARWIN.

THE HYDROGRAPER.

MR. SHAW (*Secretary*).

1. The Minutes of the last meeting (March 12th) were read and confirmed.

2. *Antarctic work.*—The Secretary reported that, in pursuance of Minute 2 of March 12th, he had arranged for an expenditure not exceeding £18 in the Land Branch (£6 in the Pantagraph room and £12 in the Land room) and £3 in the Marine Branch for overtime, to be paid for at the same rate as late attendance in the Telegraphic Branch; and that he had engaged Miss E. Digby for copying work for one month at 12s. 6d. per week from March 18th.

Approved.

3. *Deutsche Seewarte* (Minute 3 of March 12th).—The Secretary was instructed to inform the Seewarte that the Office was in correspondence with the Post Office on the matter.

4. *Recent information for Pilot Charts*.—Submitted—the following report :—

March 26th, 1901.

With the Council's approval, I visited Liverpool on the 18th inst. for the purpose of securing reports from captains of steamships on their arrival from time to time. I had personal interviews with the Managers of the following important Transatlantic Steamship Lines :—Cunard, White Star, American, Allan, Dominion, Johnston, and Elder Dempster. These gentlemen willingly agreed to instruct the commanders of the steamers under their management respectively to render every possible assistance in connexion with the Pilot Charts and to circulate amongst them copies of Form No. 51 to be supplied for the record of observations.

The Chairman of the Liverpool Shipowners' Association, the Secretary of the Steamship Owners' Association, and the Representatives of the Mercantile Marine Association and Merchant Service Guild promised, during personal interviews with me, the assistance of their organizations in enlisting volunteers for the work. The former stated that a notice would be printed upon the subject, and should be issued to the Members of their Association.

I returned to work at this Office on the morning of the 22nd inst.

CAMPBELL HEPWORTH,  
Marine Superintendent.

5. *Morning Telegrams to the "Liverpool Journal of Commerce"* (Minute 7 of March 12th).—The Secretary reported the receipt of a letter (M.O. 473) from the Post Office expressing their willingness to extract two groups from the 8 a.m. reports from 30 stations, and compile a telegram to be transmitted to the "Liverpool Journal of Commerce," and stating that a charge of a penny for each station would appear to be reasonable.

It was agreed to make further inquiries about the matter.

6. *Daily Weather Report* (Minute 9 of March 12th).—The Secretary was instructed to convey the thanks of the Council to Mr. T. G. Benn for his telegrams, and to express the willingness of the Council for the telegrams to be continued from 31st March, at the expense of the Office, until 30th June next.

7. *Mr. L. H. Powers*.—Leave was given to Mr. L. H. Powers to join the Royal Army Medical Corps for a year, or during the continuance of the war in South Africa, with the understanding that he would be re-employed in the Office at the expiration of his service on the same terms as now.

8. *Weekly Summary of the Weather for Sea Fisheries*.—The Secretary reported an application (M.O. 422) from Mr. E. T. Hyde, editor and proprietor of the "Fish Trades Gazette," for an early copy of 8 a.m. observations at coast stations on Friday mornings, and a weekly summary of the weather arranged according to fishery districts.

It was agreed that the preparation of the daily report for the press could not be delayed for the preparation of a special report, and that the Secretary should make temporary arrangement for the preparation of the weekly report in the Marine Department upon Mr. Hyde undertaking to make a suitable payment.

9. *Pilot Chart*.—It was agreed that a copy of the April Pilot Chart be sent to Cav. Salvatore Raineri in reply to his letter (M.O. 477) forwarded from the Hydrographic Office.

10. *Fishery Barometers*.—(1) Marvaig—Read—Letter (M.O. 444) from the Fishery Board for Scotland asking for a barometer for the use of the fishermen of Marvaig and Calbost (Lewis), to be placed in Planasker School window, in charge of the teacher.

————— (2) Mallaig—Read—Letter (M.O. 475) from Mr. J. A. Dewar, M.P., asking for a barometer for Mallaig in anticipation of the use of the port by fishing-boats after the opening of the railway next month.

It was agreed to supply a barometer for Marvaig and to make inquiry from the Fishery Board for Scotland about Mallaig.

11. *Specification of Sunshine Recorders* (Minutes p. 110).—Submitted—The following draft letter :—

M.O. 1,726.

Meteorological Office,  
London, S.W.,  
March 28th, 1901.

DEAR MR. GLAZEBROOK,

With reference to the remarks upon sunshine recorders contained in Dr. Chree's report forwarded by you on December 21st, 1900, I am instructed by the Meteorological Council to say that they think it will be desirable to take steps towards the specification of an exact standard instrument, and for that purpose I am to ask that arrangements might be made for Dr. Chree to confer with a representative of this Office, with a view to considering the particulars which might be adopted in the specification of the standard.

Your faithfully,  
W. N. SHAW,  
Secretary.

R. T. Glazebrook, Esq.,  
National Physical Laboratory,  
Richmond.

Approved.

12. *Anemometers*.—Reported—Letter (M.O. 450) from the observer at Fleetwood stating that the pavilion on the Mount Grounds was to be rebuilt, and asking whether the existing anemometer would be re-erected or replaced by another.

It was resolved that the anemometer be re-erected, and that it be stored during the rebuilding of the Pavilion (P.C. 684).

The Secretary was requested to report upon the suggestion to provide a Dines anemometer for Falmouth Observatory.

13. Read—A memorandum from the Marine Superintendent stating that since the last meeting three logs had been received, none of them being excellent.

14. Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

#### WARNINGS ISSUED.

The signals were hoisted on 2 days, the total number of districts warned being 6.

In 2 districts the warnings were justified by subsequent gales (force 8 and upwards), and in 4 districts by moderate gales (force 7).

#### GALES EXPERIENCED FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,  
26th March 1901.

15. Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 11th March ... ..	5,492	1	3
Receipts from 12th to 25th March ... ..	26	0	6
	<hr/>		
Cheques drawn from 12th to 25th March ...	5,518	1	9
	229	16	8
	<hr/>		
Cash balance on 25th March ... ..	£5,288	5	1
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16. Submitted—The following list of publications, which had been received since the last meeting :—

*Augustin, F.*—Die Temperaturverhältnisse der Sudetenländer. 1. u. 2. Theil.

*Bolton, C. P.*—Waterford weather report. 1899, 1900.

*Borchgrevink, C. E.*—First on the Antarctic Continent; being on account of the British Antarctic Expedition. 1898-1900.

*Brussels, Observatoire Royal de Belgique.*—Annuaire astronomique. 1901.

Annuaire météorologique. 1901.

*Hamburg, Deutsche Seewarte.*—Deutsches meteorologisches Jahrbuch für 1899. Beobachtungssystem der Deutschen Seewarte. Ergebnisse der meteorologischen Beobachtungen . . . Jahrg. 22.

*London, Admiralty, Hydrographic Department.*—List of time signals established in various parts of the world. 6th ed., 1901.

*London, Meteorological Office.*—Charts illustrating the weather of the North Atlantic Ocean in the winter of 1898-9.

Hourly means of the readings obtained from the self-recording instruments at the five observatories under the Meteorological Council. 1897.

*Royal National Life-boat Institution.*—The Life-boat. Vol. 17, 1898-1900.

*Royal Society.*—Year-book of the Royal Society of London. 1901.

*Marseilles, Commission de Météorologie du Département des Bouches du Rhone.*—Bulletin annuel. Année 1899.

*St. Lucia, Botanic Garden.*—Meteorological return for 1900.

*Tacubaya, Observatorio Astronómico Nacional.*—Anuario. 1901.